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## **Index**

Welcome to *3D Studio MAX User's Guide, volume 1*. Spanning two volumes, the *User's Guide* is part of the print and online documentation set accompanying 3D Studio MAX™. The complete set is listed below.

This guide takes a *task-based* approach you might not be familiar with. The emphasis is on what you want to accomplish, and how to use the program to meet those ends. Information is organized into sections, chapters, and *topics*. Each topic, descriptively titled, offers a self-contained unit of information about how to get something done using 3DS MAX.

This Preface is a short set of topics to help you understand how the *User's Guide* is put together and how to navigate its contents. The page layout of the guide contains a number of clues to keep you oriented and to aid in finding the information you need.

This Preface also describes the access, navigation, and special features of the online Help system.

## Documentation Set

The documentation set for 3D Studio MAX combines printed and online material. These are its major components:

- *3D Studio MAX User's Guide, volume 1*—This book. Covers fundamental concepts, user interface controls, and modeling methods.
- *3D Studio MAX User's Guide, volume 2*—Covers lights and cameras, surfaces, hierarchies, kinematics, animation, and rendering. Contains the Glossary.
- *3D Studio MAX Help* (online)—Contains reference material describing the features of 3D Studio MAX, as well as many step-by-step procedures.

- *3D Studio MAX Tutorials*—Introduces functionality in hands-on fashion.
- *Setting Up 3D Studio MAX*—Covers information needed to install and run the program on a standalone or networked system.

## Sectional Organization of Volume 1

Volume 1 is divided into three sections. A color code, applied to the thumb tab on every page, identifies the three sections at a glance.

### The Basics

- Overview of 3D Studio MAX, its underlying concepts, and interface.
- Introduction to 3D space, including concepts and viewing and navigation techniques.
- Basics of selecting and grouping objects, and how to transform objects in 3D space by moving, rotating, and scaling.
- Basics of using units, grids, snaps, alignment, and other features to maintain precision.

### Creating Objects

- Basic creation methods for all objects in 3DS MAX.
- Specific creation methods for geometric primitives, patches, splines, text shapes, lofts, morphs, booleans, particle systems, space warps, copies, and arrays.

### Modifying Objects

- Basic modification methods for all objects in 3DS MAX.
- Specific modification methods for applying geometric modifiers and editing shapes, meshes, and patches.

# How to Use This Guide

This guide was designed with ease of access as a primary goal. As you work with 3D Studio MAX, you should be able to find information on the task at hand with a minimum of effort.

## Navigating the Guide

- All information in this guide is *clustered*.

Related subjects are always grouped together, beginning at the volume level and continuing through sections and chapters to the topic level. Once you find a general area of interest, you can be reasonably certain that the specifics are contained within it, not scattered elsewhere.

- Information is uniformly presented as *topics* in a modular, multi-column format.

Each topic is a self-contained unit from one to four columns in length. The largest topic is a two-page spread. By design, and with only rare exceptions, you can read any topic without turning the page. If related information is important to a topic, cross-references are provided.

- Topics are descriptively titled.

Topic titles tell you in plain language what the topic contains. As the guide was written, topics were often split into smaller topics to avoid “buried information” and to ensure clear and accurate content descriptions.

- Topics are typically clustered in a hierarchy.

Topic clusters appear in the Contents for each volume and each chapter. An introductory “parent” topic appears with “child” topics indented below it.

This hierarchy is signaled in each topic by the small headline above the topic title. For a child topic, this headline names the parent. The

highest-level topics use the chapter title for this headline. See the figure on the facing page.

- Chapters are clusters of related topics.

The individual chapter is key to navigation. Once you find the chapter you want, the topics within are easy to scan by title.

## How to Find the Information You Want

When you look for information, you’re looking for one or more topics among the hundreds contained in this guide.

As in any information search, you need to know what you want to know. Ask a question, then decide which volume to look in. From there, choose a section, a chapter, and the final topic.

**Ask a question**—How do I taper an object? How do I copy keys in Track View?

**Pick a Volume**—You need to categorize the question into a general search area. The subtitles of the two volumes indicate the four general areas of information covered in this guide: volume 1, *Concepts and Modeling*; volume 2, *Rendering and Animation*.

How to taper an object is a *modeling* question. How to copy keys is an *animation* question.

**Check the Volume Contents**—Each volume has a master table of contents in front, listing the sections, chapters, and every topic. Skim through to locate the section you want, then pick a chapter in that section. If you see a topic of interest, turn to it immediately.

**Check the Chapter list of topics**—Each chapter has its own table of contents. Check through the listed topics. As you do so, notice the range of related topics. Questions are seldom isolated, so you might find other information you need while you’re looking.

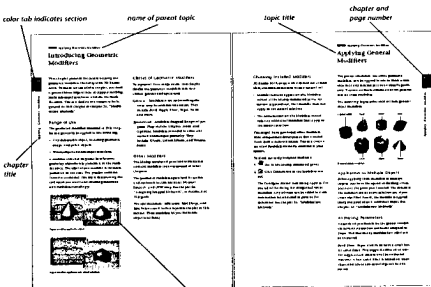
**Use the Index**—Each volume has its own index at the back. The index is particularly useful when you have a specific concept or term in mind, or when you're not sure what the related task would be. Page numbers in the index refer to the first page of the topic. The actual content might be on the facing page.

**Use online Help**—For reference details, concise feature descriptions and procedures, use the Help system. If you need to know what a specific check box does, or the range of a parameter, online Help is by far the most direct source while you're using the program. See "How to Use Online Help" on page iv.

## How to Read Page Layout

The design of this guide uses page elements to keep you oriented within the larger information framework. You can "read" the following points in the hierarchy on every page. Refer to the figure below.

- The section is coded by the tab color.
- The chapter and page number appear on the section tab.
- The chapter name runs below the section tab.
- The name of the parent topic appears above the topic title.





# How to Use Online Help

The online Help system for 3D Studio MAX follows the basic conventions of Windows 95 Help and adds new features of its own.



The 3DS MAX Help system replaces the conventional reference manual. Details of every command and dialog are included, along with a substantial set of procedures to help you use the options available.

The Help system is part of an overall plan for information delivery. It does not replace the need for the *User's Guide* and *Tutorials*. Rather, it offers a quick reference for both beginners and experienced users who want specific information about some aspect of the program while at the computer.

## Accessing Online Help

There are several ways to access the 3DS MAX Help system.

To access online help, do one of the following:

- Choose Help/Contents or Help/Topics from the 3DS MAX menu bar.
- Click F1. This opens the topic for an active button or command panel.
-  Click the Help Mode button if the toolbar. A special cursor appears. Use the cursor to click an item you want to get Help for. This opens the topic for any button or command panel.
-  Click this button in the title bar of some dialogs. This opens the topic for that dialog.

## Navigation Methods

3DS MAX Help provides two main navigation and search methods to help you to find the information you want:

**Contents**—Starting at the Contents topic, you click to select different levels of topics, proceeding from more general and proceeding to more specific.

**Help Topics**—Displays all the help topics in a hierarchical sequence with the Contents topic at the top.

- **Index**—Lists all the help topic titles alphabetically in index format. You can search the help topic titles for certain keywords.
- **Find**—Generates a list of all words in all help topics. This takes a few minutes, but you only have to do it once. Then, when you enter the words you want to search for, 3DS MAX Help gives you a list of all topics containing those words.

Often, the quickest or most effective way to get precisely the information you want is to use the Help Index option, which searches the titles of every help topic. For even finer detail, use the Help Find option, which searches every word in every help topic.

**Note:** When you right-click a feature of the Help Topics, Index, and Find Help dialogs, you see a button marked "What's This?". Click to display a brief explanation of that feature.

## Use of Color

Color in text is a navigational aid. It indicates hypertext jumps and pop-up definitions.

**Blue text bold**—Indicates that you can click on this text to go to a next-level topic.

**Green text underscored**—Indicates that you can click on this text to display a secondary window containing additional information about the highlighted term.

## Buttons

The buttons that appear at the top of the 3DS MAX Help window are mainly navigational. They have the following functions:

**Help Topics**—Displays the whole hierarchy at once as a scrolling list, like the Explorer in Windows 95. Also allows you to access the Index and Find features.

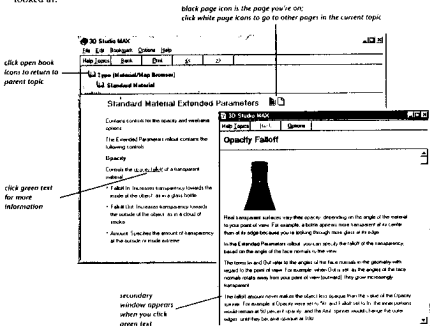
**Back**—Takes you back to the last topic you looked at.

**Print**—Prints the current topic.

**<<**—Browse back through topics on the same level.

**>>**—Browse forward through topics on the same level.

**See Also**—Displays list of topics and procedures related to the current topic. Choose a topic or procedure from the list to go to it.



# Help Menus and Keyboard Shortcuts

The menu bar and keyboard shortcuts for the 3DS MAX Help system follow Windows 95 conventions. The following features are also documented in the Help system.

## Menu Bar

The menu bar of 3DS MAX Help contains the following menus and menu options. You can access many of these options by right-clicking on any help-topic page.

### File Menu

**Open**—Opens another help (.hlp) file. You may have created custom help files or have help files installed for plug-in programs.

**Print Topic**—Prints the current topic.

**Exit**—Exits 3DS MAX Help. Has no effect on 3DS MAX itself.

### Edit Menu

**Copy**—Copies text from the help topic to the Windows clipboard.

**Annotate**—Allows you to add notes to the help topic and store them with it. You can paste text from the Windows clipboard. When you save the annotation, a paper-clip icon appears next to the title of the help topic to show a note is attached. Click the icon to open the note.

### Bookmark Menu

**Define**—Adds the current help topic to a list of numbered bookmarks. Select any bookmark to go to that topic.

## Options Menu

**Keep Help on Top**—Ensures that the 3DS MAX Help window stays on top of any other open windows. This can be useful when you are following one of the procedures.

**Display History Window**—Pops up a window that lists all the help topics you've visited during the current session. Double-click a topic in the list to go there.

**Font**—Sets the font size for the help topic text (small, normal, or large).

**Use System Colors**—Resets the 3DS MAX Help window to use the Windows system colors.

## Help Menu

**Version**—Displays the current version number and other information for 3DS MAX Help.

## Keyboard Shortcuts

You can use the following keyboard shortcuts within 3DS MAX Help:

**CTRL+C**—Copy topic to Clipboard.

**CTRL+H**—Display History window.

**CTRL+P**—Prints the current topic.

**LEFT ARROW (or comma)**—Browse back through topics on the same level.

**RIGHT ARROW (or period)**—Browse forward through topics on the same level.

**BACKSPACE**—Takes you back to the last topic you looked at.

## Acknowledgments and Feedback

Thanks to the Technical Publications team for designing, writing, editing, illustrating, and producing the 3D Studio MAX documentation set:

John Burgdorf, Randy Clark, Steven Elliott, Gary Foltz, Wolfgang Hahner, Frank Highly, Sharlene Loughton, Kathleen Marvin, Rebecca Moutray, Harriet Ostlund, Jack Powell, Lisa Rapp, Patti Reed, Tana Schimberg, Vera Vallentin-Price, Andrew Vernon, Mark Warwarick, and Stephen Wiggs.

Thanks to the Localization team for producing the 3D Studio MAX documentation set in French, Italian, German, and Spanish:

Mark Franchitto, Philippe Juton, Zack Rynew, Lisa Tenorio, Tamami Tokutake, Shawna Wolverton, Jon Yamoto, and Roberto Ziche.

And thanks to these translation agencies:

Eurolang  
Logos, Madrid  
Logos, Modena  
SDL, Ltd.

### Give Your Feedback

We're interested to hear your views and wishes about the 3D Studio MAX documentation set, print and online. Please let us know what you like in the documentation, what you don't like, what works, what doesn't. Tell us what you'd like to see beefed up or cut back, or done a different way. We look forward to hearing—learning—from you soon.

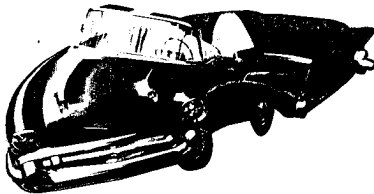
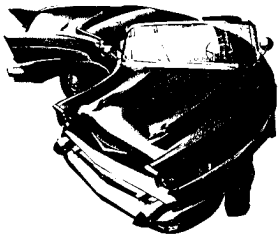
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## The Basics

Overview of 3D Studio MAX—its underlying concepts and interface.  
Introduction to 3D space—terminology, viewing, and navigation.  
Selecting and transforming objects. Maintaining precision.

Section 1



## Overview of 3D Studio MAX

### Topics

- How 3D Studio MAX Works 1-2
  - Using the Integrated User Interface 1-3
  - Understanding Instances 1-4
  - Undoing Changes 1-6
- Working with Objects in Your Scene 1-7
  - Defining Basic Object Properties 1-8
  - Differences Between Object Space and World Space 1-10
  - Differences Between Modifiers and Transforms 1-12
  - Understanding Object Data Flow 1-14
  - Understanding Object Copies, Instances, and References 1-16
  - Understanding Surface Properties 1-18

3D Studio MAX™ is a three-dimensional modeling and animation program designed for Windows NT. You use 3D Studio MAX to quickly create professional quality 3D models, photorealistic still images, and film quality animation on your PC.

This chapter presents the basic concepts that you need to know to get the most out of 3D Studio MAX.

# How 3D Studio MAX Works

The 3D Studio MAX application window presents all of the functions that you need in a single workspace. The standard Windows menus and toolbar design provide quick access to general purpose commands and the functions you are likely to use the most. The command panels at the side of the window contain specialized tools for creating, modifying, and manipulating objects in your scene.

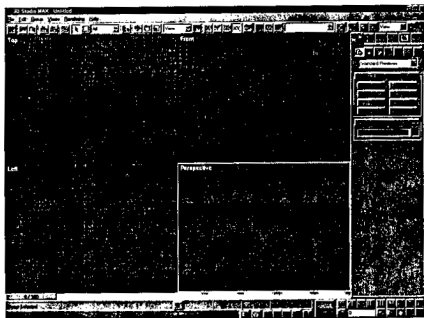
## Object-Oriented Design

3D Studio MAX uses an object-oriented design that assigns names and properties to almost everything you do. Everything in your scene, from geometry to lights and cameras, has a

name and carries its properties and creation parameters with it. You have the ability to change the properties and parameters of an object at any time.

## Plug-in Extensions

Much of what you see in 3D Studio MAX is the result of core-component plug-ins that integrate with the 3DS MAX interface. As 3DS MAX evolves, and independent developers produce new plug-ins, you will see new features and options appear throughout the program. If you cannot find information about a certain function or option, check the online Help for the latest information.



## Using the Integrated User Interface

3D Studio MAX uses an integrated workspace where you can easily jump from one function to the next. Details about how the 3DS MAX dialogs and user interface components work are in chapter 2, "Using 3D Studio MAX".

### Modeling and Editing

The cornerstone of 3D Studio MAX is an advanced 3D modeling and animation environment. You perform 2D drawing, 3D modeling, and spline-based animation within the unified workspace. Your modeling, editing and animation tools are always available in the command panels and the toolbar.

3DS MAX also supports real-world camera controls for lens length, field of view, and motion control such as truck, dolly, and pan. The lights can cast shadows, project images, and create volumetric effects for atmospheric lighting.

### Materials Definition

3D Studio MAX contains a sophisticated Material Editor that floats in its own window above your scene. You use the Material Editor to create highly realistic materials by defining hierarchies of surface characteristics. The surface characteristics can represent static materials or be animated for special effects.

### Animation

You can begin animating your scene at any time by clicking the Animate button. Click the button again to move back and forth between modeling and animating. You can even perform animated modeling effects.

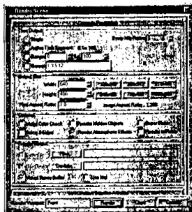
You have extensive control over your animation with the 3D Studio MAX Track View. This is a window into time where you edit animation keys, set up parametric animation controllers of

display and adjust motion curves for all of your animated effects.

### Rendering

The 3DS MAX renderer includes advanced features such as analytical antialiasing, motion blur, volumetric lighting, and environmental effects. You can also render and composite multiple views with animations stored on disk using the Video Post window.

If your workstation is part of a network, 3DS MAX supports network rendering to distribute rendering jobs over multiple workstations.



Render and Video Post dialogs



# Understanding Instances

Because 3D Studio MAX uses object-oriented design, the same *item* can be used in multiple ways throughout the program. The term *item* refers to far more than just the objects you create in your scene; it includes materials, animations, and modifiers.

When you copy an item, the item and its copy start out being identical, but they are completely independent of each other. Changing one item has no effect on the other.

When you make an instance of an item, you are using the same original item in more than one place. All instances are identical and changing one changes them all.

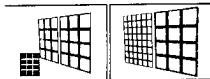
For example, say you want to post the departure schedule for an airline at multiple locations in an airport. You could print out the schedule and post copies at each location. When the schedule changed you would have to replace or change each individual copy.

Instead of posting copies of the schedule, you could set up a network of computer display stations each showing the same master schedule. Now, when the schedule changes, you go to any station and enter the change. The new schedule immediately appears on all the displays.

The computer displays are like instances in 3DS MAX. You can select any instance and make a change that affects all similar instances in your scene.

## Instancing Maps and Materials

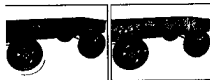
Use map instances to maintain registration on a single map used for multiple material properties. For example, you might instance an image as a bump map and opacity map to simulate leaded glass. If you change the scale of the bump map, the instanced opacity map changes maintaining the original registration. See chapter 25, "Using Map Trees and Complex Materials" in volume 2 of this guide.



Using an instanced map in a material

## Instancing Animation Controllers

Use instances of animation controllers to animate the parameters of multiple objects in exactly the same way. For example, rotate one wheel on a car and then instance the rotation controller to the remaining wheels. Rotating one wheel causes them all to rotate. See chapter 32, "Working with Controllers" in volume 2 of this guide.



Using instanced animation controllers

## Instancing Objects

Use instances of objects to place the same object in multiple locations in your scene. For example, if you instance a column to form a colonnade. Changing the radius, and the height of one column causes all columns in the colonnade to change. See chapter 14, "Creating Copies and Arrays".



Using an instanced object

Unlike other items in 3D Studio MAX, instancing objects involves many issues beyond sharing parameters and properties. Topics later in this chapter present details about working with object instances.

## Instancing Modifiers\*

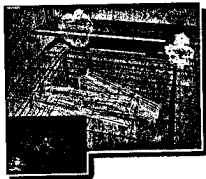
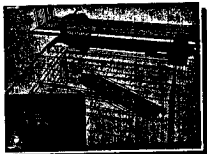
Use instances of modifiers to apply the same modeling effect to multiple, independent objects. For example you could have a collection of objects on a desktop using an instanced Noise modifier. The single modifier makes all the objects shakes back and forth in unison. See chapter 15, "Modification Methods".

## Converting Instances

Instancing is a useful technique but it won't fit in to all your animation solutions. If you instance something, you can always decide to separate it from the other instances by making it unique. When you make an item unique, you convert it from an instance to a copy, preserving the original settings and animation but sev-

ering any further relationship to other instances.

Different types of instance have different methods for becoming unique. These methods are described in later chapters. See chapter 25, "Using Map Trees and Complex Materials" and chapter 32, "Working with Controllers" in volume 2 of this guide.



Using an instanced modifier

# Undoing Changes

You can easily undo changes you have made to your scene and your viewports. 3D Studio MAX manages separate Undo buffers for both the scene objects and each viewport.

## Undoing Changes to Your Scene

Use the Undo and Redo buttons or Undo and Redo commands in the Edit menu to reverse the effects of most scene operations. Most things you do in 3DS MAX can be undone.



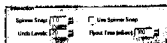
Scene undo commands

## Setting the Scene Undo Level

Using the Preferences dialog you can set the number of commands to hold in the scene undo buffer. The lowest setting for Undo Levels is 1, the highest setting is 500. High Undo Levels settings consume more memory.

To set the Undo level:

1. Choose File/Preferences.
2. Click the General panel.
3. Change the Undo Levels field in the Interaction area.



undo levels field  
Undo level in the Preferences dialog

## Undoing Viewport Changes

Use the Undo View and Redo View commands in the Views menu to undo view changes. Each viewport maintains its own undo buffer storing 20 commands.

- You can undo all view navigation commands and standard view type changes.
- You cannot undo changes to viewport rendering levels or display settings.
- Camera and Spotlight views work with camera and spotlight objects. Changes to these views are handled by the scene undo and redo functions.



Viewport undo commands

## Working with Objects in Your Scene

In 3D Studio MAX, the term *object* is used to describe something in your scene. The user interface of 3DS MAX changes to display options that are appropriate for the type of objects that you have selected.

### Scene Object Types

The following descriptions present the basic object set for 3D Studio MAX. Using plug-ins, you can add new object types beyond those listed here.

**Standard Primitives**—Parametric 3D objects for creating primitives like boxes and spheres.

**Shapes**—Collections of 2D and 3D spline curves. Shapes can be converted into meshes and patches by using various modifiers. They are also used as components to build loft objects.

**Lofts**—Compound object created by sweeping a cross section or open curve along a path.

**Patch Grids**—Bezier surface patch that can be welded to other patches creating complex surfaces. Most other object types can be converted to patches by using the Edit Patch modifier.

**Meshes**—Collection of vertices connected by triangular faces. Mesh objects are usually the result of importing geometry from another program or intentionally converting another type of object into a mesh. Most objects can be converted using the Edit Mesh modifier.

**Morphs**—Compound object that animates the form of a seed object to match the form of one or more target objects. The seed object and the target objects can be individually edited and animated.

**Booleans**—Compound object that combines two operand objects with a Boolean opera-

tion. The operands can be individually edited and animated. The boolean object can also be the operand of another boolean object.

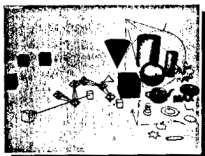
**Particles**—Objects that emit small 2D and 3D particles to simulate rain, snow, and similar effects.

**Lights**—Include Omni, Spot, and Directional lights. You can also use lights to cast shadows, project images, and create atmospheric effects.

**Cameras**—Set up viewpoints inside your scene. Cameras use real world controls like field of view, roll, and dolly.

**Helpers**—Useful objects that define points in space, and measure distances and angles.

**Space Warps**—Define an effects field in space that can deform or move objects that move over them.



Scene object types

All objects share certain properties and techniques. The following topics describe common properties shared by all 3DS MAX objects.

## Defining Basic Object Properties

All objects are defined by three general properties. These properties are: a collection of *creation parameters*, a *pivot point*, and a *bounding box*. These properties describe the form, local origin, initial orientation, and extents of an object in your scene.

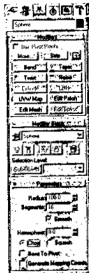
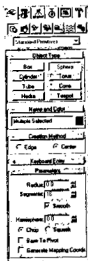
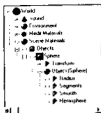
### Creation Parameters

Creation parameters are the original values that describe the size and shape of an object. You normally enter these values in the Parameters rollout when you create an object.

The creation parameters for an object appear in three locations of the 3DS MAX interface.

- You first set the creation parameters for an object in the Create panel.
- You change the creation parameters in the Modify panel.
- You edit creation parameter animation in Track View.

In the Create and Modify panels the creation parameters are contained in one or more parameters rollouts. In Track View the creation parameters are listed under the Object container.



Locations of object creation parameters

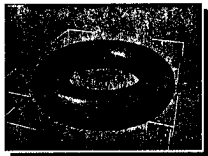
The number and type of creation parameters vary for each object. Even though all objects have creation parameters, some objects do not display any parameters because they have no user-adjustable properties.

For example, a mesh object displays no creation parameters. It is just a collection of vertices and faces. You change a mesh object by applying modifiers and transforms. A cone on the other hand displays many creation parameters such as top and bottom radius, height, and number of sides.

## Pivot Point

Every object in the scene has a pivot point that identifies the center and orientation of the object. The pivot point is the heart of an object and 3D Studio MAX uses the pivot point in the following ways:

- As the origin of the object's *local coordinate system*.
- As the center of rotation and scaling.
- As the object's location in *world space*.
- As the connection point between a child and its parent in a *linked hierarchy*.
- As the joint location for *inverse kinematics*.



Display of the object pivot point

When you first create an object the pivot point is placed in a default location, usually at the center of the object's base or at the 3D geometric center of the object. You can then use the tools in the Hierarchy panel to move and rotate the pivot point in any way you want. See chapter 27, "Building Hierarchies" in volume 2 of this guide.

## Object Bounding Box

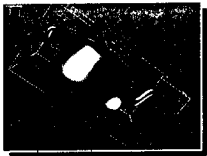
The bounding box defines a rectangular volume that completely encloses an object. This volume is what you see surrounding a shaded object when you select it or when you set display to Box mode. An object's bounding box also affects the way modifiers work. The size and orientation of a modifier's gizmo is set by an object's bounding box.



Display of the object bounding box

## Differences Between Object Space and World Space

There are two spatial coordinate systems at work in 3D Studio MAX. These two systems are called *Object Space* and *World Space*.



world space icon

object space icon

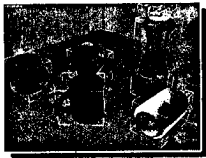
Object space versus world space

### Defining Object Space

Object space is the coordinate system unique to each object in your scene that tracks the location of everything applied to an object. The location of object vertices, the placement of modifiers, mapping coordinates, and materials are all defined in object space.

As mentioned in the previous topic, each object has its own local center and coordinate system as defined by the location and orientation of the object's pivot point. The local center and coordinate system of an object combine to define its *object space*.

- When you choose Use Pivot Point/Centers from the toolbar or Use Pivot Points from the Modify panel you are telling 3DS MAX to use the Object Space origin of one or more selected objects as the center of a transform or modifier effect.
- When you choose Local from the coordinate systems pulldown of the toolbar, you tell 3DS MAX to use a selected object's object space for the orientation of the active coordinate axes.



local axes

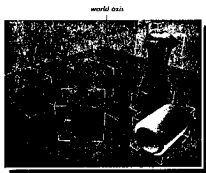
Local object center

## Defining World Space

World space is the universal coordinate system that 3DS MAX uses to track objects in the scene. When you look at the Home Grid in the 3DS MAX viewports, you see the World Space coordinate system. World space is constant and immovable.

All objects in your scene are located in world space by their position, rotation, and scale (their transforms).

Space warps also operate in world space. A space warp defines an area in world space that is affected by the space warp's parameters. Any object that is bound to the space warp is affected as it moves through the space warp's area of world space.



World space center



## Differences Between Modifiers and Transforms

Modifiers are applied in Object Space and Transforms in World Space, but they differ in more ways than which space they are applied in. They also differ in how they affect an object and the order in which they are applied to an object.

### Modifying Objects

Modifiers are operations that act on the internal structure of an object in object space. For example, when you apply a modifier such as Twist to a mesh object, the position of each vertex of the object is individually changed in object space to produce the twist affect.

Modifiers operate at the sub-object level and are dependent on the internal structure of the object when the modifier is applied.

Modifiers have the following properties:

- Modifiers can be applied to all or part of an object using sub-object selection.
- Modifiers are dependent on the order of application. Applying a Bend followed by a Twist produces a result different from applying a Twist followed by a Bend.
- Modifiers are displayed as individual entries in the Modifier Stack where you can turn them on and off, and apply them in a specific order.



bend



twist



bend then twist



twist then bend

Applying modifiers

## Transforming Objects

Transforms are the most basic of 3D manipulations. Unlike modifiers, transforms are independent of an object's internal structure; they act directly on the object's local coordinate system.

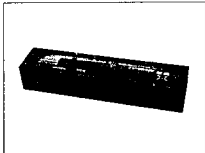
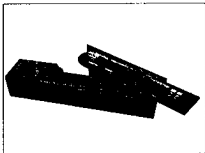
The local coordinate system of an object can be expressed as a matrix of values that specify the following information in world space:

- Position of the object's center in world space
- Rotation of the object in world space
- Scale of the object along its local axes

The matrix is called the *transformation matrix* and its information relates directly to the transforms of Move, Rotate, and Scale. These transforms represent addition and multiplication of the values in the transformation matrix.

Transforms have the following properties:

- They are applied to the entire object.
- They are stored as single values independent of the order of application. No matter how many times you transform an object, the results are stored as one set of values in the matrix.
- Transforms are applied after all object modifiers have been evaluated.



Transforming objects

# Understanding Object Data Flow

Once you have defined an object, 3D Studio MAX evaluates changes affecting the base object and displays the result in the scene. What these changes are, and the order in which they are evaluated is called the *object data flow*.

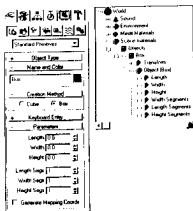
## Master Object

*Master object* refers to an object defined by a set of creation parameters and the original position and orientation of its pivot point. You never see the master object. What you see on the screen is always the result of at least the following data flow:

Master Object

→ Object Transforms

→ Object Properties

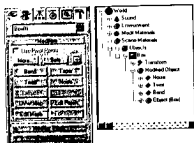


Object creation parameters in the Create panel and Track View

## Object Modifiers

The Object Modifiers are the next group evaluated in the data flow. Each modifier is evaluated in the order it was placed on the Modifier Stack.

The modifications all occur in the object's object space and the result is called the *modified object*.



Object modifiers in the Modify panel and Track View

## Object Transforms

Once the modified object has been evaluated, it is transformed within the world coordinate system. Transforms cover the position, rotation, and scale changes applied from the transform buttons on the toolbar.



Object transforms in the toolbar and Track View

The method of evaluating all modifiers first and then evaluating the combined transforms has important ramifications for the way you work with 3D Studio MAX.

Transforms are completely independent from the order of application. For example, imagine a cylinder that is 40 units high. If you scale the

cylinder along its Z axis, increase its height, and then bend the cylinder 180 degrees, you get the same result as if you bent the cylinder first and then scaled it. The scale transform is always evaluated after the bend modifier.

If you want to apply a transform that is evaluated in a specific order in the Modifier Stack, use the XForm modifier. See chapter 16, “Applying Geometric Modifiers”.

## Space Warps

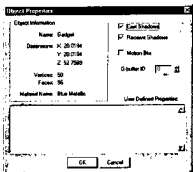
Space warps are evaluated after transforms. They distort objects bound to the space warp based on the position of the object in world space. For example, a Wave space warp causes the surface of an object to undulate in the form of a wave. As the object moves through world space, the wave moves across the object's surface.



Space Warp bindings in the scene and Track View

## Object Properties

Object properties are the last to be evaluated before the object is displayed. These are properties unique to each named object such as its name, wireframe color, and shadow casting properties. This is the end of the data flow and the result is the *named object* you see in your scene.



Object Properties dialog

Object properties  
(Cylinder.1) (Checker material)

Space Warps  
(Ripple)

Transforms  
(Rotate) (Position) (Scale)

Object modifiers  
(Bend) (Taper)

Creation parameters  
(Cylinder)



Data flow diagram of a typical 3DS MAX object

## Understanding Object Copies, Instances, and References

3D Studio MAX objects can be copied, instanced, or referenced. The difference between a copy, instance, and reference lies in how the data flow branches on its way from the master object to the named object.

### Evaluating Copies

When you copy a 3DS MAX object, you create a new, independent master object and data flow resulting in a new named object. The copy duplicates all of the data of the original object at the time it is copied. The copy has no connection to the original object.

### Evaluating Instances

When you instance an object, you are displaying multiple named objects based on a single modified object. Each named object instance has its own set of transforms, space warp bindings, and object properties, but it shares the object modifiers and master object with the other instances. The data flow for an instance branches just after evaluating object modifiers.

Because instances share the same master object and object modifiers, changing the creation parameters or applying a modifier to any one instance changes all related instances.

### Evaluating References

When you reference an object you split the object modifiers into groups of shared and unique modifiers. Like instances, references share the same master object and some object modifiers. The data flow for a reference branches just after the object modifiers but then evaluates a second set of object modifiers unique to each reference.

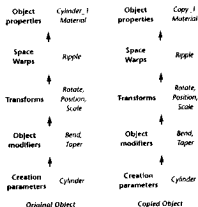
The data flow for references depends on where in the Modifier Stack the reference is made.

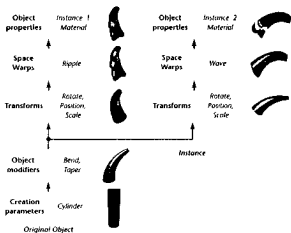
Each time you create a reference, the data flow branches after evaluating all of the current object modifiers and adds a container for another set of object modifiers. In the Modifier Stack you can see where branching occurs by looking for a dashed line between modifiers.

Because references share the same master object, changing the creation parameters for any reference changes all related references.

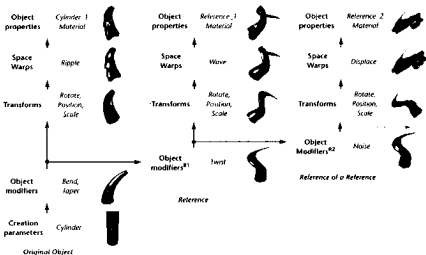
The results of changing or applying a modifier to a named object reference depends on where in the Modifier Stack it is applied:

- Applying a modifier to the top of the Modifier Stack affects only the selected named object.
- Applying a modifier below a dashed line affects all references branching above that line.
- Applying a modifier at the bottom of the Modifier Stack affects all references derived from the master object.





Instance



Reference and Reference of a Reference

# Understanding Surface Properties

All rendered objects eventually display their surface as a mesh of faces. The mesh is used for two purposes:

- To help you visualize and manipulate the surface of the object.
- To render the object to a still image or animation.

Faces are flat triangles made by joining three vertices with three edges. Two common concepts of working with meshes in 3D Studio MAX are the orientation of face normals and assignment of smoothing groups.

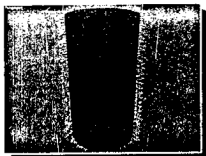
## Working with Face Normals

A face normal is a vector that defines which way a face is pointing. The direction that the normal is facing represents the front, or outer surface of the face.

Face normals are used for many purposes throughout 3DS MAX. Some of these uses include:

- Aligning the surface of objects using the Align Normals button. See chapter 7, "Precision and Drawing Aids".
- Increasing display and rendering performance by hiding faces with normals that point away from the current view. See chapter 3, "Viewing 3D Space".
- Adjusting surface properties such as transparency and bumpiness by manipulating normals during rendering. See chapter 23, "Designing Basic Materials" and chapter 24, "Designing Mapped Materials" in volume 2 of this guide.
- Manually flipping and unifying face normals to fix surface errors caused by modeling operations or by importing meshes from other

programs. See chapter 24, "Designing Mapped Materials" in volume 2 of this guide.



Displaying face normals

## Working with Smoothing Groups

Pairs of faces are joined at an edge. When you render an object you often want to hide edges and render a smooth surface. Smoothing groups define whether a surface is rendered with sharp edges or smooth surfaces.

Smoothing groups are numbers assigned to each face of an object. Every face can carry any number of smoothing groups up to the maximum of 32.

If two faces share an edge and share the same smoothing group, they will render as a smooth surface. If they don't share the same smoothing group, the edge between them will render as a corner. Because each face has only three edges, only three smoothing groups can be in effect for any face.

Extra smoothing groups assigned to a face are ignored for smoothing purposes. You can use extra smoothing groups assigned to faces as an alternative strategy for organizing sub-object selections.

Smoothing groups are used for the following purposes:

- To adjust whether a surface renders as smooth or faceted.
- As a selection method for selecting faces that share the same smoothing group. See chapter 24, "Designing Mapped Materials" in volume 2 of this guide.

In the following example, imagine that you have created a Boolean object subtracting one cylinder from another. The result is a cylinder with a hole bored through its center.

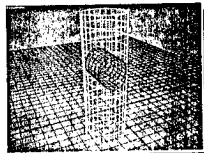
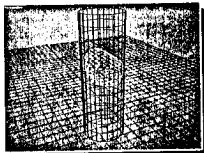
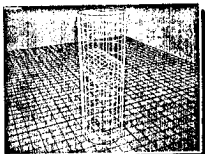


Result of subtracting one cylinder from another

The resulting object uses three smoothing groups:

- One smoothing group smooths only the faces of the top and bottom caps. (Top figure)
- Another smoothing group smooths the outer surface of the cylinder. (Middle figure)
- A final smoothing group smooths the faces of the hole. (Bottom figure)

You can use the smoothing group assignments to select and edit faces on the object. For details about assigning and selecting smoothing groups, see chapter 22, "Adjusting Normals and Smoothing" in volume 2 of this guide.



Using smoothing groups for rendering and selection



## Using 3D Studio MAX

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3D Studio MAX uses a variety of controls to accommodate a rich set of commands and capabilities. Most of the controls you see when you use 3DS MAX are familiar from other Windows applications. Some, however, have been extended to improve ease of use and to get the most out of the comparatively limited space available on a computer screen.

The first topics in this chapter describe the 3D Studio MAX window and its different functional areas. These topics introduce various controls that are described in greater detail in subsequent chapters.

The final topics describe how to begin working with 3D Studio MAX and how to use the general color and file management functions.

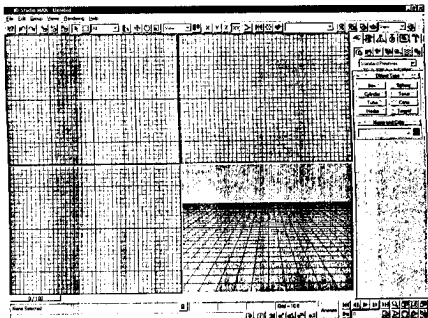
## Launching 3D Studio MAX

Once you have installed 3D Studio MAX, you launch it by double-clicking the 3DS MAX icon in the program group created during installation. You can also use any other standard Windows NT method to launch 3D Studio MAX.

After launching the product, the 3DS MAX application window appears on your desktop as seen in the figure below.

3D Studio MAX is a single document Windows NT application. This means that only one instance of 3DS MAX can run on your Windows NT desktop and that only one scene can be loaded at any time.

If you try to launch a second instance of 3DS MAX, your current 3DS MAX application window comes to the front of the desktop.



3D Studio MAX window

# The 3D Studio MAX Window

Most of the 3D Studio MAX window is occupied by the viewport area, which lets you see the 3D geometry you are creating, modifying, or animating. The remaining areas of the window are for commands, controls, and showing status information.

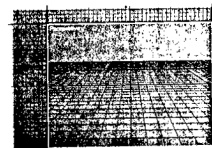
As the previous figure shows, the MAX window has seven main areas:



**Menu bar**—This is a standard Windows menu bar, with pulldown menus for several categories of commands.



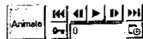
**Toolbar**—The buttons and other controls on the toolbar are commands for selecting, transforming, and rendering the geometry in a scene.



**Viewports**—You can display from one to four viewports. Multiple viewports can show multiple views of the same geometry.



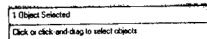
**Viewport Navigation buttons**—The button cluster at the lower-right of the MAX window provides controls for navigating within the viewports.



**Time controls**—These controls are for creating an animation and playing it back, and for navigating among the frames in an animation.



**Command panels**—At the right of the window are six command panels that provide controls for creating, modifying, and animating geometry; also for choosing display preferences. Only one command panel is visible at a time. You display the other command panels by clicking their tab.



**Status bar and prompt line**—These two lines display prompts and information about your scene and the active command. They also contain system toggles controlling selections, precision, and display properties.

The topics that follow describe these areas of the 3D Studio MAX window in more detail.

3D Studio MAX - Untitled  
File Edit Group Views Rendering Help

Item	Date	Item	Date
Bank		Bank	
Open	CHQ	Open	
Month		Month	
Year	CHQ	Year	
Source		Source	
Import		Import	
Export		Export	
Analysis		Analysis	
Summary Info		Summary Info	
View Info		View Info	
Configure Paths		Configure Paths	
Preferences		Preferences	
1 C:\MSDOSO\Account\update.mxd		1 C:\MSDOSO\Account\update.mxd	
2 C:\MSDOSO\Account\hand.mxd		2 C:\MSDOSO\Account\hand.mxd	
Log		Log	

**Edit menu**—Contains commands for selecting and transforming geometry, including Undo and Redo.

[illegible]

**Views menu**—Contains commands for controlling viewports and viewport use. These commands complement the viewport navigation buttons.

**Help menu**—Contains commands for accessing online help about 3D Studio MAX and any plug-ins you have installed in your system.

Detailed descriptions of the menu commands appear in this guide in conjunction with the appropriate functional subject. You can also find detailed command descriptions in the online help for 3D Studio MAX.



## Toolbar



The toolbar contains buttons and other controls that let you choose commands for selecting, transforming, and rendering the geometry in a scene. Some of the toolbar controls are shortcuts to menu commands; others appear only on the toolbar.


**Note:** The toolbar uses some special controls such as *flyouts*. A flyout is similar to a dropdown menu, except that the menu items are buttons rather than text. See "Special Controls" on page 2-12.




From left to right, these are the toolbar controls:




 **Help**—Click to launch the 3DS MAX help system.






  **Undo and Redo**—Shortcuts to the commands Edit/Undo and Edit/Redo.


  **Hierarchical linking**—Create and break hierarchical links between objects. See chapter 27, "Building Hierarchies" in volume 2 of this guide.


 **Bind to Space Warp**—To bind objects to a space warp. See chapter 13, "Creating Copies and Arrays".



   **Selection controls**—These controls provide several different ways to select objects. See chapter 5, "Selecting Objects".




   **Transforms**—Let you select objects and transform them with Move, Rotate, and Scale. See chapter 6, "Using Transforms" in this guide.


     **Transform Managers**—Use these controls to choose the coordinate systems and constraint methods to use with transforms. See chapter 6, "Using Transforms".


 **Inverse Kinematics (IK)**—Toggles the state of Inverse Kinematics (IK) transform mode. See chapter 28, "Using Inverse Kinematics" in volume 2 of this guide.


 **Mirror**—Displays the Mirror dialog. This button is a shortcut to the command Edit/Mirror. See chapter 14, "Creating Copies and Arrays".

  **Array flyout**—Displays the Array and Snap Shot buttons. This flyout is a shortcut to the commands Edit/Array and Edit/Snap Shot. See chapter 14, "Creating Copies and Arrays".

   **Align flyout**—Displays the alignment buttons. This flyout is a shortcut to the commands Edit/Align, Edit/Align Normals, and Edit/Place Highlight. See chapter 7, "Precision and Drawing Aids".

 **Named Selections list**—Use to name a selection set or use a selection set that has been previously named. See chapter 5, "Selecting Objects".

 **Track View**—Displays the Track View dialog. See chapter 29, "Basic Track View Use" in volume 2 of this guide.

 **Material Editor**—Displays the Material Editor dialog. See chapter 23, "Designing Basic Materials" in volume 2 of this guide.

     **View**

**Rendering Controls**—Use to render your scene with various options. See chapter 34, "Rendering Scenes and Animations" in volume 2 of this guide.

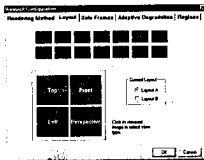
## Viewports

The viewports show multiple views of the geometry in your scene. This is useful—often necessary—for visualizing 3D geometry on a flat display screen.

You can have from one to four viewports displayed at a time, using several different layouts. The following figure shows the Viewport Configuration dialog with the different layouts available in 3D Studio MAX.

You can also use a viewport to display a Track View of your animation. (Or you can display Track View in a dialog, leaving all viewports available for geometry display.)

See chapter 29, "Basic Track View Use" in volume 2 of this guide. See also chapter 3, "Viewing 3D Space".



Different viewport layouts

## Viewport Navigation Buttons

The viewport navigation buttons change the view in the active viewport or viewports. The viewport navigation buttons vary, depending on which kind of viewport is active.

### Standard Viewports



These are the viewport navigation buttons for orthographic and user viewports—Top, Front, Left, and so on. They also apply to perspective viewports, except that the Region Zoom button is replaced by a Field of View button.

### Camera Viewports



The navigation buttons for camera viewports are different from the standard viewport navigation buttons, except that the Zoom Extents All and Min/Max Toggle buttons are still present. (If a camera viewport is active, Zoom Extents All affects other viewports but doesn't affect any camera viewports.)

**Note:** The viewport navigation buttons for camera viewports also differ from other viewport navigation buttons in that they not only change the view, but *change the camera object* as well.

These camera effects can be animated. See chapter 21, "Using Cameras" in volume 2 of this guide.

### Spotlight Viewports

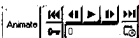


The navigation buttons for spotlight viewports are similar to those for camera viewports except that buttons for camera Field of View and Adjust Perspective are replaced with buttons to adjust Spotlight Hotspot and Spotlight Falloff.

Like camera buttons, the viewport navigation buttons for spotlight viewports not only change the view, but *change the spotlight object* as well.

These spotlight effects can be animated. See chapter 20, "Lighting Your Scene" in volume 2 of this guide.

## Time Controls



**Time controls**—The time controls are for creating animations, playing back animations, and moving through the frames of an animation.



**Time Slider**—Use to set the active frame in an animation by dragging the slider or clicking to either side of it. You can also play the animation by dragging the slider from side to side.



**Animate**—Toggles animation mode. When you click this button it turns red, as does the highlight for the active viewport, to emphasize that you are in Animation mode. In this mode, changes you make to your scene generate animation keys on the frame set by the time slider.

You don't have to be in Animate mode to use the other time navigation buttons.



**Go to Start**—Moves to the first frame in the active time segment.



**Previous Frame**—Moves to the previous frame or the previous keyframe.



**Play Animation flyout**—Displays play option buttons for playing animations in the viewports.



**Next Frame**—Moves to the next frame or the next keyframe.



**Go to End**—Moves to the last frame in the active time segment.



**Key mode toggle**—Makes the Previous Frame and Next Frame buttons move among the animation's keyframes instead of moving one frame at a time.



**Frame Number field**—Displays the current frame number. You can go to a different frame by typing its number here.



**Time Configuration**—Displays the Time Configuration dialog, which lets you set the frame rate, time display, active time segment, and other parameters.

See chapter 26, "Animation Concepts and Methods," in volume 2 of this guide.



## Command Panels

To the right of the viewports are the six command panels. Only one command panel is visible at a time; you display a panel by clicking its tab at the top.



Command panel tabs



Create command panel (sample)

**Create**—Provides controls for creating objects in your scene. See chapter 8, “Creation Methods”.

**Modify**—Provides controls for changing object creation parameters, applying object modifiers and editing sub-object geometry. See chapter 15, “Modification Methods”.

**Hierarchy**—Provides controls for adjusting object linking, pivot points, and for setting the parameters for inverse kinematics. See chapter 27, “Building Hierarchies,” in volume 2 of this guide.

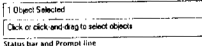
**Motion**—Provides controls for assigning and editing transform controllers. You can also display and edit object motion paths. See chapter 32, “Working with Controllers,” in volume 2 of this guide.

**Display**—Provides controls that set display preferences and optimizations for the viewports. See chapter 3, “Viewing 3D Space”.

**Utilities**—Provides access to various utility plug-ins provided by third-party developers.

**Note:** The command panels use some special controls such as *rollouts*. See “Special Controls” on page 2-12.

## Status Bar and Prompt Line




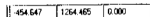
Status bar and Prompt line

The status bar and prompt line are two rows of information about the current state of your scene. They also contain toggles for setting selection, snap, and display behavior.

### Status Bar

**Current selection**—Displays information about the current selection. For example, “5 Objects Selected” or “Light1”.

 **Lock Selection Set**—Locks the current selection, which allows you to click and drag elsewhere in a viewport without selecting a different object. See chapter 5, “Selecting Objects”.



**Coordinates and offset values**—When you aren’t transforming an object, these three fields show the X,Y,Z location of the cursor in world coordinates.


When you transform an object, these fields show offsets from the object’s previous position. See chapter 6, “Using Transforms”.


Grid = 10.000


**Grid scale**—Displays the size of a grid square, in the current units, for the active viewport. See chapter 7, “Precision and Drawing Aids”.

### Prompt Line

**Prompt**—Displays a prompt that describes the current command state. For example, when the Select Object button is active, this field says, “Click or click and drag to select objects.”

 **Window/Crossing**—Toggles the region selection state. When this toggle is popped out, a region selection box (or circle or fence) selects objects that it crosses. When this toggle is pushed in, the region must entirely enclose an object to select it. See chapter 5, “Selecting Objects”.

 **Degradation override**—Click this button to turn adaptive display degradation on or off. See chapter 3, “Viewing 3D Space”.

 **Snap Controls**—Click these buttons to toggle the settings for various snap functions. See chapter 7, “Precision and Drawing Aids”.

## Controls and Color

The 3D Studio MAX interface employs some color cues to help remind you what state the program is in.



**Red for animation**—The Animate button and the border of the active viewport turn red when you are in Animate mode.



**Green for modal function buttons**—

When you turn on a button that puts you in a generic creation or editing mode, the button is highlighted in green. There can be only one green functional mode active at any give time.

You can always exit a green functional mode by clicking another modal button. Other exit methods supported by some buttons include right-clicking in a viewport, or clicking the modal button a second time.



**Blue for IK mode**—When you turn on IK mode the button is highlighted in blue. This indicates that the transform buttons behave differently when IK is active.



**Yellow for special action modes**—

When you turn on a button that alters the normal behavior of other functions, the button is highlighted in yellow.

Common examples of this behavior include, sub-object selection and locking your current selection set.

## Special Controls

This section describes some user interface controls that behave a particular way in 3D Studio MAX. These controls might differ from other Windows applications.

### Flyouts



A flyout is similar to a dropdown menu, except that the items are buttons rather than text. Choosing a button from the flyout replaces the original button.

A flyout button is indicated by a small arrow in the lower-right corner.

A flyout shows all options *as well as* the button that is currently in place. For example, if there are three alternatives, as in the illustration, you see four buttons. Releasing the mouse over the in-place button leaves the flyout state unchanged.

In general, choosing a new button from a flyout makes the new button active—but flyouts are used for different kinds of button actions.

Selecting a button from a flyout can do the following:

- Start a command, such as selecting Align, Align Normals, or Place Highlight from the Align flyout.
- Enable a mode that you can later turn on or off, such as Uniform Scale, Non-Uniform Scale, and Squash under the Scale transform flyout.
- Set a system state, such as Rectangular, Circle, and Fence under the region selection flyout.

- Cause an immediate action, such as Zoom Extents and Zoom Extents Selected under the Zoom Extents flyout.

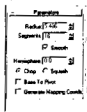
### Rollouts

Rollouts are areas in the command panels and dialogs that you can collapse (roll in) or expand (roll out) in order to manage screen space and make the display more readable.

collapsed rollout



expanded rollout



- When a rollout is expanded, its controls appear within a border and a minus sign (-) appears in the left side of the title bar. Click the title bar to collapse the rollout.
- When a rollout is collapsed, a plus sign (+) appears in the left side of the title bar. Click the title bar to expand the rollout.



Sometimes a command panel or dialog is not large enough to display all rollouts at once. In this case, a panning hand appears over the non-active parts of the rollout. You can still use controls such as buttons—the hand changes to a regular arrow cursor when you move over any control.

### To drag rollouts up or down:

1. Position the cursor over an empty area of a rollout.
2. Drag up or down.

A thin scroll bar also appears on the right side of the rollout indicating whether you are viewing the top or bottom of the rollout. You can use the hand to drag the scroll bar as well.

### Spinners



A spinner is an incremental control for numeric entry fields. As in other Windows applications, you can click the up and down arrows to increase or decrease the value. You can also press the mouse button on an up or down arrow to increase or decrease the value continuously.

In 3D Studio MAX, spinners have the following added functions:

- Drag upward to increase the value by more than 1 digit at a time, or drag downward to decrease it.
- Press **CTRL** while you drag on a spinner to increase the rate at which the value increments.
- Press **ALT** while you drag on a spinner to decrease the increment rate.
- Right-click on a spinner to reset it to its minimum value.

### Entering Text

To select a text field (including a numeric field), click it. To highlight the text, you can either double-click or drag over some of the characters—typing replaces highlighted text.

- **LEFT ARROW** and **RIGHT ARROW** move the cursor one character at a time.
- **HOME** moves to the beginning of the field.
- **END** moves to the end of the field.
- **BACKSPACE** deletes the previous character.
- **DEL** deletes the following character.
- Press **ENTER** or click a different field to accept your entry.

### Entering Numbers

Besides using spinners, you can enter a number by typing its value in the text field and then pressing **ENTER** or clicking a different field.

- You can also enter a relative value by preceding the value with **r** or **R**.

For example, if a radius field shows 70 and you highlight it, type **30**, and press **ENTER**, the radius value changes to 30.

If you type **r30**, 30 is added to the radius and the value changes to 100.

If you type **r-30**, 30 is subtracted from the radius and the value changes to 40.

## Working with Dialogs

3D Studio MAX uses two types of dialogs.

- Modeless dialogs that can remain visible on your desktop while you move on to other actions.
- Modal dialogs that must be closed before you can proceed.

Many of the dialogs in 3DS MAX are modeless. This approach places the fewest restrictions between you and your work.

### Using Modeless Dialogs

Modeless dialogs look like small application windows floating above the 3D Studio MAX window. You use these dialogs much like you use multiple applications, moving freely between the dialogs and the 3D Studio MAX window to accomplish your work.

Modeless dialogs share one or more of the following properties:

- All modeless dialogs evaluate your actions in the dialog immediately. There are no OK or Cancel buttons to implement or discard your changes.
- Most modeless dialogs have the Windows icon in the upper-left corner. Click this icon to display the standard window properties menu.
- Most modeless dialogs have the full set of window control buttons in their upper-right corner. Click these buttons to minimize, maximize, or close the dialog.
- Most modeless dialogs can be resized by dragging their edges or corners.

Examples of modeless dialogs are the Material Editor and Track View.



Track View is a modeless dialog

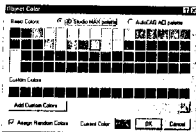
### Using Modal Dialogs

Modal dialogs must be closed before you can perform other tasks in the 3D Studio MAX window.

Modal dialogs share the following properties:

- All modal dialogs have OK and Cancel buttons. You make changes in the dialog and then click OK to accept and implement those changes or Cancel to discard them.
- All modal dialogs only have a Close button in the upper left corner of the dialog. Clicking Close is the same as canceling the dialog.
- Modal dialogs cannot be resized.

Examples of modal dialogs are the Object Color dialog and Viewport Configuration dialog.



Object Color is a modal dialog

## Beginning to Work with 3D Studio MAX

The following headings describe the basic procedures for creating and working with 3D Studio MAX scenes.

### Creating a New Scene

You can create a new scene in 3DS MAX at any time by choosing File/New or File/Reset. With either choice, if you currently have an unsaved scene open you will be asked if you want to save your changes.

**New**—Creates a new scene using the same program settings as the previous scene.

**Reset**—Creates a new scene using the 3DS MAX start-up defaults. These default are stored in the file *maxstart.max*.

### Creating and Changing Objects in Your Scene

Use buttons in the Create command panel to create geometry, cameras, lights and other objects in your scene. For information about creating 3DS MAX objects, see chapter 7, "Precision and Drawing Aids", and chapters 8 through 14 (section 2: "Creating Objects") in the present volume, and chapters 20 and 21 (section 4: "Lights and Cameras") in volume 2 of this guide.

Use buttons in the toolbar, and Modify and Hierarchy command panels to make changes to objects you create. For information about changing your objects, see chapter 6 "Using Transforms" and chapters 15 through 19 (section 3: "Modifying Objects") in the present volume, and chapter 27, "Building Hierarchies" in volume 2 of this guide.

Use the Material Editor to design and assign materials that control the color and appearance of object surfaces objects. For information about working with materials and surface prop-

erties, see chapters 22 through 25 (section 5: "Surfaces") in volume 2 of this guide.

### Animating Your Scene

Set the Animate button On and adjust the Time Slider to animate changes to your objects.

Use Track View and the Motion command panel to change animation values for anything in your scene. For information about animating your scene, see chapters 26 through 33 (section 6: "Animation and Track View") in volume 2 of this guide.


### Rendering Your Scene

Use the Rendering buttons on the Toolbar and choices in the Rendering menu to set-up rendering environments and create rendered images. For information about creating rendered images, see chapters 34 through 37 (section "Rendering" in volume 2 of this guide.

### Saving Your Scene

Choose File/Save to save your scene to disk. The first time you choose Save for a new file, you see the Save As dialog where you enter the name for the scene file. Also see "Saving Your Scenes" on page 2-24.

### Getting Help

 Click the Help button on the Toolbar or choose one of the Help menu commands to launch the 3D Studio MAX help and online documentation. See the "Preface" of this guide for information on using the 3D Studio MAX Help system.

### Exiting 3D Studio MAX

Click the close button in the 3D Studio MAX application window title or choose File/Exit.

## Working with Color

3D Studio MAX is a true color program. When you pick a color in 3D Studio MAX you are specifying 24 bits of color data which provides a range of over 16 million colors.

There are two dialogs that you use in 3D Studio MAX to specify colors:

- The Object Color dialog contains a preset palette of colors that you pick from to set an object's wireframe color.
- The Color Selector is a generic dialog that you use to define any color in the 24-bit color range.

The next two topics describe using each dialog.

## Using the Object Color Dialog

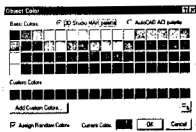
Object wireframe colors are used primarily as an organizational tool in 3D Studio MAX. When you combine object naming strategies, named selection sets, and object wireframe color strategies, you have a rich set of tools for organizing even the most complex scenes.

To display the Object Color dialog:

1. Select one or more objects.
2. Click the color switch to the right of the Object Name field.
3. Check Use Random Colors.

You can alternate between two versions of the Object Color dialog:

- A 3D Studio MAX version that contains a fixed palette of 64 colors, plus a custom palette of 16 user-defined custom colors.
- Use this version when you want to work with a smaller palette of colors or when you want to define custom object wireframe colors.



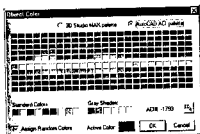
Object Color dialog

- An AutoCAD<sup>®</sup>-compatible version that contains a fixed palette of 256 colors matching the colors in the AutoCAD Color Index (ACI).

Use this version when you want to assign object colors that match the AutoCAD Color Index. Using ACI colors is useful if you plan



to export objects to AutoCAD and want to organize them by object color.



AutoCAD Color index palette from the Object Color dialog

To switch between the two versions of the Object Color dialog:

- Click the appropriate radio button at the top of the dialog for the version you want.

You can switch between either version of the dialog at any time.

## Choosing Object Wireframe Colors

Choosing a color from either version of the Object Color dialog assigns that color to all selected objects and sets it as the current color for all objects created later.

To choose an object wireframe color:

- Click a color switch in either version of the Object Color dialog.

## Defining Custom Colors

The 3DS MAX version of the Object Color dialog contains a palette of 16 custom color swatches. You can define any color for each of the 16 color swatches using the Color Selector dialog described in the next topic.

To define a custom object wireframe color:

- Choose the 3DS MAX version of the Object Color dialog.
- Click one of the 16 custom color swatches.
- Click Add Custom Colors to display the Color Selector (see the following topic).
- Define a custom color and click Add Color.

The custom color is stored in the selected color switch of the Object Color dialog and is set as the current color.

You can also get a custom color from an object in your scene and drag that color into one of your custom color swatches.

To make the current object color one of your custom colors:

- Drag the current color switch up to one of the custom color swatches.

## Using Random Color Assignment

You can have 3D Studio MAX assign colors randomly as objects are created. The colors are chosen from the current palette in the Object Color dialog.

To assign object wireframe colors randomly:

- Choose a version of the Object Color dialog.
  - Use the 3DS MAX version to randomly assign the 64 standard colors. The 16 custom colors are not used.
  - Use the AutoCAD version to randomly assign the 256 ACI colors.

## Selecting Objects by Color

Click the Select by Color button to display the Select Objects dialog. You can use this dialog to select objects based on their wireframe color. See chapter 5, "Selecting Objects".

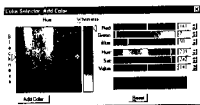
## Using the Color Selector

You use the Color Selector whenever you specify a custom color parameter in 3D Studio MAX. You can work simultaneously with three different color models to help you zero in on the exact color you want.

The Color Selector is used to specify many color parameters such as light colors, material colors, background colors, and custom object colors.

### To display the Color Selector:

- Click the color switch of any color parameter, such as a light color or a material color.



The Color Selector is divided into three different color selection models. You can use the controls for any model to define a color. The three color models are:

- Hue/Blackness/Whiteness (HBW)
- Red/Green/Blue (RGB)
- Hue/Saturation/Value

As you adjust the controls of one color model, the controls of the other two models change to match. The color defined by the color model is displayed in the right swatch of the Color Output box. The original color, before you began making changes is displayed in the left swatch.

### To reset the Color Selector to the original color:

- Click the Reset button below the Color Output box.

## Changing the HBW Color Model

The most prominently displayed and intuitive color model is the HBW model. This model represents a natural, pigment based way of mixing color by starting with a pure color (*hue*) and then making it darker by adding black, or lighter by adding white.

The main feature of this model is a large square box displaying the color spectrum. Across the top of this box you have the spectrum of pure colors, or hue. Down the side of the box you see increasing levels of *blackness*, making the color darker as you approach the bottom.

**Hue**—Define a pure color by dragging the hue pointer across the top of the box.

**Blackness**—Drag the blackness pointer down the side to darken the pure color by adding black.

You can also click or drag inside the box to change hue and blackness at the same time.

**Whiteness**—Vertical bar to the right controls the amount of whiteness. The color set by the hue and blackness pointers is displayed at the top of the bar and pure white at the bottom. Drag the whiteness pointer down to lighten the color by adding white.

## Changing the RGB Color Model

The RGB model adjusts the mix of Red, Green, and Blue to define a color. This model represents the way colored light is mixed.

The controls for the RGB are three horizontal sliders with matching numeric fields, one for each color component.

The position of the slider sets the amount of Red, Green, or Blue used in the color mix.

- When a slider is all the way to the left, its field reads 0 meaning that none of the color controlled by that slider is being used.
- If the slider is all the way to the right, the field reads 255 meaning that the maximum amount of that color is being used.

## Changing the HSV Color Model

HSV represents the traditional color model of Hue, Saturation, and Value. You operate these sliders the same as the RGB sliders, but the range of 0 to 255 has a different meaning.

**Hue**—Sets the pure color. Locating the slider all the way to the left gives you pure red. As you drag the slider to the right you move through the spectrum or Red, Yellow, Green, Cyan, Blue, Magenta, and back to Red again.

Hue is more accurately represented as a color wheel rather than a linear slider. That is why the Hue slider is red at both ends. Think of the hue range from 0 to 255 as being points on a circle where the numbers 0 and 255 are right next to each other.

**Saturation**—Sets the purity or strength of the color. A weak color, with saturation near 0, is dull and gray. A strong color, with a saturation near 255 is very bright and pure.

**Value**—Sets the lightness or darkness of a color. Low values darken the color towards black. High values lighten the color towards white. A value in the middle, setting of 127, gives you the color defined only by hue and saturation.

## Reading the Slider Background Colors

As you change the color settings in any color model, you will notice that the backgrounds of all the sliders, except hue, change color as well. The background of a slider displays the current color at a slider's location and shows what will happen to the current color if you drag the slider in a given direction. When you release a slider, the backgrounds update to show the new current color.

For example, imagine your current color is a bright orange. Looking at the Green slider you see orange directly underneath the slider, yellow to the right and red to the left. This indicates that if you increase the amount of green, dragging to the right, the color will change from orange to yellow.

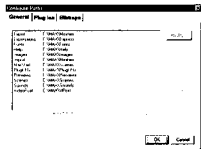
**Tip:** A rule of thumb when working with color sliders is to drag in the direction of the color you want.

## Working with Files

3D Studio MAX supports many types of files for working with plug-ins, image maps, models from other programs, rendering images and animations, and of course saving and opening your MAX scene files.

### Configuring File Paths

The default locations that 3DS MAX searches for all file types are specified in the Configure Paths dialog.



Configure paths dialog

You can choose to open and save files in any path location. The Configure Paths dialog contains three panels for the general categories of 3DS MAX support files.

To access the Configure Paths dialog:

- Choose File/Configure Paths.

### Changing File Paths

You can change paths to point to another drive or directory. You can also add paths to the Plug-ins and Bitmaps panels to have 3DS MAX look for these types of files in more than one place.

To modify a file path:

1. Choose a path entry in any panel.

2. Click Modify.

3. Do either of the following:

- Enter a path in the Path edit box.
- Use the directory navigation buttons to locate a path.

To add a path:

1. Click Add in the Plug-ins or Bitmaps panels.

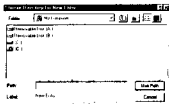
2. Do either of the following:

- Enter a path in the Path field.
- Use the directory navigation buttons to locate a path.

When you are adding paths to the Plug Ins panel you also have the option to type a path description in the Label field.

To delete a path:

1. Choose a path entry in the Plug Ins or Bitmaps panels.
2. Click Delete.



Sample path dialog

## Setting General File Paths

The General panel contains paths for the standard 3DS MAX support files. You can specify one path for each of the following file types:

File Type	Path Used for
Export	Saving scenes you export to other file formats
Expressions	Loading and saving text files used by expression controllers
Fonts	Loading font files
Help	Loading online help files
Images	Saving and viewing image files
Import	Loading files you import from other programs
MaxStart	Loading <code>maxstart.max</code> that provides initial 3DS MAX scene settings
PlugCFG	Loading plug-in configuration files
Previews	Saving and viewing animation files rendered with preview renderer
Scenes	Opening and saving for 3DS MAX scene files
Sounds	Loading sound files
Video Post	Opening and saving Video Post queues

## Setting Plug-In File Paths

Most of what you see in 3D Studio MAX is implemented as a plug-in. This means you can change and extend the functionality of 3DS MAX by adding new plug-ins from Kinetix or third-party developers.

The entry "Standard MAX plug-ins" sets the path to where the plug-ins that ship with 3DS MAX are located. This entry is set during 3DS MAX installation and cannot be deleted.

You tell 3DS MAX where to find additional plug-in files by adding path entries to the Plug Ins panel. If you had to place all of your plug-ins in a single directory plug-in file management would quickly become a mess. That's

why 3DS MAX supports multiple entries in the Plug Ins panel.

## Setting Bitmap File Paths

The Bitmaps panel contains multiple path entries that 3DS MAX searches for image files. Image files are used for many purposes in 3DS MAX such as material and map definition, spotlight projections, and environment affects. It is easy to imagine a single 3DS MAX scene using many image files.

You identify the default locations of for image files by adding paths to the Bitmaps panel. Use this technique to identify the standard directories used by most of your scenes.

3DS MAX also reads the full path of any image your load and saves that as the image filename. When 3DS MAX needs to reload the image, it searches for it in the following order:

- The path saved with the image file.
- The directory of the current scene.
- All sub-directories below the current scene.
- The paths listed in the Bitmaps panel, starting at the top of the list.

You can change the order of paths in the Bitmaps panel using the Move Up and Move Down buttons.

**To move a path up or down in the list:**

1. Choose a path entry.
2. Do either of the following:
  - Click Move Up to move the entry closer to the top of the list.
  - Click Move Down to move the entry closer to the bottom of the list.

## Opening Scenes

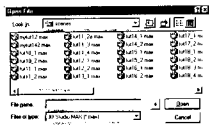
A 3D Studio MAX scene file stores all of the objects and materials in your scene, as well as many of the 3DS MAX program settings. 3DS MAX scene files use the extension *.max*.

### Using the Open Command

Use the standard Windows file selector to find and open any 3DS MAX scene file.

To access the Open File dialog:

- Choose File/Open.



Open File dialog

### Select from the File History

3DS MAX tracks the names of scenes you have worked with previously and lists them at the bottom of the File menu.

To reopen a previously opened file:

- Choose the file name from the bottom of the File menu.

You set the number of scene files listed by changing the Display Last field in the Files panel of the Preferences dialog. The valid range for the number of files to display is from 0 to 9.

### Double-Click a File

When in the File Manager or Explorer you can double-click a 3DS MAX scene file to launch 3DS MAX and open the file simultaneously.

### Drag and Drop a File

Drag a file from the File Manager or Explorer and drop it in the 3D Studio MAX application window to close the current file and open the dropped file.

### Launch 3D Studio MAX with Command Line Options

You can launch 3DS MAX with command line options using two techniques:

- Open a Command Window and manually enter the command at the prompt.
- Set up a program shortcut and enter the command in the Target field.

Two useful command line techniques both involve launching 3DS MAX with a preloaded scene file.

To launch 3DS MAX and open a specific file:

- Specify the filename after the 3DS MAX program file. For example, enter:

`C:\3DSMAX\3DSMAX.EXE myproject.max`

To launch 3DS MAX and open the last file you worked on:

- Type `-L` after the 3DS MAX program file:

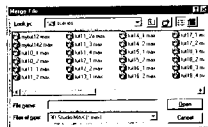
`C:\3DSMAX\3DSMAX.EXE -L`

## Merging Scenes

Use Merge to combine multiple 3D Studio MAX scenes into a single large scene. When you merge a file you can select which objects get merged and whether or not to replace objects with identical names.

### To select a file to Merge:

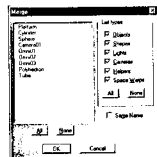
1. Choose File/Merge.
2. Choose a scene file from the file selector.



Merge File dialog

### Selecting Objects to Merge

After selecting a file to merge, the Merge File dialog appears. Use this dialog to choose object types and select specific objects of each type to merge into your scene.



Merge options in the Merge File dialog

The check boxes in the List Types area set which objects are available for selection in the list box to the left.

### To specify object types to list:

- Check the object types that you want displayed in the list box.
- Click All or None to select or clear all of the object types.

The names of all objects that match the checked object types are displayed in the list window.

### To select objects to merge, do one of the following:

- Click to select single objects.
- Press CTRL and click to add and remove single objects from the selection.
- Press SHIFT and click to select all objects between the previously selected object and the current object.
- Click All or None to select or deselect the entire list.

### Replacing Objects with Duplicate Names

Use the Same Name check box to replace objects in the original scene with objects from the merged scene that have the same name. When Same Name is checked only objects with the same name in both scenes appear in the list box.

### To replace objects with the same name:

1. Check Same Name in the Merge File dialog.
2. Select objects to replace from the list box.

# Saving Your Scenes

You should save your scenes frequently to avoid losing work due to mistakes or hardware failure. You can choose from many options for saving your scene.

## Using Save

Use Save to write your current scene to a file. The first time you save a new file, the Save File As dialog appears so you can specify the file name and location. After that, clicking Save saves the file with no extra effort from you.

To save a file:

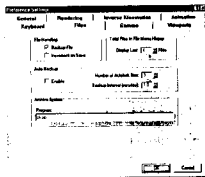
- Choose File/Save.

You can set two additional options that change the behavior of the Save command. These options are found in the Files panel of the Preference Settings dialog.

**Backup File**—When checked, a backup file is created if you save a scene over a file using the same name. The data from the original scene is copied to a file named *maxback.bak*, in the current scene directory, before the current scene is saved.

You can rename *maxback.bak* with a *.max* file extension and load it like any other scene file.

**Increment on Save**—When checked, the current scene is renamed each time you save by incrementing a two-digit number appended to the end of the file. For example, if you open a file named *myfile.max* and then save it, the saved file is named *myfile01.max*. Each time you save same the file its name is incremented, producing the files *myfile02.max*, *myfile03.max*, etc.




File Handling controls in the Preference Settings dialog

## Using Save As

Use Save As to save the current scene with a different name or to manually increment the file name with a two-digit number.

To save a file to a different name:

1. Choose File/Save As.
2. Do either of the following:
  - Enter a name in the File Name field.
  -  Click the Increment button.

The file is saved using the same method as Increment on Save described previously.

## Saving Objects with Save Selected

Use Save Selected to write only selected objects to a scene file.

To save selected object to a new file:

1. Select one or more objects.
2. Choose File/Save Selected.
3. Enter a name in the File Name field.



## Clearing Scenes

### Using Automatic Backup

3DS MAX can automatically save backup files at regular intervals. The backup file is named *autobak#.mx*, where the # is a number from 1 to 9. Automatic backup files are stored in the directory indicated by the Scenes path in the Configure Paths dialog (see "Working with Files" on page 2-20). You can rename *autobak#.mx* with a *.mx* file extension and load it like any other scene file.

Controls for the Auto Backup system are found in the Files panel of the Preferences dialog.

**Enable**—When checked, the automatic backup system is active. Default=unchecked.

**Number of Autobak Files**—Sets the maximum number of *autobak#.mx* files to save. When the maximum number is reached the file name restarts at 1, overwriting the older *autobak#.mx* files. The valid range is from 1 to 9.

**Backup Interval**—Sets the amount of time in minutes between the saving of each *autobak#.mx* file. The valid range is from 0.01 minutes to 480 minutes.

### Using Hold and Fetch

The Hold and Fetch commands are convenient methods for quickly saving and retrieving your 3DS MAX scene to a temporary file. Both of these commands are found in the Edit menu.

**Hold**—Saves your current scene to a temporary file named *maxhold.mx*. Hold files are stored in the directory pointed to by the Scenes path in the Configure Paths dialog. You can rename *maxhold.mx* with a *.mx* file extension and load it like any other scene file.

**Fetch**—Opens the temporary file *maxhold.mx* replacing your current scene.

You can choose New or Reset in 3D Studio MAX to clear your current scene and start a new one. The command you choose determines how much information is retained from the previous scene.

### Starting a New Scene

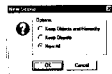
Use the File/New command to start a new scene that preserves the 3DS MAX program settings and deletes some or all object information from the previous scene.

When you choose File/New, the New Scene dialog appears with the following options:

**Keep Objects and Hierarchy**—Clears all animation from the scene. Retains all objects, modifiers, and hierarchical linking with parameters set to their value at frame 0.

**Keep Objects**—Clears all animation and hierarchical linking from the scene. Retains all objects and modifiers with parameters set to their value at frame 0.

**New All**—Clears all objects from the scene.



New Scene dialog

### Resetting a Scene

Use the File/Reset command to clear all 3DS MAX program settings and objects from the scene. The new scene uses the default start-up settings saved in the file *maxstart.mx*, located in the MaxStart path.

# Importing and Exporting Files

You use the Import and Export commands to exchange data between 3D Studio MAX and other programs.

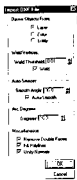
## Importing Objects into Your Scene

Use File/Import to merge objects from non-3DS MAX files into your scene. The types of files that you can import into 3DS MAX are listed in the Files of Type pulldown list in the Select File To Import dialog.

### To import a file:

1. Choose File/Import.
2. Choose an import file type from the Files of Type list in the file selector dialog.
3. Select a file to import.
4. If a second Import dialog appears, choose the import options you want.

Depending on the file type you choose, you might be presented with options available for that import plug-in. Check the 3DS MAX Help system or documentation from your plug-in developer for details on each import plug-in.



Example of the DXF file import dialog

## Exporting Objects from Your Scene

Use File/Export to save your scene in a non-3DS MAX file format. The types of files that you can export are listed in the Files of Type list in the Select File To Export dialog.

### To export a file:

1. Choose File/Export.
2. Choose an export file type from the Files of Type pull down list in the file selector dialog.
3. Enter a name File Name field.
4. If a second Export dialog appears, choose the export options you want.

Depending on the file type you choose, you might be presented with options available for that export plug-in. Check the 3DS MAX Help system or documentation from your plug-in developer for details on each export plug-in.



Example of the DXF file export dialog

## Archiving Scenes

3D Studio MAX scenes make use of many different files. When you want to exchange scenes with other 3DS MAX users or store scenes for archival purposes you need to save more than just the scene file.

Use the Archive command to store and compress the scene file and any bitmap files used in the scene into a single archive using a PKZIP compatible archiving program.

### To archive a file:

1. Choose File/Archive.
2. Enter a name in the File Name field.

You specify the external utility program and file archival options used by the Archive command by entering command-line information in the Files panel of the Preferences dialog.

### To set up the Archive program:

1. Choose File/Preferences.
2. Click the Files tab to display the Files panel.
3. Enter the full path and executable file name, and any command line option you want, for your external archive program in the Program field.



Archive System controls in the Preferences Setting dialog

# Viewing Files

You can view various file types within 3D Studio MAX using the View File command. This command can be used to view both static and animated file types.

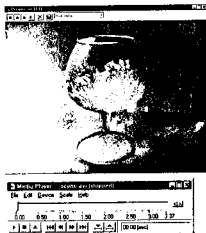
The viewing window and buttons presented on the toolbar vary according to the type of file you are viewing.

To view a file:

1. Choose File/View File.
2. Choose a file type from the Files of Type list.
3. Select a file to view.

Your selected file is displayed using of the following viewers:

- 3DS MAX Virtual Frame Buffer (VFB) is used to display static files.
- Windows® Media Player is used to display animation files.



Virtual Frame Buffer and Media Player window

## Virtual Frame Buffer Options

The VFB window contains a toolbar with file viewing options. The pulldown list on the right sets the viewing *channel*. Different file types support different channels. All of the channels supported by the selected file appear in this list.

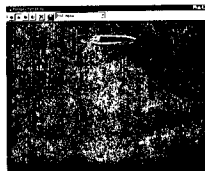


View File window toolbar

## View RGB Alpha Channel

The default choice in the viewing channel list is RGB Alpha. All viewable files support the RGB Alpha channel and enable the RGB Alpha buttons on the left end of the toolbar.

**Enable RGB Channel**—Use the first three buttons to enable the display of the RGB color channels. If a button is selected, that color channel is displayed in the VFB window. Any combination of 1, 2, or all 3 color channels can be displayed.



Example of viewing different color channels

**Display Alpha Channel**—Disables the three color channels and displays an image's alpha channel.

Alpha channels are used for various composite and mono-output effects. The most common use is to set image transparency. The grayscale values of an alpha channel have the following effect on image transparency:

- White is opaque.
- Black is transparent.
- Gray is partially transparent, based on the darkness of the gray value. Dark gray is more transparent than light gray.



Example of viewing the alpha channel

## View Other Channels

The remaining channels in the pulldown list are used for special effects during rendering and compositing. 3DS MAX writes these channels to a file using the extension *.rla*. If you configure the Renderer to create *.rla* files, you can view these channels in the VFB.

**Z-Buffer Depth**—Displays Z-Buffer information in repeating gradients from white to black. The gradients indicate relative depth of the object in the scene.

**Material Effects**—Displays the Effects Channel used by materials assigned to objects in the scene. The Effects Channel is a material property set in the Material Editor and used during Video Post compositing. Each Effects Channel is displayed using a different random color.

**Object**—Displays the G-Buffer ID assigned to objects using the Object Properties dialog. The G-Buffer ID is used during Video Post compositing. Each G-Buffer ID is displayed using a different random color.

**UV Coordinates**—Displays the range of UV mapping coordinates as a color gradient. This channel shows where mapping seams might occur.

**Normal Vector**—Displays the orientation of normal vectors as a grayscale gradient. Light gray surfaces have normals pointing towards the view. Dark gray surfaces have normals pointing away from the view.

**Non-Clamped Colors**—Displays areas in the image where colors exceeded the valid color range and where corrected by 3DS MAX. The areas appear as bright saturated colors usually around specular highlights.



Examples of viewing UV Coordinates and Normal Vector channels

## Save and Clear Image

☒ Click Clear to remove the image from the View File window.

☒ Click Save Bitmap to save all channels of the image to a new file.

## Viewing and Changing Summary Information for Your Scenes

You can choose to display and save information about your scene at any time using the Summary Info command. The Summary Info dialog displays general information about your scene at the current frame. The dialog also contains buttons for saving the information to a text file and for viewing information about plug-ins.

**To display summary information for your scene:**

- Choose File/Summary Info.

The various areas of the dialog present information about the following aspects of your scene:

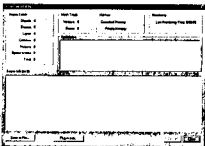
**Scene Totals**—Number of objects in your scene listed by type.

**Mesh Totals**—Total number of vertices and faces in the scene.

**Memory Usage**—RAM committed by the system and by 3D Studio MAX.

**Rendering**—Time spent rendering the previous frame.

**Scene Info**—Object-specific information sorted by category. Includes information such as object name, assigned material name, type of material, object vertex and faces counts, etc.



Summary info dialog

**To save the summary information to a text file:**

- Click Save to File and enter a file name.

## Adding Notes to Summary Information

Along with all of the information that 3DS MAX displays in the Summary Info dialog, you can add your own notes about what the file represents and how it should be used. You enter notes into the Description edit box of the Summary Info and they are stored in your scene.

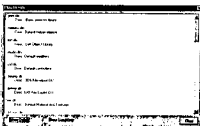
## Viewing Plug-in Info

Click the Plug-In Info button to display the Plug-In Info dialog. This dialog displays information about the plug-ins installed in 3DS MAX.

The default view shows the name and a brief description of each plug-in. Two check boxes alter the view in the following way:

**Show Details**—Shows information about all of the classes supported by each plug-in.

**Show Used Only**—Restricts the view to only those plug-ins that have been used in the scene.



Plug-In Info dialog