Table of Contents

Introducing AutoCAD® 2000…Where Design Connects.

By every objective measure, AutoCAD® Release 14 has been one of the most successful products in the history of design software with a customer base of nearly one million users. Developing and delivering a new release that delights even the most satisfied AutoCAD customer is the challenge that AutoCAD 2000 is designed to meet.

With this release we wanted to connect better with you, our customers, to deliver the design software tools and features needed to elevate you to the next level of design productivity. AutoCAD 2000 does just that, and is designed to help you connect better to your designs, to your team and to the world around you.

Since the beginning, the design has been driven by you, our customers. What you are about to experience is the result of extensive customer research based upon information and feedback from customer visits, comments from AutoCAD 2000 alpha/beta sites, written customer requests, and the AUGI® wishlist. Customer interviews, usability testing and surveys were carried out throughout the entire development process, and our marketing team regularly reviewed the AUGI wishlist to ensure that the software we were producing was the software our customers expected. We are confident AutoCAD 2000 accomplishes that goal.

With this release, we worked to meet these overarching customer needs:

1. Improve productivity, connecting you to your design through our Heads-Up Design Environment™ .

2. Clearing obstacles in your path towards design, through the improved Access and Usability of the software.

3. Connecting design to documentation, by providing Streamlined Output.

4. Helping you connect to your team and to your data, through a set of features designed for Expanded Reach.

5. Connecting the software to your exact needs, by enabling Greater Customization and Extensibility.

Best of all AutoCAD 2000 is based on a powerful technology framework and philosophy of open architecture. AutoCAD 2000 also marks the completion of the technology transition that began in Release 13. Including a fully object-oriented database and architecture, a modern 3D graphics pipeline, and full optimization for the 32 bit Windows environment.

AutoCAD 2000 more smoothly connects you with your design information, your colleagues, and the world by integrating the most sought after features into a cleaner, smarter design environment. AutoCAD 2000 is where design connects....

Heads-Up Design Environment

Connecting you to a world of intelligent, automated design

In a very real sense, AutoCAD 2000 represents a movement away from keyboard dependence into a world of efficient "heads-up" design. Features such as the *Multiple Design Environment*, *AutoCAD DesignCenter (ADC)*, and *Enhanced AutoSnap* enable you to direct your attention to the drawing and the task at hand, thereby working smarter and more efficiently than ever before.

Multiple Design Environment (MDE)

You may be familiar with the term *Multiple Document Interface (MDI)*--the ability to open multiple documents within a single session. AutoCAD 2000 takes this concept a step further and introduces MDE, Multiple Design Environment. MDE adheres to Windows® standards and provides an intelligent environment that increases performance, productivity, and ease of use. With MDE, you can multitask between drawings with no interruption in workflow and "connect" to both your own data and the data of others by reusing previously defined content. MDE offers a multitude of capabilities, including such high-level functionality as:

- **Opening Multiple Drawings.** AutoCAD 2000 provides you with ability to open multiple drawing files in one session of AutoCAD. From the File > Open dialog, you can select several files to open with the Shift or Control keys and selecting the Open button. Alternatively, you can open multiple drawings by dropping them from Windows Explorer into an AutoCAD session.

- **Object Drag & Drop.** This feature gives you the option to copy or move objects within or between drawings with a simple drag and drop operation. Right dragging a drawing or document from Windows Explorer provides you with the option to Open, Insert, XREF, Copy as an OLE Object, or Create a Hyperlink to the document you are dragging. This significantly reduces the number of steps required to perform many common tasks and immediately increases efficiency.

- **Property Painter Support.** With a simple mouse-click, you can now paint object properties such as color, layer, linetype, linetype scale, and more, from one drawing to another. This feature improves consistency between drawings and speeds up drawing completion.

- **Cut/Copy/Paste.** This feature enables you to accurately copy drawing objects from one drawing to another within a single session of AutoCAD software, reducing the time spent reworking similar design ideas. Additionally, you have the ability to either specify a basepoint or reuse original coordinates not only increases efficiency but also maintains drawing placement precision.

- **Concurrent Command Execution.** By enabling you to switch between drawings without canceling the current command, Concurrent Command Execution significantly reduces workflow interruptions.
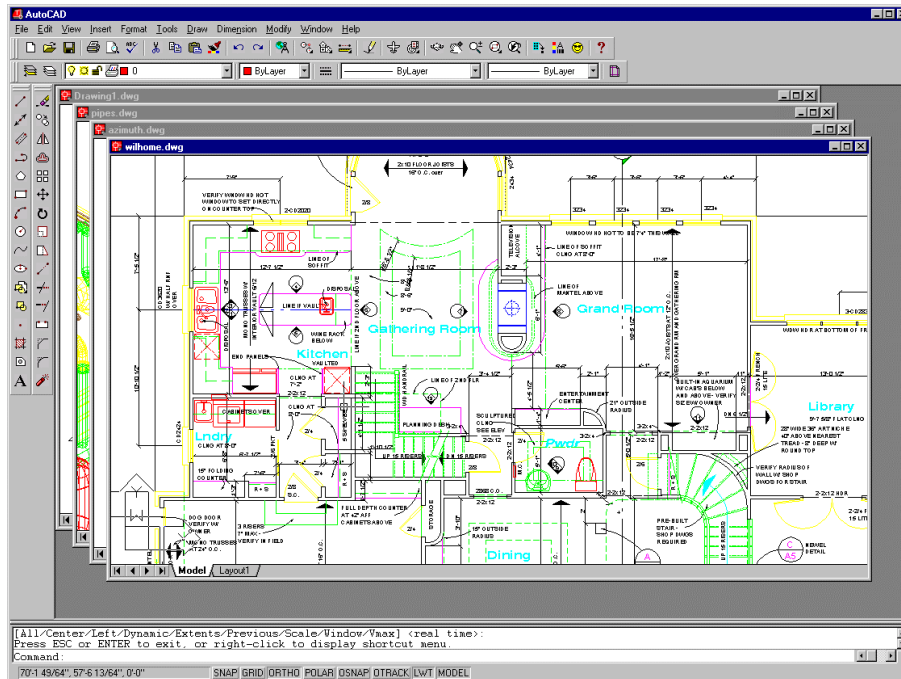
Open Multiple Drawings in a Single AutoCAD® Session

AutoCAD DesignCenter™

The AutoCAD DesignCenter (ADC), similar to the Windows Explorer in appearance, provides a more intuitive and efficient dialog interface in which you can "mine your design." With ADC you can easily view and copy data from any drawing—open or not. You can list drawing content such as blocks, layer definitions, layouts, and xrefs from sources as varied as local machines, network drives, and even Internet sites. You can then simply drag and drop any of these components from one drawing file into any currently open file. Additional automation is provided for blocks: if both block and destination drawing have units assigned, the block automatically scales to match the drawing units. You benefit by being able to easily and quickly extract and reuse previously completed work.
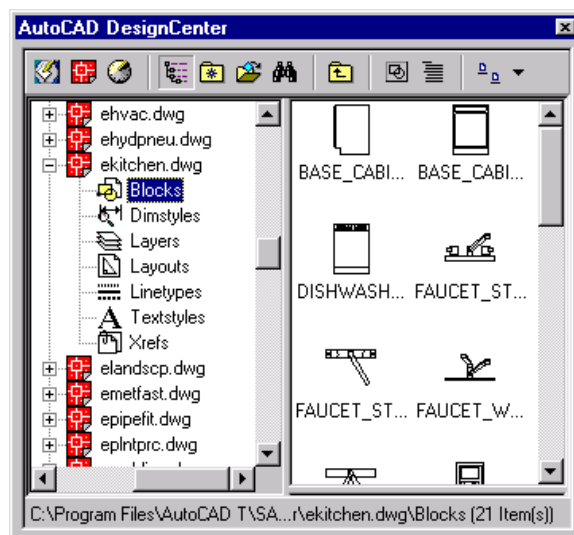

AutoCAD DesignCenter —Tree View on Left

The AutoCAD DesignCenter also provides a powerful, timesaving Find tool that enables you to search for drawings using drawing content information such as a layer name or block name, summary information such as subject or title, or by drawing date. Once the drawing is found, you can load it into ADC and then drag and drop the entire drawing or any of its components, such as blocks or layers, directly into the currently open drawing. For frequently used drawings and locations, ADC provides a Favorites feature giving you direct access to your most commonly used data. These features not only save significant amounts of time by making it easy to find and reuse existing content, they also enhance collaborative projects where standardization is important.

## AutoSnap™ and AutoTrack Enhancements

The AutoSnap feature, first introduced in AutoCAD Release 14, has been significantly enhanced in AutoCAD 2000. As a result, without ever having to touch the keyboard, you can more intuitively and efficiently create and accurately position new geometry based on existing drawing objects. A visual display of temporary construction lines and acquired graphical points enhances editing—a real timesaver since actual construction lines need never be drawn. The AutoSnap, Ortho, and *XY* Point Filter features are all incorporated into the new AutoTracking and Polar features, further decreasing drawing time. AutoSnap enhancements include the following:

- New Extension and Parallel object snap modes.
- Updated status bar that enables you to toggle the Polar and Align features on and off.
- The ability to track cursor movement along specified incremental angles as the cursor moves into the proximity of these angles.
- The addition of angle overrides that behave in a manner similar to OSNAP overrides.
- Visual feedback through temporary visual construction lines, called AutoTracking that can be based AutoSnap points, extensions of objects, and an arbitrary temporary tracking point defined by you.
- The ability to track along an alignment path based on acquired points (osnap points and tracking points).
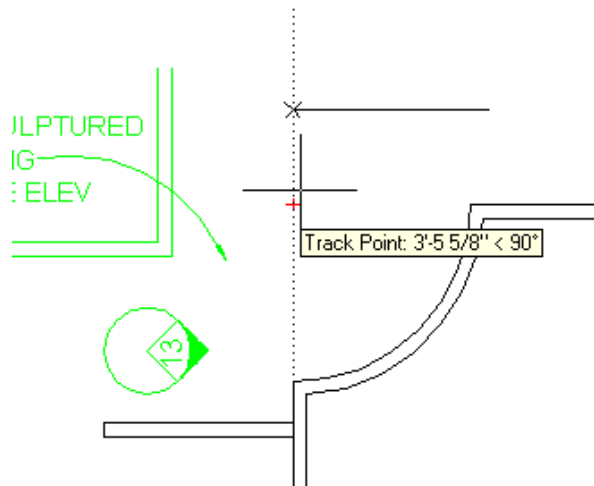
AutoTrack Temporary Construction Lines and Tracking Points

- The ability to specify displacement points at any angle when in Tracking mode—in addition to direct entry and picking.
- Application Programming Interface (API) enhancements that permit developers to implement their own snap modifiers.
- The consolidation of Snap, Grid, Osnap, and Alignment settings into a single, tabbed dialog accessed through a right-click shortcut menu.
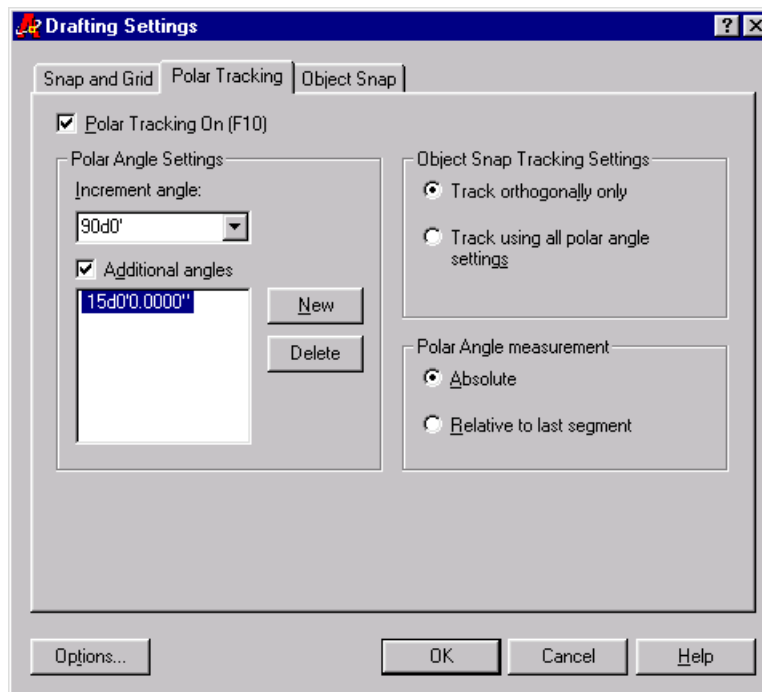
Polar Tracking Tab of Drafting Settings Dialog

IntelliMouse™ Support – Real-time Zooming and Panning

AutoCAD 2000 supports Microsoft IntelliMouse and compatible pointing devices with Real-time Pan and Zoom features. Rotating the IntelliMouse wheel performs a Real-time zoom; clicking and dragging the wheel performs a Real-time pan and double clicking the wheel performs a zoom extents function. With these operations, drawing navigation proceeds smoothly and transparently—even in the middle of a command.

QDIM (Quick Dimensioning)

Dimensioning is one of the most time-consuming but vital drawing tasks for a designer. The new QDIM command can greatly reduce this time and boost productivity significantly. QDIM enables you to create several dimensions with a simple selection of geometry. In many instances, the QDIM command can substitute for a conventional dimensioning procedure, greatly reducing the number of screen picks required to place dimensioning elements. QDIM supports the rapid creation of a number of dimensioning modes including staggered, baseline, and ordinate among others. For example, to dimension the part below required just four mouse-clicks. And with the new Dimensioning Shortcut menu, an additional right-click provides elements such as the Dimension style or precision to be quickly changed.
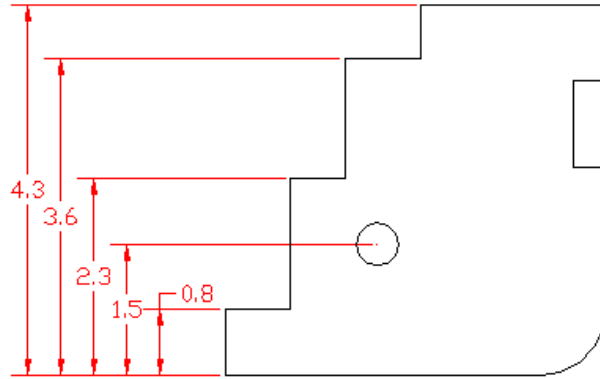
QDIM—Dimensioning with Four Picks

Partial Open and Partial Load

A significant overall increase in performance and productivity can be gained when working with large drawings by using the new Partial Open feature. With Partial Open, you can open any desired portion of a drawing and external reference files, based on saved views or customer-specified layers or the geometry shared by both. Since only the needed portions of the drawing are opened, memory requirements and opening times can be significantly reduced while retaining full draw and editing functionality.
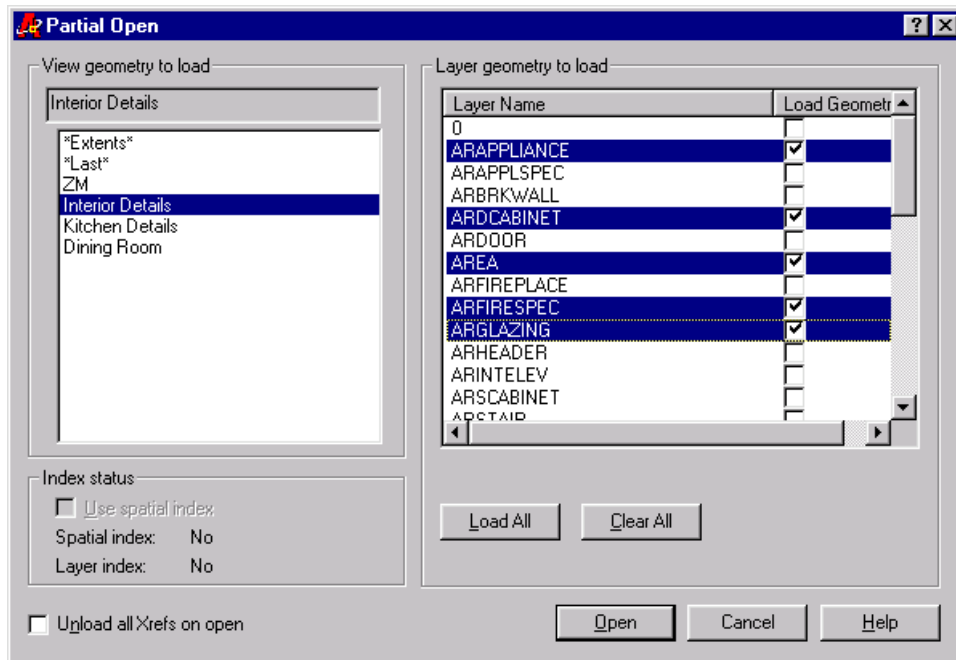
Partially Opening a Drawing Based on Views or Layers

The Partial Load feature also enhances productivity. Once you have partially opened a drawing, the Partial Load feature can be used to load additional portions of the drawing on an as-needed basis. As with the Partial Open feature, additional loading is based on saved views, specified layers, or spatial selection. Control over the amount of external reference layers and geometry is also provided. In certain cases,

smart object-demand-loading automatically loads the required data. For example, if a hatch boundary is modified, the hatch pattern definition will automatically demand load and modify accordingly, instantly providing feedback to you.

3DOrbit – Persistent Shading and Advanced 3D View Control

AutoCAD 2000 marks a further advance in 3D visualization in AutoCAD software, making it both faster and more intuitive. For example, the 3DOrbit feature enables you to perform fast, real-time rotation and zooming of rendered and wireframe models. With 3DOrbit, you can also dynamically create, view, check, or edit 3D models from any angle in a perspective or parallel view. Additionally, model sections can be viewed using dynamic front- and back-clipping planes that reduce the visual complexity of 3D models.
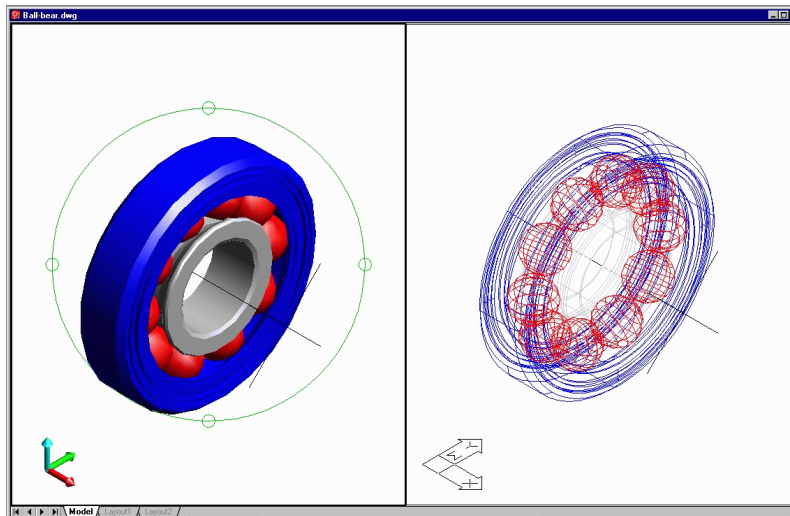
3DOrbit (left) in Gouraud shaded mode with 3D UCS icon

Such new visualization tools as a 3D grid plane and optional front- and back- clipping planes help designers understand and convey their design ideas. And a variety of shading modes, such as hidden wireframe or Gouraud, can be set persistently in different viewports. These new visualization tools assist any customer, from novice to expert, by making the viewing of 3D models easier and more intuitive.
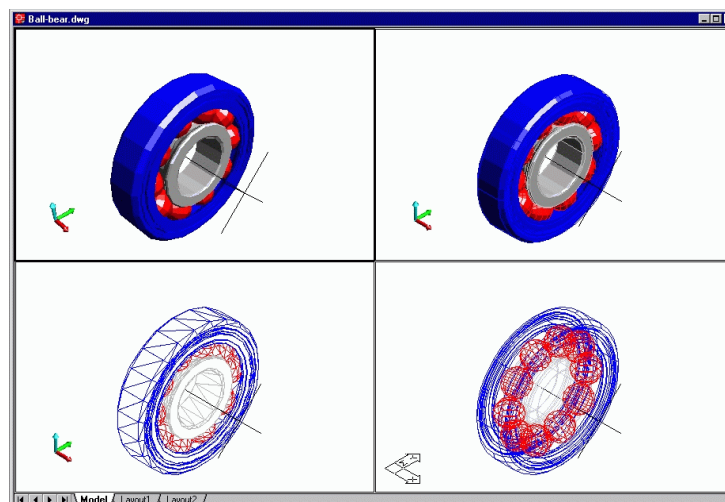
Persistent Shading Modes

UCS per Viewport – Viewport Independent User Coordinate Systems

Both new and experienced users will find it much easier to work in both 2D and 3D with the new UCS per Viewport feature. The User Coordinate System (UCS) can now be defined on a per viewport basis. This enables you to change from one viewport or view to another without having to reset the UCS. With the UCS per Viewport feature, the UCS can be set to automatically align with your current view or viewport, thus saving time and increasing efficiency. Predefined orthographic UCSs of front, top, and side views are provided and can be created with the new Viewports dialog.

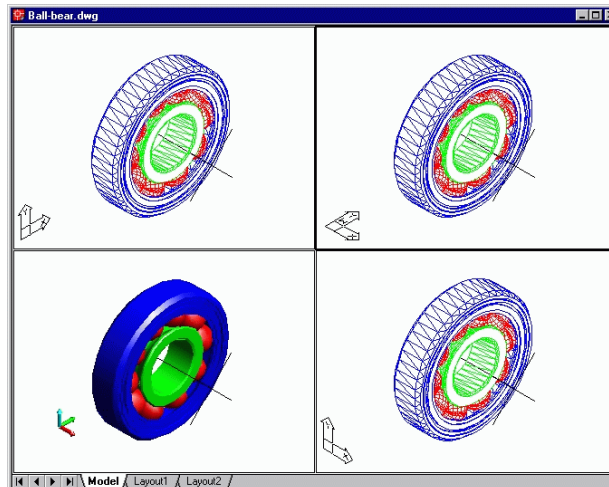UCS per Viewport - (clockwise from upper left) Right-side, Top, Front

In-Place Reference and Block Editing

With AutoCAD 2000's new In-Place Reference and Block Editing feature, which includes a Reference Edit dialog and Refedit toolbar, you have a powerful, timesaving enhancement that enables you to edit reference geometry and the current drawing at the same time. Use it to select all or a portion of a block or external reference and edit it from within the context of the parent drawing, *i.e.*, in place. Selected objects in Xrefs and Blocks then become available for editing. All other objects visually dim in display intensity, providing an easier environment for editing your selected objects. This intuitive tool yields more accurate results significantly increasing your drawing efficiency. You can either save the changes back to the reference file or discard them. You also have the capability to copy objects in the reference drawing into the parent drawing as well as to copy objects from the parent drawing into the external reference.

An additional benefit of this feature is the ability to edit the definition of block without exploding it. With Refedit, you can select a block within a drawing, edit its definition, and save it. Once you have saved your changes, all instances of that block in the drawing file will automatically be updated with your change.
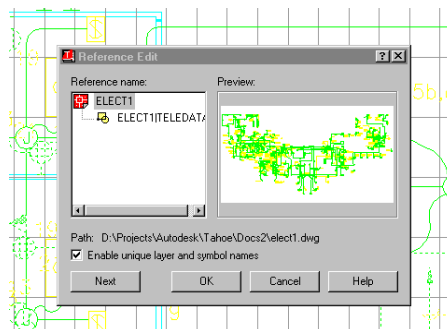
In-Place Reference Editing

IMPROVED ACCESS AND USABILITY

Designed to clear your path.

AutoCAD 2000 is continuing to shift the user interface from command-centric to design-centric and making the software more transparent throughout the design process. One way to accomplish this is to enhance productivity and make commonly used tools more accessible and easier to use. AutoCAD 2000's productivity enhancements are designed to increase ease of use by automating certain tasks and by making AutoCAD more integrated with Windows. Some of these features include the *Object Properties dialog*, *Improved Selection Filters*, and *Right Click Context Menus*.

Object Properties Dialog

AutoCAD 2000 introduces the Object Properties dialog, which revolutionizes the way you view and edit an object's properties. The Object Properties dialog combines the functionality found in such commands as DDMODIFY and DDCHPROP and adds many other object-specific editing commands. Through a single, resizable, dockable, modeless (always available until dismissed) dialog, the Object Properties dialog enables you to modify virtually all properties of AutoCAD objects in a simpler, faster, more efficient manner. The Object Properties feature include the following:

- **Edit by type.** The Object Properties feature filters selection sets by object type, thus enabling you to modify properties on a per-object basis.
- **No selection set.** When no selection set is current, the current state of properties, such as hyperlinks, plot style, Hide plot, UCS, and viewport data, are displayed and can be modified.
- **Tabbed Listing.** Dialog tabs enable listing of object properties by category (*e.g.* General, Geometry, *etc*.) or in alphabetical order making it easier to find a specific property.
- **Dynamic Updating.** Modified properties are updated dynamically on-screen providing instant feedback for more accurate property editing.
- **Quick Select Access.** When used with Quick Selected filtered selection set (*e.g.* all circles on a specific layer), the Object Properties dialog makes the modifications of an object's properties quick and easy.
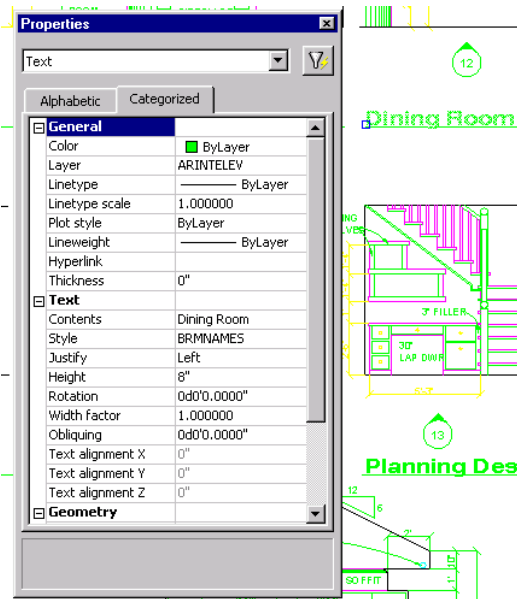
Object Properties dialog

Find –Find and Replace Text

AutoCAD 2000 introduces the Find feature, which provides you with a quick and easy method for finding and replacing text within a drawing file. You can use the Find tool to locate text in block attributes, dimension annotations, and hyperlink/URL names. Once you have located text of interest, the Zoom option enables you to locate and zoom to it in the drawing file. Highly flexible search options include case-sensitive searches, whole-word only searches, searches restricted to specific types of text (*e.g.* URLs), or searches limited to the current selection set instead of the whole drawing.
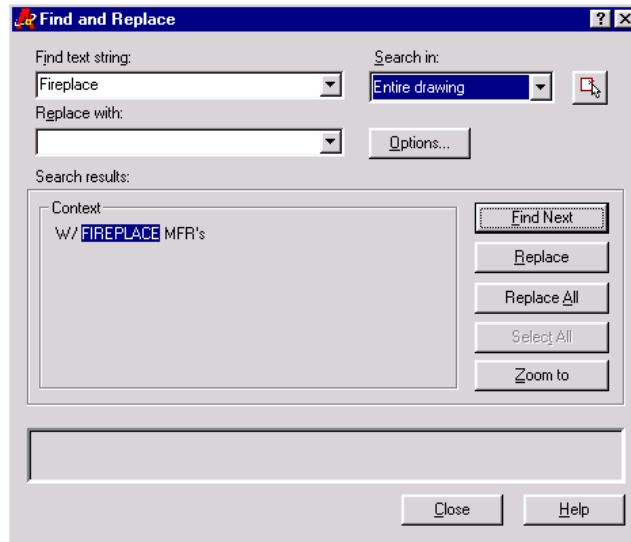
Find and Replace Text dialog

Quick Select – a Quick Selection Set Builder

The new Quick Select dialog, representing a subset of the FILTER command, intuitively, eases and simplifies the process of creating and filtering selection sets based on object properties such as object type, layer, color, linetype, or lineweight. Filters may be applied either inclusively or exclusively to the entire drawing or to the current selection set. With Quick Select, for example, a filtered selection set
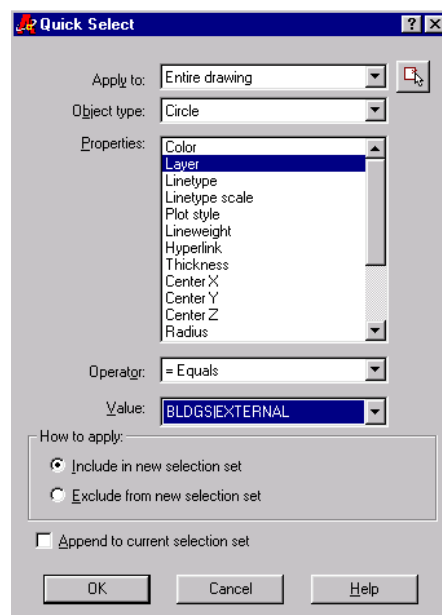
Quick Select Dialog

containing all circle objects found on a given layer can be built quickly. Once defined, a selection set can be further refined with additional applications of Quick Select. When used with the Object Properties dialog, Quick Select becomes a powerful, quick, and intuitive way of selecting and editing AutoCAD objects.

Object Property Toolbar

To support new AutoCAD 2000 functionality, the Object Property Toolbar is updated and includes the addition of a Plot/No-plot icon in the Layer States combo box and a new Lineweight combo box. A new Plot Styles button has also been added. The Object Property Toolbar enables easy access to frequently used properties and settings.
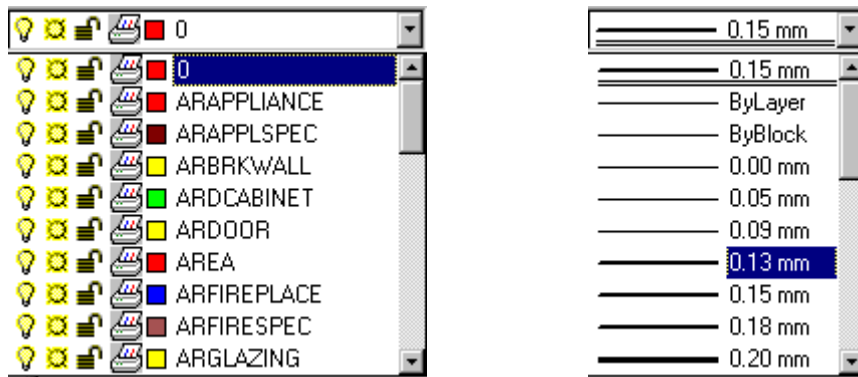
Updates to the Object Property Toolbar

Context Menus – Right Click Shortcut Menus

AutoCAD 2000 greatly extends the use of right-click shortcut menus to support the Heads-Up Design Environment. Context menus provides you rapid access to the options available for tasks or commands currently underway. For example, while a performing dimensioning task, the right-click menu will display a group of dimensioning options or subcommands, such as an option for changing dimension text location or the degree of precision. These shortcuts are tremendous timesavers enabling you to concentrate on your work area in a "heads-up" manner.

Five basic modes of shortcut menus are implemented in AutoCAD 2000 and all are customizable and extensible. The basic menu modes include the following:
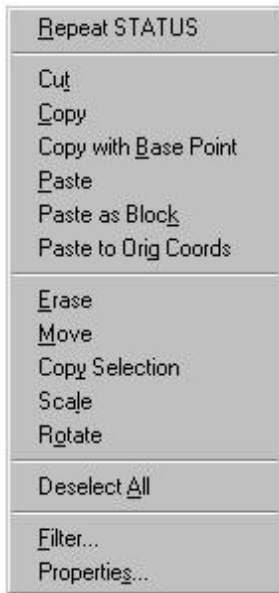
Edit-mode menu appears when you right-click with objects selected but no command in progress. For some high-level objects such as dimensions, the menu will display object-specific editing tools.

Default menu appears when you right-click in the drawing area and no command is in progress or when a selection set is available.

Dialog-mode menus appear when you right-click in modal dialogs or on dialog tabs. (Shown the Layer Properties Right Click Menu.)

Command-mode menu appears when you right-click during a command in progress. Options specific to that command are displayed.
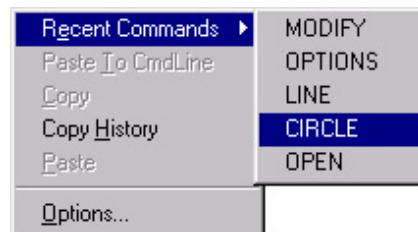
Other menus. Right-clicking on the command line displays a recent command history. Right–clicking on any toolbar displays a list of all toolbars.

Solids Editing Enhancements

Creating 3D solid models is significantly easier in AutoCAD 2000 with the addition of a full-featured solids-editing capability. First of all, designers can now take full advantage of the ACIS® 4.0 modeling engine in AutoCAD to create complex solid models quickly and easily. Once created, these models can be easily modified using techniques for face, body, and edge editing. Editing capabilities include: face move, rotate, offset, taper, delete, copy, and change color. Flexible shelling and imprint features are also included. You can select faces with an intuitive face-picking method. All of these tools are available on an easy-to-use Solids Editing toolbar.

Solids Editing toolbar

Drawing Properties

With Drawing Properties, you can embed ancillary data in drawing files and perform queries and retrievals of these drawing files based on this data. The drawing file then becomes more than just a repository for drawing data; it provides you with base-level file-retrieval and file-management capabilities.

For people who are not running AutoCAD, they can now see drawing properties via the Windows Explorer Properties right click shortcut menu command outside of AutoCAD. This adds additional value to drawing files enabling those that don't have AutoCAD to see information about the drawings. Used in conjunction with AutoCAD DesignCenter's Advanced Find feature, Drawing Information makes it much easier to find or catalog drawings.

By exposing an API to this new AutoCAD capability, independent developers can further enhance and extend Summary Information functionality in innovative, discipline-specific ways.
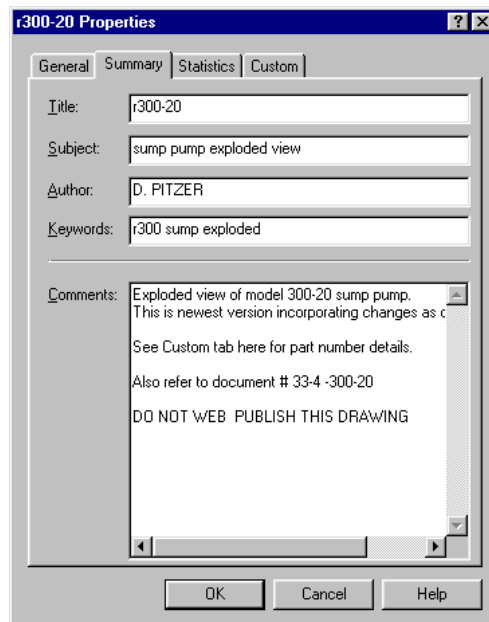
Drawing Properties dialog – Summary tab

Text Enhancements

Text capabilities have been significantly enhanced in AutoCAD 2000 for increased performance, flexibility, and usability. Text enhancements include the following:

- Line spacing and curly brace support in the Mtext editor.
- Automated stacked fractions, architectural-style fractions, alignment control (top, middle, and bottom) plus capability to scale fractions relative to text height for more professional presentations.
- Resizable Mtext dialog.
- Add Uppercase override, Relative Height override support, and new Combine Paragraph option with right-click menu.
- Display of most recently used fonts in dropdown list.

Clockwise: dbConnect Manager, Data View, and Query Editor

DXF Enhancements

In AutoCAD, the DXF format is synonymous with the DWG format. The entire AutoCAD community has always been able to work with DXF files through the familiar commands that access and save drawing files. AutoCAD 2000 expands on this powerful capability by providing an improved database exchange, more "intelligent" DXF files, a higher degree of interoperability, and reduced loading times.

STREAMLINED OUTPUT

Connecting from Design to Documentation

AutoCAD 2000 is not just about making you more productive; it is also about better communications. AutoCAD 2000 includes many new features and enhancements intended to help you better communicate design intent. These features include the introduction of a *Multiple Layout* concept, the ability to create *Nonrectangular Viewports*, the addition of *Lineweight* as an object property, *Text-Handling* enhancements, *OLE text-height scaling*, and a *More Flexible Plotting Interface*. This all adds up to faster, easier to setup, plotting that gives you the level of control required to satisfy your plotting needs.

Layouts—Multiple Paperspaces

The new Layouts feature in AutoCAD 2000 gives you the ability to create multiple paperspace layouts in a single drawing. You can now visually compose a drawing on a virtual "sheet" of paper. Aided by visual cues that indicate plotting area, configuring a layout for plot scale, paper size, plot area, paper orientation and the plot device becomes a simple, straight forward task. Multiple drawing layouts enable you to consolidate multiple drawing sheets into a single drawing file. This will greatly reduce the time and effort required to setup and configure your drawing files for plotting. Since each layout stores its own plot settings, you have unprecedented plotting control over drawing output.

- **Layout Creation.** You can quickly and easily create individual layouts using the layout wizard, layout templates, or create one from scratch. Once created, a layout from any drawing can be inserted into the current drawing using the AutoCAD DesignCenter or the layout import command--saving time and maintaining drawing standards.

- **Page Setup.** Page setup provides you with the ability to specify plot parameters such as plot device, paper size, scale factor, plot orientation, and plot area in each layout. This provides you with Plot Preview-like feedback on how your layout will appear when plotted. These settings are saved within each layout enabling you to plot each layout the same way, every time without having to re-configure your plot settings from the last plot. As a result, you can leverage the work in a single drawing for many drawings.

- **Named Page Setups.** After you have configured the Page Setup for your layouts, you can name and save them into the drawing file for later use. This provides you with on-the-fly flexibility and convenience to change a layout's Page Setup settings from one configuration to another. Additionally, you can also import Named Page Setups from other AutoCAD 2000 drawings.

- **WYSIWYG Layouts.** The Layouts feature provides a preview of exactly what will be plotted out. The preview-like feedback displays a paper border that accurately indicates the plot area for the layout based on paper size, scale factor, paper orientation, and offsets. The layout also accurately reflects lineweights, screening, color, fill patterns, etc. With WYSIWYG layouts, you are in full control of your output and it simplifies the plotting process to the simple act of pressing a button.

AutoCAD 2000's Model and Layout Tabs

Non-rectangular Viewports

In AutoCAD 2000, viewports can be defined or clipped with any closed shape; they no longer need to be rectangular. This capability makes for a more efficient use of drawing presentation space and gives you the flexibility to better present viewport data by "designing" your viewports to fit the minimal area necessary.
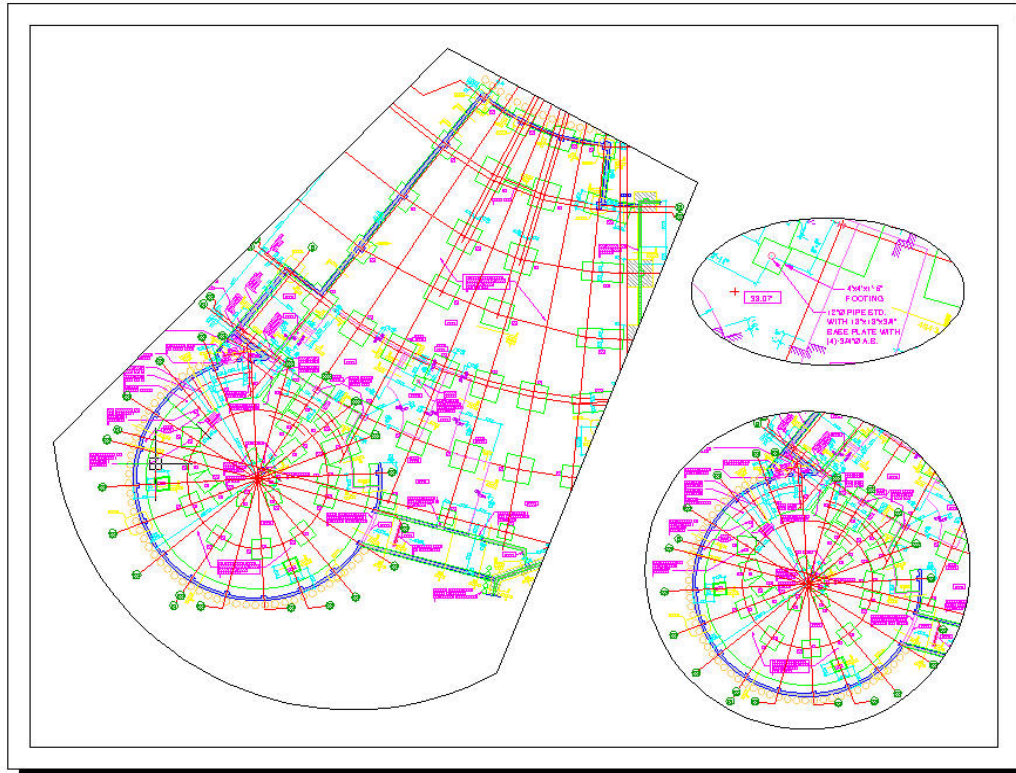
Non-rectangular Viewports

A new Viewport toolbar enables you to easily assign standard viewport scales, like 1:1, 1:4, 1:100, as well as enabling you to type in any custom scale to accommodate your needs. Once you have set the scale for a viewport, you now have the option with AutoCAD 2000 to lock the viewport's scale. Using the new Viewports dialog, you can easily setup a layout for standard orthographic views. These tools provide an efficient means of setting, saving, viewing, and configuring various viewports and enable a more efficient use of drawing space.
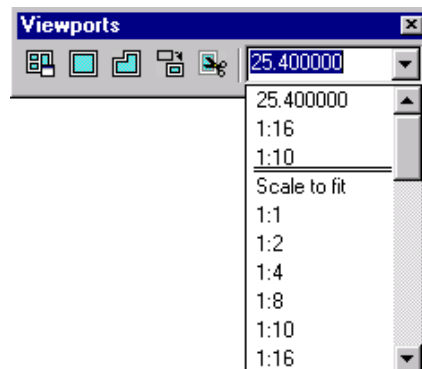
Viewports Toolbar
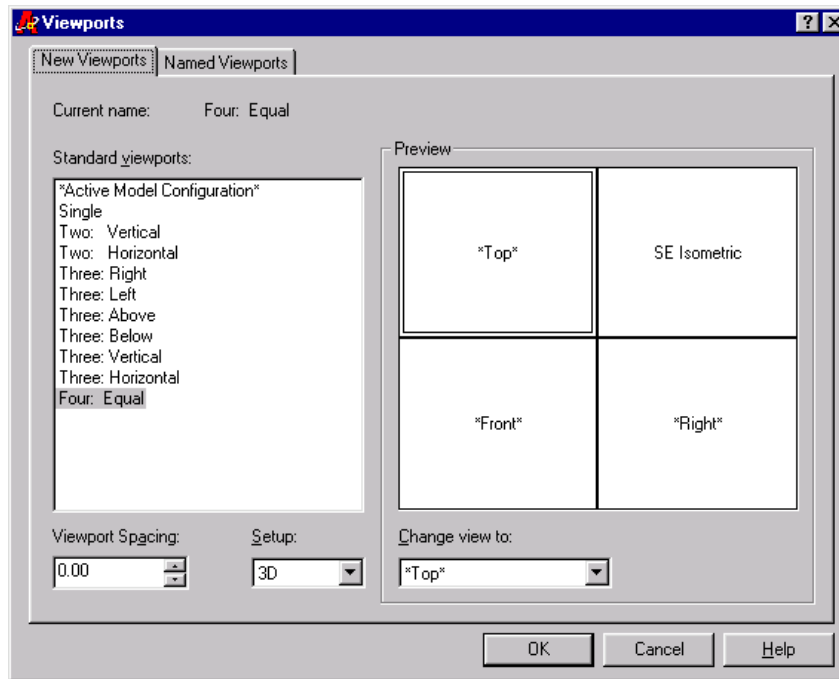
New Viewports toolbar and dialog

Plotting Enhancements

Virtually all AutoCAD users generate output in one form or another. Most generate paper plots and, in AutoCAD 2000, many will want to produce DWF (drawing web format) or ePlot output as well. The streamlined plotting in AutoCAD 2000 offers ease of use, power, and flexibility tailored to your needs, and the new Plotting feature modernizes and updates AutoCAD software's plotting functionality. The traditional ADI® plotter drivers have been replaced with new Heidi® Device Interface (HDI) plotter drivers.

In addition to its technical advantages, HDI has been used to create a new set of modern graphical user interfaces based on the Windows standard. Both the layout and plotting enhancements provide consistent output with little effort and improved plot performance. Consider these advances:

- Plot settings are saved in the drawing, reducing set-up time, and providing consistent plotting.
- New Plot dialog emulates the Windows Print interface so it's easier to learn and use.
- Many drawing files can now be incorporated into a single drawing file with multiple layouts.
- Plotting becomes simpler and more efficient since Plot Setups are stored on a per layout basis.
- Plot preview provides WYSIWYG plotting by incorporating lineweights, True color, linetypes, screening, fill patterns, paper size, plot area, and scale factor, saving time and eliminating guesswork.
- Plotter configurations are portable and can be easily shared with other project members, saving time, reducing confusion, and enhancing collaborative efforts.
- Plot Styles enable you to move away from color based plotting by assigning a plot style to the layers or objects in your drawing. The named Plot Style will then determine the appearance of your drawing when plotted. Plot Styles can also be assigned based on an object's color as in R14. A Plot Style now controls plot appearance characteristics on any plot device, except pen plotters. Plot Style control lineweights, linetypes, color (dithering and grayscale), screening value, fill pattern, line end style and line joint style of drawing objects when they are plotted. Plot Styles are saved in a file called a Plot Style Table (formerly pen assignments); the table is then attached to your drawing for plotting. Plot styles can be displayed in a drawing layout and are displayed in a full plot preview. This enables you to see exactly what your plot will look like before you plot it.
- Screening enables you to control the display intensity of plotted objects so you can emphasize portions of your design. It also yields more effective, easier-to-understand plots.
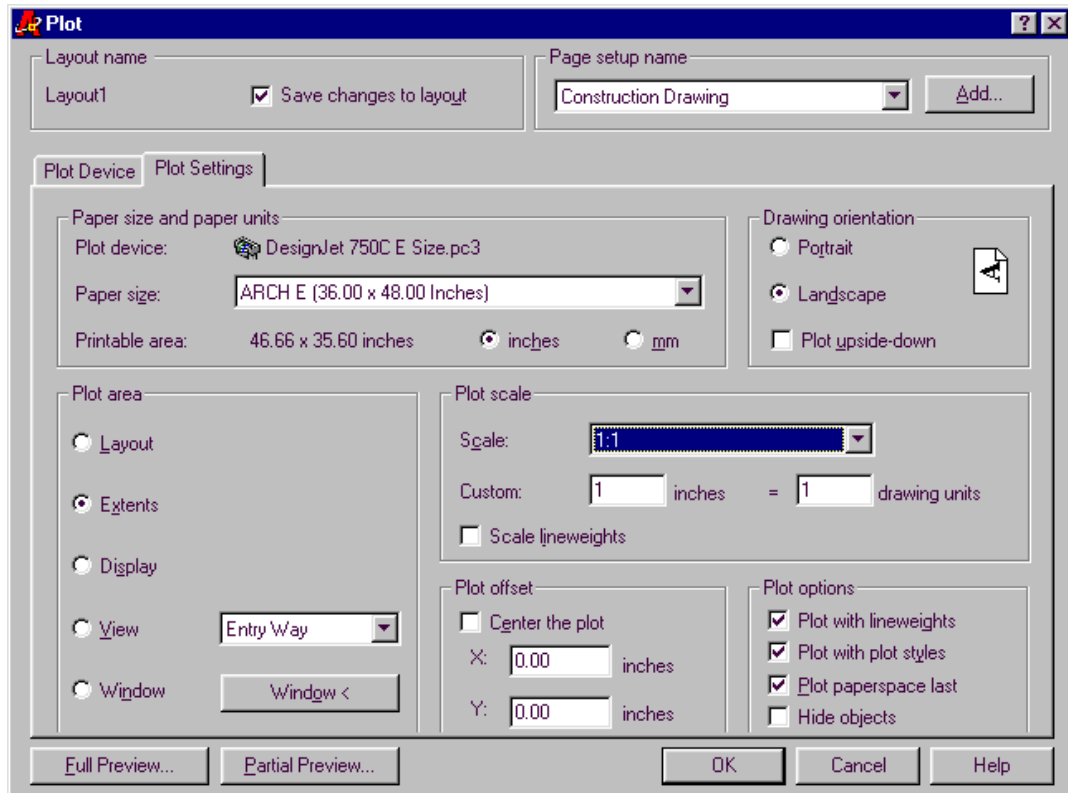
Plot dialog – Plot Settings tab

Lineweights

If you do not wish to use Plot Styles to control line thickness, AutoCAD 2000 introduces a new object attribute—Lineweight—to layers and objects in your drawing. Lineweights can be assigned from the Object Property toolbar and in the Layer Properties Manager dialog. Lineweight represents another AutoCAD 2000 WYSIWYG enhancement to viewing and plotting, giving you more control over screen display and printed output.
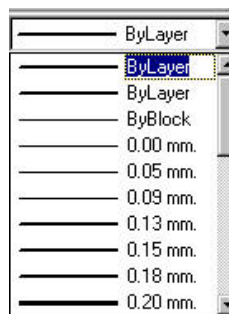
AutoCAD 2000's Lineweight attribute

OLE Text Scaling

A new, easy-to-use Scale OLE Object dialog provides a variety of ways to control the size of OLE text objects, which leads to more accurate plots and better integration with other Windows applications. You can access the new dialog at any time during an editing session. You can scale OLE objects with the following methods:

1. By entering a width and height in AutoCAD units.
2. By assigning a height corresponding to the point size of a font contained in the OLE object.
3. As a percentage of the current height and width.
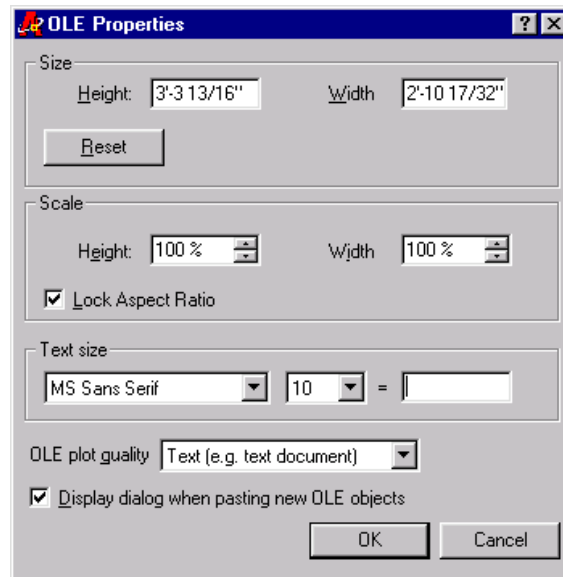
OLE Properties dialog

True Color Support

AutoCAD 2000 breaks the 255-color barrier with 24-bit True Color support of rendered and raster images, increasing the on-screen and hard-copy quality of both. The standard ZOOM command can also now be used on rendered images.

GREATER CUSTOMIZATION AND EXTENSIBILITY

Connecting AutoCAD to your needs has never been easier

AutoCAD software has always been open and easily extensible, but never more so than with AutoCAD 2000. The addition of the Visual LISP API to AutoCAD 2000, for example, not only updates the AutoLISP environment, it also greatly expands AutoCAD ActiveX support by including additional ActiveX objects and events. AutoCAD 2000 has also enhanced its VBA functionality, supporting multiple VBA projects and providing the ability to embed VBA projects inside AutoCAD drawing files. Developers can now use ObjectARX 3.0 to derive from base classes in the ObjectARX database for all AutoCAD objects.

Integrated Visual LISP Development Environment
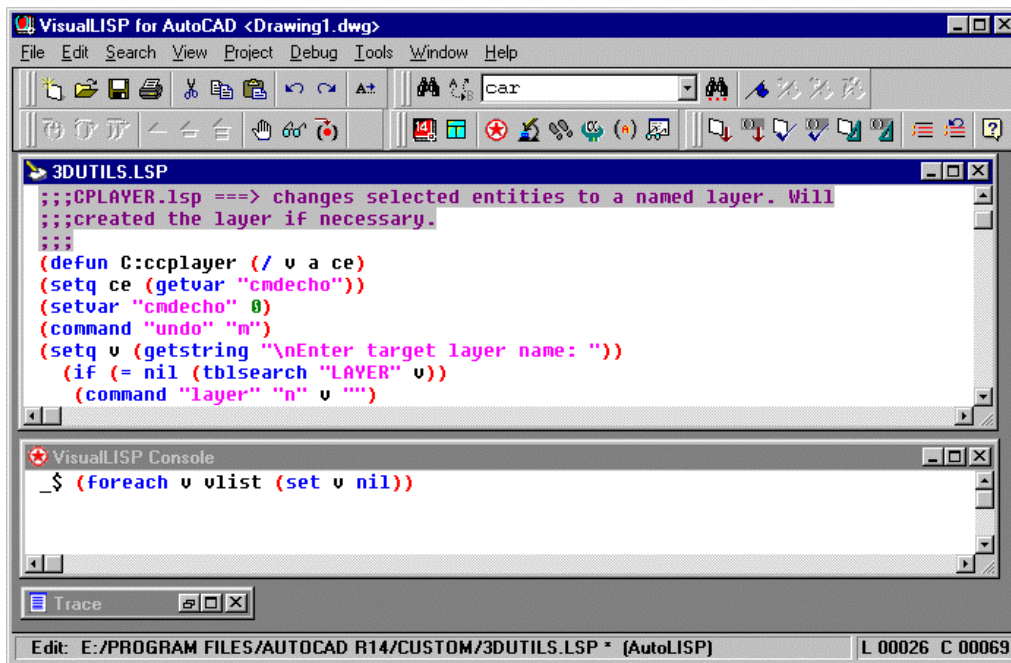
The modern Visual LISP Integrated Development Environment (IDE) makes it easier and faster for users and developers alike to create, debug, and deliver AutoLISP-based applications. With the extensive Visual LISP feature set, LISP function set, object reactors, LISP access to AutoCAD ActiveX objects, and other functionality, customizing AutoCAD 2000 has never been simpler.

Major Visual LISP features and benefits include:

- **Performance.** Visual LISP provides new ways to develop LISP customization by using objects. These new methods of using ActiveX offer significant performance gains over the conventional "procedural" methods utilized in AutoLISP.

- **Ease of Use.** The Visual LISP IDE has:

  - An AutoLISP code editor with color-coded source display for easier-to-read code.
  - A source syntax checker that reduces syntax errors.
  - Autoformat and Smart Indent features that promote standardization and readability.
  - Dynamic symbol completion that saves time and reduces errors.
  - Program structure navigation for easier editing.
  - Direct LISP function evaluation that reduces code errors.
  - Unlimited number of opened source files for more efficient code development.

- **Security.** You can compile LISP source code into object code, which provides a non-ASCII P-code format that protects your software, algorithms, and intellectual property from theft, tampering, and unauthorized editing.

```
VisualLISP for AutoCAD <Drawing1.dwg>
File  Edit  Search  View  Project  Debug  Tools  Window  Help
```

```
3DUTILS.LSP
;;;CPLAYER.lsp ===> changes selected entities to a named layer. Will
;;;created the layer if necessary.
;;;
(defun C:ccplayer (/ v a ce)
(setq ce (getvar "cmdecho"))
(setvar "cmdecho" 0)
(command "undo" "m")
(setq v (getstring "\nEnter target layer name: "))
  (if (= nil (tblsearch "LAYER" v))
    (command "layer" "n" v ""))
```

```
VisualLISP Console
_$ (foreach v vlist (set v nil))
```

```
Trace
```

```
Edit: E:/PROGRAM FILES/AUTOCAD R14/CUSTOM/3DUTILS.LSP *  [AutoLISP]        L 00026  C 00069
```

Visual LISP Editor provides a complete Development Environment

- **Windows Integration.** Visual LISP provides the following Windows integration and feature extensions:

  - ActiveX automation interface for AutoLISP.
  - Visual LISP reactors that respond to AutoCAD events.
  - Additional operating system file-operation functions.
  - Additional AutoLISP functions for list processing.

Full Objectification
In AutoCAD 2000, developers can now derive from all AutoCAD object-classes in the ObjectARX AcDb database. This enables fundamental custom object development built from existing AutoCAD database objects. The transition to object-oriented architecture, begun in AutoCAD Release 13 and carried forward in Release 14, is now completed in AutoCAD 2000.

ActiveX Extensions and Events
AutoCAD 2000 users and developers have a larger set of AutoCAD ActiveX objects from which to choose in customizing and programming the software. That means you can create and manipulate more objects and program in object-based environments such as VBA and the new Visual LISP.

AutoCAD 2000 also offers developers an increased set of ActiveX events that can trigger applications to either launch or react to the AutoCAD environment. Some 22 Application level and Document level events have been added to AutoCAD 2000. This enhancement gives developers more flexibility in structuring customization efforts that would otherwise have to "synchronize" with the AutoCAD editor or database. This expanded capability gives you the freedom to "mold" AutoCAD 2000 through object-based environments such as VBA and Visual LISP so that it works the way they want to work.

VBA Projects

With AutoCAD 2000, users and developers can build, load, and embed *multiple* VBA projects in AutoCAD, a great improvement over the single-project limit of Release 14. This enhanced functionality also lets users and developers rapidly distribute customized solutions built in VBA that need to remain with the drawing file.
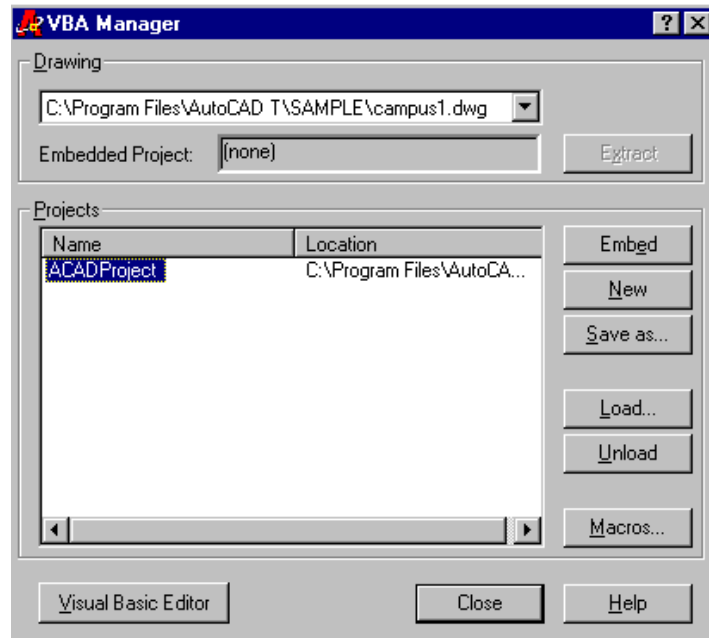
VBA Manager dialog

Options (Preferences) Dialog

The new Options dialog provides easy access to new AutoCAD 2000 controls while incorporating options from the former Preferences dialog. Together these improvements enhance software learnability, improve system management, and give you the control you need over your drawing environment. The Options dialog:

- Displays the current Profile name in the Options dialog title bar. This lets you positively identify which profile any changes to the various options will be saved—especially helpful when you have multiple files open and/multiple profiles created.
- Has a more user-intuitive interface with a redesign of former Preferences controls.
- Displays system variable locations. Settings stored in the drawing are identified with a drawing icon; other settings are stored in the profile.
- Is completely resizable. The Files tab gains the most from this functionality, since the tree view control gains space when the dialog size is increased, making it possible to see longer paths in the tree view when looking at support file paths.
- Is extensible. Enables the ability to add your own tabs to the Options dialog to gives you one central location for setting up your AutoCAD and third-party settings.
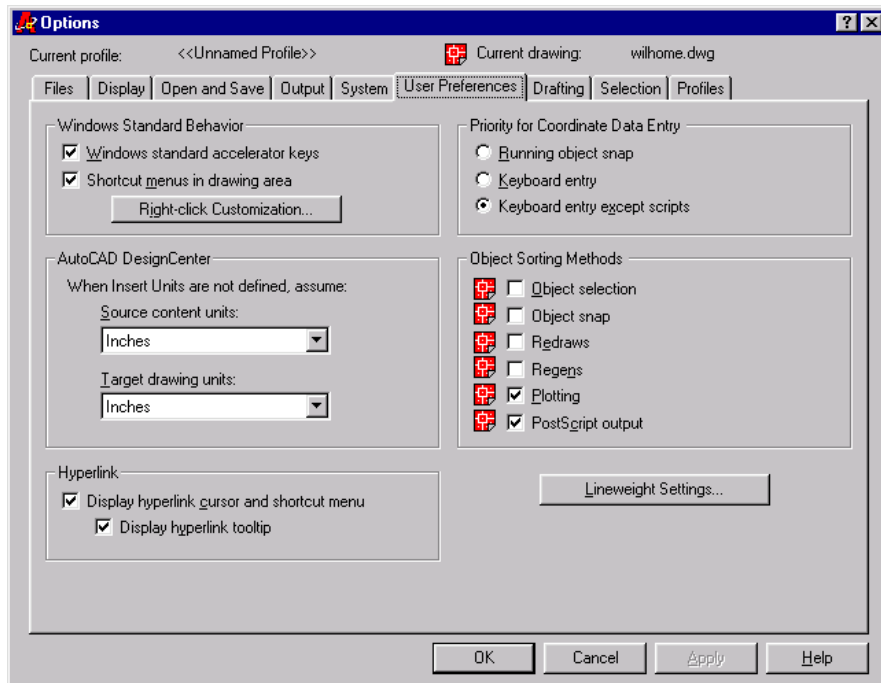
Options dialog – User Preferences tab

Toolbar and UI API

Release 14 introduced ActiveX Automation as an AutoCAD API. AutoCAD 2000 leverages this interface by adding two new objects—MenuBar and MenuGroup—to the ObjectARX database. These additions provide a seamless integration of APIs, especially where toolbars are the preferred method of user interaction with the program.

API Extensions

Many new features in AutoCAD 2000 have Application Programmable Interfaces (API) giving users and developers more flexibility and control over the AutoCAD environment and database object set. Some of the more prominent features APIs include:

- Context (right-click) Menus
- AutoCAD DesignCenter
- DXF Enhancements
- Extended Symbol Names
- IntelliMouse®
- Lineweight
- Object Property Manager
- OSNAP Custom Modes
- Shortcut Menu and Toolbars
- Solids Editing
- Drawing Properties
- AutoSnaps

Although not exhaustive, this list is indicative of the wide scope both users and developers have in developing customized features and extended functionality for AutoCAD 2000.

WITHIN A POWERFUL TECHNOLOGY FRAMEWORK

Under the hood of this extensive, yet friendly, product exists a powerful technology framework. AutoCAD 2000 is designed to solve the problems of today while creating the foundation for your needs tomorrow.   A few of the key technologies included in AutoCAD 2000 include:

ObjectDBX/ObjectARX

Autodesk's industry leading object oriented database (ObjectDBX) and accompanying API (ObjectARX) form the underpinnings of this release. With AutoCAD 2000, Autodesk has completed the monumental task of converting all AutoCAD objects and methods to the new database, years ahead of our competition. This technology is now being fully exploited by our market group products, such as the AutoCAD Architectural Desktop and the Autodesk Mechanical Desktop, and by our application developer partners to deliver a new generation of design products that are both powerful and easy to use.

The ObjectARX/DBX technology is extensively used throughout AutoCAD 2000 itself - many of the new features are implemented as ObjectARX applications, creating a modular, demand-loaded environment which is packed with functionality but remains moderate in terms of memory footprint. Components such as Spatial Technologies' ACIS™ 4.0 kernel are implemented through this interface.

The AutoCAD 2000 object model is fully accessible via Microsoft's COM and ActiveX API interfaces, in addition to our ObjectARX environment. This enables you to use a variety of programming interfaces to customize AutoCAD, ranging from Visual Basic for Applications to Java.

HEIDI™- 3D graphics pipeline

Based on award-winning HOOPS technology, AutoCAD 2000 incorporates the HEIDI™ graphics pipeline, providing a rich 3D environment in which to create and interact with your designs. The graphics pipeline is designed for high performance in both 2D and 3D mode, and takes advantage of OpenGL and DirectX graphics interfaces and graphics hardware acceleration. Accompanying this piepline is a 24-bit raster imaging engine and a new hardcopy pipeline that speeds output up over 20% over the previous release.

Windows and Web optimized

Finally, AutoCAD 2000 is extensively optimized for the 32-bit Windows environment. From its user interface, which makes extensive use of the Microsoft Foundation Classes and adheres to Windows logo standards, to its installation and configuration settings, AutoCAD 2000 is designed to fit neatly in the Windows environment. Our relentless focus on optimization for the Windows environment continues to pay performance dividends - despite all the added functionality, AutoCAD 2000 is between 10 and 20% faster than AutoCAD Release 14, creating a new champion in the "fastest AutoCAD ever" contest.

Up and Running in No Time

Web Registration
To get up and running quickly with AutoCAD 2000, you can go directly to the Registration website to obtain an authorization code any time of the day—or night!

Installation Enhancements
The AutoCAD 2000 installation procedure provides a virtually "hands-off" installation. You retain the flexibility to choose from several setup options including Typical, Full, Compact, and Custom. In addition, AutoCAD 2000 introduces two new installation features:

- **Migration of Release 14 files to AutoCAD 2000.** Many AutoCAD users have customized Release 14 files that they may want transferred to their AutoCAD installation. These files include such items as custom toolbars and menus, multiline styles, PGP files, custom dictionaries, and more. The AutoCAD 2000 installer provides an option to migrate such files into the AutoCAD installation structure saving time and protecting previous customization efforts.

- **Text File Association.** The AutoCAD 2000 installer enables you to choose an ASCII text editor other than Notepad with which to associate AutoCAD text files, like .MNU and LISP files. This eliminates the time-consuming procedure of re-associating these files manually after installation.

Network Support Enhancements
AutoCAD 2000 provides support for homogeneous and heterogeneous Banyan, Novell, and TCP/IP network environments. For companies working within a mixed network environment this feature reduces the time spent managing your AutoCAD investment and the Total Cost of Ownership.

AutoCAD Learning Assistance™ (ALA)
AutoCAD Learning Assistance, the tutorial-based, multimedia learning tool, includes lessons and concepts material for many new AutoCAD 2000 features. ALA is especially useful in assisting both the novice and veteran AutoCAD user in taking full advantage of new features such as Object Tracking, the Layer Properties Manager, Object Properties dialog, and the many other connectivity and productivity enhancements introduced in AutoCAD 2000.

AutoCAD Support Assistance (ASA)
AutoCAD Support Assistance is an easily accessible, always available knowledgebase providing solutions and answers for commonly experienced AutoCAD questions. Compiled over several years and incorporating the solutions that highly experienced AutoCAD Resellers and the Autodesk Product Support teams have developed, ASA is directly accessible from AutoCAD's Help facility and contains such items as:

- Technical documents applicable to AutoCAD in general and AutoCAD 2000 in particular.
- Solutions to commonly experienced product support issues.
- Troubleshooting guidance for the most commonly experienced AutoCAD messages.

You can periodically update the ASA knowledgebase through Web access. ASA is a dynamic, up-to-date and growing source of assistance for every AutoCAD customer.

In Summary

We built this release of AutoCAD to meet your evolving design software needs. One of our goals with AutoCAD 2000 was to address many of the Top 50 Wishlist Items for AutoCAD functionality. This release is designed with you in mind: to provide the quality, performance gains, features, ease-of-use, and connectivity that you requested. We hope that AutoCAD 2000 will help you work smarter and more efficiently.

You'll be able to reuse your valuable data through the Multiple Design Environment and AutoCAD DesignCenter™. You will work faster and easier with features such as the Object Properties dialog and Context menus. You will expand your business and design reach from individuals to teams located anywhere in the world with the new web capabilities in AutoCAD 2000. You will save time and money as you gain better control over your output through features like Layouts and Plot Styles. And you can tailor AutoCAD 2000 to your precise needs more effectively than ever before with powerful tools such as Visual LISP and VBA. All of these features increase your productivity and connectivity while decreasing your Total Cost of Ownership.

This release was designed for and with you, our customers. AutoCAD 2000 is designed to smoothly connect you with your design information, your colleagues, and the world by integrating the most sought after features into a smarter, more accessible design environment.

AutoCAD 2000 is *Where Design Connects...*

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