



## Finally, Advanced 3-D CAD for PCs

by Morris D. Carey, Jr.

Rarely do I write about a computer program that isn't entirely complete, but there's a first time for everything. I recently reviewed a beta version of a CAD program for construction that knocked my socks off, and I want you to know about it. (A "beta" version, by the way, is an unfinished version of a program that is sent out to a few users for testing and refinement.)

Before I tell you about the program, I'd like to give you some background on CAD in general. CAD is short for "computer-aided design." The concept behind the development of CAD programs is to help architects, draftsmen, designers, and engineers do their work faster and more accurately than with pencil and vellum. And it works. One big plus is the ability to make changes. They're a breeze on computer.

### Looks Are Deceiving

Most CAD software is not very useful to those in the construction industry. The problem isn't so much with the programs, but with how we perceive what they can do for us. We expect them to be the answer to all of our design and sales problems, rather than a tool to enhance our existing ability. An accomplished typist can do better work in less time on a word processor than on a typewriter, and an electronic spreadsheet generates results faster and more accurately than one done by hand. But if you can't use a typewriter, you can expect even greater difficulty using a word processor. And if you don't know how to create valuable information on a paper spreadsheet, an electronic one could prove useless. Similarly, CAD programs won't turn you into a draftsman if you don't know how to draw.

For the past several years, CAD companies have been trying to make their products more efficient, easier to use, and more versatile. Not until recently have they directed their efforts specifically toward building and construction. To do this, they not only provided more extensive architectural symbol libraries, but they added the ability to create sections automatically from plan-view drawings and to draw two lines at once, with dimensions shown from one side of the wall or the other, instead of at wall center. And they developed 3-D, solid modeling, coloring, shading, complex roof design capability, and more.

Our first instinct, once we've seen a CAD demonstration, is that our drawing problems are over and our

sales figures are going to jump through the roof. Then we see the price, and things start to fall apart. A good CAD system, without 3-D or solid modeling functions, can cost \$3,000 to \$5,000, but usually includes a pretty complete architectural symbol library. Most inexpensive CAD programs simply draw lines. GenericCad, for example, sells for about \$300 and is a super program. But without an extensive architectural library, you are left to draw your own. At \$15 per hour, you could easily spend \$3,000 creating your own series of toilets, windows, cabinets, and other symbols.

The demonstrations you see at computer shows can be deceptive. Programmers spend thousands of hours creating intricate drawings which, in fact, represent the capability of that program. But these drawings pop on and off the screen so fast and are so easy to alter that one can be left with the impression that the whole process is ridiculously simple. Not true.

### 3-D Solid Modeling

A 3-D or perspective drawing is a dynamite sales tool, especially when it is created automatically from a simple plan-view drawing, and enhanced by a new feature called solid modeling. In the old days, if you drew a cube on a computer screen, every line of the cube showed through, front or rear. Solid modeling erases the lines that would ordinarily not be seen as viewed by the eye. The end result is a finished perspective. Although the technology is not new, the cost to the end user has become affordable.

Macintosh has led the industry in CAD programs that do all of the wonderful things I've just mentioned. In the past, I have reported on ArchiCAD and Architron ("State-of-the-Art Contractor," 9/90, 10/91), a couple of CAD packages for the Mac that are truly written for contractors and building designers. These programs handle complex functions like roof design and three-dimensional solid modeling very effectively. Unfortunately, they're Mac-based. Don't get me wrong, I like the Mac. It is a superior computer when it comes to any kind of CAD software. But the hardware alone costs \$10,000 or more, and with the additional expense of a good CAD program (note I used the word "good") at \$4,000 or \$5,000, the investment starts to get steep.

Most folks in our industry own

PCs, and, except for Autocad and GenericCAD, we really haven't had much to choose from in the way of quality computer-aided design. Much of the software I review that is written for the construction industry is made by building contractors who acquired an interest in computing as a result of their desire to improve their businesses. Then they made their programs available to others in the industry for a profit. I salute these folks; they are the backbone of computer software in construction. One big drawback with many programs created this way, however, is that they don't operate as smoothly as programs written by computer experts.

### SolidBuilder

But every once in a while someone comes along who has been in the computer industry for 15 or 20 years, has 10 or 12 years of construction experience, and thoroughly understands the intricacies of both fields. This combination can make for a magnificent construction-related program. This is the case with *SolidBuilder*, a solid modeling program on its way to becoming the first PC-based CAD software to give the Macintosh a run for its money.

*SolidBuilder* is truly unique in the world of PCs. First, it is very professionally written, so it is reasonably easy to use, has good menus, is mouse driven, and has a fast screen. And hundreds of routines are handled behind the scenes, so you get multiple results from a single action. Second, the logical order of construction is defined by the user; you can build up or down. Third, it deals specifically with construction problems. Fourth, it can be used as a fantastic selling tool. Finally, it is the only 3-D solid modeling program I know of for use on the PC that sells for under \$16,000.

*SolidBuilder* will create a framing cut list for windows, doors, walls, floors, ceilings, and, yes, roofs. An extremely complex hip roof can be built on screen, with all framing members included, in a few minutes. Most importantly, the routine for drawing a complex roof is the simplest procedure I have ever seen, even easier than ArchiCAD. Best of all, it is interactive. For instance, the program asks the user: "Do you want the perimeter of the roof equal to the perimeter of the walls below?" If the answer is "yes," *SolidBuilder* automatically matches the shape of the roof to the shape of the house. Interactive design also means the computer matches the outline of a new shape to the one that was previously worked on. As far as I'm concerned, this is an incredibly valuable, mistake-preventing feature.

What's the down side? Why so much power for so little money? The program isn't finished yet. Does

that bother me? Not a bit. It's amazing — and it's one of a kind.

What's not finished? The symbol library isn't available yet: no toilets, doors, windows, or cabinets. When that's complete, the price will probably go up \$1,000 or \$2,000.

What is available now? A CAD program that will draw a structure from the foundation to the completed frame, with a cut list for every stick of wood and blocking automatically optimized to reduce waste, and a list of the area of wall covering (inside and out), roof covering area, and more. And the finished result can be viewed as a frame or with wall covering.

For the price, it is unbelievable. A beta copy of *SolidBuilder* can be purchased from Pat Murphy at Computer Integrated Building, P.O. Box 222, Occidental, CA 95465 (707/874-2826), for \$3,995. Beta sites are provided with monthly updates. ■

*Morris D. Carey is a partner with Carey Bros. Construction, a remodeling firm based in Pittsburg, Calif. He has reviewed hundreds of construction-related computer products, and conducts computer seminars. If you have questions about computing in construction, address it to State-of-the-Art Contractor, JLC, RR#2, Box 146, Richmond, VT 05477.*

## Computer Bytes

### Worms, bombs, and Trojan horses

are generic terms for computer viruses. These small software programs hide themselves in the midst of "healthy" code and spread from machine to machine when infected floppy disks or modem files are exchanged. Over 700 known strains are in circulation, and 100 new ones are expected to surface this year, causing hardware crashes and lost data. But protection is available. The October 29 issue of *PC Magazine* reviews 20 utilities that detect, remove, and inoculate against computer viruses. Most cost between \$100 and \$150, and offer annual upgrades for an additional cost. To be safe rather than sorry, the issue is available from Back Issues Dept., Ziff-Davis Publishing Co., P.O. Box 53131, Boulder, CO 80322.

**MS-DOS 5.0**, an upgrade to the popular operating system for IBM-compatible PCs, was released early this summer. The program offers several improvements over earlier versions, including the ability to free up RAM by installing programs and device drivers in upper memory, extensive on-screen help for any command, a new text editor to replace the clunky Edlin, and the ability to recover data from deletion and formatting errors. MS-DOS 5.0 is available at retail stores and mail-order houses, or from Microsoft Corp., One Microsoft Way, Redmond, WA 98052; 206/882-8080.