PRODUCT REVIEW

DataCAD 3-D

ONE OF THE primary dilemmas that makers of architectural CAD systems face is how to best represent and utilize the evasive third dimension within their design and drafting products. Microtecture's new DataCAD Version 3.6 and its expanded family of software support products provide a superb solution to this problem, and to a host of other architectural drawing and production needs.

The desire among architects to develop and view their designs in 3-D, and the promise of CAD to provide such capabilities, have been frustrated by the fundamental nature of architectural drawings. This stems from the fact that architectural plans are symbolic, rather than pictorial representations of buildings.

While a number of architectural CAD systems provide excellent 3-D modeling functionality, they too often fail to be productive. This is true not because they lack capability, but because of the labor intensive set up work required to generate and render 3-D models.

Features

DataCAD, for a long time one of the most intelligent architectural CAD software programs, tackles the challenge presented by 3-D drafting with a technique that has proven to be both clever and intuitive.

By DAN SMITH
& ERIC TEICHOLZ

Integrated 2-D and 3-D capabilities are finally at hand.

For starters, Microtecture has acknowledged that the primary function of a drafting system is to perform 2-D working drawings. Any hindrance of this task would invite trouble. So, while DataCAD maintains a true 3-D database, it isn't forced upon the user. Though the 2-D and 3-D capabilities are highly integrated, the 3-D operations are completely transparent to the user working on a regular 2-D drawing.

Second, because the 2-D and 3-D capabilities have been finely dove-tailed, the user can instantaneously snap back and forth, say, between plan and perspective views. Since the DataCAD product is dedicated to architectural applications, it has been able to anticipate and respond to the requirements particular to architectural 3-D design and drafting. To a large degree, these functions have been automated. So, while the user draws a 2-D plan, DataCAD fills in the 3-D information needed to create a basic model ready for viewing.

Finally, Microtecture has added products to its software line that permit users to embellish their 3-D models and produce state-of-the-art 3-D renderings on their PCs.

Performance

The basic DataCAD 3.6 product comes complete with the capabilities to view models in 3-D and perform hidden line removal on these views.

At any point, the user may choose to view the model in 3-D simply by selecting the 3-D menu option. Orthographic (front, side, etc.) and oblique views (isometric and axonometric) may be viewed as well as perspective projections. Views can be saved and returned to after (or during) the course of other drawings and edits. You can actually move or edit drawn elements while viewing the event in 3-D.

Because DataCAD is an architectural system, it allows you to position a station point in the building plan. The direction and width of the cone of vision may be defined, and alternate focal lengths may be selected that simulate the images a camera would record with different lenses used at the designated station point. Since DataCAD renders these views as wire frame images, they generate quickly and provide the designer with an immediate vision of what the interior or exterior of a building might look like.

DataCAD provides a full complement of 3-D clipping and view control functions. All system variables and defaults can be set to the user's preference. As with 2-D views, 3-D views can be stored and recalled, and walk-through can be programmed and played back.

Accessories

Occasionally, the user may wish to model additional 3-D shapes such as sloped roofs, domes, vaults, cornices, etc. For these occasions, Microtecture has developed the DC Modeler, which may be purchased separately. Once installed, it's totally integrated with DataCAD. A series of new menus will appear within DataCAD's regular menu structure.

DC Modeler is a sophisticated 3-D modeling system that supports 15 new 3-D entities and a host of specialized 3-D editing functions. DC Modeler supports

true drawing and editing in all 3-D views, including oblique and perspective projections. Points can be located (snapped to) in 3-D space, and lines can be drawn at angles oblique to the viewing plane. The model's coordinate system can be snapped to any orientation by selecting any three points. Editing functions are supported for all essential 3-D transformations.

To complement the 3-D drawing and modeling capabilities of DataCAD, Microtecture has released Velocity, a comprehensive 3-D rendering package. Velocity takes views of models created in DataCAD and renders them in up to 256 colors out of a palette of 16 million. The broad range of colors and Velocity's ability to assign colors, textures and translucency to surfaces gives renderings one of the best quality images available with PC CAD software.

Velocity supports a number of common display devices capable of producing 256 simultaneous colors. Images are initially processed at extremely high levels of resolution (2,000x2,000 pixels) and color definition (24 bits per pixel) prior to being mapped to the resident display device. These intermediate images may be output to very high-resolution printing and photographic devices for hard copy.

Velocity has been optimized to run very quickly. Only four to eight minutes are required to perform a typical rendering. Once generated, these images may be played back as slide shows.

The user interface lets users select colors as well as textures for different materials to be rendered. Textures are mapped onto the surfaces indicated. This process is facilitated by allowing users to select predefined surface textures such as steel, copper, tin, aluminum, wood, marble, stone and shingle. Through combinations of color and transparency, other materials such as tinted glass can be rendered. Up to 17 light sources can be set at varying levels of brightness to illuminate models as desired.

The availability of Velocity provides DataCAD users with a full range of 3-D resources. At one end of the spectrum, users can draw 2-D images while DataCAD automatically generates the third dimension essential for effortless viewing of simple 3-D models. DC Modeler supports the creation of a broad range of 3-D primitives and complex shapes, while Velocity provides quick and realistic renderings of the models generated.

DataCAD AEC is a collection of parametric design routines that automatically perform a number of common tedious tasks involved in building design and drafting. The DataCAD functions are written in DCAL, Microtecture's macro programming language, and appear as menu options within DataCAD's regular menu structure. DataCAD AEC is included in the purchase price of DataCAD 3.6. As well as performing tasks related to each phase of the drawing process, the AEC functions are organized roughly in the order of natural progression, so users can run down the list in an organized fashion. However, users need not adhere to this order.

All the AEC functions are delivered with preset defaults, so they are ready to run at the push of a button. Therefore, it's never necessary to exhaustively set all or any design parameters. Parameters need only be set as changing conditions or as the user's preference dictates. Changes are stored as new defaults for future use or until reset.

These routines are remarkably powerful, and reduce hours of labor intensive calculation and rendering into the push of a button. They also provide for the testing of alternative designs since any macro can just as easily be erased and retried with new parameters.

DataMERGE is an integrated software product that automates cost estimating, specification writing, bidding and construction cost tracking.

To begin the process, elements in a DataCAD drawing can be tagged with cost information tied to a material database that the user has established. This permits DataMERGE to analyze the graphics drawing data and calculate material take-offs and cost breakdowns for all identified building elements. Surface areas of floors, walls and ceilings are actually calculated and tabulated to determine material quantities.

Once building components are identified, DataMERGE can link with a specification package and automatically extract relevant sections of the specifications. These specifications can be further edited or embellished using DataMERGE's built-in word processor.

DataMERGE's bid module will produce bid documents for distribution to contractors (on hard copy or floppy disk) and later compare bids that are resubmitted to aid in the contractor selection process. Once the contract has been awarded, the system will produce contract documents based on the specifications and the accepted bid information. Finally, progress of the project can be tracked through the construction phase.

Summary

In addition to the new products described above, a host of new additions and refinements—too numerous to list here—have been made to the existing software. Many are quite significant. Notably, DataCAD Version 3.6 is particularly solid and bug free. Also, the addition of polylines and 3-D entities makes DataCAD files particularly compatible with AutoCAD DFX. DataCAD's DFX translator is well polished and operates transparently through one of DataCAD's regular menus. ♦

Dan Smith is the principal author of "PC CADD: A Buyer's Guide" and a well-known authority on PC CAD. Eric Teicholz is president of Graphic Systems Inc., a Cambridge, Mass.-based CAD and facility management consulting and publishing firm.

DataCAD

	Unacceptable	Poor	Satisfactory	Good	Very Good	Excellent
Features	☐	☐	☐	☐	☐	☑
Performance	☐	☐	☐	☐	☐	☑
Ease of Installation	☐	☐	☐	☑	☐	☐
Ease of Learning	☐	☐	☐	☐	☐	☑
Ease of Use	☐	☐	☐	☐	☐	☑
Error Handling	☐	☐	☐	☑	☐	☐
Documentation	☐	☐	☐	☐	☐	☑
Support	☐	☐	☐	☑	☐	☐

Microtecture Corp., 617 W. Main St., P.O. Box 3788, Charlottesville, VA 22903; (804) 295-2600

PRICE:

DATACAD 3.6
   (INCLUDES AEC) $3,495
DATAMERGE $3,495
VELOCITY $2,000
DC MODELER $495

Additional workstations with DataCAD 3.6 and AEC are available for $975 each. Additional DataMERGE packages cost $975. Additional DC Modelers cost $150.