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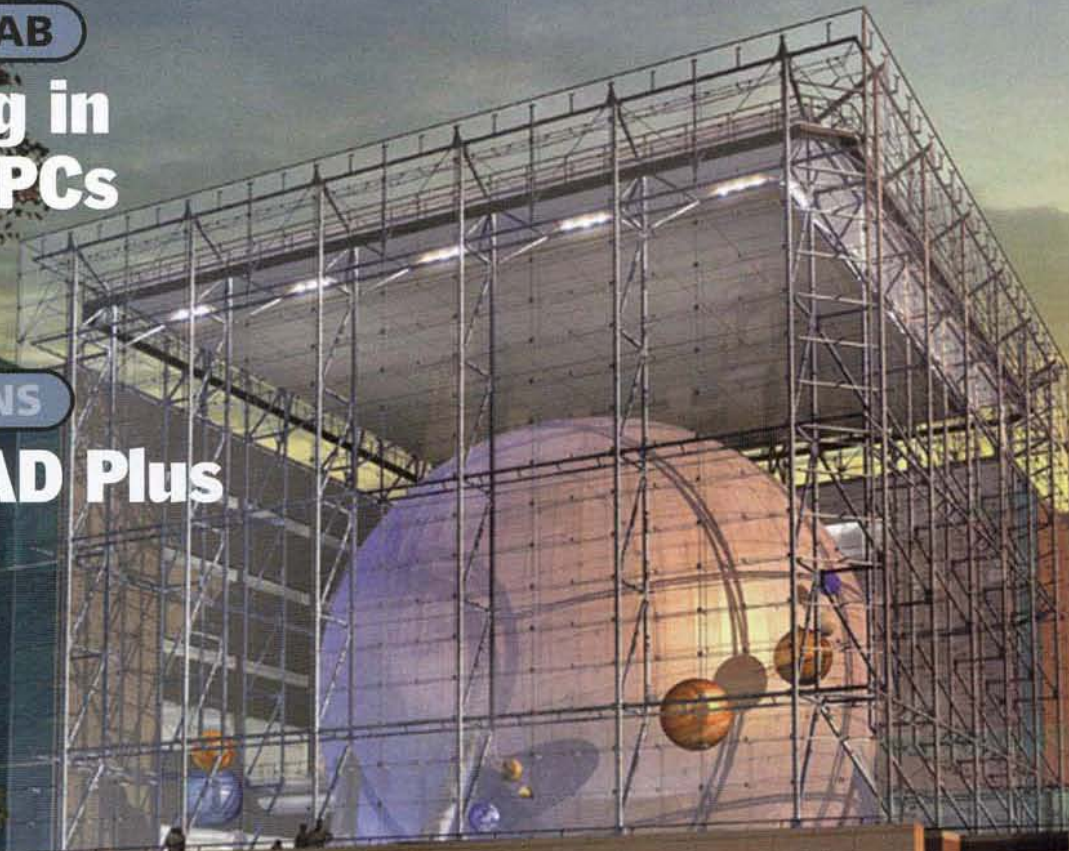
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"Two roads diverged ... and sorry I could not travel both"

—Robert Frost, "The Road Not Taken"

DataCAD Plus

Jerry Laiserin, FAIA

CADENCE Verdict



DataCAD Plus extends "classic" DataCAD's heads-up drafting productivity into the realm of integrated 2D/3D, with modeling and rendering capabilities that are at once sophisticated and easy to use. Zone-based Architectural Construction, or ZAC, provides a painless path into the benefits of "intelligent" CAD without some of the program rigidities and system overhead associated with other "object-CAD" approaches. It also is easy to learn because familiar DataCAD commands work as expected on ZAC elements.

Pros: Integrated 2D and 3D within the context of a familiar interface and commands; ample selection of pre-defined elements and textures that can easily be customized or added to by users without programming skills; drag-and-drop editing of textures allows choosing preview-mode rendering alternatives in real time, a great presentation tool for design clients.

Cons: No support for sloped, canted or skewed geometry; no curtain walls; stair tool not code-based; continued insistence on anachronistic hardware lock (but softened somewhat by the optional availability of USB or PC Card dongles); limited Web integration compared to the industry leaders.

Price: \$2,495 (\$995 "sidegrade" for currently licensed DataCAD users).

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The road that winds through the undulating Connecticut countryside toward DATA CAD LLC's offices in Avon is lined with those New England stone fences, the stolid practicality of which calls to mind the "good neighbors" of Robert Frost's poem, "Mending Wall." Befitting its Yankee roots, DataCAD has long been a good neighbor to the architectural design community, even though product development sometimes lagged under a tangled succession of pricing strategies and busi-

ness ownership. One of those earlier corporate regimes licensed the underlying code to softTECH GmbH (www.softtech.de), who extended the product and offered it in the German market as Spirit. When Germany's MB Software AG (www.mb-softwave.de) subsequently acquired softTECH GmbH and also made a strategic investment in DATA CAD LLC, an opportunity arose to reconverge the two code streams and travel both the DataCAD and Spirit "roads" under the new banner of DataCAD Plus.



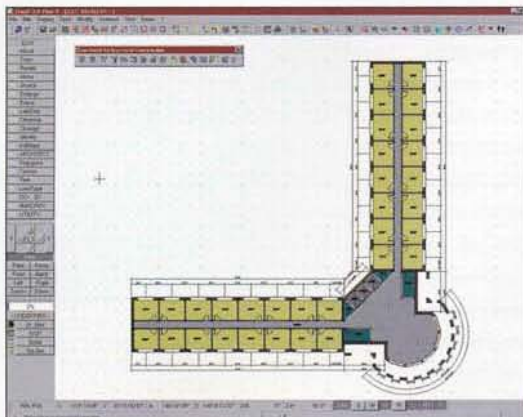


Figure 1. The basic commands in DataCAD Plus will be familiar to DataCAD users, but the overall interface is cleaner, more icon-oriented and more Windows-compliant.

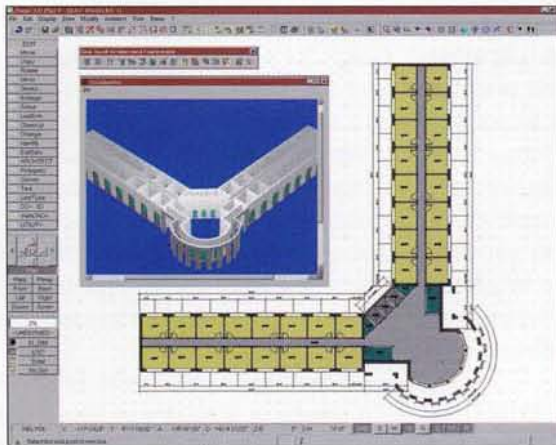


Figure 2. DataCAD Plus's Dynamic Viewing Window displays a live, rotatable, 3D model that is automatically generated via Zone-based Architectural Construction (ZAC) links from elements drawn in 2D.

(See sidebar, DataCAD.)

On the Road Again

Legions of loyal DataCAD road warriors will recognize approximately 90 percent of the DataCAD Plus interface and command set as comfortable and familiar, while first-time users will

Feature Report Card

Scoring from 1 (lowest) to 10 (highest)

Installation and Setup	8
Interface	8
Features	8
Expandability/Customization	7
Interoperability	7
Support	8
Value	9

find Plus to be a surprisingly competitive product for full-featured, integrated 3D and 2D architectural design. The biggest “plus” in Plus is something called Zone-based Architectural Construction (ZAC), which adds “smart” components that not only support integrated 3D but also considerably enhance the 2D functionality and ease-of-use for which DataCAD itself is justly famous. Some observers

of the CAD scene throw around terms such as *parametric* or *intelligent objects* when describing technology such as ZAC, debasing the meaning of the terms without necessarily clarifying exactly what it is that the technology actually does. With ZAC, DATA CAD LLC makes no claims of being *parametric*, certainly not in the sense of a truly parametric system such as Revit, nor does the company say much about *objects*. What ZAC

really accomplishes is to create a hybrid realm, the “ZAC Envelope,” which functions as a kind of architectural shorthand that mediates between 2D and 3D, between the pre-defined and the user-created and between logical segments or zones within a project. Because ZAC is neither as constraint-based nor as rules-driven as some “object-based” systems, it serves the user and the design process in a friendlier and more flexible way. Just as myriad keyboard shortcuts and macros fueled the rapid productivity of the old DataCAD for DOS, ZAC fuels the productivity of DataCAD Plus. The desired tool or view seems

always a mere mouse-click or two away from the task at hand.

DataCAD Plus sports an array of context-sensitive dockable toolbars and floating palettes for an easily learned icon-based interface, as shown in Figure 1, that has embedded in its menus all of the commands that long-time DataCAD users expect. However, the underlying presence of ZAC becomes apparent with new tools for creating and editing walls, columns, floor plates, windows, doors, cut openings, roofs and so forth. These tools flexibly allow different modes of input (drawing walls with a mouse or by keyboard entry of distances) and different degrees of specificity (default generic wall types can be replaced later by specific wall components). Standard 2D editing commands familiar from DataCAD, such as the Trim command for two-line walls, operate equally well on ZAC walls. The difference is that ZAC automatically links the 2D elements and operations to 3D, which can be observed in Plus's Dynamic Viewing Window, as shown in Figure 2, adapted from Arcon, MB Software's AllPlan-like modeler for the German market.

The properties of all ZAC elements are defined in database tables, accessible via the Database icon, as shown in Figure 3. Walls, for example, incorporate the properties of thickness, cost, type (including multi-line) and symbol (for representation and hatching) although geometric extravagances, such as canted walls or skewed walls of

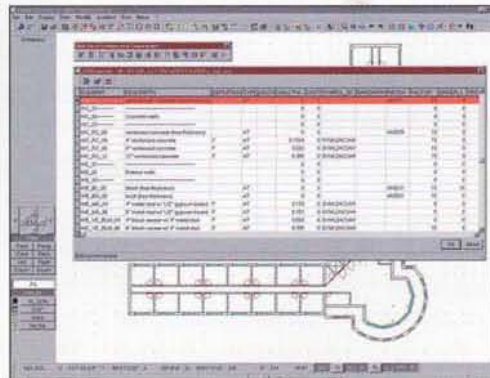


Figure 3. Every DataCAD Plus building component—walls, floor plates, columns, doors, windows, roofs and so on—is defined by properties in a database table.

DataCAD 9.0

The advent of DataCAD Plus does not sound the death knell for DataCAD itself. In fact, the "DataCAD Classic" flavor remains on the market in a new release (9.0) that has some significant new features not yet available in DataCAD Plus. Company plans call for the feature sets of the two products to become more synchronized over subsequent releases, until some unspecified future date when "Classic" and Plus will converge into a single product. However, in the here and now, the two feature sets will present many current DataCAD users with some intriguing choices.

Among the long-awaited enhancements to be found in DataCAD Release 9 but not yet in DataCAD Plus are: a multi-document interface (MDI) that supports multiple drawing windows on-screen with cut and paste between them, as shown in Figure 5; reference file capability between any DataCAD drawing and any other DataCAD drawing (or between two users' work on the same drawing); hyperview linking from any drawing entity, such as detail bubbles and symbols, to any other drawing view; batch-plotting capability for defined "set files" composed of multi-scale layouts (sheets) that can be output conventionally or saved as direct-to-PDF for Web or other distribution.

Aside from some other "wish list" favorites, such as unlimited undo/redo, that are included in both DataCAD Version 9 and DataCAD Plus, the DataCAD V9-only features add tremendous power and 2D productivity that DataCAD Plus buyers or "side-graders" will have to do without for a while.

A project drawn in DataCAD Release 9 will benefit from the simultaneous viewing and copying facilities of MDI, along with the work-leveraging reach of reference files, but will not be able to benefit from the modeling and visualization available in DataCAD Plus (because a project done in DataCAD R9 lacks the "ZAC envelope" behind the 2D to bridge over to the 3D and rendering modes). Conversely, designing in DataCAD Plus provides all the integrated 2D/3D benefits of ZAC, but at the expense of foregoing DataCAD R9's big-time productivity boosters, such as MDI and reference files.

This is the "dirty little secret" of all "intelligent" CAD systems:

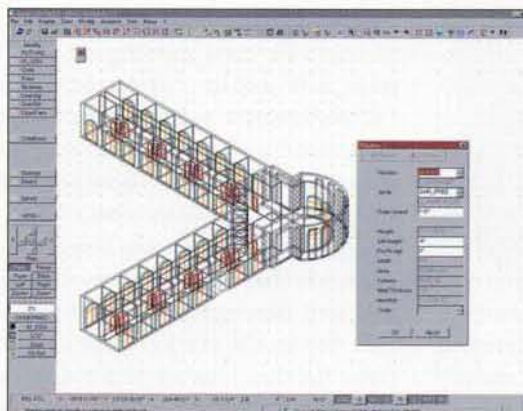


Figure 4. The software includes many predefined components, such as 1,000 window types based on the Andersen catalog, and users can modify these or create their own.

varying thickness, are not supported. Floor plates have similar properties and similar geometric limitations, for example, no sloped floors (ramps can be individually modeled, as a work-around). The windows database initially includes more than 1,000 types, based on the Andersen catalog, with user adjustable properties, as shown in Figure 4, that cover every detail from

jamb, sill and height above finished floor to groupings by number of units and spacing between them. This latter capability serves as an effective work-around for the lack of a curtain wall tool, although one is promised for an upcoming version. Columns can be round or rectangular, defined by different materials and placed singly or with an Array command. Like the roof tools in most architectural CAD packages, Plus's roof modeler generates hipped roofs by default (this is so because the hipped roof

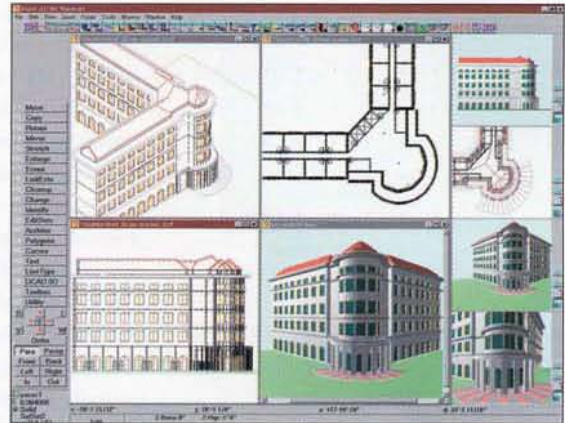


Figure 5. A multiple document interface (shown), reference files and hyper-view linking are among the new features in DataCAD Release 9 but not in DataCAD Plus.

such intelligence does not travel well. DataCAD and DataCAD Plus are hardly alone in posing this conundrum to users. For example, AutoCAD can't fully handle "custom objects" created in Autodesk's own Architectural Desktop unless the correct version-specific "object enabler" is present. Edit a "smart" object and it becomes dumb.

Larger firms, or those working on larger projects, will need to choose a judicious mix of DataCAD R9 and DataCAD Plus seats in order to craft a project workflow that reasonably captures the greatest benefits of each tool at various design phases, from schematics through construction documents. Smaller firms, or those working on smaller projects, face a temporary fork in the DataCAD road, with strategic choices likely based on the near-term business needs of their practices. Continue down the road of wringing every last drop of productivity out of the 2D drawing paradigm (DataCAD R9)? Or, follow their current path of 2D productivity as a base to advance into the world of "smarter" 2D/3D modeling and visualization? Truly a dilemma worthy of the Robert Frost poem, but one that DATA CAD LLC hopes to resolve for its users as soon as possible.



Figure 6. DataCAD Plus handles a variety of roof shapes, including arched and curved segments, as well as pitched and hipped roofs.

represents a well-defined software problem capable of a straightforward algorithmic solution). It is robust enough to follow complex perimeter wall contours, including curved bays and the default hipped roof is easily edited by changing heights or dragging ridges (including turning a hip into a gable). The roof tool also can handle arched roofs and curving roof planes, as shown in Figure 6. The stair tool handles straight, L-shaped, U-turn, and winding stairs, but does not include automatic routines for code-based tread-to-riser ratios.

The Long and Winding Road

As one would expect in a product with DataCAD's long and illustrious heritage, Plus has a full range of tools for the efficient creation of construction drawings. Comprehensive dimensioning automatically goes on its own layer and follows windows, doors and cut openings as they are dragged or copied around a plan. ZAC allows for area, volume and perimeter calculations, reported in a Rooms database, and ZAC also supports solid color fills that are useful for space planning purposes. DataCAD Plus imports and exports DWG files (up to and including release 2000) via the OpenDWG libraries (www.opendwg.org), as well as DXF in and out, DWF out (for Web publishing) and WMF (Windows metafile, the format of the Windows clipboard). Plus also can import BMP (bitmap raster image) files, useful for copying and pasting site plans and aerial photographs (a feature long requested by DataCAD users). A handy blow-up window, as shown in Figure 7, facilitates

detailed tracing over imported raster images, such as when transferring contours from a topo map or other site plan information.

ZAC extends the 2D productive capabilities of "classic" DataCAD fully into 3D. A typical use of zones might be to define zones by height, creating different stories. Then, editing across zones would mean editing multiple stories or the elements on multiple stories simultaneously. Thus, if a building design included ground floor and penthouse stories that were different from several middle floors, editing by zone could change all the windows on the middle floors with a single command, while leaving the ground floor and penthouse windows untouched. Alternatively, zones can be defined as sections of a plan, to divide the editing of a project in that manner (for example, an office block attached to a warehouse). The resulting degree of control is not quite automatic extraction of 2D construction documents from 3D models, but a major head start in that direction.

Thunder Road

Besides ZAC, the other high-octane new component in DataCAD Plus is a visualization tool called DataCAD Plus Vis (pronounced "viz," but not to be confused with the Autodesk/Discreet version of 3D Studio that is spelled "VIZ") Vis, adapted from MB Software's Arcon, is a separate module accessed from the Plus toolbar that operates on the 3D geometry of ZAC models. The description sounds more cobbled together than the actual experience. Vis renders, texturizes and animates (but does not edit) ZAC models. An Explorer interface affords access to hundreds of predefined 3D "objects" (including entourage, such as plants, street furniture, cars and people) and to hundreds of scalable, editable, drag-and-drop textures (including transparency; additional textures can be created by importing any BMP file). Textures render quickly enough in preview mode that designers will be tempted to "try on" textures in

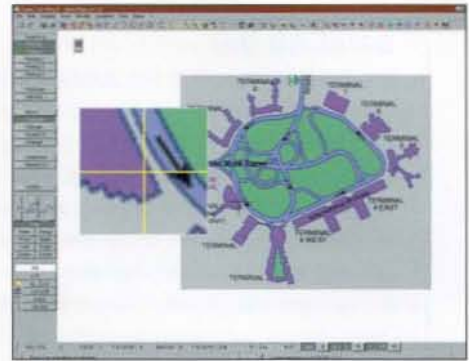


Figure 7. A blow-up window is a handy tool for tracing elements from a raster image, such as site plan information, into DataCAD Plus.

real time, such as while reviewing a design model with a client. Rendering includes ray tracing, with multiple light sources as well as solar and lunar angles calculated by time/date and location.

Vis can preserve any rendered image as a saved view, as shown in Figure 8, and also can save paths as "walk" files that are macro-like recordings of mouse navigation through the model. Because Vis operates on ZAC geometry, it can render true orthographic projections (elevations, top views) without perspective distortion. Vis also can output VRML, for navigable 3D on the Web and can plot to HPGL in line drawing mode for use with "hand-drawing simulators," such as Squiggle (www.insightdev.com).

King of the Road

Where does DataCAD Plus fit in the overall architectural CAD market? Despite the extensive range of modeling and visualization features, the package is forgiving of hardware/system requirements (the minimum is Windows 95/98/NT4/2000 running on any Pentium with 64MB; "preferred" is only PIII300/128MB), putting it within reach of anyone currently using any mainstream CAD program. Those same modeling and visualization tools clearly are targeted at 2D users, especially DataCAD users, who have not yet invested the time and skill development for 3D visualization, but would like a comfortable entry point for that added functionality. However, Plus is neither an add-on to nor an upgrade from DataCAD, but a separate

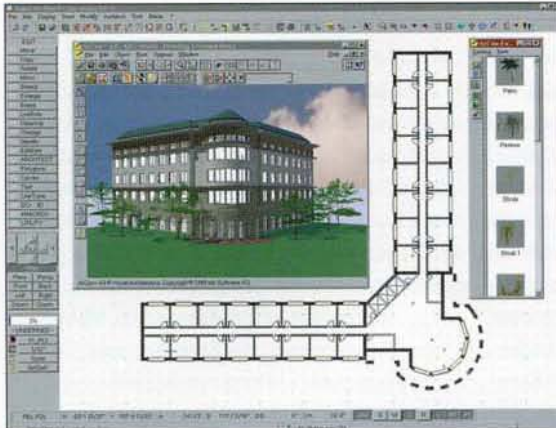


Figure 8. An included rendering/visualization module, DataCAD Plus Vis, incorporates drag-and-drop textures, ray tracing and saved paths for animated viewing.

stand-alone product. At \$2,495 it is pitched approximately halfway between lower-priced offerings such as Nemetschek North America's VectorWorks Architect and the higher-priced

spreads, such as Graphisoft's ArchiCAD. On this spectrum, features and performance generally are proportional to price (subject to some diminishing returns—paying twice the price does not necessarily buy twice the results).

DataCAD Plus' features and performance are indeed commensurate with its standalone price. Existing DataCAD users can get a "sidegrade" for \$995.

Although many DataCAD users will find the sidegrade to be more costly than what they

paid for DataCAD itself, Plus does offer these folks the most affordable way to get all the model intelligence and visualization capability they are likely to need in the foreseeable future. **C**

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