

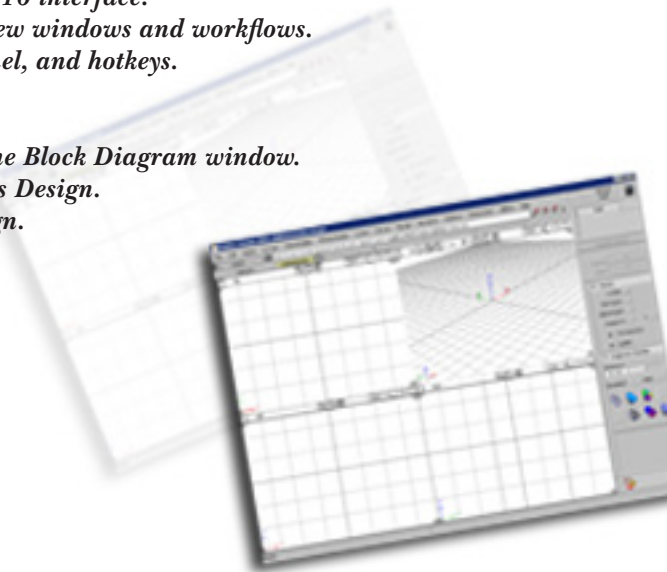
Chapter 1

Getting Started with Autodesk Alias Design

Learning Objectives

After completing this chapter, you will be able to:

- Understand the basic concepts of surfacing.
- Know system requirements for Alias Design 2016.
- Get familiar with Alias Design 2016 interface.
- Get familiar with Alias Design view windows and workflows.
- Use Marking menus, Viewing Panel, and hotkeys.
- Use snapping tools.
- Customize shelves.
- Use the Object Lister and the Scene Block Diagram window.
- Open, save, and close files in Alias Design.
- Change preferences in Alias Design.
- Change color schemes.



INTRODUCTION TO Alias Design

Welcome to the world of Computer Aided Industrial Designing (CAID) with Alias. If you are a new user of this software package, you will be joining thousands of users who are using this creative and conceptual design software package. If you are familiar with the previous releases of this software, you will be able to upgrade your designing skills with tremendously improved release of Alias.

Alias Design, a product of Autodesk Inc. USA, is a complete set of interactive surfacing and concept-based design software. Alias meets all the requirements of the industries based on industrial design workflow. This software provides you with a complete set of tools that are required for conceptual design of surfaces and for their realization into real world surface models. You can communicate your design intent to this software by sketching, building the model, and then evaluating it to realize your design. Alias provides you flexibility in taking design decisions and prevents the design from getting modified or lost during the engineering phase. This software also enables the designers and engineers to collaborate with each other to help ensure that aesthetics and functional requirements of design are taken care of. Alias provides you with the specialized design tools to meet the specific design requirements that are listed below:

1. **Concept Exploration:** The concept is explored through sketching or painting, editing, and modifying images. The concept exploration also involves creating sketches and then importing 3D CAD data to make sure the designs are feasible.
2. **Design Modeling:** Design modeling is an iterative process that involves application of modeling tools to sculpt a 3D model. This process also includes editing 3D models by using the advanced modeling techniques so that the specified requirements of the project are met.
3. **Visualization and Communication:** This concept involves analyzing the concepts and the model to provide feedback to help you understand the design intent. Feedback is given in the form of shading, rendering, and animation. You can use this feedback to communicate better ideas to the software to get the best possible design solution.
4. **Precision Surface Modeling:** In this phase of design, you can create a high quality surface model by using the advanced surface creation tools. These tools enable you to maintain continuity and alignment between different parts of a model. Also, you can render high quality surface models in less time.
5. **Reverse Engineering:** Reverse engineering involves effective handling of scanned data such that it can be extracted properly. The extracted data enables you to evaluate the shape information of the model. If you modify the physical model, the digital data corresponding to that model is updated accordingly.
6. **Productive Environment:** Alias Design provides the intuitive user interface (UI) that helps you work quickly and efficiently. You can even customize the user interface to suit the workflow that you are using for the design process.
7. **Process Integration:** It involves exchanging digital design data with CAD software while maintaining the design integrity at engineering stage. You can use CAD translators to convert

the data into the industry-standard data formats such as IGES, STEP, DXF, DES, and so on. The design data of a model created in Alias can be exchanged with other software packages such as CATIA, CREO, and SOLIDWORKS. You can even prevent the potential problems that can occur while transferring the data into these CAD software packages.

BASIC TERMS USED IN Alias Design

Before you start working with Alias Design, you need to know the basic terms used in this software. Getting acquainted with these terms will help you become easily accustomed to the software. As you go through this book, you will know about these terms in detail as well as learn their applications. A brief description of these terms is given next.

Point

A point is a location defined in three-dimensional space. A point can be located by specifying three spatial coordinates. A point has no size or unit but it specifies the location.

Curve

A curve is a line that deviates from straightness with smooth and continuous transition. A curve represents data in the space. A curve can be represented by nonparametric or parametric equation. The nonparametric equation of a curve relates coordinates directly with each other. For example, the equation of a circle of radius 1 unit and center (0,0) in nonparametric form is expressed as

$$x^2 + y^2 = 1$$

The parametric equation of a curve expresses coordinates of the curve in terms of another variable known as parameter. For example, the equation of a circle in parametric form is expressed as

$$x = \cos t, y = \sin t$$

where x and y are the coordinates of the points on the curve and are the functions of the parameter t .

Surface

A collection of points in three-dimensional space is known as a surface. A surface can be defined as the locus of points that satisfy a constraint equation in the form of $F(X, Y, Z) = 0$. The parametric form of a surface is expressed as

$$\begin{aligned}x &= X(u, v) \\y &= Y(u, v) \\z &= Z(u, v)\end{aligned}$$

where X , Y , and Z are the functions of two parameters, u and v .

The simplest form of a surface is the plane surface. Other examples of surfaces are cylinders, spheres, cubes, and so on.

REPRESENTATION OF CURVES

Curves are categorized into different types based on their representation. The types of curves are discussed next.

Cubic Spline

Cubic spline is a curve that passes through a number of data points and is based on interpolation technique. Cubic spline curves have global control characteristics, therefore, when you modify a single data point, the shape of the entire curve is modified, which sometimes is not desired. As a result, cubic splines are not popular in design applications.

Bezier Curve

Bezier curves were developed by French Engineer, Pierre Bezier at Renault Automobile Company to design automobile bodies. These curves blend at joints and are completely defined by four consecutive points (x_0, y_0) , (x_1, y_1) , (x_2, y_2) , and (x_3, y_3) . A Bezier curve passes through the first and fourth points only, but the second and third points define the slope of the curve at end points. You can change the direction of the curve at joints by specifying the positions of the second and third points. The limitation of Bezier curves is that when you modify the position or shape of one point, it affects the entire curve rather than that local point. Bezier curves are generally used in computer graphics to produce curves that are smooth on all scales.

B-Spline Curves

B-Spline curves provide another effective method to generate curves. B-Splines were developed for ship building. In addition to the characteristics of bezier curves, B-Splines enjoy some other unique advantages. These curves, unlike the Bezier or Cubic spline, provide local control by using control points. This means that modifying one control point affects only that part of the curve that lies near the control point. You can also add more control points without affecting the degree of curve. In other words, the degree of curve is independent of the number of control points.

NURBS

NURBS, an acronym for Non-Uniform Rational B-Splines, encompasses all the characteristics of the Bezier and B-spline curves. Non-uniform reflects the parametric nature of the curve, which allows you to have multi-knots in it. In a NURBS curve, a local vertex is defined by a set of four-dimensional control points. A NURBS curve is expressed in homogenous space as

$$P = (W_i x_i, W_i y_i, W_i z_i, W_i)$$

where x_i , y_i , and z_i are the coordinates of a particular point and W is the weight associated with each control point. The weight can be viewed as an extra shape parameter.

REPRESENTATION OF SURFACES

Surfaces are designed in patches in which each patch corresponds to a rectangular array of data points in u - v space. Surfaces are categorized into different types based on their representation. The types of surfaces are discussed next.

Bicubic Surface

A parametric bicubic surface connects four corner data points and uses a bicubic equation. The characteristics of a bicubic surface are same as that of a bicubic curve. The control characteristics of a bicubic surface are global.

Bezier Surface

A Bezier surface is an extension of bezier curves in two parametric directions, u and v . A Bezier surface consists of control points that are set in an order to build a topological surface. The characteristics of a Bezier surface are same as that of a Bezier curve.

B-Spline Surface

A B-Spline surface is an extension of B-Spline curves. The degree of surface is independent of control points. You can control B-Spline surfaces locally. The characteristics of a B-Spline surface are same as that of a B-Spline curve.

NURBS Surface

A NURBS surface is an extension of NURBS curve. The NURBS surface consists of two parametric directions, u and v . The NURBS surface can be defined by its order, weighted control points, and a knot vector. A knot vector defines the sequence of parameter values that specify how and where the control points affect the NURBS surface. The order of the surface specifies the number of nearby control points that affect a given control point in the surface. The characteristics of a NURBS surface are same as that of a NURBS curve.

Autodesk Alias PRODUCTS

Autodesk Alias family provides a range of products to meet unique creative requirements of the entire industrial design workflow. The various products offered by Alias are discussed next.

Autodesk Alias Design

Autodesk Alias Design is a complete concept design package. Using this package, you can create and communicate design concepts by using sketches, illustrations, visualization, animation, rendering, prototyping, data sharing, and so on. In this book, you will be working on the Alias Design product.

Autodesk Alias Surface

This product of Autodesk Alias is used to develop Class-A surfaces by using the most sophisticated technical features such as reverse engineering, real-time diagnostics, scan-data processing, and so on. This product provides you with a set of tools to attain a high level of quality, precision, and accuracy required in automotive styling.

Autodesk Alias SpeedForm

Autodesk Alias SpeedForm is used to transform 2D sketches and curves into 3D design concepts. It enables you to visualize your final product from concept sketches through Class-A surfacing.

Autodesk Alias Concept

Autodesk Alias Concept is used for concept sketching, fast concept modeling, and visualization. The tools in this package support concept communication, design modelling, fast concept modelling, technical surfacing, reverse engineering, real-time design visualization, and engineering development collaboration.

Autodesk Alias AutoStudio

Autodesk Alias AutoStudio is used for creating automotive design and styling, 3D concept modeling, data integration, technical surfacing, analysis, and visualization. It enables you to realize your final product from concept sketches through Class-A surfacing.

SYSTEM REQUIREMENTS

The system requirements to install Alias Design on your system as well as to ensure smooth functioning of this product are as follows:

- **System Unit:** Microsoft® Windows® 7 (SP1), Windows 8 Professional, Windows 8.1 Professional operating systems, Apple® Mac OS® X 10.9.x, or 10.10.x operating system
- **Processor:** 2 GHz 64-bit Intel® or AMD® multi-core processor
- **Memory:** 4 GB (8 GB recommended)
- **Hard disk:** 5 GB for installation
- **Internal/External drives:** A DVD drive or a shared DVD drive accessed through a network mapped drive for the software installation.
- **Display:** A graphic color display compatible with the selected platform-specific graphic adapter. The minimum recommended monitor size is 17 inches.
- **Graphics card:** Supported NVIDIA® or ATI graphics card with a minimum of 256 MB dedicated texture memory
- **Mouse:** A three-button mouse.

STARTING Alias Design 2016

To start Alias Design 2016, double-click on its shortcut icon on the desktop of your computer; the **Autodesk Alias Design 2016** window will be displayed momentarily, as shown in Figure 1-1.

As Alias Design gets started, a design screen is displayed, as shown in Figure 1-2. Figure 1-3 shows different components of the Alias Design screen. In this figure, the display of grids has been turned off for better visibility of screen components.

Alias Design 2016 INTERFACE

The initial screen of the Alias Design 2016 interface is shown in Figure 1-3. The components of the Alias Design 2016 interface are title bar, **Palette**, **Shelves** window, menu bar, promptline, **Layer** bar, and **Control Panel**. The **Shelves** window, **Control Panel**, and **Palette** may or may not be visible when you start Alias Design 2016 for the first time. They can be made visible by choosing the **Windows** option from the menu bar and choosing the required option from the menu. Various components of the Alias Design 2016 screen/interface are discussed next.

Menu Bar

The menu bar is located at the top of the interface screen of Alias Design interface, as shown in Figure 1-4. It contains different menus that have options to control Alias Design programs such as preferences, layouts, objects, and views. When you click a menu, a flyout showing different options is displayed.



Figure 1-1 The Autodesk Alias Design 2016 window

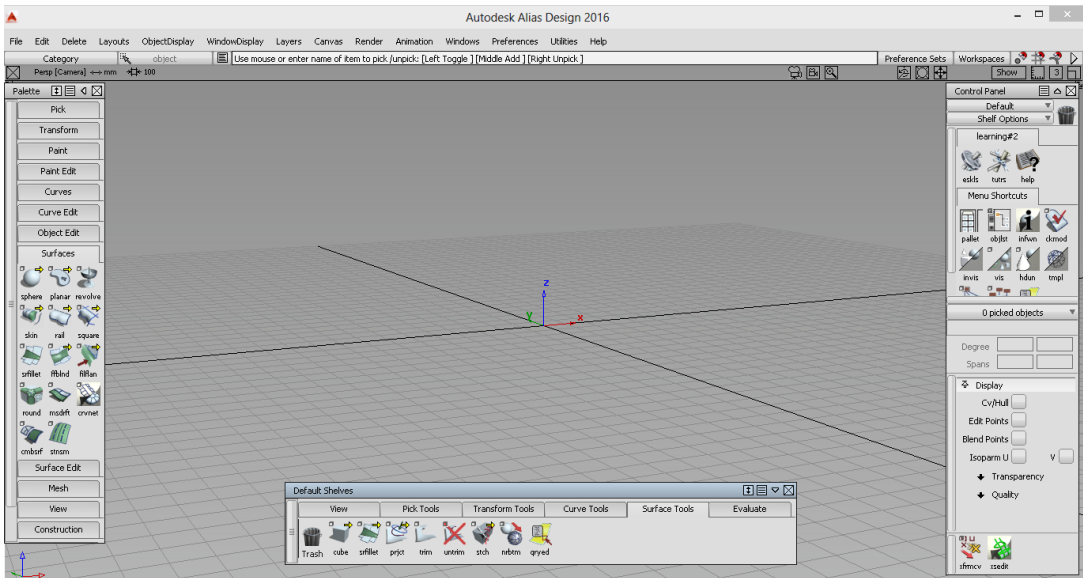


Figure 1-2 Initial screen of the Alias Design 2016 interface

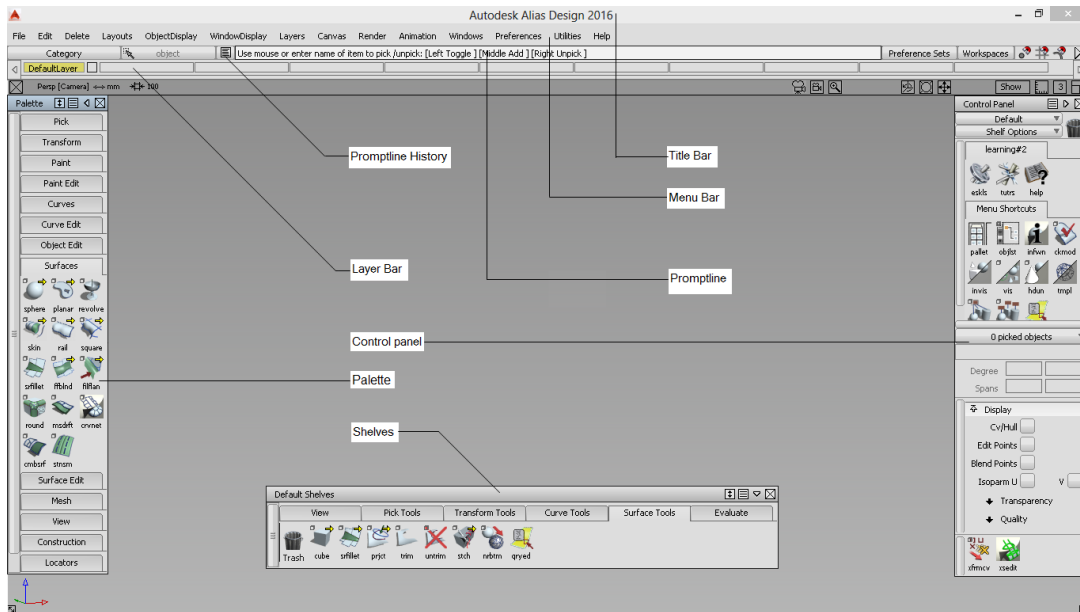


Figure 1-3 Different components of the Alias Design 2016 interface screen

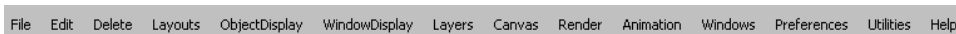


Figure 1-4 The menu bar

Promptline

The promptline is located below the menu bar. It displays instructions for the currently selected tool, error messages that occur while using a tool, numeric feedback, and the input that you key in.

Promptline History

The **Promptline History** icon is located on the left of the promptline. When you click on this icon, a list of promptline messages will be displayed in the **Promptline History** window, as shown in Figure 1-5. The **Promptline History** window is essential in case you want to know all the promptline messages that you may not view in the promptline.

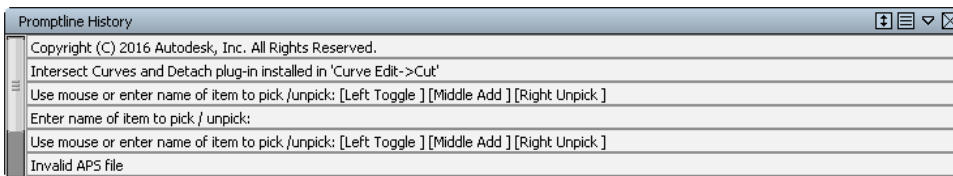


Figure 1-5 The Promptline History window

Layer Bar

The Layer bar is located below the promptline. It is used to organize, assign, and manage objects on the screen. You can create a new layer, assign one or more objects to a new layer, select a

layer, set the current layer as an active layer, or delete a layer. You can view the options associated with a layer in the **Layers** flyout that is displayed on choosing **Layers** from the menu bar, as shown in Figure 1-6. The options in the Layer bar are discussed in the next chapter.

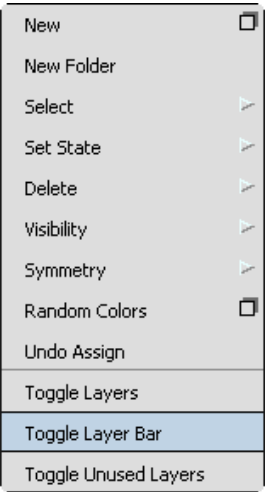


Figure 1-6 The **Layers** flyout

Work Area

The work area or window area includes all the windows of the interface screen. It occupies maximum space in the interface window. When you start Alias Design for the first time, the perspective view window will be displayed. The view windows are used to display entities in orthographic or perspective views. The view windows will be discussed later in the chapter.

Palette

By default, the **Palette** is displayed on the left of the interface screen. Figure 1-7 shows the **Palette**. You can move it to any position on the interface screen by clicking on the title bar and then dragging it. If the **Palette** is not displayed by default, you can invoke it by choosing **Windows > Palette** from the menu bar. Alternatively, you can choose the **Palette** button from the **Menu Shortcuts** tab of the **Control Panel** to invoke the **Palette**. The **Palette** contains tools for creating, editing, and manipulating objects. These tools are displayed on expanding the **Palette**. The **Palette** can be expanded by choosing the tabs in it. Partial view of the expanded **Palette** is shown in Figure 1-8.

Control Panel

By default, the **Control Panel** is displayed on the right of the interface screen, refer to Figure 1-3. If it is not already displayed, you can invoke it by choosing **Windows > Control Panel** from the menu bar. This panel has different modes that control modeling, visualization, and painting. This panel can be used as a combination of the **Shelves** window, tools, and display controls to provide a focussed workflow. It also contains some learning tools and menu shortcuts that are used to invoke respective tools quickly. You can also customize the **Control Panel** by inserting tools or the whole tab from the **Palette** and the **Shelves** window so that you can select the tools from the **Control Panel**.

Shelves Window

By default, the **Shelves** window, as shown in Figure 1-9, is located at the bottom of the interface screen. You can move this window to any position by clicking and then dragging. You can change the position of the **Shelves** window in the interface screen. To do so, choose **Preferences > Interface** from the menu bar; a cascading menu will be displayed. Click on the box on the right of the **Palette/Shelves Layout** option in the flyout; the **Palette/Shelves Layout** dialog box will be displayed. Next, select the required radio button from the **Shelf Position** area of the dialog box to specify the new position for the **Shelves** window. This window is also used to change the position of the **Palette**. If the **Shelves** window is not displayed, you can invoke it by choosing **Windows > Shelves** from the menu bar.

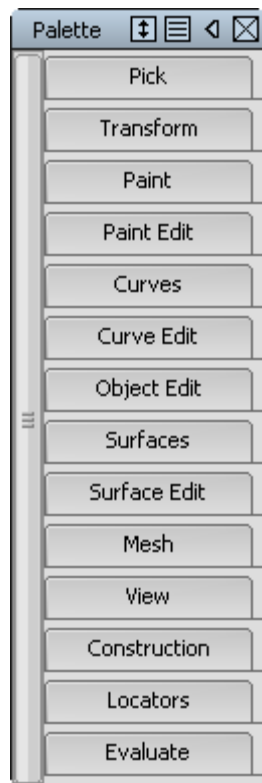


Figure 1-7 The Palette



Figure 1-8 Partial view of the expanded Palette

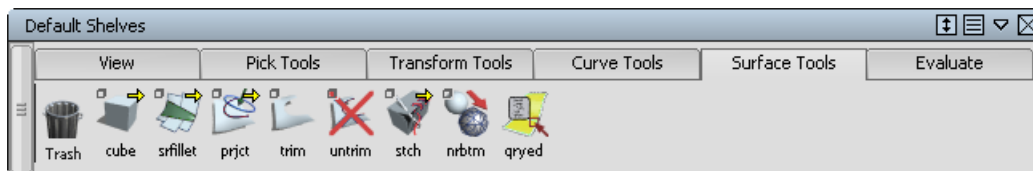


Figure 1-9 The Shelves window

Status Bar

The status bar is displayed at the bottom of the interface window. The status bar displays the status of the current or active tool. Also, it displays the function of the tool.

HISTORY VIEW

The **History View** window shows the stepwise procedure of creating a model or a feature, as shown in Figure 1-10. The **History View** window can be invoked by choosing **Windows > Information > History View** from the menu bar. You can view the objects and the operations used in creating the model by viewing this window.

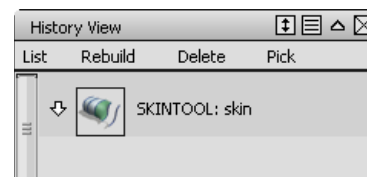


Figure 1-10 The History View window

Alias Design WINDOWS/LAYOUTS

When you start Alias Design for the first time, the **Perspective** window/layout is displayed on the interface screen, refer to Figure 1-2. The size, position, and number of windows can be changed according to your need. If you have resized your windows and are using more than one window then the window in which you are currently working is called active window and it is highlighted in a white border. You can activate a window by clicking on its title bar.

Types of Windows

There are three types of windows in Alias Design: **Orthographic**, **Perspective**, and **Paint**. These windows are discussed next.

Orthographic Window

As the name suggests, the orthographic window shows two-dimensional view of the object in six different views. These views are top, front, right, bottom, back, and left. You can zoom and pan the orthographic views.

Perspective Window

In this window, you can see the 3D view of a model. You can zoom, rotate, and pan a model in the perspective view. You can control the perspective view in better way by using the ViewCube. The ViewCube will be discussed later in this chapter.

Paint Window

This window is used for viewing canvases and overlays. This window allows you to easily focus on the task of sketching without being distracted by the 3D modeling world. This window is not visible when you create a new file. You can make it visible by choosing **Layouts > Paint** from the menu bar or by pressing the F3 key. You can close the **Paint** window by choosing the Close box given on the top left corner of the window.

Navigating the Windows

You can control the camera views in Alias Design to get the best possible view. The three options to do so are track (pan), dolly (zoom), and tumble (rotate). The SHIFT and ALT keys with the mouse buttons play important roles in performing these tasks. These options are discussed next.

Track (Pan)

The track (pan) option is used to move the scene or view for better visibility. Tracking is done by pressing the SHIFT and ALT keys and then dragging the middle mouse button to track up, down, left, and right.

Dolly (Zoom)

The dolly (zoom) option is used to increase or decrease the size of the scene. You can dolly a scene or view by pressing the SHIFT and ALT keys and then dragging the right mouse button. Dragging the right mouse button upward zooms in the scene or view, whereas dragging the button downward zooms out the scene or view.

Tumble (Rotate)

The tumble (rotate) option is used to rotate or tilt the scene or view to get better orientation of the model. Tumbling is done only in the **Perspective** window. It is done by pressing the SHIFT and ALT keys and then dragging the left mouse button.

Controlling the Window Display

In Alias Design, you can rearrange, resize, move, and close windows. You can also control the display of windows as well as their numbers. These operations are discussed next.

Arranging Windows

By default, perspective window will be displayed on starting a new file in Alias Design. These windows occupy equal space on the interface screen. But, you can change the number, position, and display of the windows by using the options in the **Layouts** menu. Choose **Layout** from the menu bar; the **Layouts** menu will be displayed, as shown in Figure 1-11. This menu shows various options to select a window or windows. You can also use hotkeys to toggle between different windows. Hotkeys will be discussed later in this chapter.



Figure 1-11 The **Layouts** menu

Resizing a Window

You can change the size of a window by using the resize arrows located at each corner of the window, as shown in Figure 1-12. To resize a window, drag the resize arrow diagonally upward or downward by using the left mouse button. The size of the window increases or decreases depending upon the direction of movement of the cursor and the window selected for resizing. You can click on the Maximize box given at top right corner of each window to resize the window to its maximum. After clicking on this box, the active window fills the entire space of the interface screen. This allows you to work in a single window. You can move, close, and resize the windows by using the controls located on the borders of the windows. The controls of the windows are Close box, Title bar, Maximize box, Show, ViewCube, and Resize corners. The Close box control is used to close a window. The Title bar displays the name of the window such as Top, Front, Right, Bottom, Back, Left, and Persp. The Title bar also displays the controls such as Rotate, Zoom in/out, and Track. The Maximize box control is used to display the window in the entire interface screen. The Resize corners control is used to increase or decrease the size of the window depending upon the direction used for dragging. The ViewCube is used to control the view of the object in the **Perspective** window and is discussed later in this chapter. Figure 1-12 shows the **Perspective** window with the controls mentioned above.

Note



The grid display has been turned off and the background color of the window has been changed to white for clear visibility of the controls. You can toggle the grid display on or off by choosing **WindowDisplay > Toggles > Grid** from the menu bar. The background color of the window is changed by using the **User Colors** dialog box. To invoke this dialog box, choose **Preferences > Interface > User Colors** from the menu bar. The options in the **User Colors** dialog box will be discussed later in this chapter.

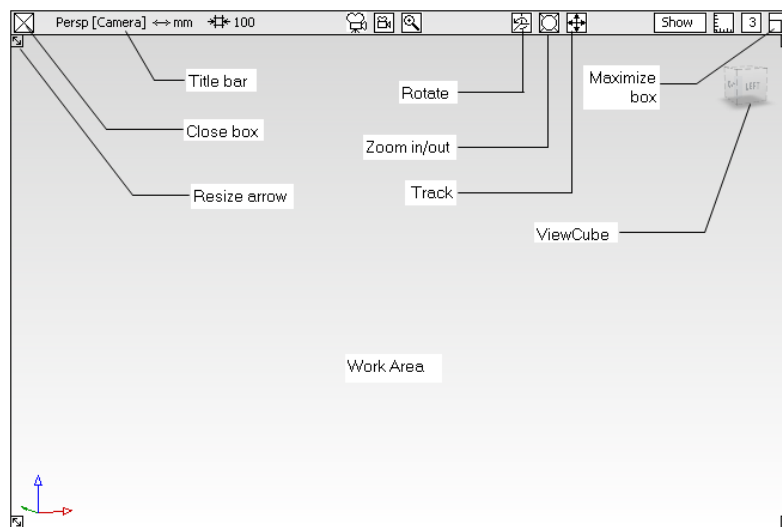


Figure 1-12 The *Perspective* window showing different controls

Moving a Window

You can move a window anywhere on the interface screen. To move a window, click on the title bar of the window and then drag it to the desired position. The window will be snapped to the new location. When you do so with other windows, the windows get stacked one above the other. The stacking of windows is called overlapping. To activate a window from the stack, click on it; the required window will be displayed on of the interface screen. You can reset these unorganized windows to the default layout by choosing **Layouts** from the menu bar and then choosing the required option from it.



Note

*If you choose **Layouts > All Windows** from the menu bar, a cascading menu will be displayed. The options in the cascading menu enable you to view the windows arranged in different patterns such as all windows, All (Front/Persp), All (Top/Persp), All (Right/Persp), All (SketchPad), and so on.*

Creating a User-defined Layout

You can create a user-defined layout in Alias Design. In a user-defined layout, you can arrange different windows and resize them as per your requirement. You can save a user-defined layout and retrieve it. To create a user-defined layout, you need to close all the windows/layouts from the interface by clicking on the Close boxes of the respective windows. Next, choose a window from the **Layouts** menu; the chosen window will be displayed. Next, click on the Maximize box to reduce the size of the window. You can also drag corners to resize the window. Click and drag the title bar of the window to place it at the required position, as shown in Figure 1-13.

Similarly, invoke other layouts and then rearrange and reposition them according to your requirement; a user-defined layout is displayed, as shown in Figure 1-14. After creating the layout, you need to save it. To do so, choose **Layouts > User Windows > Save Current Layout** from the menu bar; the **Save As** dialog box will be displayed. Browse to the required location folder and then enter the name in the **File name** edit box. Next, choose the **Save** button; the

user-defined layout will be saved at the specified location. You can use this layout to create your models and designs. To retrieve a saved layout, choose **Layouts > User Windows > Retrieve Layout** from the menu bar; the **Open** dialog box will be displayed. Browse to the folder where the required layout is saved. Next, select the layout and then choose the **Open** button from the dialog box; the selected layout will be retrieved

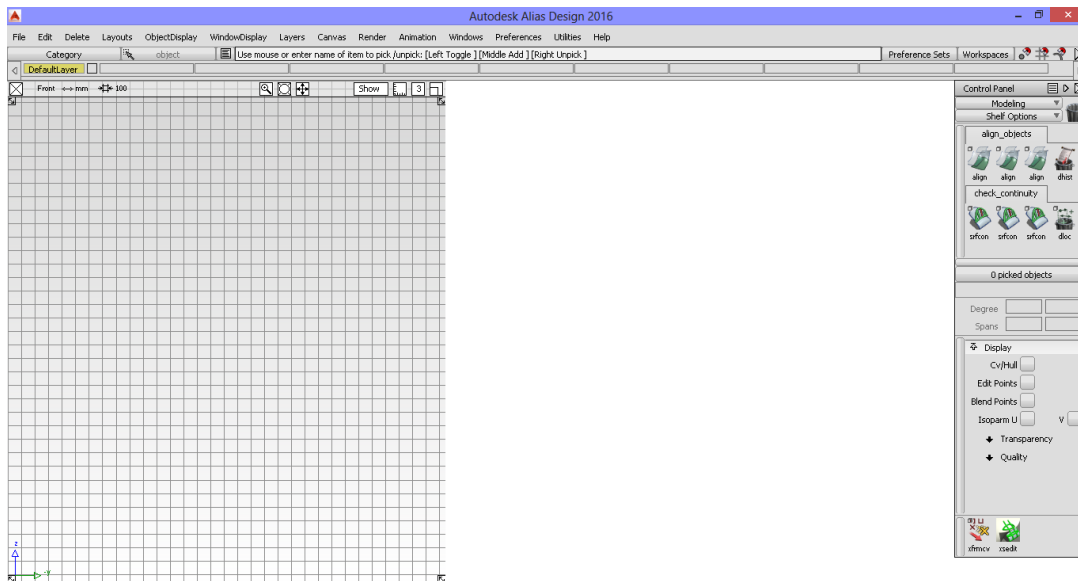


Figure 1-13 The Front window after resizing and repositioning

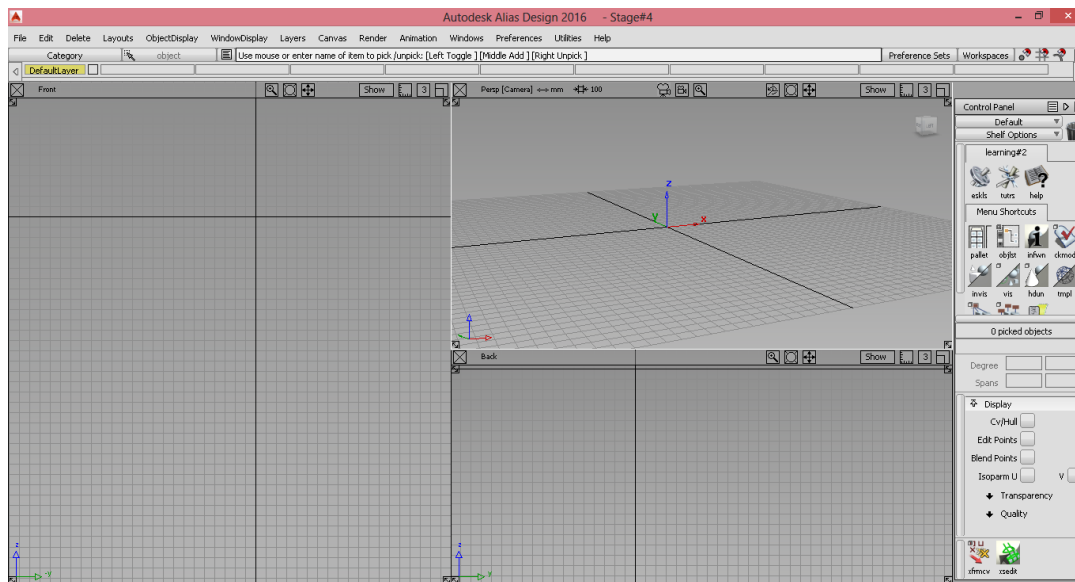


Figure 1-14 A user-defined layout

USING MARKING MENUS

Marking menus enable you to invoke different tools. They contain fewer tools than the **Shelves** window and the **Palette** but they help you invoke the tools faster. Marking menus do not appear by themselves. To display these menus, press the SHIFT and CTRL keys and click. It is recommended not to use marking menus unless you are an advanced user of Alias Design and continue to use the tools from the **Palette** or the **Shelves** window. The mouse buttons work in coordination with the SHIFT and CTRL keys.

By default, the tools in the Marking menus are grouped into three categories based on the mouse button used for invoking them. The marking menu displayed by using the left mouse button are used as selection tools whereas the marking menu displayed by using the middle mouse button are used as translation tools. Similarly, the marking menu displayed by using the right mouse button are used as display control tools. The selection procedure for different marking menu is discussed next.

Press and hold the SHIFT and CTRL keys and then press the left mouse button; the tools used for the selection of entities will be displayed radially along the cursor, as shown in Figure 1-15. Press and hold the SHIFT and CTRL keys and then press the middle mouse button; the tools used for translation will be displayed, as shown in Figure 1-16. Similarly, use the right mouse button with the SHIFT and CTRL keys pressed to view the tools that are used for displaying entities, as shown in Figures 1-17. To invoke a tool from any of these marking menu, drag the cursor on the required tool; a dark thick line will be displayed and the tool will be highlighted in blue. Figure 1-18 shows the **Curves** tool being invoked by using the marking menu.

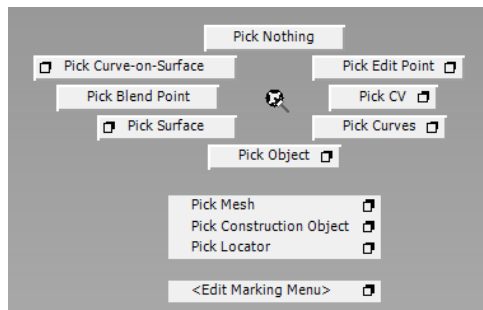


Figure 1-15 Marking menu displayed on pressing the left mouse button

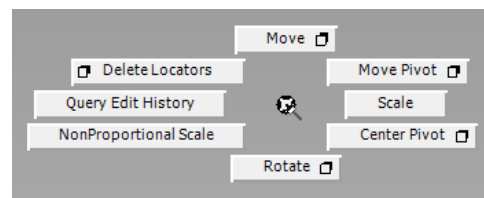


Figure 1-16 Marking menu displayed on pressing the middle mouse button

You can edit the marking menus to rearrange the tools contained in them. To do so, choose the **<Edit Marking Menu>** option from the marking menu that are displayed using the left mouse button; the **Default Marking Menu** editor will be displayed, as shown in Figure 1-19. The tools in this editor are grouped under three tabs: **Selection**, **Translation**, and **Display**. To view tools grouped under a tab, choose the respective tab from the **Default Marking Menu** editor. You can rearrange tools within the three tabs of the **Default Marking Menu** editor. To do so, drag the required tool from one of these tabs with the middle mouse button and then drop it in another tab. You can also invoke the **Default Marking Menu** editor by choosing **Preferences > Interface > Marking Menu** from the menu bar.

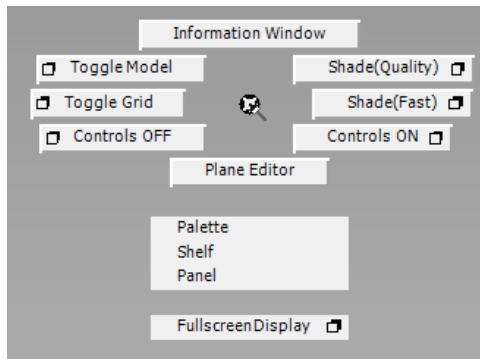
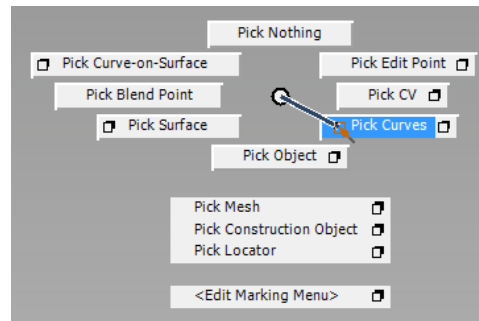


Figure 1-17 Marking menus displayed on pressing the right mouse button



*Figure 1-18 Invoking the **Curves** tool by using the Marking menu*

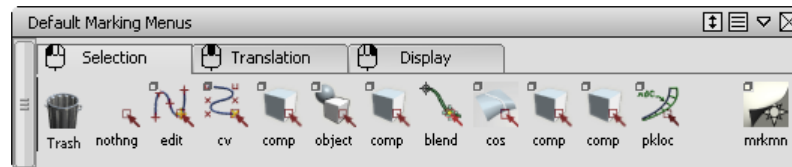


Figure 1-19 The Default Marking Menu editor

VIEWING PANEL

In Alias Design, the **Viewing Panel** is not available by default. Therefore, you need to set the preference for displaying it. To do so, choose the **Preferences** option from the menu bar; a flyout will be displayed. Choose the box icon on the right of the **General Preferences** option in the flyout; the **General Preferences** dialog box will be displayed. From this dialog box, choose the **Viewing** tab and then choose the **View Panel** option in the **View control** drop-down. The **Viewing Panel** only appears in the **Perspective** window. This panel allows you to switch from the perspective view to a user-defined or a default view of the model. To display this panel, activate the **Perspective** window and then press the SHIFT and ALT keys. The **Viewing Panel** is displayed as long as you keep the SHIFT and ALT keys pressed. Figure 1-20 shows the default **Viewing Panel**. To expand this panel, click on the **Open/Close variants section** icon; the variants section will be displayed. Figure 1-21 shows different options in the **Viewing Panel** which are discussed next.

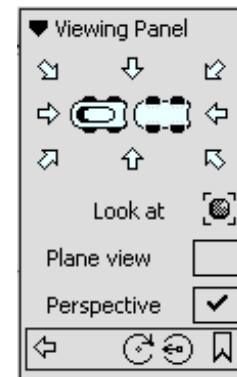


Figure 1-20 The default Viewing Panel

Preset View

The Preset view area contains arrows that are used to display front, back, top, bottom, and side views of the model. The four diagonal arrows in this area represent three-quarter view of the model. To display a view, click on the corresponding arrow in this area. The top or bottom view is displayed by choosing the top or bottom view icon located at the center of this option.

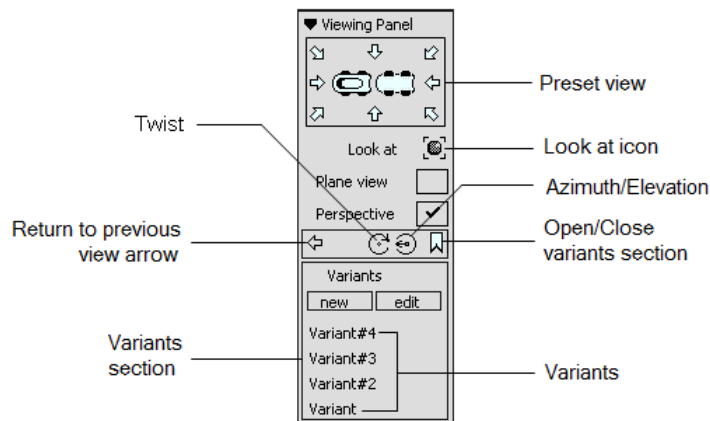


Figure 1-21 The expanded *Viewing Panel*

Look At

Click on this icon to orient and center the object in such a way that it fits best in the view window. The view obtained by clicking on the **Look at** icon involves automatic application of zooming, tracking, or rotation of the canvas.

Plane view

Choose this button to use the construction plane as the ground (view) plane. On doing so, the views will behave like orthographic views. The preset views will track and dolly like orthographic views.

Perspective

This check box is selected by default and is used to display the preset views as the perspective views. The preset views will track and dolly like the perspective views.

Variants

The **Variants** area is used to create a user-defined view and save it in the **Viewing Panel**. To do so, modify the current view by using various display controls such as dolly, track, tumble, and so on. Next, click on the **New** option in the **Variants** area; a variant will be created and saved in the variant section. You can create any number of user-defined views and then save them. You can delete, add, toggle between the existing variants by clicking on the **Edit** option. When you click on the **Edit** option, the **Variant Lister** window will be displayed, as shown in Figure 1-22. The **Variant Lister** window is discussed next.

VARIANT LISTER

The **Variant Lister** window is used for creating and presenting multiple variants of a scene. Using this window, you can create, edit and store different variations of views, shading, layer, object, grids and so on. You can invoke the **Variant Lister** window by choosing **Windows > Variant Lister** from the menu bar. The **Variant Lister** window is shown in Figure 1-22.



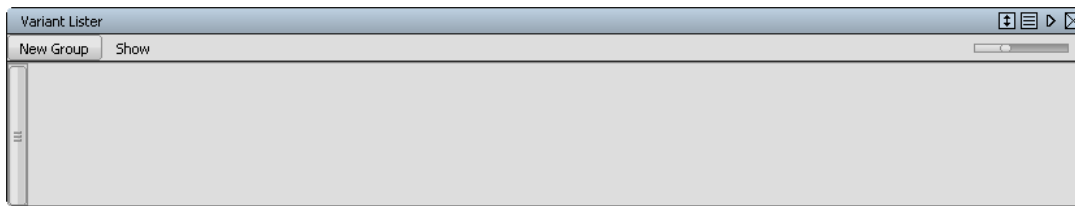


Figure 1-22 The Variant Lister window

In Alias Design 2016, the **Bookmarks** window is replaced with the **Variant Lister** window. You can access scenes in all the variants with a single click on their corresponding thumbnail. You can group and resize the thumbnail of all the variants listed in the **Variant Lister** window. The options in this window are discussed next.

New Group

This button is used to create a new group of the variants in the **Variant Lister** window. To create a new group in the **Variant Lister** window, click on the **New Group** button below the title bar; a new group will be added to the **Variant Lister** window with thumbnail of variant of the current scene and the **Capture** button, as shown in Figure 1-23.

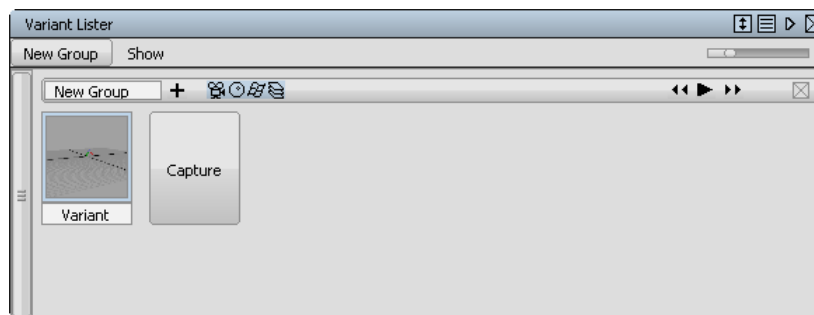


Figure 1-23 New Group Created in the Variant Lister window

Show

When you click and hold on the **Show** button; a flyout will be displayed. This flyout contains options to enable/disable display mask, playback controls, and bookmark names in the **Variant Lister** window.

Capture

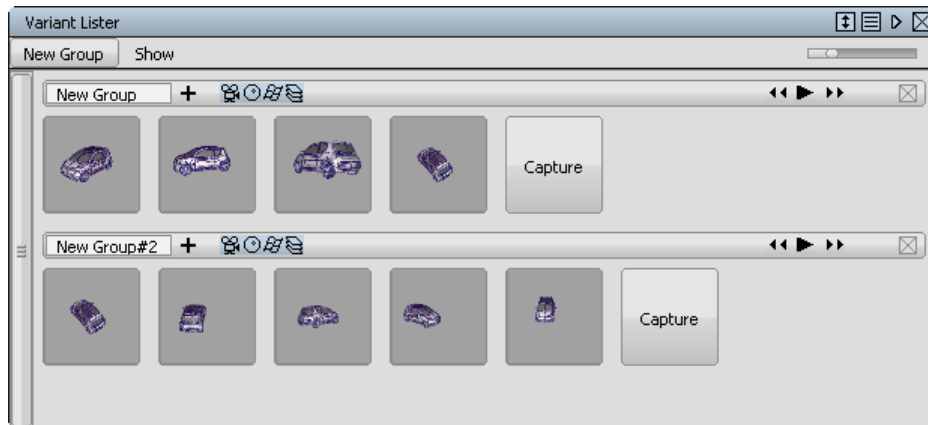
This button will be available only when you create a new group in the **Variant Lister** window. This button is used to capture a new variant. When you click on the **Capture** button, a new variant will be added in the corresponding group. When you right click on any variant, a flyout is displayed with **Recapture**, **Delete** and **Publish** options. The **Recapture** option is used to recapture a variant with new modification. You can delete a variant by using the **Delete** option from the flyout. The **Publish** option is used to save the image of a variant. When you choose this option, the **Save As** dialog box will be displayed. Specify the location of the file and then choose the **Save** button from the dialog box. You can also add new variant by clicking on the **New bookmark** (+) button available on the left side of the group title bar.

Mask Icons

When you create a new group, four mask icons are displayed on the group title bar. These icons are **Apply camera**, **Apply shading**, **Apply Geometry**, and **Apply layer visibility**. These mask icons are used to include or exclude the mask attributes of all the variants in the group. These mask icons are discussed next.

The **Apply Camera** icon controls camera information such as view, up, position of the variant. The **Apply shading** icon controls the shading information such as hardware shading, diagnostic shading, switch shader assignment, and grid display. The **Apply geometry** icon controls the geometry information such as object visibility, locator visibility, layer symmetry, reference file, and file set visibility. The **Apply layer visibility** icon controls layer visibility information such as layer visibility, category visibility, and reference layer visibility.

You can resize the thumbnails of variants by using the slider bar available on the top right side of **Variant Lister** window. Figure 1-24 shows the different groups and variants created in the **Variant Lister** window. You can re-order all the variants between groups or in the same group by dragging their thumbnails using the middle mouse button. You can change the name of the newly created group with the edit box available on the left side of the group title bar.



*Figure 1-24 The groups and variants in the **Variant Lister** window*

ViewCube

Autodesk Alias Design 2016 provides you with an option to change the view of a model freely in 3D space. This option is called ViewCube. The ViewCube is a 3D navigation tool that allows you to switch between the standard and isometric views in single click. By default, the ViewCube is displayed at the top right corner of the **Perspective** window. If it is not displayed, you can display it by setting the options in the **General Preferences** dialog box as discussed earlier in the **Viewing Panel**. By default, the ViewCube is displayed in inactive state, as shown in Figure 1-25. When you move the cursor closer to the ViewCube, it gets activated, refer to Figure 1-25. The faces, vertices, and edges of the ViewCube are known as clickable areas (hotspots). If you place the cursor on any clickable area (hotspot), the area will be highlighted. Click in the required area to orient the model such that the clicked area and the model become parallel to the screen. You can switch to the top, front, back and other views by clicking on the corresponding face in the ViewCube.

If you press and drag the left mouse button on the ViewCube, you will get a visual feedback of the current viewpoint of the model. The House icon provided near the top left corner of the ViewCube is used to switch to the home view or perspective view. If you click on the down arrow given near the lower right corner of the ViewCube, a shortcut menu will be displayed, as shown in Figure 1-26. The options in this shortcut menu are discussed next.

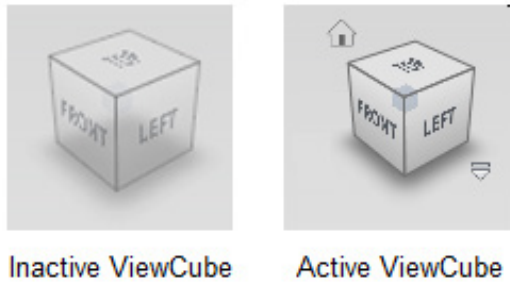


Figure 1-25 Inactive and active states of the ViewCube

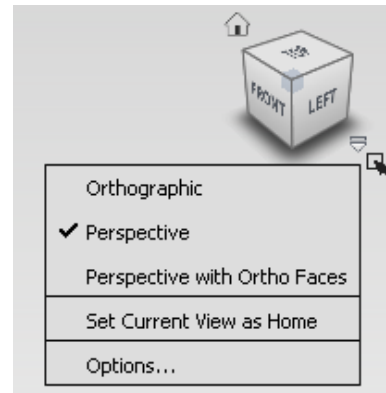


Figure 1-26 The shortcut menu

Orthographic

Choose this option to display the model in the orthographic view.

Perspective

Choose this option to display the model in the perspective view.

Perspective with Ortho Faces

Choose this option to display the model in orthographic projection when one of the faces of the ViewCube is active.

Set Current View as Home

Choose this option to set the current view as the home view in the **Perspective** window.

Options

This option is used to specify the options related to the display of the ViewCube. This option is discussed in detail later in this chapter.

If you press the SHIFT+ALT keys in the **Perspective** window, the **NavBar** will be displayed, as shown in Figure 1-27. Most of the options in the **NavBar** are the same as those discussed in the ViewCube. The remaining options are discussed next.

Camera Based Tumble

This option allows you to dolly, track, and tumble the view by using the SHIFT+ALT keys along with different mouse buttons. The dolly, track, and tumble operations have already been discussed in this chapter.

Object Based Tumble(Azimuth/Elevation)

This option will be available only when you toggle the **Camera Based Tumble** option in the **NavBar**. This option allows you to dolly, track, and revolve the view by using the SHIFT+ALT keys along with different mouse buttons. This option allows you to change the Azimuth/Elevation of a view by using the left mouse button. You can also twist the view by dragging the right mouse button horizontally.

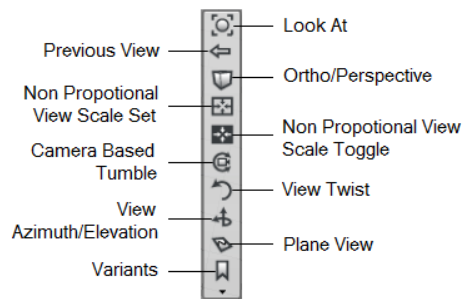


Figure 1-27 The NavBar and its components

View Twist

This option will be available only when you choose the **Camera Based Tumble** option from the **NavBar**. Choose this option and then drag the cursor with the left mouse button; the view will be twisted in the perspective view.

View Azimuth/Elevation

This option will be available only when you choose the **Camera Based Tumble** option from the **NavBar**. Choose this option and then drag the cursor with the left mouse button; the view will be revolved in the perspective view. Note that the view revolves differently with different mouse buttons.

Non Proportional View Scale Set

This option is used to scale the view independently along the horizontal and vertical axes in the orthographic window. Click this option and drag the mouse left or right to scale the view horizontally and drag the mouse up or down to scale the view vertically. You can also scale a view horizontally by dragging it using the middle mouse button. Similarly, you can scale the view vertically by dragging the view using the right mouse button.

Non Proportional View Scale Toggle

This option allows you to toggle between proportional and non-proportional views.

You can set the parameters of the ViewCube. To do so, choose the **Option** option from the flyout that is displayed on choosing the down arrow given near the lower right corner of the ViewCube; the **ViewCube Options** dialog box will be displayed, as shown in Figure 1-28. The options in this dialog box are discussed next.

On-screen position

This area is used to specify the position of the ViewCube in the **Perspective** window. By default, the **Top Right** button is chosen in this area. As a result, the ViewCube is displayed on the top right corner of the **Perspective** window. You can change the position of the ViewCube to top left, bottom right, or bottom left by choosing the corresponding button in this area.

ViewCube size

This area is used to specify the size of the ViewCube in the **Perspective** window. You can change the size of the ViewCube to tiny, small, large, normal, or automatic size by choosing the respective button from this area.

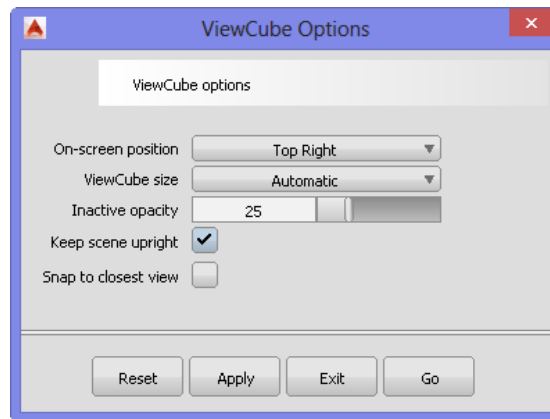


Figure 1-28 The ViewCube Options dialog box

Inactive opacity

This edit box is used to specify the opacity of the inactive ViewCube. Alternatively, you can drag the slider bar given at the right of this edit box to change the opacity of the inactive ViewCube.

Keep scene upright

This check box is selected by default and is used to keep the scene upright.

Snap to closest view

Select this check box to snap the viewpoint of the scene/window to one of the fixed views while dragging the scene. Note that the viewpoint snaps to the fixed view that is angularly closer to it.

Reset

This button is located at the bottom of the **ViewCube Options** dialog box. This button is used to reset the settings of the dialog box to default values.

Apply

This button is used to save the current setting of the ViewCube in the **ViewCube Options** dialog box.

Exit

Choose this button to exit the **ViewCube Options** dialog box without saving the current settings.

Go


Choose this button to apply the current settings and then exit the **ViewCube Options** dialog box.

SNAPPING TOOLS


Snapping restricts or constrains the movement/placement of objects and points to the specified locations or paths. The locations or paths are defined by grid points, curve, edges, edit points,

or control vertices. There are three snapping tools in Alias Design. These snapping tools are displayed on the right of the promptline. These tools allow you to toggle snap modes on and off. Snapping works in coordination with the middle and right mouse buttons. Different snap modes are discussed next.


Snap to CV/Edit Point

 You can snap a current object or a tool to the nearest CVs, edit points, pivot points, or locators by using the **Snap to CV/Edit Point** tool. To invoke this tool, click on the **Snap to CV/Edit Point** button located on the right of the promptline on the interface screen. You can also invoke this snapping tool by pressing the CTRL key before selecting any tool.

Snap to Grid

 You can use the **Snap to Grid** tool to snap the current object or the tool to the nearest grid point or grid intersections. To invoke this tool, click on the **Snap to Grid** button on the interface screen. You can also invoke this tool by pressing the ALT key before selecting any tool.

Snap to Curve

 You can snap the current object or the tool to the nearest curves, edges, or curves-on-surface by using the **Snap to Curve** tool. To invoke this tool, click on the **Snap to Curve** button from the interface screen. You can also invoke this tool by pressing and holding the ALT and CTRL keys before selecting any tool.

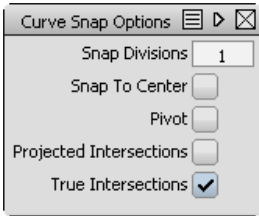


Figure 1-29 The Curve Snap Options dialog box

You can control different parameters of curve snapping by using the **Curve Snap Options** dialog box, as shown in Figure 1-29. To invoke this dialog box, click on the arrow given on the right of the **Snap to Curve** button. The options in this dialog box are discussed next.

Snap Divisions

This edit box is used to specify snap divisions on the curve. Snap divisions are displayed as snappable locations (light blue line segments on the curve). By default, this edit box displays 1 and assumes the curve as one segment with snappable points displayed at endpoints of the curve. If you enter 3 in this edit box, the snappable points will be displayed at 1/3rd and 2/3rd of the curve length in addition to endpoints. Similarly, entering 4 in this edit point will display snappable points at 1/4th, 2/4th, and 3/4th of the curve length in addition to endpoints. You can snap the current tool to these snappable locations.

Snap to Center

Select this check box to snap the current object or the tool to the center of the bounding box of the curve. When you select this check box and click on the curve, the center of the bounding box of the curve, represented by a + sign surrounded by a small circle, will be displayed near the curve. If you move the cursor in proximity of the center of the bounding box, the current tool will be snapped to it.

Pivot

Select this check box to snap the current object or the tool to the pivot point of the curve. When you select this check box and click on the curve, the pivot point of the curve will be displayed. If you move the cursor in proximity of the pivot point, the current tool will be snapped to it.

Projected Intersections

Select this check box to snap the current object or the tool to intersection points between the curves in orthographic or perspective views even if the curves do not intersect with each other. Intersection points are represented by pink cross marks.

True Intersections

This check box is selected by default and is used to snap the current object or tool to intersection points of curves, curves-on-surface, surface edges, isoparametric curves, and trim edges. If you want to snap with the **True Intersections** check box selected, you must intersect curves with each other. You can also snap a new curve-on-surface to the intersection of two curves-on-surface on a single surface. You will learn about curves-on-surface, isoparametric curves, and surface edges in later chapters.

WORKFLOWS IN Alias Design

Alias Design provides you different working environments such as painting, modeling, and visualization. These environments are known as workflows. You can invoke these workflows by choosing **Preferences > Workflows** from the menu bar and then choosing the required option from the flyout displayed, as shown in Figure 1-30. By default, the **Default** workflow is chosen from the flyout. However, you can choose other workflows from this menu to suit your requirements. Each workflow contains different set of tools that are used in different applications. You can even customize workflows according to your requirements. Workflows used in Alias Design 2016 are discussed next.

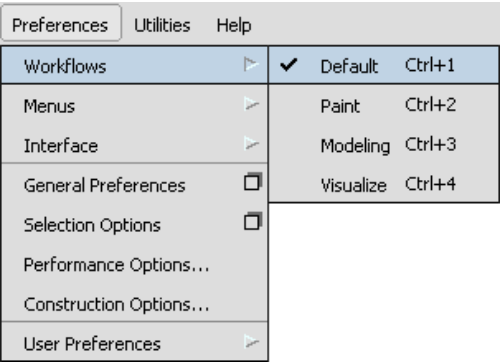


Figure 1-30 Invoking workflows from the Preferences menu

Default

The **Default** workflow is suitable for general work, painting, rendering, and animation. This workflow displays all the tools in menus, Marking menus, **Palette**, **Shelves** window, and **Control Panel**. You can invoke this workflow by choosing **Preferences > Workflows > Default** from the menu bar. The shortcut key for invoking the **Default** workflow is CTRL+1.

Paint

This workflow is suitable for sketching (painting) and creating 2D works. It displays the sketch-related tools in menus, Marking menus, **Palette**, **Shelves** window, and **Control Panel**. You can invoke this workflow by choosing **Preferences > Workflows > Paint** from the menu bar. The shortcut key for invoking the **Paint** workflow is CTRL+2. In this workflow, the grid display is turned off.

Modeling

This workflow is suitable for 3D modeling. It displays the modeling-related tools in menus, Marking menus, **Palette**, **Shelves** window, and **Control Panel**. In this workflow, the number of tools related to painting, rendering, and animation are reduced or hidden to facilitate the modeling operations easily. To invoke this workflow, choose **Preferences > Workflows > Modeling** from the menu bar. The shortcut keys for invoking the **Modeling** workflow are CTRL+3. In this workflow, the grid display is turned on.

Visualize

This workflow is suitable for rendering objects. The **Visualize** workflow displays the rendering related tools in menus, Marking menus, **Palette**, **Shelves** window, and **Control Panel**. In this workflow, the number of tools related to painting, modeling, and animation are reduced or hidden to facilitate the rendering processes easily. To invoke this workflow, choose **Preferences > Workflows > Visualize** from the menu bar. The shortcut keys for invoking the **Visualize** workflow are CTRL+4. In this workflow, the display of grids is turned on.

UNDERSTANDING SYMBOLS IN MENU, PALETTE, AND SHELVES WINDOW

When you choose an option from the menu bar, a menu with the associated commands or tools is displayed. You can choose any option from the menu depending upon the task you want to perform. These options have symbols beside them, as shown in Figure 1-31. One more symbol is given at the top right corner of some tools in the **Shelves** window and the **Palette**. The function of these symbols is discussed next.



This symbol indicates that the associated option or tool has an option window, dialog box, or an editor.

You can open the associated option window, dialog box, or editor by clicking on this symbol. You can change the settings (parameters) of the corresponding option by using these option windows, dialog boxes, or editors. This symbol is also located at top left corner of tools in the **Palette** and the **Shelves** window. To open the associated option window, dialog box, or editor from the **Palette** and the **Shelves** window, double-click on the tool/button. Alternatively, press the SHIFT key along with the left or right mouse button.



This symbol indicates that the selected option has another associated cascading menu displaying sub-options in it. To open the associated cascading menu, click on this symbol. Next, choose the required sub-option from this cascading menu.



This symbol indicates that the selected tool has a submenu. This symbol is seen at top right corner of tools in the **Shelves** window and the **Palette**. Press and hold the left or right mouse button on the tool to display the submenu. Next, select the required tool from this submenu. You will learn more about these symbols and their associated tools in later chapters.

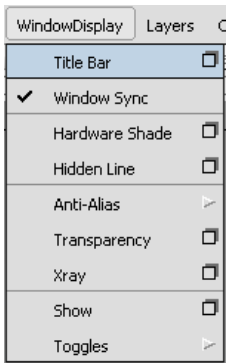


Figure 1-31 The **WindowDisplay** menu showing symbols

HOTKEYS

Hotkeys are the shortcut keys that allow you to invoke tools or choose different options from menu bar. You can use hotkeys to speed up your task. There are some default hotkeys that have been assigned to some tools and options in the menu bar. For example, the function key F8 is the hotkey for displaying the **Perspective** window. You can also assign a new hotkey for these tools and options in the menu bar. To do so, choose **Preferences > Interface > Hotkeys/Menu Editor** from the menu bar; the **Hotkeys / Menus Editor** will be displayed. Click on a down arrow of any of the options given under the **Function Titles** area; a new flyout will be displayed with different options in it. Next, click on the down arrow of any of the options in this rollout; the dialog box will expand, as shown in Figure 1-32. To assign a new hotkey to a tool/option, check the box given on the right of any options under the **Default Workflow Short Menu Display** area. Next, enter a new hotkey in the edit box given under the **HotKey Defines** area and choose the **Apply** button; the **confirm** message box will be displayed. Choose the **OK** button from the **confirm** message box; the hotkey will be assigned to the respective tool/option. To change the default hotkey, delete the assigned hotkey and then enter a new hotkey. You will get familiar with hotkeys in later chapters.

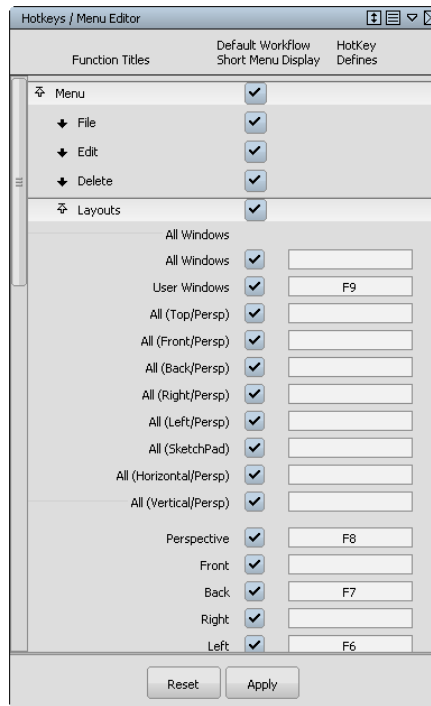


Figure 1-32 The expanded Menu/Hotkeys Editor

CREATING CUSTOMIZED SHELVES

In Alias Design, a tool is invoked from the **Palette** or the **Shelves** window. Invoking a particular tool from the **Palette** or the **Shelves** window activates the tool and allows you to proceed further with that tool. Alias Design provides you with a better option to invoke a tool without using the **Palette** or the **Shelves** window. You can create customized shelves and use them to invoke tools.

These shelves are created in the Shelf area of the **Control Panel**. The procedure to create your shelf for the **Sphere** tool in the Shelf area is discussed next.

1. Choose **Windows > Control Panel** from the menu bar; the **Control Panel** will be displayed on the right of the interface screen.
2. Create a new shelf in the **Control Panel**. To do so, press and hold the left mouse button on the **Shelf_Set** button in the **Control Panel**; the **Shelf_Set** flyout will be displayed, as shown in Figure 1-33. Choose the **New** option from this flyout; the **confirm** message box will be displayed, as shown in Figure 1-34. In the **confirm** message box, enter the new name (Surface) in the **Shelf Name** edit box and choose the **OK** button; a new shelf with the entered name will be displayed.

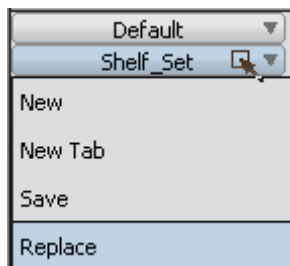


Figure 1-33 The Shelf flyout

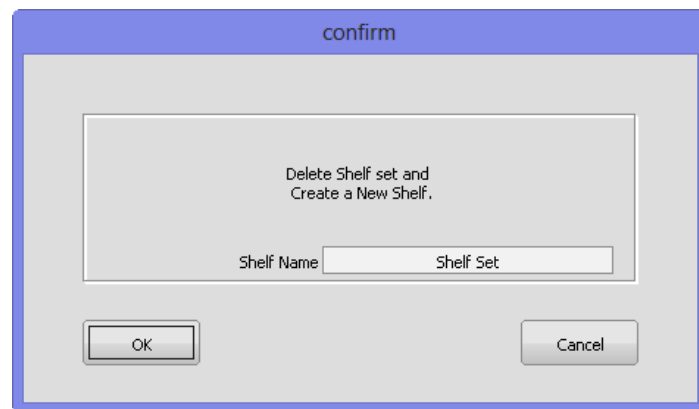


Figure 1-34 The *confirm* message box

3. Choose **Windows > Palette** from the menu bar; the **Palette** will be displayed. Next, expand the **Surfaces** tab by clicking on it. Drag the **Sphere** tool to the newly created shelf (**Surface**) by using the middle mouse button; the **Sphere** tool will be added to the new (**Surface**) shelf, as shown in Figure 1-35.
4. You can delete an existing shelf. To do so, drag the shelf from the **Control Panel** using the middle mouse button and drop it on the **Delete** icon at the top right corner of the interface screen; the existing shelf will be deleted.

Similarly, you can add tools to the **Control Panel** from the **Shelves** window. You can even place the entire tool tab from the **Shelves** window to the **Control Panel**. To remove a tool or a tab from the shelves of the **Control Panel**, drag the tool or the tab by using the middle mouse button and drop it on the **Delete** icon.



Note

While dragging the tool icon from the **Shelves** window or the **Palette**, the tool icon will not be displayed. Only a tool tip will be displayed on top of the cursor.

OBJECT LISTER WINDOW

Like any other modeling software, Alias Design keeps the track record of all features of a model or a scene in hierarchical order. This record is kept in the **Object Lister** window. This window allows you to locate an object and its duplicate copy. You can also group and ungroup objects using the **Object Lister** window. While modeling a complex shape, it is difficult to pick an object from the view windows. In such a case, you can pick objects from the **Object Lister** window. This window is also used to view hidden objects. However, you cannot pick hidden objects from the **Object Lister** window. To invoke the **Object Lister** window, choose **Windows > Object Lister** from the menu bar; the **Object Lister** window will be displayed, as shown in Figure 1-36.

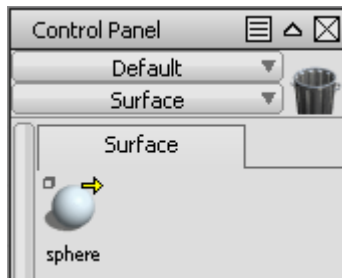


Figure 1-35 The Sphere tool added to the Surface shelf

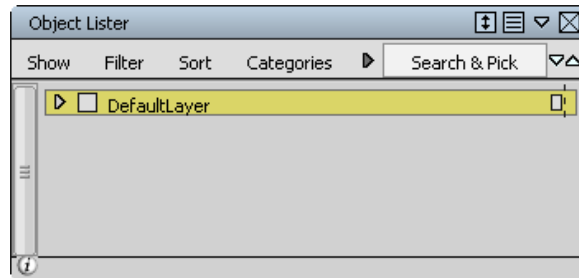





Figure 1-36 The Object Lister window

The default **Object Lister** window will not display the hierarchical structure of model in scene. To display this structure, click on the  sign on the left of the **DefaultLayer** node; the **DefaultLayer** node will expand and display different groups and nodes. These groups and nodes will be displayed in compressed state. Click on the  sign on the left of these nodes to expand them; the hierarchical structure showing tools, objects, and features used in modeling will be displayed. To view all the structures of the **Object Lister** window and its associated nodes and groups simultaneously, press the SHIFT key and then click on the  sign in the **DefaultLayer** node. The expanded **Object Lister** window for a model is shown in Figure 1-37. The options in the **Object Lister** window are discussed next.

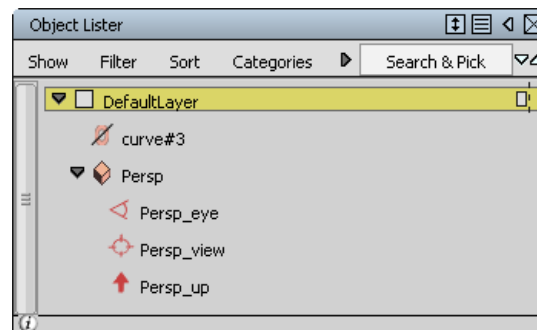


Figure 1-37 The expanded Object Lister window

Show

This option is used to specify the way you want the items to be listed in the **Object Lister** window. You can list items as layers or simple objects.

Filter

This option is used to control the display in the **Object Lister** window.

Sort

This option is used for shorting a mode for the layers.

Categories

This option will be available only when you choose the **By Layer** option from the **Show** shortcut menu. The **Categories** option allows you to display objects of all layers, selected layers, or reference layers. Also, this option enables you to control the visibility of layers through the **Layer Categories** window that will be displayed when you choose the **Open Editor** option from the **Categories** shortcut menu.

Expand/Contract All Branches



Choose this button to expand or collapse the node. This button allows you to toggle between the expanded and collapsed node states.

Search & Pick

You can pick objects by entering their names in the Search & Pick field. The names entered are case-sensitive.

Scroll Up/Down Arrows

The default size of the **Object Lister** window cannot always show all the features of a model. To view the picked objects that are not visible in the default size **Object Lister** window, use the Scroll Up and Scroll Down arrows on the right of the **Object Lister** window. Click on the Scroll Up arrow to view the lowest picked object at the top of the **Object Lister** window. Click on this arrow once more to view the next picked object. Similarly, click on the Scroll Down arrow to view the highest picked object at the bottom of the **Object Lister** window. Click on this arrow once more to view the next picked object.

DIFFERENT STATES OF NODE

The information about objects, features, and tools that have been used are stored in the nodes in the **Object Lister** window. Depending on the object, tool, and features, the nodes in the **Object Lister** window may be displayed in different states. You can expand or compress these node states. The node states are discussed next.

Grouped


This node state is represented by an orange block in the **Object Lister** window. If you expand a grouped node, its individual members will be displayed. This node state represents the grouping of several objects.

Instanced

This node state is represented by a white cube in the **Object Lister** window. Sometimes, you may need to create a duplicate copy of an object as an instance. This duplicate copy is displayed as

an instance in the instanced node. This instance acts as a reference for an existing geometry in view windows. The duplication of objects will be discussed in Chapter 5.

Compressed

Sometimes, the **Object Lister** window displays many nodes and gets crowded. You can collapse some nodes of the **Object Lister** window into a single node. This node state is known as the compressed node state. In this state, all nodes collapse into a single node. You can click on the  sign given on the left of the compressed node to expand it again.

Invisible

If you want to make objects invisible, use the invisible node state. In this state, the text corresponding to the nodes appears in gray. To make an object or a feature invisible, select it from the **Object Lister** window and right-click; a shortcut menu will be displayed. By default, the **Visible** option is displayed in the shortcut menu with a tick mark on the left. Choose the **Visible** option; the tick mark disappears and the nodes turn invisible. When you switch over to invisible node, the tick mark disappears. You can view properties of the object in the **Information Window** that will be displayed when you choose the **Properties** option from the shortcut menu.

Templated

The templated node state represents the objects that are visible but cannot be picked or transformed. The templated objects are highlighted in pink when they are activated. In the inactive state, the templated objects are highlighted in grey.

SCENE BLOCK DIAGRAM (SBD)

The **Scene Block Diagram** (SBD) is another way to display the internal structure of a model or an object in the view windows. To view the internal structure of a model, choose **Utilities > SBD > SBD Window** from the menu bar; the **Scene Block Diagram** window will be displayed. The **Scene Block Diagram** window is a view window like an orthographic window or the **Perspective** window. It displays the internal structure of a model or an object as a graphical representation rather than a visual representation in the window. Figure 1-38 shows the **Scene Block Diagram** window for surfaces.

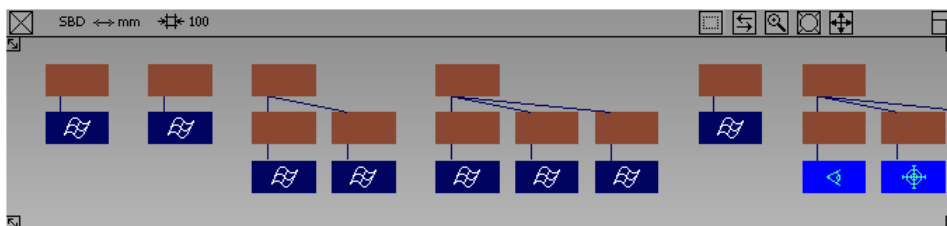


Figure 1-38 The **Scene Block Diagram** window for surfaces

The **Scene Block Diagram** window of a model displays all objects such as curves, surfaces, lights, cameras, transformations, groups, and so on in the form of nodes. The main components or objects in this window are known as DAG (Directed Acyclic Graph). The brown nodes in the **Scene Block Diagram** window are known as positioning nodes. The positioning nodes represent the transformation applied to the geometry below them. The blue nodes in this

window are known as geometry nodes and represent the internal structure of the model or the object. These nodes also represent the objects that are without construction history. The green nodes represent the objects that have construction history. Control vertices, edit points, and other features of internal structure of a geometry do not have separate nodes. They are stored as part of internal information of the object. The camera and lights are displayed in light blue nodes. You can notice that the top level objects represent top nodes and are placed at the top of the **SBD** window. The object or component nodes of the model are grouped under the top level nodes. The geometry nodes representing the internal structure of objects are given below the component nodes. Different types of geometry in an object are represented by different symbols. The **SBD** window is used to pick individual components of a model or an object. You can hide nodes under a picked node. To do so, pick a node and then choose **Utilities > SBD > Compress SBD** from the menu bar; the nodes under the picked node will be hidden. The hidden nodes are represented by two brown rectangles, one inside the other. To display the hidden nodes again, pick the hidden nodes and then choose **Utilities > SBD > Expand SBD** from the menu bar; the hidden nodes are displayed again in the **SBD** window. Like the **Object Lister** window, the **SBD** window is also used to view the hidden objects. However, you cannot pick the hidden objects in this window.

STARTING A NEW FILE

To start a new file, choose **File > New** from the menu bar; the **confirm** message box will be displayed, as shown in Figure 1-39. This message box will ask you whether the objects, shades, and so on need to be deleted before starting a new session. Choose the **Yes** button; a new wire file will be started.

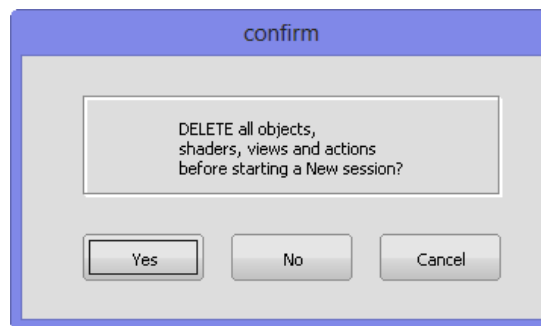


Figure 1-39 The *confirm* message box

OPENING AN EXISTING FILE

To open an existing file, choose **File > Open** from the menu bar; the **Open** dialog box will be displayed, as shown in Figure 1-40. Browse to the location of the file to be opened; a list of all the files and folders in the specified location will be displayed. Double-click on the folder containing the file to be opened. Select the required wire file and choose the **Open** button from the **Open** dialog box. Alternatively, you can enter the name of the file to be opened in the **File name** edit box. You can open image files (bmp, jpeg, tiff, als), wire files (wire), or modeling files (stp, prt, igs, and so on) by using the **File Types** drop-down list. When you select a file, the preview of the selected file is displayed in the preview window.

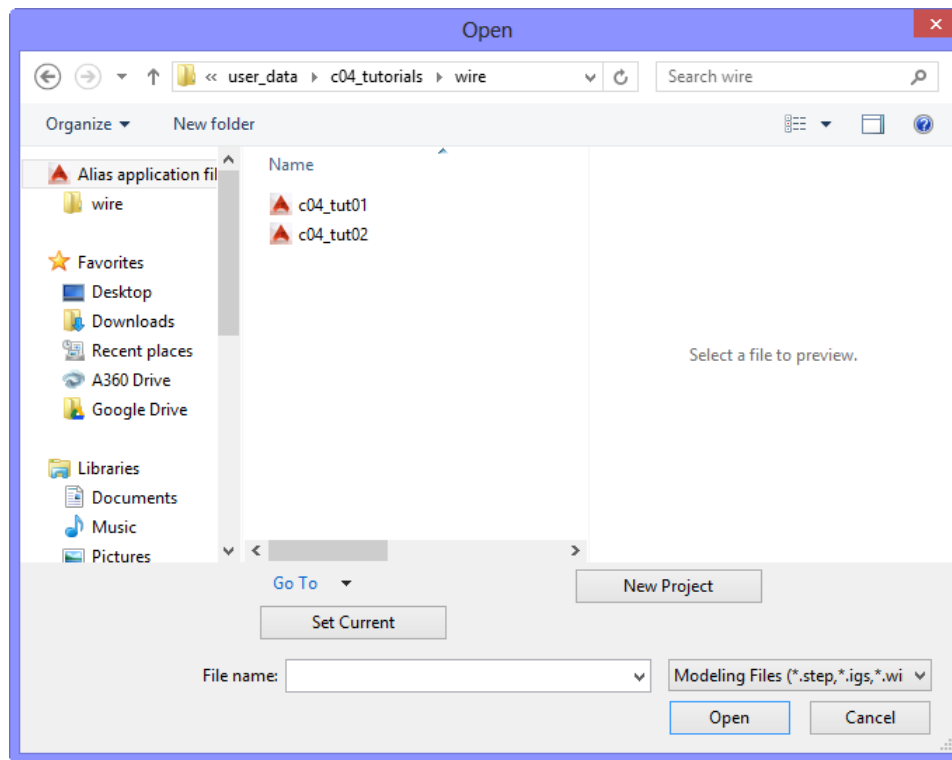


Figure 1-40 The Open dialog box

You can set different options for opening files in different formats such as WIRE, IGES, STEP, STL, OBJ, and so on. To do so, choose the **File** option from the menu bar; a flyout will be displayed. Click on the box given on the right of the **Open** option; the **Open File Options** window will be displayed, as shown in Figure 1-41. By default, all the check boxes in the **Wire Options** area are selected. When you choose the **Open** button from this window; the features associated with the selected file such as windows, cameras, lights, shaders, and so on will be displayed in the opened file. To open an existing file without some or all these features, clear the corresponding check boxes in the **Wire Options** area. Similarly, you can set options for other file formats while opening an existing file.

OPENING RECENT FILES

You can also open the recently used or saved files in Alias Design 2016. To do so, choose **File > Open Recent** from the menu bar; a cascading menu showing all recently used files as well as their locations will be displayed. Choose the required file from the cascading menu; the **confirm** message box will be displayed. Choose the **Yes** button from this message box; the selected file will open. To delete the history of all the recently used or saved files, choose the **Clear History** option from the flyout.

SAVING FILES

You can save your file or store your data in Alias Design 2016 and can retrieve it later. To do so, choose **File > Save** from the menu bar. If you are saving the file for the first time by using the **Save** option, the **Save As** dialog box will be displayed, as shown in Figure 1-42.

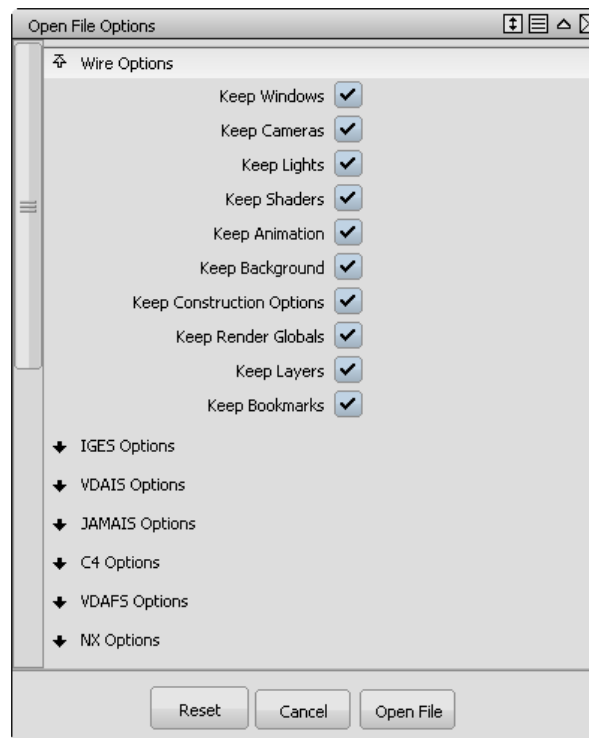


Figure 1-41 Partial view of the **Open File Options** window

Browse to the location where you want to save the file; a list of all the files and folders in the specified location will be displayed. Double-click on the folder in which you want to save the file or use the **New folder** option to create a new folder. Enter the name of the file in the **File name** edit box and then choose the **Save** button from the **Save As** dialog box. The options in this dialog box are discussed next.

Go To

This drop-down list is used to specify directory for saving the file. You can specify **Current Home**, **Current Project**, or **Current Wire** saving directory.

New Project

This button is used to create a project directory. The project directory helps you systematically organize your files and also to easily retrieve the required files. To create a new project directory, specify the location and select the **New Project** button; a folder is created by name *new_project*. You can rename this folder as required. Next, select this folder and then select the **Set Current** option; a project directory will be created and gets set as the current directory. Enter the name of the file in the **File name** edit box and choose the **Save** button; the file will be saved in the directory created. Next time, if you want to save a file in this directory, select **Current Wire** from the **Go To** drop-down list and enter the name of the file in the **File name** edit box. Next, choose the **Save** button from the **Save As** dialog box; the file will be saved.

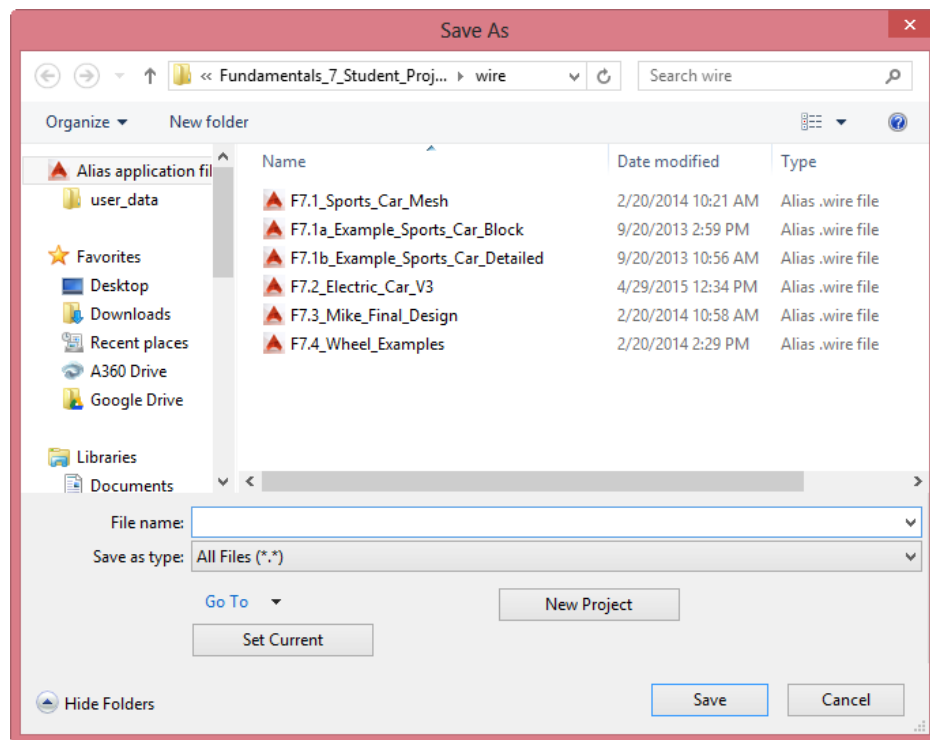


Figure 1-42 The Save As dialog box

Up one Level



Choose this button to move one level up in the current directory. On choosing this button, you can navigate through different directories.

New Folder

Choose this button to create a new folder in the list box. When you choose this button, a folder with the name **New folder** will be displayed in the list box. Click outside this folder to keep this name or rename it as per your requirement.

View Menu



Choose this button to display a flyout. The options in this flyout are used to view files and folders of the list box with an arrangement. You can arrange these files and folders in the form of thumbnails, tiles, icons, list, or with details by choosing the corresponding options in the flyout.

File name

This drop-down list is used to specify the name of the file to be saved. If you select an existing file from the list box, its name will be displayed in the **File name** drop-down list. You can overwrite the selected files by choosing the **Save** button.

Save

After specifying the location and name of the file, choose the **Save** button to save the file.

Cancel

Choose this button to exit the **Save As** dialog box without saving the file.

Saving the File with a New File Name/Format

You can change the file name/format of an already saved file by using the **Save As** option. To save a file with a different name, choose **File > Save As** from the menu bar; the **Save As** dialog box will be displayed. Rename the file, specify the location of the file to be saved, and choose the **Save** button; the file will be saved. You can save files in different formats such as WIRE, IGES, STEP, OBJ, and so on. To do so, choose the **File** option from the menu bar; a flyout will be displayed. Click on the box given on the right of the **Save As** option; the **Save All Options** window will be displayed, as shown in Figure 1-43. The options in this window are discussed next.

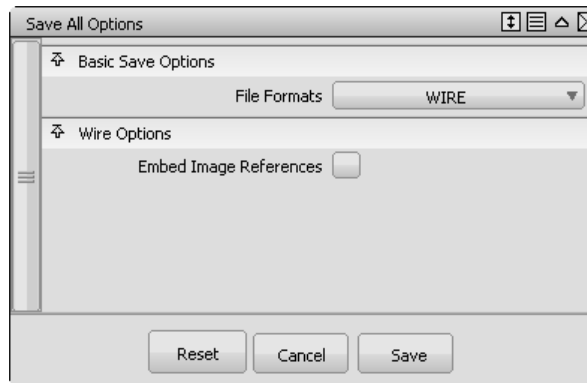


Figure 1-43 The *Save All Options* window

Basic Save Options

The options in this area are used to specify the file formats for saving the files. The **File Formats** drop-down list is used to specify the format of the file to be saved. By default, the **WIRE** button is displayed in the **File Formats** drop-down list. As a result, files will be saved in the wire format. Press and hold the left mouse button on the **WIRE** button; a drop-down list displaying all file the formats will be displayed. You can choose the **IGES**, **OBJ**, **UGS NX**, **CATIA V5**, **STEP**, or some other button from the drop-down list to specify the required file format.

Wire Options

This area is used to specify various options associated with the wire file format. Changing the file format by using the **File Formats** drop-down list changes this area as well. For example, if you choose the **STEP** button from the **File Formats** drop-down list, the **Wire Option** area will be replaced by the **STEP Options** area displaying the options associated with the **STEP** format.

Reset

This button is used to get the default values again after you have made some changes.

Cancel

Choose this button to exit the **Save All Options** window without saving any change.

Save

Choose this button to exit the **Save All Options** window with the changes saved in it.

PRINTING THE OUTPUT

After creating a model, you can preview, print, and send output to a printer. To do so, choose **File > Print** from the menu bar; the **Alias Print** dialog box will be displayed, as shown in Figure 1-44. The options in this dialog box are discussed next.

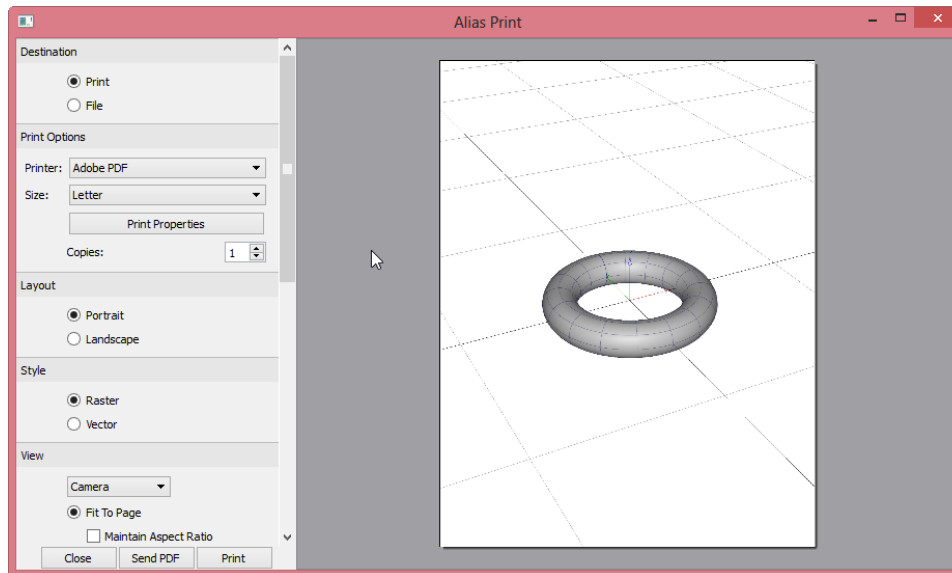


Figure 1-44 The Alias Print dialog box

Alias Print Window

The **Alias Print** window displays the print preview of the model as the view in the selected window. It occupies maximum space in the **Alias Print** dialog box.

Destintion

In this area, there are two radio buttons, **Print** and **File**. The **Print** radio button is used to send the job to print to the selected printer. The **File** radio button is used to convert your file into pdf and save it.

Print Options

In this area, you can specify the destination printer, paper size, print setup and the number of copies to be printed.

Page Size

This option will be available only when you select the **File** radio button in the **Destination** area. The **Size** drop-down list in the **Page Size** area is used to specify the print paper size.

Layout

In this area, you can specify the printing format by selecting the **Portrait** or **Landscape** radio button.

Style

The radio buttons in this area are used to control the quality of print. The **Raster** radio button is used to produce poor quality of printing. But takes less time for printing. The **Vector** radio button produce good quality of printing.

View

In the **View** area, you can select an option from the drop-down list to select the view to be printed.

View Options

In the **View Options** area, you can hide/show grid or background by selecting/deselecting the corresponding check box. By using the **Model** check box you can toggle between the wireframe and shaded modes of the view.

Margins

The Left, Right, Top, and Bottom edit boxes in the **Margins** area are used to specify the values for the margins. You can assign the required unit system to the margins by selecting the required unit from the **Margin Units** drop-down list.

Alignment

This area will be activated only when you select the **Scale** radio button from the **View** area. The options in this area are used to define the alignment of the printable page.

Close

This button is used to close the **Alias Print** dialog box.

Send PDF

You can choose this button to save the file in the PDF format and to attach it with a new e-mail in your default email program.

Print

Choose this button to print the content of the view.

EXITING THE APPLICATION

To exit or quit the current session of Alias Design, choose **File > Exit** from the menu bar; the **confirm** message box will be displayed, as shown in Figure 1-45. To exit Alias Design after saving the file, choose the **Save** button from the **confirm** message box; the **Save As** dialog box will be displayed. The options in this dialog box have been discussed earlier. After specifying the location and name of the file, choose the **Save** button; the current session of Alias Design will be closed. To exit the session without saving the file, choose the **Don't Save** button from the **confirm** message box; the current session will be closed. Choose the **Cancel** button from the **confirm** message box to exit the **confirm** message box. Alternatively, you can exit the current session of Alias by pressing ALT+E keys.

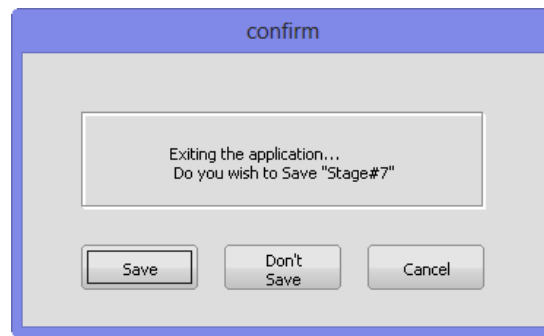


Figure 1-45 The *confirm* message box

CONTROLLING THE DISPLAY OF WINDOWS

In Alias Design, you can control the display of view windows. The methods of controlling the display of the view window are discussed next.

Controlling the Display of the Title Bar

You can turn the visibility state of the title bar in the active window on or off. By default, the visibility state of the title bar is turned on. As a result, this bar is displayed on the top of each view window. To turn its visibility state off, choose **WindowDisplay > Title Bar** from the menu bar. To change the options for displaying the title bar, click on the box on the right of the **Title Bar** option; the **Title Bar Options** dialog box will be displayed, as shown in Figure 1-46. You can control the display of the title bar in all windows or current (active) window by selecting the corresponding button in the **Toggle Type** area of this dialog box.

Toggling the Window Components

Alias Design provides you with another option to toggle the visibility state of window components. To toggle the visibility state of window components on or off, choose **WindowDisplay > Toggles** from the menu bar; the **Toggles** cascading menu will be displayed, as shown in Figure 1-47. Choose the required option from this cascading menu to turn off or on the visibility of the corresponding window component. For example, if you choose the **Grid** option from the **Toggles** cascading menu; the visibility of grid will be toggled on or off based on the initial state of grid. Similarly, choose another option from this cascading menu to toggle between the visibility states of the corresponding window component. You can set options for these components by clicking on the box given on their right. You can also toggle the visibility states of components in the active window without affecting other windows. To do so, click on the **Show** button given on the title bar of the active window; a flyout showing different components of the corresponding window will be displayed. Choose the required component from the flyout to turn its visibility state on/off.

Controlling the Display of Window Components

By default, components of the view window such as grids, pivots, locators, guidelines, cameras, lights, and so on will be displayed in view windows. Sometimes, you may need to turn the visibility of these components off. To do so, choose **WindowDisplay > Show** from the menu bar; the visibility of the mentioned components will be turned off. You can even control the display of these components individually without affecting other components. To do so, click on the box

given on the right of the **Show** option; the **Show Options** option box will be displayed, as shown in Figure 1-48. Now, specify components according to your requirement and then choose the **Go** button; the visibility of the specified components will be turned off. The options in the **Show Options** option box are discussed next.

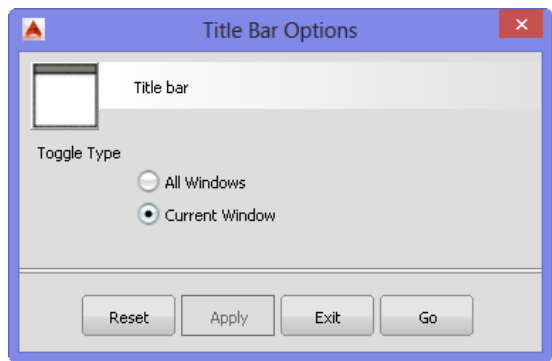


Figure 1-46 The Title Bar Options dialog box

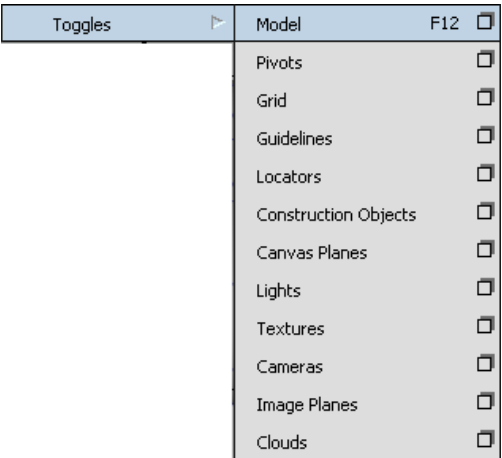


Figure 1-47 The Toggles cascading menu

Mode

By default, the **Show** button is selected in this drop-down list. As a result, the components whose check boxes are selected will be displayed and the components whose check boxes are cleared will be hidden. If you choose the **Toggle** button in the **Mode** drop-down list, the visibility of the components whose check boxes are selected will be toggled on or off.

All

You can select or clear the check boxes given under the **All** button automatically by choosing this button.

None

Choose the **None** button to clear all the check boxes automatically. You can turn the display of components on or off by selecting or clearing the corresponding check boxes manually.

CHANGING PREFERENCES IN Alias Design

The change in preferences allows you to customize the Alias Design interface. You can change workflows, display of menus, hotkeys, **Palettes**, **Shelves** window, colors, and so on. You can also save, load, and retrieve options and set preferences. The different options to change the preferences in Alias Design 2016 are discussed next.

Setting Preferences in Alias

To set preferences in Alias Design according to your requirements, choose the **Preferences** option from the menu bar; a flyout will be displayed. Next, click on the box given on the right of the **General Preferences** option; the **General Preferences** window will be displayed, as shown in Figure 1-49. There are ten tabs in this window that are discussed next.

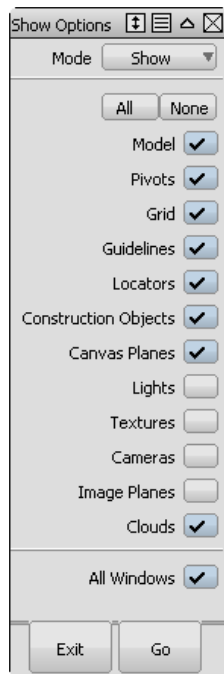


Figure 1-48 The Show Options option box

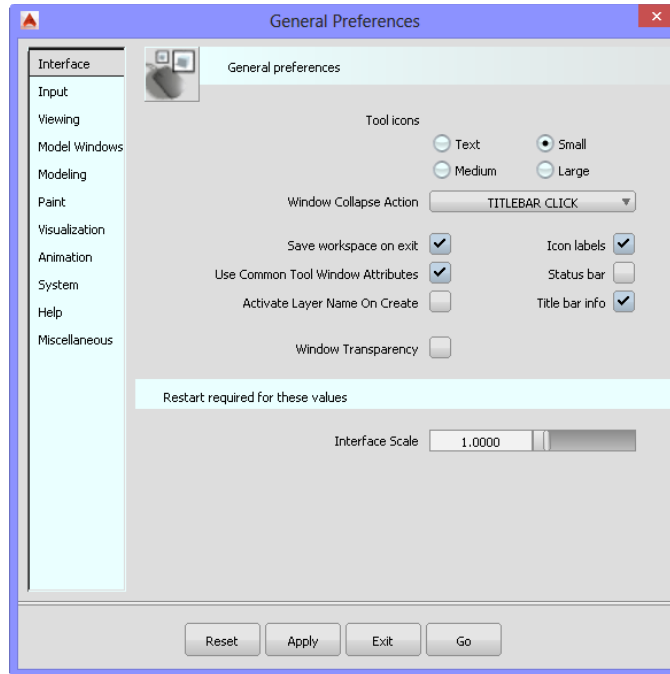


Figure 1-49 The General Preferences window

Interface

The **Interface** tab is chosen by default and allows you to set tool icons in the **Palette**, **Shelves** window, and **Control Panel** to different sizes. By using the options in this tab, you can control the display of tool icon labels, tool tips, title bar, and status bar.

Input

When you choose this tab, the options related to the input provided to Alias Design will be displayed. These options are used to control the keyboard entry mode, view modes, display of the **Pick chooser** menu, and so on.

Viewing

When you choose this tab, the options that control the view of the objects and windows will be displayed. By using these options, you can specify the option for view control such as **ViewCube** and **Viewing Panel**, view transition time, dolly options, view step angles, and so on.

Model Windows

When you choose this tab, the options related to modeling windows will be displayed. These options are used to control the display of axis triad, title bar transparency, direction of coordinate system, and so on. You can control the display of transform guides and dynamic display box that appear while moving an object. You will learn about the method of moving an object in the next chapter.

Modeling

When you choose this tab, the options related to modeling will be displayed. These options are used to specify the number of the guidelines displayed in the view windows. You can assign name or number to layers according to your requirements by using this tab.

Paint

When you choose this tab, the options related to sketching will be displayed. These options are used to control the paint display quality, brush stamp preview, paint cursor, cursor outline, and so on. You can change the default size of canvas by using this tab.

Visualization

On choosing this tab, the options related to the visualization of objects will be displayed. These options are used to control the size of shader sample thumbnails. You can specify a location for the shader library to be used for applying shaders by using this tab.

Animation

When you choose this tab, the options related to the animation of objects will be displayed. These options are used to specify the bone style.

System

When you choose this tab, the options related to different file locations will be displayed. These options are used to change the type of file browser so that the next time you import, export, or save the file, the selected browser will be opened to specify the file location. You can specify the location for **MSave**, **Shared Preference**, **Library**, **Checkpoint file** folders/directories, and so on. If Alias wire file closes abnormally, it will be saved in the **MSave** file location.

Miscellaneous

The options in this tab are used to control the number of undo actions performed and the memory allocated to these undo actions. You can locate and load plug-ins into the Alias Design system by using this tab.

Setting Construction Options In Alias Design

Sometimes you may need to open/import an object created in Alias Design into other CAD packages such as SolidWorks, Pro/ENGINEER, CATIA, and so on. Alias Design allows you to set the construction options for an object so that it can be opened/imported into other CAD package with set units, tolerances, fonts, scale factors, and so on. To do so, choose **Preferences > Construction Options** from the menu bar; the **Construction Options** window will be displayed, as shown in Figure 1-50. You can set different options by using the options in the **Construction Options** window. The options in this window are discussed next.

Construction Presets

The **Construction Presets** area is used to specify the settings of the selected profile for its best compatibility with Alias Design 2016. The options in this area are discussed next.

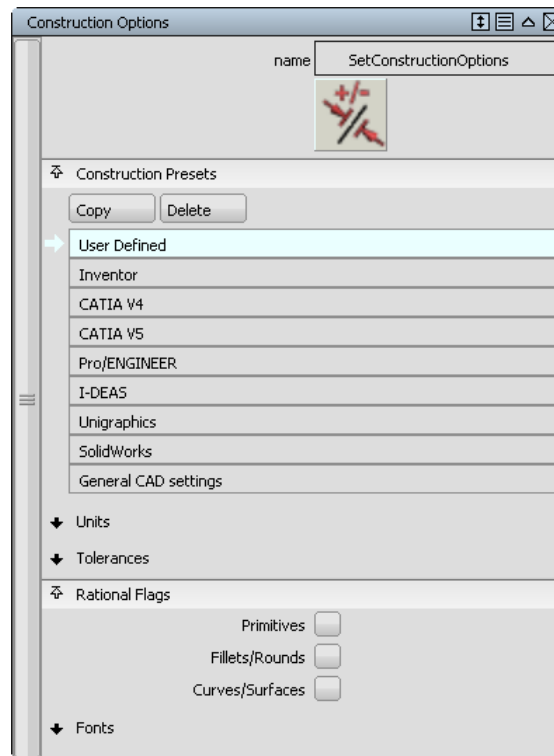


Figure 1-50 The Construction Options window

Profile List

You can create an object with the default settings of a specific CAD profile by selecting it from the profile list given below the **Copy** and **Delete** buttons. Note that you cannot edit default settings of a specific CAD profile. However, if you want to edit settings of a CAD profile, select it and then choose the **Copy** button from the **Construction Options** window; the copied CAD profile will be listed in the Profile list. Next, modify the settings of the copied CAD profile. If you want to delete the copied settings of a CAD profile, select the copied profile and then choose the **Delete** button from the **Construction Options** window.

Units

The **Units** area is used to set units for the user-defined or the copied CAD profile. Click on the down arrow given on the right of this area to display different areas, which are discussed next.

Linear

Click on the **Linear** down arrow to display the linear unit specification that is set for the user-defined or copied CAD profile. You can specify the scale factor, main units, sub units, and so on related to linear units.

Angular

Click on the **Angular** down arrow to display the angular unit specification that is set for the user-defined or copied CAD profile. You can specify the scale factor, main units, sub units, and so on related to linear units.

Tolerances

The **Tolerances** area is used to specify different tolerances for the user-defined or copied CAD profile. Click on the down arrow given on the right of this area to display different areas, which are discussed next.

Fitting

Click on the **Fitting** down arrow to display fitting specifications that are set for the user-defined or copied CAD profile. In other words, the **Fitting** option allows you to specify permissible distances upto which curves and surfaces can be considered to be occupying the same place. You can specify curve fit distance, curve fit checkpoints, and maximum surface spans.

Continuity

Click on the **Continuity** down arrow to display continuity specifications that are set for the user-defined or copied CAD profile. In other words, the **Continuity** options allow you to specify permissible distances upto which curves and surface can be considered to be just touching each other. You can specify maximum gap distance, continuity angle, and continuity curvature.

Topology

Click on the **Topology** down arrow to display topology specifications that are set for the user-defined or copied CAD profile. The **Topology Distance** edit box allows you to specify the distance that determines the adjacency of surfaces.

Curve On Surface / Trim

Click on the **Curve On Surface / Trim** down arrow to display specifications related to curves-on-surface and trimmed edges. You can specify the maximum deviation that is allowed between curves-on-surface and trimmed edges. You can also specify the maximum gap between the endpoints of various curves-on-surface to consider them continuous for the trimming operation.

Rational Flags

The **Rational Flags** area allows you to use rational geometry for creating curves, surfaces, advanced surfaces, and primitives in the user-defined profile or copied CAD profile. Generally, the rational geometry is slower and harder to model. You need to use these options, only if required. The options in this area are discussed next.

Primitives

Select this check box to create primitives using rational geometry.

Fillets/Rounds

Select this check box to create fillets/rounds using rational geometry.

Curves/Surfaces

Select this check box to create all the surfaces other than primitives, fillets, and rounds using rational geometry.

Fonts

Click on the down arrow given on the right of the **Fonts** area to display different options. These options are used to specify the attributes related to the fonts used in the user-defined or the copied CAD package. You can specify the default modeling text size and text display mode.

COLOR SCHEMES

In Alias Design, you can use various color schemes as the background color of view windows. Also, you can use these color schemes to display different feature in it. By default, colors are assigned to modeling windows, active modeling features, inactive modeling features, and user interface. To change color schemes, choose **Preferences > Interface > User Colors** from the menu bar; the **User Colors** editor will be displayed. Click on the down arrow given on the right of the **Active Modeling Colors** area to display various features used in modeling with their default colors schemes, as shown in Figure 1-51.

Choose the Color swatch box given on the right of any features in the **User Colors** editor to display the Color editor. Select the required color from the Color editor; the color will be assigned to the selected or active object. You can specify color for active control vertices, active edit points, active meshes, and so on by using the respective Color swatch boxes. Similarly, you can specify colors for inactive objects, inactive control vertices, inactive edit points, inactive meshes, view windows, templates, locators, grids, and so by using the options in the **User Colors** editor. You can create a color scheme that can be stored and retrieved later according to your requirements. Create a color scheme and then press and hold the left mouse button on the **File** button; a flyout will be displayed. Choose the **Export** button from this flyout; the **Save As** dialog box will be displayed. Specify the name and location for the color scheme and the choose the **Save** button; the color scheme will be saved. To restore or retrieve color schemes, choose the **Import** button from the **File** flyout; the **Open** dialog box will be displayed. Specify the location and name of the color scheme that needs to be retrieved and then choose the **Open** button; the color scheme will be opened. Similarly, you can undo, redo, or reset the changes made in color schemes. To do so, press and hold the left mouse button on the **Edit** button; a flyout will be displayed. Choose the corresponding button from the flyout. The **User Interface Colors** area is used to specify the color of the cursor in view windows.

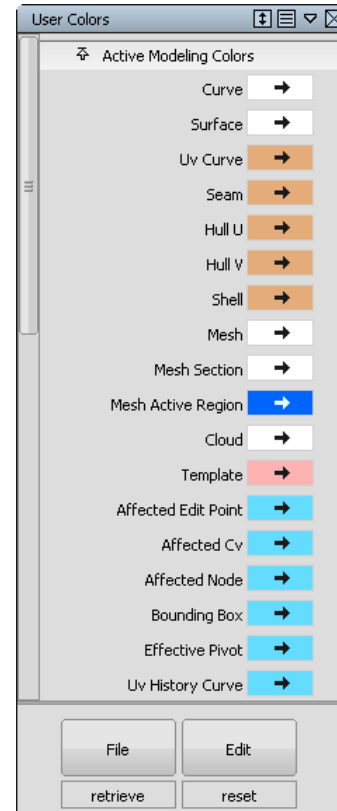


Figure 1-51 The **User Colors** editor

**Note**

1. Throughout this book, we have used white, blue, and dark red colors for the background, inactive object, and active object, respectively.

2. Whenever you switch between the workflows, the color schemes also change. However, you can store a color scheme in one workflow and then retrieve it in another workflow so that you can work in one color scheme.

3. The topics discussed briefly in this chapter will be covered in detail in the later chapters.

Self-Evaluation Test

Answer the following questions and then compare them to those given at the end of this chapter:

1. Like the **Object Lister** window, the **Scene Block Diagram** window also displays the _____ of a model or an object in view windows.
2. The creation of _____ helps you organize files systematically.
3. The _____ dialog box enables you to change the settings for output, printer, paper specifications, information about model, and so on.
4. Press the _____ keys to exit the current session of Alias Design.
5. The **Viewing Panel** appears in the _____ window.
6. The work area or window area occupies the maximum space in Alias Design interface. (T/F)
7. You can customize tools by inserting them into the **Control Panel**. (T/F)
8. You can invoke the **Paint** window by pressing the F8 key. (T/F)
9. You can re-order all the variants in the **Variant Lister** window by dragging them using middle mouse button. (T/F)
10. You cannot assign a hotkey to an existing hotkey. (T/F)

Answers to Self-Evaluation Test

1. internal structure, 2. project directories, 3. **Alias Print**, 4. ALT+E, 5. **Perspective**, 6. T, 7. T, 8. F, 9. T, 10. F