

cad options

LISTED AS THE SECOND MOST WIDELY USED SOFTWARE BY ARCHITECTS
(NEXT TO AUTOCAD) IN A 1997 SURVEY CONDUCTED BY THE AMERICAN
INSTITUTE OF ARCHITECTS, DATACAD NOW PROVIDES A WINDOWS OPTION
FOR ITS LOYAL FOLLOWING OF DOS USERS.

DataCAD 8 for Windows 95/NT

Geoffrey Moore Langdon

The new DataCAD 8 software for Windows 95, 98 and NT opens a whole new world for current DataCAD users who, until now, have had only DOS as their platform choice. The new release also gives AutoCAD users a compatible, less-expensive option and a feature-rich product that is easy to learn and use.

Current DataCAD users will notice that not a lot has changed or been added since the DOS DataCAD 7.5, other than running fast and reliably in Windows (and, thus, supporting all of those formerly troublesome peripheral devices). Apparently, DataCAD develop-

ers have elected to avoid feature creep, where attempting to incorporate too many wish-list items results in complex, bogged-down software. The main improvements are a more powerful multi-scale plotting ability (a sort of super

CADENCE Verdict

DataCAD 8 for Windows 95/NT



DataCAD has a lot of power, allowing you to draw or model in seconds what can take hours in other CAD programs. The logic of its menu layout and functions make it an intuitive, easy-to-use program. Its walls, doors and windows do not automatically adjust, as with parametric programs, but in DataCAD it is easy to delete an object—a door or wall—and pop in a new one.

Pros: Allows design approach flexibility; an easy program for those making the transition from manual drafting to CAD; powerful architectural macros for roofs, stairs and so on; strong technical support network; customizable; reads and writes AutoCAD DWG directly.

Cons: Many powerful features are hidden in macros in the Toolbox; an advanced line-drawing program, but no parametrics or intelligent objects; no automatic 3D; photorealistic rendering requires transferring to another program.

Price: \$695

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Visual Reality Suite (included) provides photorealistic rendering, animation and photo editing.

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Paper Space), the switch to Visual Reality for better and easier photorealistic rendering, better AutoCAD DWG file support and inclusion of next-generation DC Viewer software.

AutoCAD users will find that DataCAD is functionally equivalent to AutoCAD plus Auto-Architect without parametric changeability in a well integrated, stable product. DataCAD has many architecture-specific features, starting with walls, windows and doors. The product also includes automatic macros for everything from stairs and roofs to elevators, and libraries of thousands of furniture-symbol blocks.

Users who are new to CAD, from architects and interior designers to builders, contractors and students, will likely find DataCAD appropriate for their tasks and relatively easy to use. The product has just enough power to give people who have resisted CAD in the past a good reason to implement DataCAD.

The Software Package

DataCAD comes with a mix of several different programs, some developed by other companies (with their own interfaces and learning curves). These programs include:

- DataCAD—2D drafting and 3D modeling software.
- DC Viewer—multiple drawing viewer and shader with VRML.

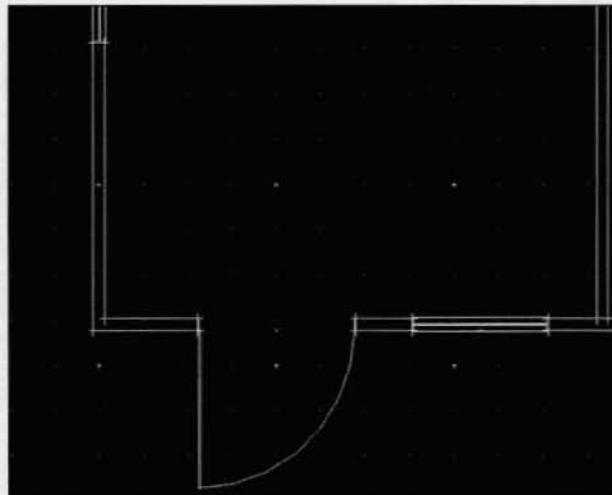
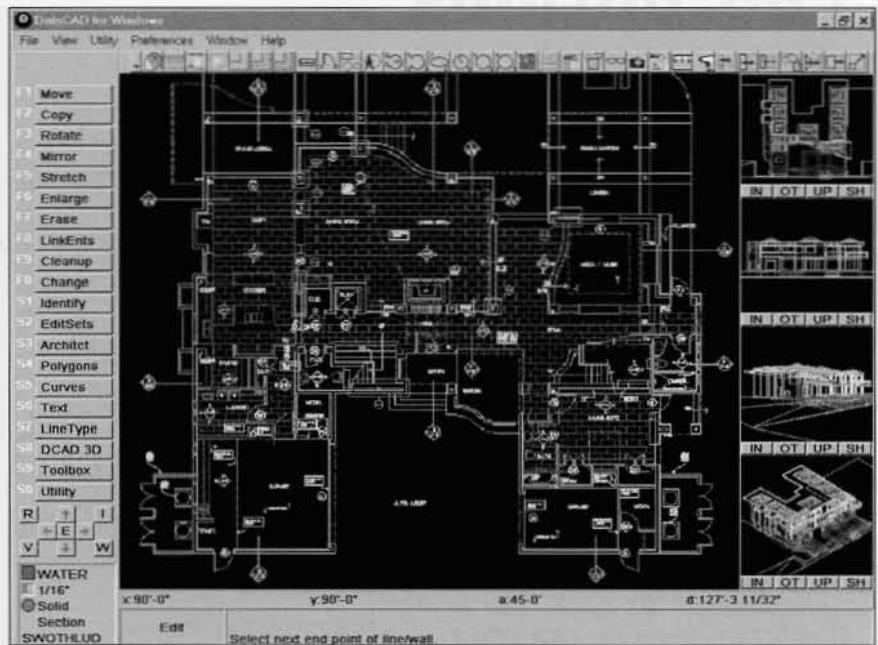


Figure 1. DataCAD 8 can format selected lines to overshoot, recreating a drafting style occasionally seen with manual techniques.



DataCAD 8 for Windows 95/NT sports an easy-to-use, architecture-friendly interface.

- DCAL—application programming language.
- The Visual Reality Suite—Renderize Live photorealistic rendering, digital imaging and scanning.
- 3D Wood Framing—automatic framing and cost estimating.
- Symbol Block Library—with more than 1,600 2D and 3D architectural symbols.

Dozens of architecture-specific macros come with the basic system; others, such as Blocker (space planning) and 3D PowerTools (3D modeling), are available as add-on options.

Powerful, But Not Revolutionary

DataCAD 8 for Windows is not one of the new generation of smart CAD programs in which walls heal themselves and grow up to roof planes or windows and doors change dynamically. Nor is it capable of automatically finish-

ing sections or elevations. DataCAD 8 for Windows is essentially a combination 2D drafting program and a 3D CAD surface modeling program that is similar to AutoCAD, MiniCAD and MicroStation. It even offers a hybrid 2½D (extruded lines) feature. What makes DataCAD stand out from generic drafting/modeling products is its orientation toward the drawing and modeling of buildings.

How DataCAD Works

Designers can take a number of different approaches in DataCAD. A space-planning module, called Blocker, can be used to lay out areas by square footage and then automatically generate walls. An architect designing an especially dramatic building might want to start with the powerful 3D modeler.

Builders who do cost analysis and figure wood framing cuts may want to import the architect's or engineer's drawings, and use only DataCAD's framing and estimator abilities. A production detailer may only want to make use of DataCAD's symbol templates to quickly build details by plunking down pieces visually from libraries.

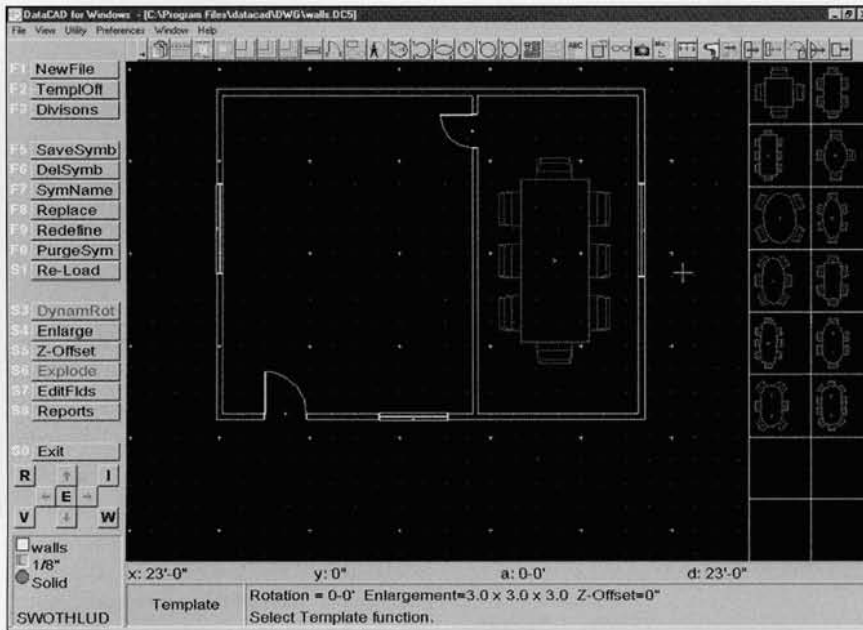


Figure 2. Libraries of symbols are displayed on-screen in groups, and may be inserted just by clicking on the desired symbol.

DataCAD allows many approaches to design and drafting. Essentially, all the different techniques can be boiled down to three different ways of working, each offering a number of advantages and limitations.

- Architect and DCAD AEC—a 2D and hybrid 2½D approach to producing plans, sections, elevations and details.
- FrameIt and AEC Model—the system will automatically build a complete 3D detailed wood frame model from different specified parameters.
- Real 3D modeling blocks and slabs with voids.

Fortunately, each of these different approaches can coexist (usually on different sets of layers) and work with each other. For instance, a designer could develop a 2D production plan with Architect simultaneously, using a 3D model or could use one as a template to trace the other.

The Production Drawing Approach

Two-dimensional production drawing is what most people associate with DataCAD, and it's the chief focus of the product's tutorials. A designer can

place walls, drawn as two lines, three lines (having a centerline), four lines or in 3D as extruded faces, just by picking both ends of the wall with the mouse. These will semi-automatically clean up at intersections. The designer pops in windows and doors by clicking points to indicate size and location. Stairs, elevators, curtain walls and

other architectural elements in the DCAD AEC macro also pop in, based on parameters you set before clicking in the drawing to indicate their location. The software instantly draws these elements as simple lines and arcs. To change any of these elements, you stretch, copy, move, trim or erase the lines that make them up. You can also erase the whole element (by group) and pop in a new one with different parameters. So, to change a door to a double door, remove the first one and then place the new one.

This straightforward approach should appeal to people making the transition from paper to CAD—it's easier to comprehend than the more esoteric specialized commands, such as MODIFY DOOR, as seen in parametric architectural software. It is easy to select groups or individual lines to make them print wider, wavy, gray screen or overshoot so as to give the whole drawing a professional architectural look, as shown in Figure 1.

A macro called EZ Tools helps develop elevations by allowing you to specify window types and then drawing them in elevation with muntions and shutters if desired. It is also possible to

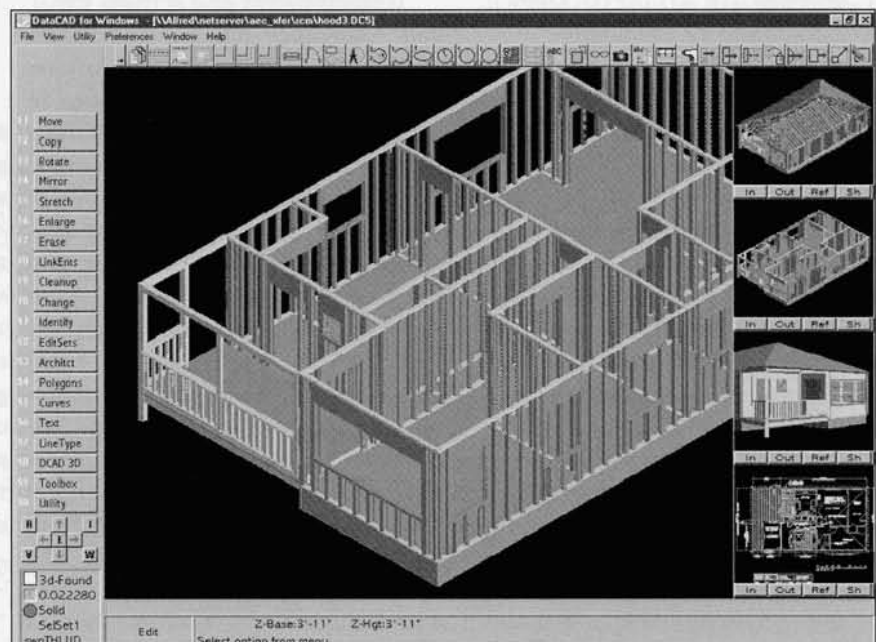


Figure 3. DataCAD 8 can generate 3D drawings of wall framing plans easily, and can also generate a material list to match.

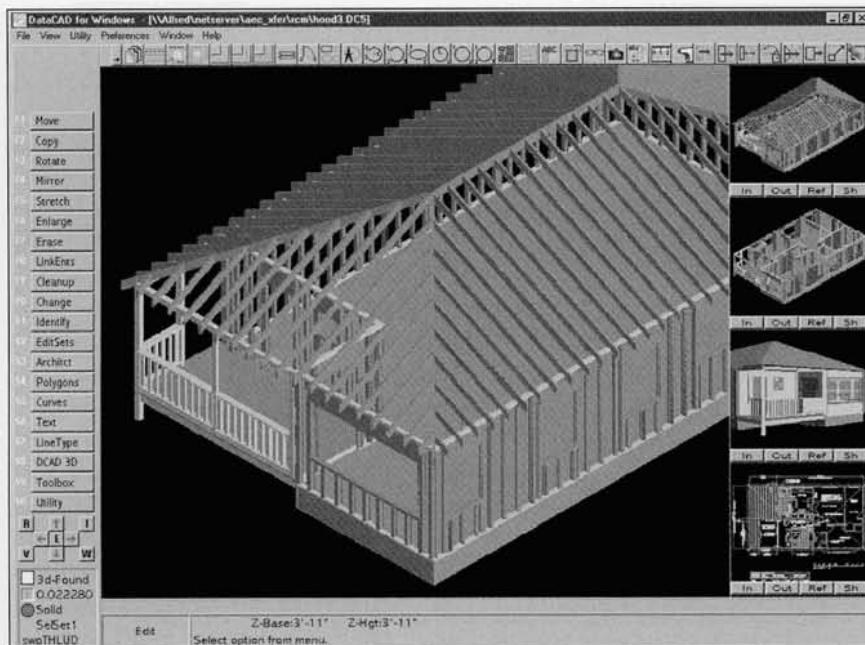


Figure 4. Basic roof framing plans can also be generated, although they are missing the rafters.

make use of the hybrid 2½D of the walls, and simply go to an elevation view of the model, but a significant amount of cleanup and touchup is required with that technique. More often, designers can make a simple 3D block model on another layer developed in tandem to help them more easily generate not just elevations but also sections.

Details get drafted line-by-line, just as with most other 2D programs. However, since DataCAD has a system of visually showing groups of related symbol blocks in a library called *templates*, as shown in Figure 2, it is more common for designers to build details by inserting building components.

FrameIt

The FrameIt macro involves an entirely different approach meant to appeal to builders, contractors and developers. Essentially, you trace the outline of where floors go (specifying beams and stair openings if desired), indicate where walls, windows and doors go (all with just two mouse clicks), select BUILD and watch the computer build a complete 3D model showing every stick of wood and overlap from the ground up in all perspectives, as shown in Fig-

ure 3. A roof framing module handles gable, hip, shed and gambrel, whereas the Roofit macro handles six different roof types including intersecting valleys (but does not build the individual wood rafters), as shown in Figure 4.

The information from the Framers macro feeds directly and automatically into the optional Cost Estimator module for DataCAD, so that Builders can run cost analysis on changing designs.

Real 3D

DataCAD includes a comprehensive 3D modeling program with three menus of commands and 3D primitives accessible via a menu choice called DCAD 3D. Entities created with this module can coexist on the same layers as 2D entities; however, for organizational purposes it makes sense to try to keep the sets of layers sorted out. Also, the results of any HIDE command (that is, a snapshot of a perspective or elevation with the usual wireframe view appearing as though solid) can be stored as simple editable 2D lines on a new layer, as shown in Figure 5. There are 15 surface modeling entity types, from simple cubes to freeform revolved mesh entities. Most can be extensively mod-

ified, making it possible to model just about any building or building component. Though the modeler does not have subtractive Boolean solid modeling, it has one type of entity that can have as many holes (in one orientation) as you want—the misnamed Horizontal Slab, which can be created or rotated in any orientation. DataCAD 3D users have used Horizontal Slab for everything from lacy gothic windows and curved walls to stair handrails, crown moulding and elaborate furniture.

DataCAD modelers use these 3D entities to build exterior wood-block type models or intricately detailed interior models. They tend to use the 2D walls on other layers only as guidelines for developing the 3D model separately for use with visualizations, walk-throughs or lighting studies. Some designers choose to use the modeler the other way, starting with a conceptual model and using it as a guideline for placing the 2D production drawing walls.

No UCS Needed

An interesting limitation in the software has actually helped make working in 3D easier and more intuitive. DataCAD allows only one active view of a model at a time (you can see up to four other smaller views on screen). When you go from plan to left elevation (or any other view), the axes do not change—the *x* axis still runs along the bottom, the *y* along the left edge of the screen and *z* similar to a pole coming out of the screen. Regardless of where you are looking from, you already know around which axis to rotate something, and, best of all, you need never set a construction plane (although you can if you really want to).

For even more flexibility and ease in sophisticated 3D modeling, there is the optional 3D PowerTools macro (\$45). This utility sports near-Boolean solid modeling and can sweep profiles along curved paths (for detailed stair handrails, for example) and easily punch holes and slice through almost anything.



Figure 5. Hidden line views can be displayed easily, and then saved in a 2D representation to another layer in the current drawing for further editing.

DC Viewer and Web VRML

To take 3D models even further, the new DataCAD 8 for Windows includes a number of other tools. Within version 8.05 is a color Quickshader with light intensity control. With the included DC Viewer software, you can open many different DataCAD drawings at once, see and render any view (see Figure 6) and convert the files to VRML (virtual reality modeling language files for the Web).

Rendering, Animation

DataCAD 8 also includes the Visual Reality suite—another six programs, including Digital Imaging (much like PhotoShop) and Renderize Live for photorealistic rendering. To use Renderize Live, you need to first output the file as DXF (tessellated 3D Faces) from DataCAD and then import it into Renderize Live. By simply dragging and dropping color swatches of various desired materials and lights, you can achieve stunning architectural renderings very quickly, as shown in Figure 7.

A Few Criticisms

DataCAD is not a parametric, object-oriented program (where objects

change automatically). It is more of a what-you-see-is-what-you-get drafting and modeling program.

DataCAD 8 for Windows is indeed full 32-bit Win95 software, which means all peripheral devices will work as expected. However, since DataCAD does some things differently than Microsoft dictates, it cannot have full Windows 95 certification, which means that there will inherently be changes ahead.

The two nearly-identical 3D Edit and 2D Edit menus can invite confusion when, for example, a STRETCH command doesn't work because you are trying to use the 2D STRETCH command on 2D entities.

Most of the real power in DataCAD is hidden under the Toolbox. These macros have been developed over time by hundreds of third-party developers. Several dozen ship with the vanilla software, and hundreds more are available from a variety of sources including Cheap Tricks Ware (www.world.std.com/~eshu/ctw/ctw.htm). They are in the Toolbox in alphabetical order, rather than by the macro name. This may make sense to long-time DataCAD users, who know that the automatic roof tool called Roofit and the trimming tool called Clipit were developed long after basic DataCAD. However, it is disorienting to new users, who would have expected these features under the program's Architect and Cleanup menus.

Although the basic DataCAD menu items are now excellently covered in the context-sensitive online help, many of the macros are not equally well-documented. There are certain rules of thumb for how all things in DataCAD run, so that it is possible to

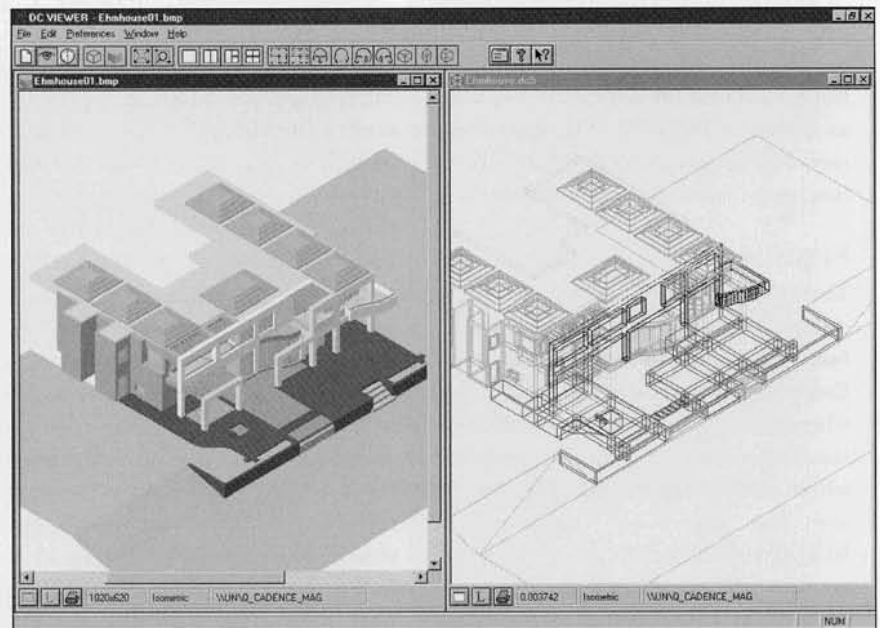


Figure 6. DC Viewer can be used to create 3D views of DataCAD drawings and to convert them to VRML files.

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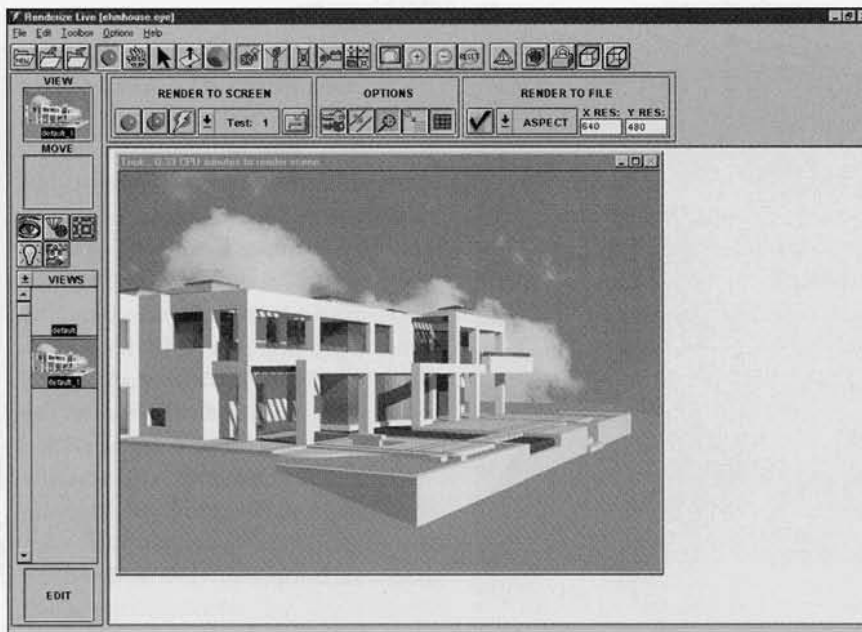


Figure 7. Renderize Live can render high-quality scenes, including background images and shadows.

figure out any new command on one's own, but each macro has its own internal way of working—each with a small learning curve.

Another result of this multiple mini-program approach is that different options show up for some of the same things. For instance, the way you place windows and doors and the options to choose from are different in Architect, DCAD AEC, Frameit, AEC Model and EZ Elevations.

A few third-party macros are regarded by intensive users as virtually indispensable, so be prepared to add about \$100 to \$200 worth of these for areas specific to your work. In particular, Stickyback, part of the DC Sprint utilities (\$49.95) for fancy cut-and-paste abilities; RoofBuilder Tools, which goes beyond the built-in Roofit macro for complex roofs with towers; and some of the others previously mentioned.

More Than a Few Raves

Most of the macros are relatively easy to learn because they are based on the same philosophical approach as the rest of DataCAD—logical default values for architecture. Without having

to set any parameters, you can just click three places anywhere, and the macros will draw what they are supposed to. After examining what the macro has drawn, it is relatively easy to figure out what each parameter setting can adjust, and where in the actual drawing to click. Just erase the test with one key shortcut, and pop that new element where it goes.

It seems simple and perhaps trivial, but sometimes the smallest details make a big difference. DataCAD's use of [pageup] and [pagedn] to zoom in and out, with the arrow keys panning view left/right and so on is one of the most intuitive view navigation tools of any CAD program. These viewing keys, as well as the zoom window and extents, are completely integrated and can be used at any time within any command.

Right-out-of-the-box DataCAD works so well you may not need any customization. But if you do, DataCAD is easily customizable. Every single key on the keyboard (plus [Shift], [Alt] and [Ctrl] combinations) including the function keys can be assigned as a command shortcut. Most of the built-in

shortcuts are mnemonic (**M** for move, **C** for copy, **E** for erase, **L** for layer and so on). Some users also put customizations (such as an automatic sheet layout to office standards) on the icon toolbar at the top of the screen, which can automatically call up other toolbars. DCAL, a powerful graphic macro programming language, comes free with the software.

DataCAD flawlessly handles the transition from metric SI to imperial Foot/Inch and vice-versa. It provides a completely automatic updating of all dimensions between engineering decimal feet, architectural inches and metric units.

Conclusion

Even with little CAD exposure, you should be able to teach yourself DataCAD within a few weeks. The approach to drawing is similar enough to AutoCAD that users can be working on projects within a day or so. DataCAD software covers the entire stretch between conceptual design and contract documentation, including pretty good 3D.

There are a number of books, audiotapes and videotapes on DataCAD available from many different sources listed on DATACAD's Web site. The Cheap Tricks newsletter (www.world.std.com/~eshu/cheap.htm) by Evan Shu, AIA, is extremely valuable, and it's worth getting the back issues for tips and tricks. The best Internet forum is datacad-dbug@world.std.com.

DATA CAD LLC is also one of the founding members of the OpenDWG Alliance. As a result of its membership, future versions of DataCAD will be fully compatible with the DWG standard right through AutoCAD 14.01. ■

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