Don't be caught by the data burglar

Back Up, Back Up and Back It Up Again

By David Porter

I left my office on the evening of Feb. 27th in my normal fashion by backing up all the day's work on both of my computers. I arrived early the next morning with the sun shining brightly and expecting to continue onward with my projects. But, to my shock, I found my desks moved about and a spaghetti entanglement of computer cables laying where computers used to sit on tables. I had been robbed!

My CAD system computer, a 17-inch monitor, a mouse, and two printers were taken. The thieves left untouched a complete 486-66 system and my plotter. They were probably not in my office more than two minutes and had hauled off more than $8,000 worth of computer equipment.

It used to be that the "people" were the "value" in a firm, not the T-squares, triangles, and pencils. Now, in the computer age, firms are deeply indebted to their computers and the data within them — almost more than they are to the "people" who use them. You can replace people (regretfully so). You can also replace the computers. But you cannot replace the lost data. At no other time is that more evident than after a disaster (hard drive crash, fire, theft, hurricane, tornado).

I credit, in large part, my compulsive, neurotic, back-up procedures for saving my architectural practice from extinction. After the shock wore off, I searched through my backup tapes and found that I had lost only one project. Fortunately, construction on it had been finished two years ago. All of my current work was saved on backup tape.

See BACKUP, page 17 ⇨

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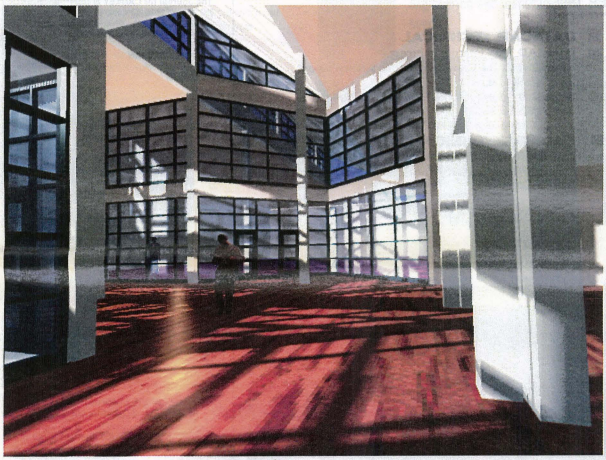
KEY SOLUTIONS

THE PROFESSIONAL JOURNAL FOR CADKEY & DATACAD USERS

VOLUME 4 NUMBER 9

NOVEMBER 1995



A school library model designed by WRA Architects.

WRA takes DataCAD to school

By Claudia Martin

WRA Architects Inc. of Dallas, Texas, has completed more than 500 educational buildings and support facilities for school districts since they began in 1954. The success of their projects has been based on a dedication to quality and a team approach that involves close interaction between the client, architects, engineers and other consultants.

WRA Architects has a reputation among general contractors for producing construction documents of high quality and superior detail. This historically has resulted in more accurate and competitive bids and fewer change orders during the course of construction. This high quality is partially a result of the fact that virtually 100 percent of the construction documents are created with DataCAD. In fact, WRA is a DataCAD company all the way. The staff of 14 includes eight registered architects, but everyone in the company has DataCAD on their computer and is skilled in using the program. This means everyone can understand what's going on with any given project and most can pitch in when needed.

Another factor affecting project quality is WRA's internal structuring, which avoids departmentalizing the design process. The principal team members assigned to a project carry it through all phases of design and construction, including follow-through during the one-year warranty period after a project's completion.

Liana Handley is the team member at WRA responsible for much of the 3D modeling and rendering used for presentations and in-house project studies. Her responsibilities at WRA range from site modeling to realistic renderings of exteriors and interiors. She has learned how to most effectively use color, light and shadow to illustrate how spaces, patterns, and realistic finishes will appear in reality. "These types of renderings really help clients make informed decisions on materials," she says. "They have a much better sense of what the project will be like upon completion." The renderings shown with this story are typical of her work. Although she specializes in 3D and rendering, she also works on

See WRA, page 17 ⇨

Ranor: A Giant in Goliath Manufacturing

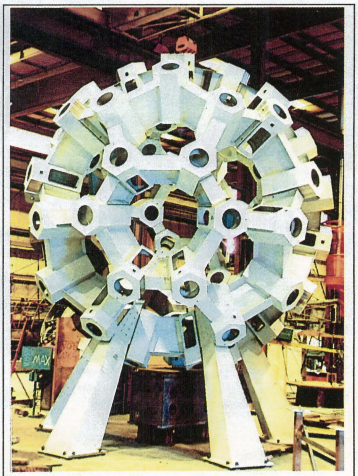
Ranor Inc. in Westminster, Mass., is not your ordinary metal fabrication and machine shop. From aerospace components for composite layups to catamaran keels to laser fusion projects, Ranor specializes in Goliath manufacturing.

A pressure vessel consisting of 104,000 lbs. of steel and measuring 116 inches in diameter by 40 feet in length is just one example of the type of work done at this New England business.

A tour of Ranor's 100,000-square-foot facility puts the day-to-day operation in perspective. Two massive buildings occupy the site, one for fabrication, the other for machining. The production floors are filled with a variety of parts, most larger than the average-sized person. Cranes, servicing up to 120,000 pound lifts, help move parts and materials to each production site. Jib booms over each work center help lift heavy materials for forming and fabrication. For yard handling, Ranor utilizes forklifts with a capacity up 55,000 lbs.

By the end of the tour, one fact becomes increasingly clear. To

See RANOR, page 10 ⇨



With the test fitting complete at Ranor, the TMS stood 30 feet high and weighed in at 35,000 lbs. This structure would be shipped in 42 pieces for the final on-site assembly.

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CADKEY Communiqué

CADKEY IN THE NEWS

New Web Page with Cadkey Info

Unitec Inc. recently announced the debut of their Web page (http://www.unitec.com) that contains a good deal of CADKEY-related information. Products featured include CADKEY, DataCAD, FastSURF, DraftPAK and Dimension Guru. Additions to the page are being actively sought. Please submit any recommendations to Webmaster@unitec.com.

CADKEY AT AVA

Cadkey will attend the American Vocational Association Convention Dec. 2-4 in Denver, Colo. Cadkey will be in booths 909 and 911. This year's convention addresses leading-edge issues, such as teaching and skill standards, tech prep, implementation of school-to-work systems and achieving diversity goals. More than 6,000 people are expected to attend.

DataCAD Textbook

"A Textbook for DataCAD" by William C. Barnhill is now available. The author has used the text for nearly five years at Ricks College in Idaho. The book is structured so that it can be used in traditional teaching settings or as an individualized, self-paced study text. The content and illustrations are designed to help the student progressively develop a working knowledge of DataCAD (including version 6). The textbook is available from WCB Enterprises for $40 (includes shipping and handling in the U.S.). Phone: 208/356-1873 or fax: 208/356-1860.

DataCAD 7 Release Nears

DataCAD 7 is expected to be released by the end of December. The product specifications include multi-scale plotting, multi-line walls, PrintAPlot Pro (supports 1500+ printers), AutoCAD Rev. 12 DWG read/write capabilities, layer freezing, 3D roof framing, and file locking.

Strategic Partners Program Expands

All third-party developers interested in becoming a Cadkey Strategic Partner can contact Dale Arsenault at Cadkey for detailed information on the program. Mark Hyjek, AEC Product Manager, can be contacted regarding interesting add-ons for DataCAD.

Advanced Modeler for Windows

Release of the new version of CADKEY Advanced Model is tentatively slated for the end of November. It will be available for both DOS and Windows applications. Enhancements include smaller file sizes, speed increase of 700 percent to 900 percent, more robust Boolean operations, better tessellation for SLA output, solid fillets, and support for three-sided surfaces.

DataCAD Marketing News

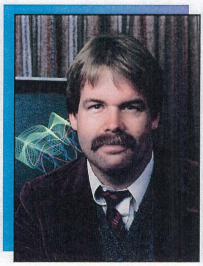
DataCAD marketing efforts continue to escalate. The Cadkey AEC product group showed DataCAD at the Chicago AEC Systems show Oct. 4-5. DataCAD advertisements were seen recently in World Architecture, Profession Builder and Builder Magazine.

CADKEY INC. PRICE LIST EFFECTIVE THROUGH DEC. 30

U.S. / Canada Master Price List (U.S. Dollars)
To order, contact your local authorized CADKEY/DataCAD dealer

Product Name	*Suggested Retail Price*
CADKEY 7 FOR WINDOWS	
CADKEY / Windows (3-1/2" or CD ROM) – SRP	$ 795.00
CADKEY	
CADKEY Professional 7 (3-1/2)	$ 1595.00
CADKEY 7 DOS (3-1/2")	$ 795.00
CADKEY Light 7	$ 99.95
Advanced Modeler (Windows/DOS)	$ 495.00
SOFTWARE FOR EDUCATION	
EduCAD America Program - DataCAD & CADKEY	
Call for Program Details/Costs	
(Contact: Pete Mancini, Cadkey Education Dept., 203-298-6420 or FAX 203-298-6590)	Call for Quote

Product Name	*Suggested Retail Price*
CADKEY UPGRADE CONTRACTS - (12 MO.)	
CADKEY Professional (Upgrades for CADKEY and Analysis, Advanced Modeler)	$ 350.00
CADKEY 7 DOS & WINDOWS	$ 250.00
DataCAD & DataCAD UPGRADES	
DataCAD 6 Professional (3-1/2" or CD ROM)	$ 149.95
Upgrades from DataCAD 5	$ 69.95
Estimator	$ 99.00
TOUCH-UP Macro	$ 49.95
BLOCKER Macro	$ 49.95



PRESIDENT'S PERSPECTIVE

BY LIVINGSTON DAVIES • PRESIDENT, CADKEY

Enterprisewide Software

CAD may be the last bastion of high-priced software in a large market. Every other application with a popular following has seen prices tumble to a tenth of what they were five years ago. From word processors to spreadsheets, database management systems to Internet tools, educational software to games, prices have dropped and markets have expanded. With the huge popularity of Windows 95, we can expect this trend to continue. CAD is the only software with a large following which seems to be bucking the trend. Products like AutoCAD and ProEngineer Junior remarkably enough still sell for prices closer to $5000 than to $500. These prices are not sustainable because the market will not let them last.

There are cracks in the surface of CAD pricing which suggest we are about to see a dramatic drop in average system price. For example, CADKEY for Windows (which outperforms not only AutoCAD but also ProEngineer Junior) sells for $795. As another example, the hugely popular architectural design program DataCAD is available for as little as $149. Each of the leading CAD companies has offered, or is preparing to offer, a limited functionality "light" version of their products.

The handwriting is on the wall. I predict that in 1996, the average price of a CAD station will drop dramatically. CADKEY and DataCAD are positioned to take up the slack as users en mass realize there is no need to spend thousands of dollars for application software when an equally good, full-function substitute is available for just hundreds of dollars.

And popular prices makes possible true enterprisewide use of CAD. The biggest savings in the use of any software occurs when you make the same software available to your entire staff. CAD is no longer just for designers. It is used in production, documentation, detailing, marketing, packaging, estimating and even secretarial services. If your secretary needs to send a status report to one of your clients, he or she can begin the document in Word for Windows, switch to CADKEY for Windows using [ALT] [TAB], bring up a design, press [Print Screen] to cut what is on the screen to the Windows clipboard, switch back to MS Word for Windows, and paste the graphic into the status report. The user interface is so Windows-consistent that there is no need to be a CAD expert to use CADKEY for Windows for general purposes.

Of course, creating 3D surface blends will require more expertise. But relatively few people use the most advanced functions. This is a little like macros in your word processor. It's nice to know they are there, but have you ever used them? Far more people use the fundamental, easy-to-use functions. The keys to enterprisewide use are: a) popular prices (hundreds rather than thousands of dollars per copy); b) popular platform (Windows 3.1, Windows 95, etc.); and c) popular functionality. It doesn't make sense for a company to spend thousands of dollars per employee on a copy of AutoCAD or ProE. It *does* make sense to spend a few hundred for a Cadkey product. The sound you hear is not caused by an earthquake in Sausalito, Calif. It is the sound of prices cracking and falling to popular levels.

EDUCATION NEWS

CADKEY goes to school in Hawaii

This article is reprinted from the September 1995 issue of "Technology in Touch,, a State of Hawaii Department of Education newsletter. Ross Perrinsalvo is the educational distributor of CADKEY in Hawaii and is making inroads into a system previously dominated by AutoCAD.

By Helen Gokan NSSB

Two years ago, Kalani High teacher Ross Perrins inherited 13 DOS-based computers from the previous mechanical drawing instructor, Gerald Wong — three 386s and 10 286s. The 386 machines had AutoCAD installed. The 286 machines were not powerful enough to run either AutoCAD or Windows. With a limited budget and lots of research from a student, Perrins built a high-powered classroom LAN for his mechanical drawing class.

Perrins first upgraded eight of the 286 computers to 386s by replacing the motherboards and he upgraded the RAM to 4MBs for each computer. He bought an Ethernet card for each computer and connected them with Thinnet, or Ethernet over "thin" coaxial cable, in a "daisy-chain" configuration to save the cost of a hub.

He researched network operating systems and decided that Netware, the most popular network operating system, was "way to expensive!" He settled on Windows for Workgroups on each of the computers, creating a peer-to-peer network where students can access any hard drive or any printer from any computer. Perrins spent $8,000 for the hardware upgrades and the new software.

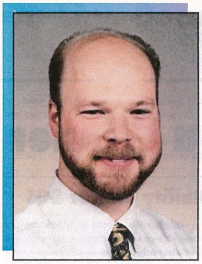
He found a CAD product — CADKEY — which is much less expensive than AutoCAD and bought one copy for every computer in the lab. He also was able to build two 486 computers with mail-order parts, each with 16MBs of RAM and a 420MB hard drive.

In setting up his lab network Perrins depended on the help of Kalani senior Jarrett Lee who helped with DOS, Windows, the CAD programs and did troubleshooting on the network. "I couldn't have done it without him!" Perrins said.

Perrins teaches two sections of mechanical drawing which cover a two-year curriculum. This past year, the students worked the first semester with traditional paper and pencil drafting tools in a conventional mechanical drawing course. Then, in the second semester, the students moved to the computer lab where they went through tutorials that covered the entire mechanical drawing curriculum from the basics of drawing geometry through 3D drawing, and of producing working and assembly drawings.

The highlight of the year came when Perrins and his students took six of their computers to this year's Science and Technology Expo at Blaisdale Center. The students became teachers as they showed Expo attendees how to work through a CAD tutorial. People were lined up six-deep to wait their turn on the computer.

Building the lab network took longer than Perrins estimated, so the students were not able to get onto the computers until just two weeks before the Expo. All of them came to lab for two full days during Spring Break to learn the system so they could properly demonstrate it at the Expo.



AEC Team Perspective

By Mark Madura • Vice President, AEC Product Group

A new attitude for the next DataCAD generation

Wish Lists. . .

I would like to thank those of you who have been sending in your wish lists. We weren't able to satisfy all of your requests for DataCAD 7. However, I'm glad we were able to provide major enhancements such as layer freezing, as well as minor enhancements like icons that can be custom sized. The feature list for DataCAD 7 is frozen. Your continuing input will help us provide you with appropriate tools for our next generation CADD software. As you read this, we will be work on wrapping up DataCAD 7. The release of DataCAD 7 will mark an important milestone for Cadkey's AEC team. It will close another chapter on more than 14 years of development on DataCAD. Its success and longevity up to this point is testimony to the efforts of the development team that has brought you such an excellent solution.

Beyond DataCAD 7. . .

We have been in discussions with one of our partners, SOFT-TECH in Germany, about the possibility of them continuing development efforts on future versions of DataCAD running under MS-DOS. Here at Cadkey AEC, we will migrate 100 percent of our development efforts to Windows-based solutions after DataCAD 7 is released. We expect that most of you will want to migrate to Windows, but we also are sensitive to those of you who would like to continue with our DOS-based solutions.

New Attitudes. . .

I would like your direct feedback (to be featured next month) on some new attitudes we might like to take with our next generation products. First, what is your opinion of our next generation products running only on Windows 95? What about software distributed on CD-ROM media only, no diskettes?

Finally, what about paperless documentation, only on-line help, tutorials and wizards, no printed materials? These ideas represent new attitudes in software development that will provide long-term benefits.

Windows 95 will become a standard, and it is a full 32-bit operating system. Standardizing on this platform will help us deliver the highest quality, reliability, and consistency in our products. The CD-ROM medium is the most efficient and cost-effectiveway to distribute software. CD-ROM media allow us to provide you with advanced software at competitive prices. CD-ROM media also make installation and maintenance easier for you. Advances in on-line authoring tools will allow us to provide more effective training and reference manuals. Your acceptance of electronic forms of documentation also will preserve natural resources. I know you will have strong opinions about these issues and I look forward to your feedback and ideas.

Recent Events. . .

AEC Systems Fall in Chicago last month went very well. The traffic was brisk and DataCAD continued to hold its own against the competition. We sold a number of copies off the floor to impressed show attendees.

DataCAD Around The World. . .

I am writing this column on my way back from Belgium, this year's location for our European International Distributors Conference. We currently have more than 30 distributors that support our products in Europe. DataCAD is sold in France, South Africa, Finland, Sweden, Ireland, Italy, Spain and Israel, to name a few of our sites. I would like to thank all of the distributors for their participation this year. We will continue to expand our presence around the world with DataCAD. We plan to host another conference later this year in Seoul, South Korea, for our distributors within the Pacific Rim.

DataCAD Enhancements. . .

I will continue to strike deals to bring you as many enhancements to DataCAD as possible. Later this month, you should find an offer on your desktop that you'll find hard to believe. I have worked with Evan Shu, editor of Cheap Tricks, co-founder of the DataCAD Boston User Group, co-author of CADD and the Small Firm Architect, and distributor of Cheapware, a listing of more than 400 enhancements for DataCAD.

Evan has allowed me to select 150 Cheapware disks to include on one CD-ROM. Individually, these would cost you more than $1,500. It will be available as a limited edition, for a limited time, for only $99.95. Such a deal! I have to thank Evan and the Cheapware authors for entertaining us on this one. If all goes well, we might consider another volume in the near future. Next month I will have more exciting news, so stay tuned.

Here's talking to you. Please communicate any way you can, but e-mail is the best route: *maduram@cadkey.com.*

To subscribe to KeySolutions
or
To request product information
See the reply form on Page 2

The Good Old Days!

Remember when ram just meant a male sheep
and bugs and worms were things that creep?

When a gopher and a mouse were li'l critters,
and virus were microbes that gave one the shivers?

When a web was a sticky net that housed a spider
and nets were just strings all woven together?

When surfing was just riding an ocean wave
and a slip was dodging trouble with a close shave?

When a mime was a pointed-face animated mute clown
and hackers were people who slashed things down?

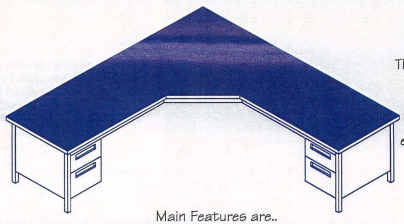
When menus and servers were all about eating
and addresses and homes were places for living?

When archie and veronica were actually people
and trolls were pests that were considered mythical?

When mud was just slime and spam was just food
and to 'finger' someone was not considered good?

When to chat and to talk still needed a voice ... ?
now being on-line has all but mooted that choice.

Maryam Wanhamid
wanhamid@falcon.cc.ukans.edu



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CG34 grommet thru hole 9/16	$6.60
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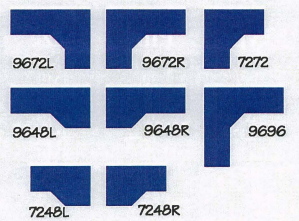

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CIRCLE 242 ON PAGE 2 FORM

How Suite It Is! Ability for Windows a Winner

By Lance M. Hillier Sr.

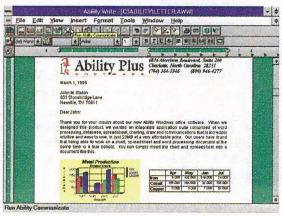
Lotus, Microsoft and Novell, look out! Ability Software Products has come up with a Windows Suite competitor that is not just a tiny dessert offering in the integrated office software category. It is a "meat-and-potatoes" package with an appetizingly low price. This robust, full-featured, integrated module package provides most of the features that the major packages offer, at a direct price of just $129.

After trying it, I think that Ability is the perfect addition to a small office that needs powerful software, but doesn't have a lot of resources for extensive training and the large hard drives and RAM upgrades required for Windows these days. And DOS users with XTs, 286s and 386sxs who can't (or don't want to) upgrade to Windows aren't left out, either. (See side bar.)

Consumers are conditioned to paying street prices of $250 (upgrade) to $600 (first-time purchase) for a full Office Package with a word processor, spreadsheet, database, presentations and communication modules. These are heavyweight packages, but for years the "real" users of these suites have been asking for more simplicity. It is a real-world fact that 80 percent of users use less than 20 percent of the features of any of the modules. All the "gee-whiz" gizmos in these behemoths generally go unused.

Furthermore, it's gotten so only heavy-weight hardware configurations can support these programs. Full suites take 60 to 100+ MB of hard drive real estate. Eight to 16MB of RAM are strongly urged to get minimum speed performance. Non-CD/ROM installation takes 24-32 floppies and a huge chunk of time. And the Big Three (Lotus, Microsoft and Novell) would have us believe the price should reflect this reality.

Ability fits its Library Manager, word processor, spreadsheet, fully relational non-programmable database (a la Alpha 4 and Lotus Approach), communications module, draw program, Forms designer, and charting program into a tiny 20MB of space, loading from just seven 3.5-inch floppies. Minimum

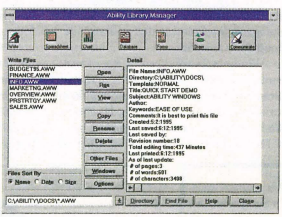


hardware requirements are a 80386, 3.1 Windows, and 4MB RAM. However, the firm does recommend a 486 with 8MB for optimum performance. On my 486DX33 with 8MB, this OLE 2.0 compliant Suite virtually rockets through its tasks with GDI and System Resources usage at just 15 percent. Personally, with all seven modules activated and occupied by opened Sample files, total System Resources drag accounted for just 38 percent, leaving me plenty of room to do other things within my precious 192K GDI allotment from Windows.

The company listened to early reports that its initial suggested retail price of $299 might be too much for a relatively unknown software developer, at least in the U.S. Ability has enjoyed a sterling reputation with its DOS products in Europe since the 1980s. The feedback from trial versions sent out in May 1995 also indicated consumer price resistance over the $200 range. As of Nov. 1, 1995, the direct price will be comparable to the Big Three's integrated "Works' packages" (seemingly designed as OJT appetizers to whet our appetites for the Executive Suite). By Dec. 1, a Win95 version should be available. No price was available at press time.

The learning curve for Ability is short. From the time I pressed OK on the Program Manager's Run Setup command button in WFWG 3.11, I was walked through the program with the aid of the Quick Tutor, Quick Cards and extensive on-line Help Files. The few times I had to read the manual, I was impressed. The entire manual is 308 pages, task-oriented, lots of graphical examples, and most pleasing — is written in Business English! Very little technical jargon distances the manual reader/user from the program.

From the Library Manager, I was able to set up a six-column word processing flier, importing the text from Word 6.0c, incorporating a spreadsheet table, a PCX graphic, and database summary in less than an hour from loading the program. The OLE 2.0 compliance meant that a change to the spreadsheet formula in the document changed the spreadsheet automatically. Faxing the document through the communication module was trouble-free. The Drawing module is a strong one, importing BMP, WMF, PCX, GIF, MPEG, and others.



Setting up a five-table relational database for a costing and invoicing system was straightforward and finished in much less time than a comparable project in Access or Approach. The database imports XLS, WQ*, WK*, ASCII delimited, DBF, FoxPro and other files with ease, and with a minimum of format loss. A maximum number of records are limited only to space available on the hard drive. A favorable feature for me was the Forms designer. After setting up the database tables, just clicking on the Easy Form designer brought up my form in an attractive format, to the length of the fields defined within the tables.

Ability has a few minor drawbacks (dependent on your needs): it was designed as a stand-alone program, and at present has no network support (I don't see a problem for peer-to-peer LANs); the word processor and spreadsheet don't support macros; the spreadsheet doesn't use the tabbed worksheets/notebook format; the database doesn't have a DBMS programming language. But remember, 80 percent of the average users don't use these features anyway.

This is a sweet Suite program! Ability for Windows 1.5 is the Suite to buy if you do not have — or cannot take — the time to learn all the features incorporated in the Big Three's Office Suite programs. It's easy to learn, very powerful, and just what the customers have been clamoring for the past few years.

Ability also comes with a 30-day unconditional money back guarantee — a pleasant change in commercial software sales. Ability for Windows is $129. A Win95 version should be available by Dec. 1.

For more information call 800/946-4277 or write 6816 Morrison Blvd, Suite 200, Charlotte, NC 28211-3579.

Lance Hillier is a freelance consultant and writer with more than 25 years of computer experience. He has been recognized by two separate Who's Who in Business organizations.

Ability 3.0 for DOS

While the Big Three are divesting themselves of DOS program support, Ability has released Ability 3.0 for DOS. At only $99.95 direct, it offers the same features as the Windows 1.5 version. Minimum requirements: XT, 640K RAM, DOS 3.3; 3MB Hard drive space. Opens maximum of 8 documents/files; limited to 16MB of extended RAM for file sizes.

got memory?

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4x3	30	4MB
4x9	30	4MB
1x32	72	4MB
2x32	72	8MB
4x32	72	16MB
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Memory prices are volatile, and are subject to change without notice. Call for details.

CIRCLE 245 ON PAGE 2 FORM

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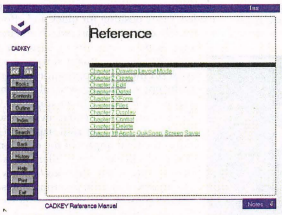
CIRCLE 243 ON PAGE 2 FORM

On-Line Documentation Puts Help Right at Your Fingertips

By John Hayes
Technical Documentation Cadkey Inc.

New authoring technologies and the storage capacity of CD-ROMs have accelerated the revolution of digital delivery of software documentation and technical information. Cadkey, riding the same information wave as the majority of the software industry, is starting to release "paperless" software packages including on-line technical documentation. Before you begin to worry about the availability of printed technical manuals for Cadkey software products, be assured that here at Cadkey, we also see value in printed documentation. Printed manuals always will be available to our valued users. However, over the past several years, we at Cadkey have become literate in the creation of on-line systems and are learning more every day in our pursuit of expertise in this new area.

Both types of documentation have a place. The ways in which they operate and are used are different. One is linear, the other associative. The new electronic documentation toolkits allow graphic data, hypertext links and even multimedia demonstrations to be combined to provide information on-screen that is impossible to demonstrate in a printed manual. In addition, Windows 95 gives the user the ability to print "wysiswyg" pages from an on-line help or documentation system one topic at a time or the entire manual.



With printed manuals, information is accessed in a linear fashion. You search for the information you need using the tables of contents and indices. However, this process requires that you already know enough about the subject of your search to know where to look for the information. An on-line context-sensitive documentation help system allows you to point-and-click on the part of the screen where you need help. Once in the system, you can use on-line searches to find all related information. The on-line process is not linear but associative; you jump from one portion of the on-line system to another — usually finding topics faster than you can in your printed manual.

How to Use On-Line Documentation

The on-line CADKEY or DataCAD documentation systems allow you to access detailed information about your software quickly and efficiently. The DOS products use an on-line hypertext system and the Windows-based products have context-sensitive help. Complete step-by-step instructions for using the documentation/help systems are located in the Getting Started manual shipped with the product. I'm sure you will find it well worth your time to learn to use these tools.

The DOS Products

CADKEY versions 6, 7, and 8 for DOS and DataCAD versions 5, 6, and 7 have on-line documentation systems that can be launched from within each application. CADKEY launches the system with the CDE program oldoc.cde and DataCAD starts the system with [Shift][F1]. Although the DOS on-line help systems are not context-sensitive, they are comprehensive and allow you to quickly locate the information you need. Key features in the DOS system include an on-line index, "readers' notes," and robust search capabilities. Once you launch the documentation system, you can use traditional methods of searching. A table of contents is the first screen displayed and a visual index is available at the click of a button. One of the most powerful features is the search engine, which can locate every instance of a topic. In fact, not only will the system locate every instance, but it also will display the results of the search in a list of hypertext links to those locations within the system.

After you have located the information on a topic, you can use the Notes button (located in the lower right of the screen) to leave yourself a note for later reference; a checkmark will appear in the box when a note is attached.

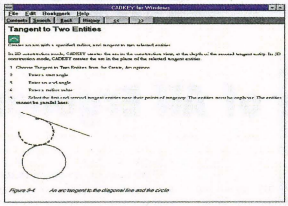


Figure 3-4 An arc tangent to the diagonal line and the circle

The buttons on the left of the screen allow you to easily use the On-Line Documentation system:

[<<] Moves to the previous topic.
[>>] Moves to the next topic.
[Contents)] Displays the table of contents for the current chapter. When you are at the beginning of a chapter, Contents displays the table of contents for the current book
[Outline] Displays an outline of the current chapter.
[Index] Displays an index of the book; use the letter buttons to move through the alphabetical listing. Click on the topic for which you want more information.
[Search] Searches for a specific term in the documentation. Type the word you want to find and choose Find. A summary box shows the number of occurrences and the locations of the searched text.
[Back] Moves to the previous topic or link.
[History] Displays a list of the topics accessed in the current session.
[Help] Displays a brief explanation of the buttons and screen objects in On-Line Documentation.
[Print] Prints the current topic text to LPT1.
[Exit] Exits On-Line Documentation and returns to the CAD application.
[Notes] Places and views reader's notes in a selected topic. Type your note and a check appears next to the Notes box in the lower right of the screen to indicate that a note is associated with the current topic.

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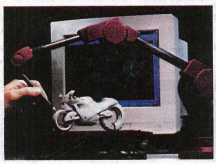

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CIRCLE 234 ON PAGE 2 FORM

Contour Mouse

The Mother of All Ergonomic Mice

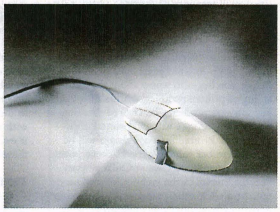
By Claudia Martin

A severe case of "rodent elbow" a few years ago left me with a profound and ongoing interest in ergonomic input devices. During the ensuing years I noticed that many mice touted as ergonomic definitely were not created equal. Some had ergonomic features; others weren't even close. Now another new one, the Contour Mouse from Contour Design Inc., is hitting the market. I had the opportunity to try this mouse recently and I now see it as a major step forward in the world of ergonomic mice.

Part of the story is best told in the words of mouse developer Les Scenna: "My motivation to find a better mouse was not just theoretical, but intensely personal. My livelihood was at stake. I joined with Steven Wang, a developer of productivity tools for CAD users, and began an 18-month development program to produce the first truly ergonomic mouse.

"We found a number of factors that were not being addressed in the design of a mouse. The most important is that the hand needs to be open and relaxed, rather than curved around a mouse, as is usually the case. The fingers need to be elevated, the palm raised, and the wrist lifted off the desk top. These are the kinds of significant design improvements we've made with the Contour Mouse. We've consulted with RSI experts, hand therapists, and research laboratories to test, refine and improve the design. While no long-term studies are yet available, I can say from my own experience and that of a number of other power users that the Contour Mouse can help you work a full day without pain and fatigue."

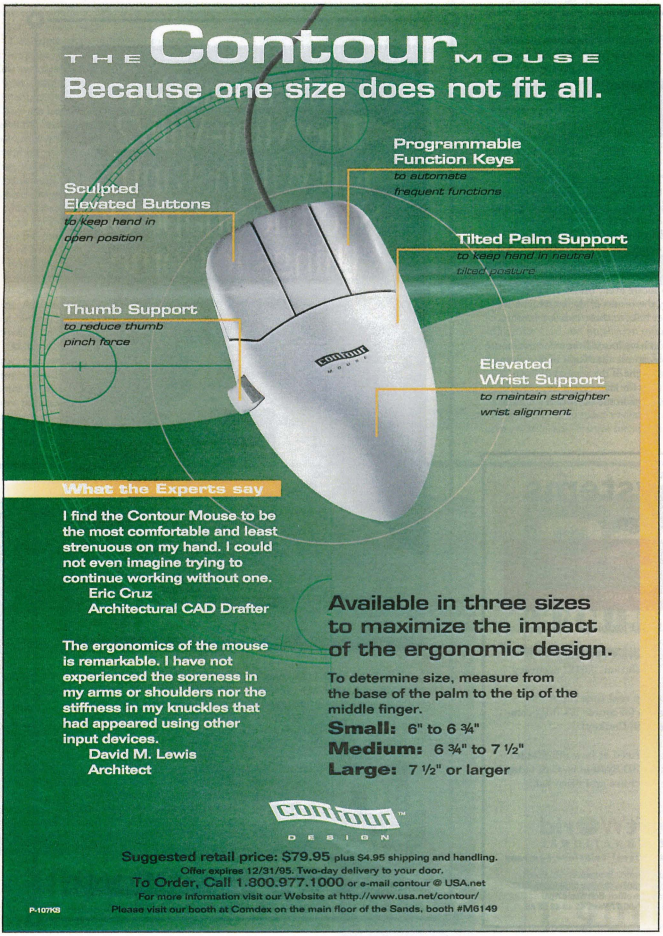
Based the on the factors discussed above, the Contour Mouse contains four patent-pending ergonomic features: a thumb support that allows the mouse to be moved with reduced pinch force, a force known to increase the risk of carpal tunnel syndrome; sculpted, elevated buttons, so the hand can remain open with the fingers extended in a preloaded, ready position for quick and effortless button activation; tilted palm support, which enhances the overall open hand architecture by balancing the hand in a neutral tilted posture; elevated wrist support that keeps the wrist off the desk top, resulting in less pressure. It also maintains a straighter wrist alignment, minimizing lateral wrist deviation. In addition, the Contour Mouse is the first mouse that comes in three sizes to maximize comfort and fit. Precision sizing and an exact fit maximizes the total impact of the ergonomic design.



Contour Mouse

A special software driver offers all the standard mouse driver controls and chording/hot key capabilities, strong macro facility, precision mouse speed and acceleration control, and Windows shortcut features.

For more information, call Contour Design Inc. Phone: 800/462-6678 or 508/937-2422 or fax: 508/937-2722



I/Vector is ideal for converting drawings

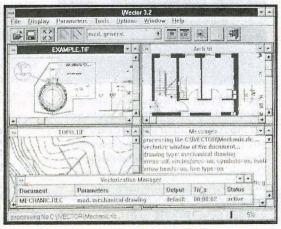
By Robert Martin

Paper drawings continue to be a problem that many CAD users face. Often drawings are scanned and saved in raster format for archiving and reference. But if the goal of scanning paper drawings is to convert them totally into a vector format that can be edited in CAD, some new software may offer a solution.

Ideal Scanner and Systems Inc. (the same folks who make and sell scanners) now also have a new software package that lets you automatically convert scanned CAD drawings into a DXF file — without a CAD operator. The software, I/Vector 3.2, is a 32-bit raster-to-vector translator that intelligently recognizes circles, arcs, symbols, OCR text at any angle, line styles, line widths, hatching, arrows, and area outlines for use in CAD, GIS, technical publishing, product data management, and engineering management systems. I/Vector 3.2 is parameter-driven, so all functions are defined and controlled by the user. In addition, you can view vector results as an overlay on the raster original to verify the results.

I/Vector 3.2 is easy to learn and use because there are only three basic steps: 1) Preview the raster image and select a drawing type. 2) Adjust the parameters for recognition and test on a section of the drawing. 3)

See I/VECTOR, next page ⇨



I/Vector 3.2

CIRCLE 253 ON PAGE 2 FORM

Freepoint 3D

A Real Time Modeling Tool for 3D

Applications such as reverse engineering, rapid prototyping, design modeling, measuring, quality inspection, failure analysis and others need efficient ways to capture surface information from 3D objects, to process 3D data, or create computer 3D models. The new Freepoint 3D™ line of three-dimensional digitizers is a practical and affordable choice if you need to do any of these things. Freepoint 3D uses a new ergonomic and unrestricted hand-held probe (it is connected to the unit by thin cord), is portable, and can digitize any material. Freepoint 3Ds come in three sizes: 3.25 x 3.25 x 3.25 feet (1 x 1 x 1 meter), 8 x 8 x 8 feet (2.4 x 2.4 x 2.4 meters) and 16 x 8 x 8 feet (4.8 x 2.4 x 2.4 meters).

One creative use of Freepoint is taking place at Ford Motor Company. The car firm uses it for chassis design and modeling. In another current example, International Technology Transfer in Japan performs quality inspection of fabricated parts and restores archeological artifacts. Engineering Animation digitizes crashed vehicles for accident reconstruction, finite element analysis and graphic representation. Freepoint helps Cleveland Clinic perform stereotactic neurosurgery and spinal pedical screw placement, and Dana Farber Cancer Institute treat breast cancer tumors through precise positioning of hypothermia transducers.

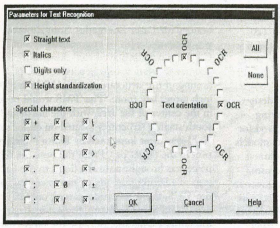
The Freepoint 3D device uses sonic technology and a contact probe to capture surface positioning from an object. The hand-held probe has two sound emitters that are "in-line" with the tip. The tip is a known distance along the vector. To digitize an object, the user contacts the surface of the object and "fires the probe." This creates a pressure front of "white noise" traveling in omnidirectional, concentric circles. This "white noise" is received by a triangular microphone array, filtering the sound at 65 Khz. Freepoint's control unit then records the time it takes for sound to travel from the source to each of the three receivers. It converts time to distance and the software driver performs compensation on a real-time basis to recalibrate the speed of sound, triangulates the data, and calculates the Cartesian coordinates for X, Y, and Z. The control unit connects to one of the computer's serial ports and operates at up to 38.4K baud. Resolution is rated at 0.0002 inches (0.005 cm).

Windows and DOS drivers provide compatibility with most leading 3D software packages. In addition, direct drivers exist for many 3D PC- or MAC-based applications, including Cutting Edge's CADDInspector, Design Automation's REV ENG, Viewpoint's Hyperspace, HighRes's HighRes Modeler, Studio and HighLight, and Blevins Enterprise's VertiSketch. Science Accessories also includes a TSR (Terminate and Stay Resident) program with the digitizer, which works within any DOS application that permits manual entry of X, Y, Z coordinate information. A Windows TSR driver also is available.

Freepoint 3D replaces Science Accessories Corp.'s GP-12 3D product line. Prices are $4,995, $5,995 and $6,995.

For more information, call 410/381-6688 or fax 410/290-9065.

Freepoint 3D



I/Vector 3.2

I/VECTOR from Page 8

Convert the entire drawing and save the DXF file. It's also fast. Jorge Sanchez of Manzer, Sanchez and Associates, located in St. Louis, MO., states, "I/Vector 3.2 is by far the best vectorization solution there is. It is five times faster than its competition."

I/Vector 3.2 includes a Raster Editor for cleaning, updating, rotating, despeckling, and deskewing images. There is a Region Editor for assigning different parameter sets to varying sections of drawing. These editors are important because they allow redundant information like borders, title blocks, logos, etc., to be omitted from the conversion process.

I/Vector 3.2 lets you process multiple documents. You also can prepare documents for conversion while others are being converted in the background. Both raster and vector images are viewable at a range of zooms, from the entire image to magnified views for estimates of line widths, text sizes, and tolerances. In addition, I/Vector's Layer Manager lets you sort entities logically into their appropriate layers including standard lines, text objects, dashed or dotted line types, hatch objects and customization of DXF output.

I/Vector 3.2 accepts the most popular raster formats including RLC, TIFF Group 4, RLE, and PCX. I/Vector 3.2 runs under Windows 3.1, 95, NT, or UNIX/Motif. It can run in single or batch mode and sells for $3,395.

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CIRCLE 251 ON PAGE 2 FORM

meet the demands of manufacturing complex, large parts in small production runs, Ranor must maintain exceptional technical expertise in the engineering departments and on the shop floor.

CAD/CAM: Essential components in a well-oiled machine

In 1989, the need for a more robust CAD/CAM solution prompted Ranor to purchase new software. Company officials selected CADKEY for 3D modeling, fixture design, shop floor drawings and data translation and Mastercam, PC-based CAM software from CNC Software Inc., for all phases of machining, from the burning bench to toolpath generation. Ranor receives CAD data from hundreds of sources and relies heavily on strength of the translators in both products to import files. The company's 14 PCs are networked in a file server environment.

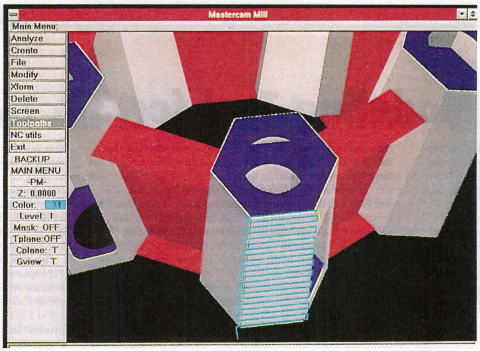
DNC communications are in place, so data can be sent directly to the CNC milling machines from the CNC programming department. "It was like we had been mowing the lawn with hedge clippers," says Ben Staples, head of CNC programming, referring to life before Ranor implemented Mastercam in 1989. "We found it to be a software package designed for the real world of CNC machining, by people who understood the frustrations of taking a conceptual design and producing a shippable part."

In a job shop atmosphere of machine programming, it provides speed and flexibility.

A classic Ranor endeavor was a complex nuclear fusion project contracted by the University of Rochester in Rochester, N.Y. Ranor's mission was to manufacture and install a unique Target Mirror Structure (TMS) and end mirror structures.

Funded by the U.S. Department of Energy, the University of Rochester's Laboratory for Laser Energetics (LLE) began nuclear fusion (Direct Drive Inertial Confinement) experimental research in the 1970s. The first phase of experimentation began with directing 24 laser beams to a deuterium-tritium target. The LLE research team proceeded to the next phase of the project, officially named the Omega Upgrade, which increased the driver capacity to 60 laser beams. At the peak of the Omega upgrade, there were 120 people dedicated to getting the project on-line.

Under the guidance of Steven Kumpan, Director of Engineering and project engineer for the Omega Upgrade, the mechanical engineering department at LLE proposed a brilliant, conceptual "soccer ball" design for the Target Mirror Structure (TMS). A soccer ball is made up of 60 intersections. Hypothetically, a laser beam would be directed through the center point of each intersection and targeted toward the absolute center of a soccer ball-like structure containing a target chamber and the deuterium-tritium target. The proposed TMS framework was 22 feet in diameter and stood 30 feet off the floor. Using a CAD program, ME30 from Hewlett Packard Inc., the LLE mechanical engineering department designed the TMS model and the staging structures in 3D.



Shown here is the 3D CAD model of the entire Target Mirror Structure shaded in CADKEY, a PC-based Mechanical Design Software.

Ranor's task was to bring this concept to reality. The manufacturing engineering department received 56MB of CAD data from LLE. Using CADKEY's IGES translator, Ranor imported the CAD data and began to design for manufacturability (DFM), as well as for field assembly (DFA). The original wireframe contained 3D models with plate thicknesses, bolts, circles, and thread holes. A CAD file representing one of the staging structures was 17MB with 8,700 entities.

Ranor's engineering team began planning a sound approach to fabricate and construct the TMS, a steel structure weighing 35,000 lbs. at completion. Ranor also was required to perform a complete test fitting in-house, disassemble and reassemble on site and maintain structural integrity .

The original TMS model was seamless. For assembly and manufacturing, Ranor's proposed design would consist of 12 pentagonal subassemblies each comprised of 5 hexagonal tubes, 25 connecting beams with the entire structure resting on five legs. For final assembly, the TMS would be shipped in 42 parts. The upper half would consist of six pentagonal subassemblies, while the other six would form the lower half of the structure. A fabricated joint system, consisting of two dowel pins, was devised to bolt the units together. Once the 3D modeling was completed in CADKEY, an IGES file was sent to back to LLE. After Finite Element Analysis (FEA) testing on Ranor's design, the proposal was approved.

According to Tom Ziobrowski, sales engineer and project manager, the focus of the manufacturing plan was to simplify field assembly and assure repetitive precision. It was determined that full mechanical assembly of precisely machined pentagon assemblies, ligaments and legs would yield the desired result. As anticipated, the total focal envelope of .120 inches was achieved without the luxury of any provision for fine adjustment. This tolerance was easily achieved at both the trial fit-up and the field installation.

CADKEY was used exclusively for designing the parts in 3D, to create the fixturing needed to machine the subassemblies, and for fabrication lay-outs. "We would create models of each component that would be machined separately, and send the data to Mastercam," said Darin Hood, a manufacturing engineer at Ranor. "Surface modeling for this project was performed in both packages. IGES translators allowed us to translate files bi-directionally without loosing surface data. We need both software packages to run both our fabrication and machine shops.

"The hexagonal plates, legs and ligaments of the TMS were all flamecut. We used CADKEY to construct the geometry for this process. The data was then imported into Mastercam, toolpaths were generated and post-processed to produce NC files. We have a custom post-processor for our flamecutter. The files are pushed out to the file server and can be downloaded directly to the flame cutting machine.

"For the forming process, we use CAD to generate the forming templates and floor sketches, which are a part of sequential routings that determine our step-by-step procedures. We include all critical data such as angles, radii and thicknesses. Because the size of the metal plates is very large and forming must be a manual process, we rely on our machine operators for their knowledge in how much pressure to apply and what dies will be used in the set-up."

Before the hexagon faces of the subassemblies could be machined, there was a lot of premachining activity. Using CADKEY, workers could design all of the patterns and provide software templates for this part of the process. An important part of the job is being able to convey the right information to the shop floor through accurate sketches and programs created from our CAD databases, said Steve Osolin, a programmer responsible for the fabrication fixtures.

For the final machining phase of the pentagon assemblies, even with the large size of machines available at Ranor, not all of the surfaces could be machined from a single set-up. It was imperative to maintain a common origin point and orientation each time the sub-assemblies were moved or rotated for machining accessibility. Engineers chose to use a series of tooling balls and reference surfaces in the center of each unit. This allowed them to maintain each machining position relative to each other.

Programming department head Staples remarks, "The difficulty of this project was the size of the components and the fact that a precision mechanical fit was required. With five non-planar bearing surfaces on each subassembly of the TMS sphere, a small deviation not apparent on the individual parts could present problems for final assembly. The first obstacle was creating good fabrications for machining down the road.

"Our CAM solution, Mastercam, is used for CNC programming, to generate toolpaths and to sequence the jobs. We write our entire machining operation from beginning to end in Mastercam. We can position our parts in 3D, as if we were physically in front of the machine tool. Working with a 3D model is like having a finished part right in front of me. Because there were no reference points, I could create strategic points in space and extract the proper measurements and dimensions on the assemblies. The backplotting utility's a great visual tool for verification and allows us to view the action of a tool in a split screen configuration."

The fabrication of the staging structures, which support mirrors used to direct 60 laser beams to the absolute center of the TMS, proved to be a formidable task. Many hours of engineering time were dedicated to designing the staging structures. A superb example of concurrent engineering, Ranor worked closely with the engineers at LLE and design changes were made until the final day of shipment.

For the final on-site assembly at the Laboratory for Laser Energetics, Tom Ziobrowski was presented with an engineering layout. The CAD drawing displayed vital dimensions and geometric relationships needed for the positioning of the structures in the 130-inch x 90-inch target bay room. The TMS would reside in the center of the area, with the north and south staging structures located on either side.

"I was most impressed by Ranor's installation in the target bay. From the time the first piece was brought onto the floor, to the last step of adjoining the upper and lower half of the TMS, the whole process took only nine days," said Steve Kumpan, project manager of the Omega Upgrade. Because the target bay is a clean room environment, there could be no welding or other activities on site. Ranor had to build and erect the TMS in an very efficient manner.

Ranor received the first engineering layouts on March 17, 1993. The Target Mirror Structure was completed the following August. The two staging structures were then fabricated and constructed. The on-site assembly was completed at the Laboratory of Laser Energetics on the proposed deadline of Nov. 24. The entire project was completed in eight months.

Ziobrowski summarizes, "Our success in the target bay must be credited to the creativity implemented by plant management and manufacturing engineering. Ranor's experienced staff and unique facility, matched with the assistance of powerful PC-based tools, continues to tackle some of the most intricate and demanding job shop work around."

For many job shops, a project of this magnitude would be a time-intensive, complex undertaking. For Ranor Inc., it's just another day of Goliath Manufacturing. With one look around the shop floor, it is clear what teamwork is all about.

Established in 1956, Ranor is a second-generation, privately owned business situated on 65 acres in Massachusetts. Eighty five of its 135 employees are divided between the fabrication and machining departments. Seven of the eleven children of the original founder, Robert A. Normandin, are still involved in the family business.

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CIRCLE 101 ON PAGE 2 FORM

SOFTWARE

Hotdij 4.0

Hotdij 4.0 is a TSR digitizing utility that directs measured data and/or coordinate points from the digitizer into most DOS or Windows programs. The data appears as if entered from the keyboard. Users can input data from the keyboard and the digitizer, adjust tablet resolution, add prefix strings or control codes into the data, automatically correct for map or drawing placement on the digitizer, select or switch to any of seven running applications, test the digitizer or direct commands to the tablet, and select 70-plus report formats.

Contact GEOCOMP Ltd. for a demonstration mode at 303/233-1250 or fax 303/233-4837.

Remove-IT 2

Vertisoft Systems Inc. recently announced the newest version of its Windows utility, Remove-IT 2. Remove-IT 2 finds and removes unneeded applications and files from your system. Among the new features: Upgrade Assistant prepares and configures for Windows 95; Installation Knowledge-Base records new program installations and provides a listing of the files that are part of previously installed applications; Disk Custodian Agent monitors your system and tells which files/applications to delete; Transfer-IT which creates a self-installing backup for moving applications; and Store-IT lets you run an archived application with one mouse click. Retail price is $39.95 through major retailers and distributors.

Contact Vertisoft Systems Inc. at 800/466-5875 or fax 800/466-4719.

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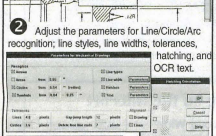
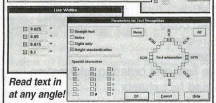
❶ Preview the scanned image and select a drawing type. I/VECTOR accepts RLC and Group 4 TIFF raster files for conversion.

❷ Adjust the parameters for Line/Circle/Arc recognition; line styles, line widths, tolerances, hatching, and OCR text.



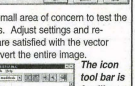
Read text in at any angle!

❸ Convert a small area of concern to test the parameter settings. Adjust settings and re-convert until you are satisfied with the vector results. Then convert the entire image.



The icon tool bar is familiar to any user.

Choose your desired parameters for DXF output and save the results. I/VECTOR can save line structures as lines or continuous polylines. ***Wasn't that easy?*** Now you can edit and clean-up in AutoCAD, LT, Microstation, or the CAD software of your choice. I/VECTOR is CAD independent and works with any software that accepts DXF files.



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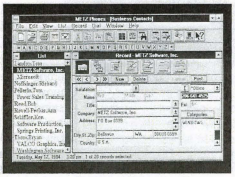


METZ Phones 5.50

METZ Phones 5.50

METZ Phones v5.50 is an address and telephone manager for individual and network users. Features include support for all major networks, administrative module for security, compatibility with Microsoft Office, importing and exporting with a wide variety of formats, automated label formats, customized sorts and searches, unlimited phone books, unlimited numbers per record, unlimited definable fields per record, and HotKey dialing. Suggested retail price is $89, and previously registered users of any METZ product can purchase v5.50 for $29.

Contact METZ Software at 800/447-1712 or fax 206/644-6026 or on CompuServe type: GO METZ or on AOL goto METZ..

Personalized Holiday Screen Savers

We know it's still early, but if you don't start now, you'll end up hurrying through the holidays. Your customers have been loyal, so wouldn't you like to send them something different and innovative? Send a Holiday Screen Saver and they'll remember you for months with your message on their screen. Don't delay. Call toll free today.

Contact DGI Multimedia at 800/352-7859 or fax 205/837-7712.

MapInfo

MapInfo desktop mapping software uses geography to correlate, visualize and analyze data. Data can be overlaid onto maps, showing relationships and trends. MapInfo is built on a geographic relational database engine designed to provide flexibility in querying. Some of the data files included are maps of the world by country, U.S. state boundaries, 1,000 U.S. city locations, Canadian province boundaries, and five-digit ZIP code centroids. Additional data and map products such as StreetInfo, ROADNET Highways, PRIZM Lifestyle Clusters, or StatInfo Business are available separately. Pricing starts at $1,295.

Contact MapInfo Corporation at 800/327-8627 or 518/285-6000.

RenderPrint® for Windows

Insight Development Corporation recently announced a Windows version of its RenderPrint® software for printing raster image files. Key Features include Live Paper Space user environment, which looks and functions like a sheet of paper and acts as a true print preview. Color management tools include 11 dithering patterns and a test page feature which allows the user to print up to 25 snapshots with varying contrast and gamma. RenderPrint reads BMP, GIF, JPEG, PCX, TIFF, and TGA files of any size, and prints from raster image files as large as 100MB. Printing is supported for any Windows printer or using the 1,500 drivers available from RenderPrint, with no extra printer memory required. Current pricing is $249.

Contact Insight Development Corporation at 510/244-2000 or fax 510/244-2020

Day-Timer Organizer 2.0

Day-Timer Organizer 2.0 from Day-Timer Technologies provides scheduling, task management, address book, notebook and expense tracking. New features include Speed Dial, Hold, Forward/Transfer, and Conference call handling, customized labels and address layouts, attach documents, spreadsheets, and other files to an address record, wider variety of printing options, enhanced third-party application support, enhanced network support, enhanced drag-and-drop capabilities, TeamOrganizer for scheduling multiple participants or activities. Price is $59.95.

Contact Day-Timer Technologies at 800/859-6955 or fax 800/362-9927 or online at keyword DayTimer.

Visual Reality 2.0 for Windows

Visual Reality 2.0 for Windows is a 3D graphics and animation suite which consists of four modules: RenderizeLive enables users to combine input from other modules and images to create full-color, high-resolution, photorealistic renderings; Visual Model enables users to create 3D models in an intuitive environment, resulting in special effects beyond traditional modelers; Visual Image enables users to combine or collage photos and images and perform multi-layer image processing; and Visual Font for transforming TrueType fonts into 3D words, with deformation controls that include squished, bent, and beveled 3D font effects. In addition, Visual Reality 2.0 also includes Visual Catalog, which contains a collection of 3D data. Also included are nine volumes of Simply Scenes, 1,500 seamless textures, 100 time lapse AVIs, and 3D Uni-Spheres, which offers a 360-degree seamless image mapped onto a hemisphere for creating 3D animation horizons. Price is $259.

Contact Visual Software at 818/883-7900 or fax 818/593-3737.

The Web BBS

Software Creations announced the introduction of software to operate a fully functional BBS on the World Wide Web. The Web BBS prototype system went online recently at http://www.swcbbs.com. The Web BBS allows anyone to operate a BBS on the World Wide Web, with file libraries that feature full file descriptions, powerful search engines, and quick download capabilities via the HTTP protocol. Subscribers need only a web browser to access and use the system. In conjunction with the introduction of the Web BBS, Software Creations has created a series of Web BBS add-on modules called WAMs to provide extended BBS services to the system.

Contact Software Creations at 508/368-7036 or online at http://www.swcbbs.com.

HARDWARE

Mobile Printer for Wireless Printing

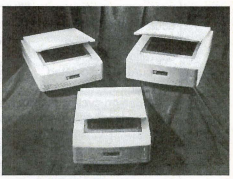
Hewlett-Packard announced the HP DeskJet 340 mobile printer for notebooks that supports wireless printing. Features include infrared printing, enabling users to print from up to three feet away without a physical connection; a lightweight 30-sheet feeder weighing less than one pound and handles letter, legal, and A4-size cut-sheet paper, transparencies, film, and labels. Black text prints at 600 x 300 dpi. An optional color kit is available. The HP DeskJet 340 can be powered by battery or adapter, with a Macintosh PowerBook adapter kit as an option.

Contact Hewlett-Packard Company by sending inquiries to Direct Marketing Organization, P.O. Box 58059, MS511L-SJ, Santa Clara, CA, 95051-8059.

Mirror Link Transportable Hard Drive Systems

SUMMATEC Computer Corp. recently introduced the Mirror Link hard drive system, consisting of a 2.5-inch high-performance hard disk drive in a sealed, high-impact cartridge, and an external or internal docking station that includes all required interface electronics (SCSI or IDE). A series of controllers are available for high-data users. With up to 1.2GB of storage and transfer rates up to 13.3mbs, Mirror Link can be used as a dedicated drive for large image files, databases, or classified or sensitive work. Initial pricing ranges from $1,000 to $1,600, depending on configuration.

Contact SUMMATEC Computer Corporation at 619/726-7807 or fax 619/945-5684.



ArtiScan Pro scanners

Tamarack debuts ArtiScan Pro Scanners

Tamarack Technologies Inc. has added three enhanced scanners to its ArtiScan Pro line: the 6000C, 8000C, and the 12000C. The three units are flatbed, CCD line sensor scanners offering 24-bit color depth, RGB output of 16.7 million colors, and TWAIN support for compatibility. Optical resolution is 300 x 600 dpi for the 6000C, 400 x 800 dpi for the 8000C, and 600 x 1200 dpi for the 12000C. Tamarack scanners are bundled with a variety of software packages, which may include Image Pals, GO! ReadIRIS OCR, PhotoShop, and a TWAIN module. Prices range from $469 to $699, and all scanners carry a two-year limited warranty for parts and labor.

Contact Tamarack Technologies at 714/744-3979 or fax 714/744-4582.

Multi-Media Monitor

ViewSonic Corp. just announced the ViewSonic 17EA multi-media monitor designed for home and office applications. Features include a 17-inch display, flat square screen, 85Hz refresh rate, resolutions up to 1,280 x 1,024, 0.28mm dot pitch with a maximum refresh rate of 120Hz, OnView on-screen control system, 20 settings and ViewMatch color control. Built-in stereo speakers eliminate the need for external speakers. Suggested price is $795, and the ViewSonic 17EA is backed by a three-year limited warranty.

Contact ViewSonic Corporation at 800/888-8583 or fax 909/869-7958.

nFINITY LCD Projector Enhanced

nVIEW Corp. announced new enhancements to its nFINITY series of projection products. Enhancements include improved focusing, side handles for easier maneuverability, and an improved adjustment mechanism for raising/lowering. prices have been reduced to $5,495 for the P110 computer-only model and $5,995 for the computer-plus-video model.

Contact nVIEW Corporation at 804/873-1354 or fax 804/873-2153.

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MISC

HANDEZE Support Gloves

HANDEZE Therapeutic Support Gloves are designed to alleviate the pain related to cumulative trauma disorder, arthritis, tendonitis, carpal tunnel syndrome, and stress-related injuries. HANDEZE gloves combine three therapeutic actions: heat, support, and massage. Heat from the hand is contained in the glove, raising the blood temperature; the form-fitting design gives support to the hand; and the Med-A-Likra four-way stretch material produces a massaging effect on the hand.

Contact Dome Industries at 401/738-7900 or fax 401/732-5377.

Windows 95 Training

"Introduction to Windows 95" training video and CD-ROM delivers hours of step-by-step instruction on the Windows 95 operating system. Topics cover the new features of Windows 95, including basics, system control devices, and file management functions. Author and comedian Daniel Will-Harris takes you on a slightly zany tour of Windows 95 while preparing you to work with Microsoft's newest OS.

Contact LearnKey Inc. at 800/865-0165.

STEP Seminar

International TechneGroup Inc. and Warthen Technology Information Services Inc. will present "STEP's Expanding Role in the AEC Industry," a two-day seminar introducing STEP's features, functionality, and applications within AEC. Speakers include David Mattei of ITI, Barbara Warthen of WTIS, and Jeffrey Wix. The seminar will be held Oct 4-5 at International TechneGroup's headquarters in Milford, Ohio.

Contact Kristin Saunders at ITI at 800/783-9199 or e-mail at kristin@iti-oh.com.

EDM/PDM Expo '96

The International Engineering Document and Product Data Management Exposition and Conference is scheduled for June 17-20, 1996, at the Anaheim Convention Center in Anaheim, Calif.

Information about the Expo may be obtained from Sharon Price, EDM/PDM Expo '96, PO Box 310318, Newington, CT 06131 or call 800/451-1196 or fax 203/666-4782 or e-mail at aecsys@ix.netcom.com. Exhibitors may contact Kelly Baxter at 610/444-9690 or fax 610/444-9583.

Techno-Sommer Components Catalog

The new "Automation Components Catalog H904" from Techno-Sommer features more than 650 automation components which are being introduced on a free trial basis. Major sections of the catalog include grippers, tool changers, swivel units, linear actuators, rotary actuators, vacuum cup devices, and lubrication products. The catalog is free on request.

Contact Techno-Sommer Automatic at 2101 Jericho Turnpike, Box 5416, New Hyde Park, NY 11042-5416.

Tel•Ed '95 Conference Scheduled

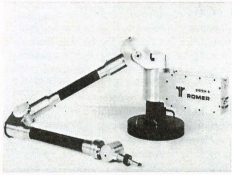
The Fourth International Conference on Telecommunications in Education will be held at the Broward County Convention Center, Fort Lauderdale, Fla., from Nov 30-Dec. 3. Featured speakers include Reed Hundt, chairman of the Federal Communications Commission, and Vinton Cerf (often referred to as the "Father of the Internet").

Contact conference coordinator Lori Novak at 503/346-2411.

PHD Inc.

PHD Inc. now offers information through the Internet. Using PHD's Web site, Internet users can access the latest information about PHD products, software support, CAD files, special services and upcoming events. PHD Inc. is a leading manufacturer of automation components and accessories.

Contact PHD Inc. at 800/624-8511 or on the Internet at http://www.phdinc.com.



Romer 2200 LX articulating arm

Engineering

ROMER 2200 LX

Romer Inc. introduces the new ROMER 2200 LX six-axis, portable articulating arm coordinate measuring machine designed for portability and on-site inspection. Weighing only 24 pounds and with a measuring envelope of 7.2 feet, the arm can reach into confined spaces, mounted into any orientation, and has a +.002" point accuracy. The new 2200 model is available as a complete system, including the arm, SUPRASTUFF'software, 486 notebook computer, and a full-page inkjet printer.

Contact Romer Inc. at 619/438-1725 or fax 619/438-3512.

Personal Modeler

CAD users now can take their designs to 3D model creation at the push of a button with Personal Modeler. Using a patented process called Ballistic Particle Manufacturing, the Personal Modeler builds models free standing, with any necessary break-away supports created automatically. Models are built in any geometric shape and are constructed in either draft "hollow shell" mode or a "cross hatched" mode. Personal Modeler is specifically designed to provide fast physical modeling for engineers and designers, with unlimited design iterations with a physical model at each iteration. Manufacturers can transmit a design to remote locations where Personal Modelers can reproduce models for verification or testing.

Contact BPM Technology at 803/297-7700 or fax 803/297-7711.

Reliability Prediction Program

Powertronic Systems Inc. introduces the Reliability Prediction Program, which performs both part stress and parts count analysis on electronic, electrical, and electro-mechanical equipment of any complexity. The program can analyze individual systems or components of any size. Features include costing fields, editing in the component data editor, user-defined reports, and method and release verification. Requirements include DOS 3.3 , 512KB RAM, 1MB disk space. The Reliability Prediction Program is sold with a 30-day money-back guarantee and unlimited technical support.

Contact Powertronic Systems Inc. at 504/254-0383 or fax 504/254-0393.

CIRCLE 203 ON PAGE 2 FORM

GEORGE shoulders the load of design details

Pooled Design Quorum's latest release of its GEORGE program can automatically section and cross hatch most CADKEY assembly and part files without the need for a solid modeler. It also can perform hidden line removal using its own proprietary algorithms, automatically generate color-coded Bills of Material, speed up plotting by removing overlapping entities, and even add centerlines to help speed up dimensioning. This release also includes an optional flattened, non-hidden output that removes redundant arcs, circles and lines, adds centerlines, and adds horizons.

GEORGE is intended to minimize the workload of the designer by automating or streamlining the task required to document a wireframe design. It targets and automates the well-known bottleneck of producing usable 2D detail and assembly drawing from ordinary 3D CAD wireframes. In the words of the developer, "Let George do it!"

George's ability to deal with non-graphical information is especially powerful. Non-graphical information is automatically gathered (weight, cost per unit, etc.) from a central file based on Group names given in the input file. You can use this data to automatically generate a sorted Bill of Materials and place in on the drawing, quickly enter information into the main company database (George can create a live worksheet file in LOTUS 123 format), and select/enter/edit drawing text and notes. Since text height, font, line type, line width, drawing levels, drawing format, etc., are defined by reading in special example formats (a quick and simple process), GEORGE helps assure that all drawings conform to company standards.

GEORGE is compatible with CADKEY version 2.1 to 7+. The cost is $295.

For more information call 302/998-1716.

TECH TIPS

CADKEY for Windows Rev. 1 will run with Windows 95 with two simple changes. If you follow these steps, you will be up and running in a few minutes. Rev. 2 is designed to run with Windows 95 without modifications.

1. In the root directory of CADKEY for Windows Rev. 1, rename the file VIB16.DLL to VIB16OLD.DLL.

2. Add a line to your autoexec.bat file to set an environment variable to disable the MOUSEHUK.DLL. The line should read: set CK_NO_MOUSEHOOK=1.

CADKEY CHAT ON THE NET

It seems like everyone's on-line these days sharing information with each other. These CADKEY interchanges were picked off the America Online Cadkey Newsgroup recently. What a great communications tool we have at our fingertips.

Question From: Pradip Sagdeo
psagdeo@aol.com

In the last few days I have had to convert drawings using mm as the unit of length to inches. The simple process of scaling down by a factor of 25.4 (dividing every length by 25.4) leads to a rather interesting situation. The drawing size is physically reduced. The drawing space size remains at original dimensions. As a result, the Alt-A quick command causes the drawing to show up as a minute object on the screen. Also, to plot, a scale factor of 25.4 has to be used to produce the drawing on a regular sheet, so that an inch will be an inch. Hence, these questions: How does one change the size of the drawing space itself in CADKEY after scaling the drawing to convert from mm to inches? If that is not possible, how does one make the program thing that the units are inches, so that if the scale factor entered for plotting stays = 1, the drawing plots in inches rather than in mm.

Answer From: Luis Estrada
luis.estrada@windmill.com

Here's how I did it. First, your drawing is not wrong. The scale is correct and should not be messed with ... yet. The problem is that the part file is set to mm instead of inches. No matter how many times you scale, copy or dimension, the dimension scale factor will never be 1.00000. What you need to do is make a pattern of the ENTIRE drawing — border and drawing. Next, load up a "NEW.PRT" or whatever you use as a blank sheet. Check the Dim.scale. If you set it to inches, it will either say 25.40000 or 1.00000. If it says the scale is 1.0000, then bring the pattern of the drawing to screen and check a dimension. If it says 25.4000 on the Dim Scale, get out of CADKEY and change the configuration to inches in the Config program. After the drawing has been put on the screen, it is in INCHES. From there on, you can scale the whole drawing to where 1" = 1".

CIRCLE 247 ON PAGE 2 FORM

Counting Balloons

By Scott Workman

This article is part of a continuing series covering various aspects of the CADKEY LISP programming language. If you have suggestions or an idea about areas we should cover in these articles, leave a message via CompuServe - Cserve ID: 72730,3154 or via E-mail: scottw@hit-wise.com

Introduction

In the last article, we pulled together several features discussed in previous articles to write a small utility program that draws detail balloons. This month we continue our work with the balloons program. We also will present new uses for old functions and even discover some useful new functions.

Recognizing drawing features

While the "balloons" program is useful in that it simplifies a rather tedious drawing task, the real power in CAD customization is not in drawing, but rather in retrieving and interpreting the data contained within the drawing. Programs that recognize the information stored in a drawing normally do this in one of three ways. First, the program may simply look for specific geometry configurations such as end points of lines that coincide or arcs and circles that share a common center point. Second, because most CAD engines have the capability to attach non-graphical data to the graphical entities, the program can retrieve the non-graphical data to recognize features of the drawing. CADKEY programs make use of a special entity type called copious data to perform this function. More on this subject and CADKEY LISP in future articles. The final method of recognizing drawing features is to use symbols and attributes associated with the symbol. This method is especially suited to schematic type drawings where a library of standard symbols can be used to create a drawing. Again, more on this subject in future articles.

Recognizing balloons

We now will take a look at the first method described above. To recognize the balloons we drew in the last program, we will search for specific geometry features in the drawing. We know the following facts about the balloons we drew: 1. Each balloon consists of a circle. 2. A balloon may contain either one or two pieces of text inside of the circle. 3. Each piece of text was drawn using a text justification of middle. The program presented this month will search for the balloons by retrieving all circles in the drawing and then retrieving any text that is encompassed by a circle. The program will draw a table listing each piece of balloon text and the number of times that particular string text appears inside of a balloon.

Program specifics

The btable program presented in this article starts by retrieving all circles in the drawing. The ssget function is used with a filter list to obtain all circle entities. The selection set returned contains the entity IDs of all circles in the drawing. This selection set then is used in the following discussed functions.

The bldlist function steps through each circle in the selection set and searches for text that is contained within the boundaries of the circle. The preliminary steps of the function should appear familiar. The function uses the ssname function to retrieve the next circle from the selection set and then the entget function retrieves the attributes of the selected circle. The center point and radius of the circle is then used to set the points, p1 and

See LISP, page 19 ⇨

```
; This LISP program is intended to be used with the program
presented
; in the September CADKEY LISP article. The previous pro-
gram was an
; utility to draw detail balloons. This program will inspect
the
; balloons and create a chart reporting the quantity of each
balloon text.
; The program will identify balloons by finding any text that
resides
; inside of a circle.
;
(defun c:btable ( / cc echo )

  (setq echo (getvar "cmdecho"))
  (setvar "cmdecho" 0)

  ; Select all circles in the drawing.
  ;
  (setq cc    (ssget "X" (list (cons 0 "CIRCLE"))))
  (if (= cc nil)
    (princ "\nNo balloons found.")
  ; else
    (progn
      (bldlist)
      (if (/= tlist nil) (drawtable))
    )
  )

  (setvar "cmdecho" echo)
  (princ)
)

; Function:  bldlist
;
; Given a selection containing nothing but circles, this
; function will build a list containing the text strings
; and counts for the text strings.
;
(defun bldlist ( / cclen idx cen rad p1 p2 txt )

  (setq   cclen (sslength cc)
          idx  0
          tlist nil)

  ; Step through each circle in the selection set and
  ; find text that fits inside of the boundaries of
  ; the circle.
  ;
  (repeat cclen
    (setq id  (ssname cc idx)
          idx (1+ idx)
          lst (entget id)
          cen (cdr (assoc 10 lst))
          rad (cdr (assoc 40 lst))
          p1  (list (- (car cen) rad) (- (cadr cen) rad))
          p2  (list (+ (car cen) rad) (+ (cadr cen) rad))
    )

    ; Select any text that contains its justification
    ; point inside of the circle boundaries.
    ;
    (setq txt (ssget "X" (list (cons 0 "TEXT")
                               (cons -4 ">=,>=") (cons 11 p1)
                               (cons -4 "<=,<=") (cons 11 p2) )))

    ; if text was found inside the circle, then retrieve the
    ; text string for each text found and add it to the list
    ; of text strings found so far.
    ;
    (if (/= txt nil)
      (addlist)
    ) ; end if
  ) ; end repeat cclen

  (ssfree cc)
)

; Function: addlist
;
; Given a selection set with text strings, this function
; will check to see if each text string resides in the
; text list.  If it does not, it is added to the list
; with a quantity of one.  If it is in the list,
; then increment the quantity.
;
(defun addlist ( / tlen tidx str lst id )
  (setq tlen (sslength txt)
        tidx 0)
  (repeat tlen
    (setq id   (ssname txt tidx)
          tidx (1+ tidx)
          lst  (entget id)
          str  (cdr (assoc 1 lst)))

    ; If the text string is not in the list, then
    ; append to end with count of one. Otherwise,
    ; increment the count.
    ;
    (if (= (assoc str tlist) nil)
      (setq tlist (append tlist (list (cons str 1))))
    ; else
      (setq tlist (subst
        (cons str (1+ (cdr (assoc str tlist))))
        (assoc str tlist) tlist))
    )
  )
  (ssfree txt)
)

; Function:  drawtable
;
; Given a list of text strings and a quantity for each one,
; draw a table listing each text string and quantity.  The
; size of the columns are determined by text size of the
; headers.
;
(defun drawtable ( / pt h1 h2 h3 sz1 sz2 sz3 p1 p2 p3 l1 l2 s
)

  ; define the text for the column headings.
  ;
  (setq h1 '((0 . "TEXT") (10 0.0 0.0 0.0) (40 . 0.125) (1 .
"Qty"))
        h2 '((0 . "TEXT") (10 0.0 0.0 0.0) (40 . 0.125) (1 . "Text
Name"))
        h3 '((0 . "TEXT") (10 0.0 0.0 0.0) (40 . 0.125) (1 .
"Description/Comments")))

  ; Find the size of each text item for the column sizes.
  ;
  (setq sz1 (cadr (textbox h1))
        sz1 (+ (car sz1) 0.25)
        sz2 (cadr (textbox h2))
        sz2 (+ (car sz2) 0.25)
        sz3 (cadr (textbox h3))
        sz3 (+ (car sz3) 0.25))

  ; Get the table position from the user and place the head-
ings
  ;
  (setq pt (getpoint "\nSelect point for upper,left corner of
table.")
        p1 (list (+ (car pt) 0.125) (- (cadr pt) 0.1875))
        p2 (list (+ (car p1) sz1) (cadr p1))
        p3 (list (+ (car p2) sz2) (cadr p2))
        h1 (subst (cons 10 p1) (assoc 10 h1) h1)
        h2 (subst (cons 10 p2) (assoc 10 h2) h2)
        h3 (subst (cons 10 p3) (assoc 10 h3) h3))
  (entmake h1)
  (entmake h2)
  (entmake h3)

  ; Draw the lines dividing the rows
  ;
  (setq l1 pt
        l2 (list (+ (car l1) sz1 sz2 sz3) (cadr l1)))
  (command "line" l1 l2 "")
  (repeat (+ (length tlist) 1)
    (setq l1 (list (car l1) (- (cadr l1) 0.25))
          l2 (list (car l2) (- (cadr l2) 0.25)))
    (command "line" l1 l2 "")
  )

  ; Draw lines dividing the columns
  ;
  (setq l1 pt
        l2 (list (car l1) (- (cadr l1) (* (+ (length tlist) 1) 0.25))))
  (command "line" l1 l2 "")
  (setq l1 (list (+ (car l1) sz1) (cadr l1))
        l2 (list (+ (car l2) sz1) (cadr l2)))
  (command "line" l1 l2 "")
  (setq l1 (list (+ (car l1) sz2) (cadr l1))
        l2 (list (+ (car l2) sz2) (cadr l2)))
  (command "line" l1 l2 "")
  (setq l1 (list (+ (car l1) sz3) (cadr l1))
        l2 (list (+ (car l2) sz3) (cadr l2)))
  (command "line" l1 l2 "")

  ; Now place the text
  ;
  (while (/= tlist nil)
    (setq s     (car tlist)
          tlist (cdr tlist)
          p1    (list (car p1) (- (cadr p1) 0.25))
          p2    (list (car p2) (- (cadr p2) 0.25)))
    (command "text" p1 0.125 0.0 (itoa (cdr s)))
    (command "text" p2 0.125 0.0 (car s))
  )
  (princ)
)

(princ "\nType BTABLE to start this program.")
(princ)
```

Human eye is still best test of print quality

When people look at a piece of output, they look for very distinct elements, often without even realizing it. Are the lines clean and straight? Are large areas of color smooth and even? Are images lifelike and true to the original? These elements are even more important in poster-sized output because of the requirements of large-format printing's two primary applications — technical accuracy for CAD and aesthetic beauty for graphic arts.

Producing large-sized output presents unique challenges. A tiny, hardly noticeable flaw in an 8.5-inch by 11-inch design can become a distracting focal point when the design is enlarged to poster size. The human eye, which really determines print quality, can readily distinguish between good and bad print quality. However, it takes a complex set of interrelated elements the eye to distinguish between good and very good print quality, and between very good and excellent.

Line Quality

The clarity of the lines that make up a design determine its technical superiority. The clearer the lines in a plan, the easier the plan is to follow and execute. Clarity is largely determined by how dark , or dense, the lines are. This quality can be affected in inkjet CAD plotters by ink formulation. The newest types of pigment-based inks contain tiny bits of material that adhere to the paper's surface in much the same way that toner used in laser printing does. For color printing, new dye-based inks provide colors that are more dense and therefore more vivid that ever before. The appearance of lines also is affected by the type of paper or other media on which they are printed. Whiter media provide higher contrast with the ink, making the line or image appear more vivid.

Line darkness also is determined by the reflection of light emitted from the output back to the human eye. When light hits an image — even a line that is only a single dot wide — some light is absorbed and some is reflected. The higher the level of reflection, the lighter the line appears; the lower the level of reflection, the darker the line appears. Proportions of reflected light can be measured and the measurements provide an objective way to compare one element of print quality among various printers.

Line clarity also is affected by the line's straightness or continuity along an arc. If a printer's datum — the mechanism that aligns inkjet cartridges — is not accurately placed, the cartridges can be slightly askew along the horizontal line of the print path and the vertical line of the paper path. These cartridges will spray dots of ink onto the page inaccurately, resulting in broken lines and circles. Inkjet cartridges also can become misaligned due to human error during manual alignment procedures or due to software miscalculations.

Poor cartridges alignment also affects color accuracy. Complex designs, such as those used in construction or mapping applications, often are color-coded. A specific color may represent a specific kind of building material, so inaccurate colors can lead to errors. Color inkjet plotters and printers normally use a CMYK (cyan, magenta, yellow and black) system that mixes four process colors to achieve a full gamut of colors — more than 16 million. Since these colors are dithered (created by mixing other colors), if two cartridges are out of alignment with one another, the dithering is not precise and can create a slightly different color than intended.

In more extreme cases, poor alignment can create a kind of ghost image and can make a straight line appear to have a shadow. Large-format plotters and printers with automatic alignment procedures prevent these particular print-quality issues. For instance, Hewlett Packard's DesignJet 750C plotter has a built-in scanner. When a cartridge is removed and replaced, the plotter prints a test strip, scans the strip and interprets it. The plotter then automatically aligns its cartridges for optimal print quality.

Edge sharpness also affects the appearance of printed lines, and, of course, text. The more clearly the edge of the line is defined, the more clearly the eye can discern where a line ends and begins. Clarity is extremely important for text, which in CAD drawings tends to be very small. If the plotter's writing system (cartridges, cartridge placement and inks) is not designed to limit "spray" or "wicking," lines and text created on the device may have sudden spikes, or "jaggies." These imperfections can make small text or converging lines appear unclear and difficult to read.

Image Quality

Clarity, darkness and accuracy — the same principles that affect line quality also affect image quality. However, the formation of individual dots of ink also is a key element of image quality. Every inkjet printer is specified to emit a certain number of ink dots horizontally and vertically on a 1-inch grid. This dots-per-inch, or dpi, specification has been used as an easy, objective measurement of a printer's resolution and print quality. The common belief has been the higher the dpi, the better the print quality. Yet, dpi is only one of many elements that determine print quality.

The quality of the dots is in some ways more important that the number of dots. A device that lays down well-formed dots accurately on a 300-dpi grid can, in fact, produce better-looking output than a 600-dpi device that lays down irregular dots.

The size and shape of a drop of ink, or the dot formulation, is a function of how much ink is shot out of each nozzle and how that ink interacts with the paper or other media. Superior dot formation prevents banding — an undesirable line pattern that occurs in solid fill areas and makes a drawing as if it were laid down in strips. Banding also can be caused by flaws in the printer's paper-advancing mechanism.

Media and Ink

Media play an even larger role in print quality in graphic arts applications than they do in CAD. By decreasing the amount of scattered light emitted from an image, the right media can make colors look richer and images look more lifelike. Scattered light can affect image quality by making blacks appear less black and by decreasing color saturation. With some large-format printers, the combination of a glossy medium
and a print mode optimized for the medium can lessen scattered light. The result is an image that can appear significantly richer and more detailed. An example would be the difference between a photo in National Geographic and one in USA Today.

Ink formation can affect the longevity of an image. Again, ink and media act as partners, and some combinations are more durable than others. Currently, the output from inkjet printers can last for a year in office light, without perceptible fading. In the future, images are expected to offer waterfastness as well as lightfastness to enable a broader ranger of large-format applications.

Although there are scientific measures for various elements of print quality, no one measure tells the whole story. The dpi standard, for example, grew out of a desire to simplify a complex issue, but the single most comprehensive and effective measure of print quality remains the human eye.

This article was contributed by Hewlett Packard, manufacturer of inkjet printers and plotters.

BACKUP from Page 1

Stop everything you are doing right now and figure out if you could regroup in one day if all of your computer system vanished. Forget about the hardware. That is replaceable and should be insured. And, most likely, you have floppies of the programs stashed away, so you could reload them into new or borrowed computers. But what about your data? Is any of it in your computers only and nowhere else? If it is not backed up — and on at least two tapes or disks — you could be out of business.

Another related tip concerns insurance. I had an "Electronic Hardware and Data" rider on my general liability policy. My premium on the rider runs about $150 per year. It covers the complete replacement cost of any damaged or stolen computer hardware. I purchased new equipment within a week and my insurance company checks arrived eight days after my claim. (Photograph all of your equipment and keep one paper with all serial numbers.) The rider also covers the "time" it takes to recover lost data. I was reimbursed for my time to reload all programs and for restoring the backup tapes to the new hardware. It even covered the time necessary to redraw some drawings that were not backed up. Take note to set the equipment coverage limit high enough to cover "lost data recovery." Many policies limit this to a percentage of the rider's limit (my policy had a 25 percent limit, which did not completely cover my downtime losses).

Now for the dos and don'ts of my back-up system (which saved my "patooty" and my practice):

1. Make two complete backups each month of everything on your hard drive(s). Use a "Month 1" and a "Month 2" tape so you don't copy over the "Month 1" information when you do a full backup in Month 2. Month 3's data can replace the data on the Month 1 tape, etc. You then will be assured that you have two full months of hard drive data backed up. Make two copies, so if you actually need to restore a tape and it breaks or comes off the spools inside the cassette (happened to me twice), you will have another copy to use and can avoid the paramedic's resuscitators. Leave the duplicate tape copies at home so that no two copies are in the same location. If the office burns, you will still be in business because you will have a tape at home with the same data.

2. Each day, between monthly back-ups, use one tape to make daily "modified" backups. Most tape programs will search the hard drive and allow you to back up new or modified data. Take this tape home each day. Thieves, I have found, are not "user friendly." They won't take the tape out of the computer before they steal it.

Get religious about backing up. Don't turn the computer off until you have backed up the day's work.

3. At the end of "Month 1," when you do a full back-up called "Month 2," also start a new modified backup tape *(call it Mod Month #2)*. Safely store the Mod Month 1 tape in something fireproof. You may need it to restore the in-between month's data not already contained on the monthly back-up tapes.

4. When a project is no longer needed in the computer, back it up onto two archival tapes. When you remove the project from the hard drive, the tape will be your only saved project data. If one of the tapes proves defective, you will have a backup of the backup. And again, you won't have to consider jumping off that building.

With a systematic approach to backing up your data (remember, at least two copies!), you will preserve your irreplaceable data even if your computers are vamoose or are destroyed. Good luck and go add a monster dead bolt to your door.

David Porter, AIA Registered Architect, practices in Palm Beach Gardens, Fla.

WRA from Page 1

construction documents and other tasks for her development as an architect.

A native Texan and Texas A&M graduate, Liana worked at Skidmore, Owings & Merrill in Chicago and at Madura Studios in Boston before returning to Texas. Like many architects, she began her career using AutoCAD. Then she discovered DataCAD and quickly realized the many advantages offered by DataCAD. She is now an enthusiastic DataCAD promoter.

On her own time, Liana trains individuals on DataCAD. She works with clients of all ages who have a broad range of computer and CAD knowledge and experience. From this experience, Liana has seen first-hand that anyone can learn DataCAD. One client is a semi-retired 72-year-old man who is learning DataCAD to design small storage warehouses. Another successful client is a travel agent who made a career change to help her husband, a homebuilder, with his business. Despite having no drafting experience, she took to DataCAD like a duck to water. Also, Liana has noticed that people with AutoCAD or other CAD experience need little if any training at all in becoming efficient DataCAD users.

She appreciates the fact that everyone at WRA has DataCAD on their computers. Unfortunately, in companies with AutoCAD and Microstation, she said, "because the price of software prohibits having a copy on every desk, communications and efficiency can suffer." Besides, she knows from experience that DataCAD is a superior architectural tool.

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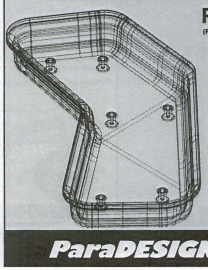

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CIRCLE 205 ON PAGE 2 FORM

p2, to represent the lower left and upper right corners of a bounding box that contains the circle.

The ssget function then is used again to select the text that is contained by the bounding box. Let's take a closer look at the ssget function used to select the text. The filter list used in this instance makes use of a combination of relational comparisons. The relational comparison "equal" is always assumed unless otherwise stated. In this case, we want to select text whose justification point (DXF code 11) is between the lower left point, p1, and the upper right point, p2. The -4 code is used in the filter list to indicate a special operation. Since we are dealing with points, we can use different relational comparisons for the X, Y and Z values of the point. The portion of the filter list that reads (-4 . ">=,>=") (11 . p1) is read as "select a justification point that has a X value greater than or equal to the X value of point p1 and a Y value that is greater than or equal to the Y value of point p1." The next portion of the filter list in a similar manner further constrains the search to points whose X and Y values are less than or equal to the X and Y values of point p2. The selection set returned by this ssget function will return any text whose justification point is contained by the boundaries of the circle.

Once the text within the circle has been found, the addlist function is called to add the text information to a list of all balloon text information. The list will contain text and quantity pairs. If the selected text is already a member of the list, the quantity is incremented by one; otherwise, the text and a quantity of one are added to the end of the list. An example of the text list would look like the list shown below:

(("A" . 2) ("B" . 3) ("C" . 1))

The assoc function is used to find the instance of a text string in the list and the subst and append functions are used to replace a text pair with a new quantity and add a new text pair respectively.

Once the text list has been formed, the drawtable function is used to draw a table showing the text and quantity pairs. The column header text entities are first formed with no particular insertion point. The textbox function is used to determine the size of each column header text. The textbox function returns a pair of points representing the opposite points of a bounding rectangle containing the text. The first point of the pair is always 0,0 so that the second point pair represents the actual height and width of the text string. The columns are sized at a value of 0.25 greater than the width of the text.

The drawtable function finishes up by drawing the lines that separate the rows, the lines separating the columns and finally steps through the text list and places the text and quantity in each row of the table.

Conclusion

Hopefully, the examples used in this simple utility program will ignite ideas of how you can use CADKEY LISP to interpret features of your drawings. Next month, Ron Brumbarger, president of BitWise Solutions, will take a look at the future of CADKEY LISP and the tools available for CAD customization and portability between CAD engines.

Source Code Availability

The source code presented in this article can be downloaded from the CADKEY library of the CAD/CAM/CAE Vendor forum on CompuServe. Go CADDVE to access the forum.

Scott Workman is the Director of Technology for BitWise Solutions Inc. BitWise Solutions offers software products and services specializing in the CAD/CAM, Internet and Multimedia markets.

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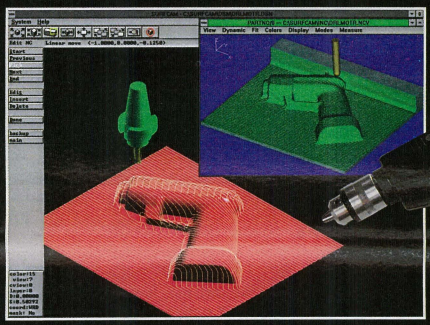

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CIRCLE 216 ON PAGE 2 FORM

Working with Custom Line Types

Charles C. Harmon Asked:

I wrote a custom dashed line that actually meets at all corners, but have come upon a new problem. Arcs do not adopt this custom line type and instead turn into a solid line. I found this when I tried to change the line type of an existing door to be removed on my plan. The door line changed fine, the arc changed to solid. I tried all the selection types and the result was the same. Is there a solution?

Answer:

While it is true that arcs will not presently support custom line types, and we hope that DataCAD 7 will address this problem, it is a little-known fact that ellipses, or portions thereof, will! Define an ellipse with equal x and y values to create a circle. Partial erase to create desired arc. Then change to any line type you wish. You may have to adjust the line spacing to get it to work.

Call DataCAD Support 617/536-5326 for further info.

Rick Morse
Madura Studios

"User-defined" line types (those after Solid, Dashed, Dotted, and DotDash) are only supported on straight line entities in DataCAD 6. Arcs and other curves will appear solid as you describe. I believe this is going to change in DataCAD 7.

Bill D'Amico
wjd@world.std.com

It is my understanding, at least with all DataCAD releases up through DC 6, that only the first four line types in DC (solid, dotted, dashed, and dash-dot) are usable with arcs so that the arcs actually show those line types. The other line types listed after these first four standard types can be used for arcs, but you will see a solid line. They will even be listed as the line type you make them when you used Identify but they will not look or plot like anything other than one of the first line types.

Also, if you use any line type other than "solid" for an arc and want to make it any line weight other than 1, it will not take. I have tried unsuccessfully to make an arc with a dashed line type into a weight 3 to match other solid line types of weight 3 but when viewed or plotted, the dashed arc only comes out as weight 1.

David Porter AIA
dpa-arch@gate.net

Another Way

I work a bit differently when it comes to line weights and don't seem to have a problem with producing different line weights with varying line types. When I draw in DataCAD, all my line weights are 1, but colors are assigned different pen numbers in the plotter menu. I have customized the setup of my plotter so that different pen numbers (colours — sorry, colors)) relate to varying line widths e.g., brown = pen3 = 0.3mm etc. (I use printgl with a Canon Bubblejet BJ330). This means when I am drawing using a color I know, that it automatically relates to a different pen widths. It also means your screen refreshes better and quicker and you don't waste time constantly changing line weights. It also ensures that the final plot gives you a more accurate result. I nominate a line weight for each of the 16 colours (some have the same, as I use 6 line weights overall 0.1mm, 0.2mm, 0.3mm, 0.5mm, 0.7mm and 1mm.) I have learned by heart which line weight relates to which color and changing color is just like picking up a new pen. To get solid walls, for example, I use a heavy pen width centered in the wall. Each to his own, but I find this method easy to understand and produces great (and expected) results.

P.S. Don't be afraid of using different colours (sorry, colors) on the same layer.

Roger Morrison
Morrison Architects
Auckland, New Zealand

What If DataCAD Won't Run?

I recently bought DataCAD 6. It worked at home, bit when I loaded it on my work machine I couldn't get it to run. The system consists of: 486/66 20MB ATI Graphics Pro Turbo, Mach64, VLB, 4MB VRAM card with caching IDE controller. I set it up to use the VESA 256 graphics mode. The Autoexec and Config are straight out of the Getting Started Book. They worked at home, except I am loading a bigger Ramdrive (8MB). When I run RUNDCAD.BAT, it loads the VESA driver and then unloads it and dumps me back to the prompt. It sometimes says, "Out of memory; cannot load Command.com; system halted." I suspect it has something to do with the video card. I tried the VESA 16 driver and got a distorted pixel image. I have already ftp'd the updated VESA drivers from CADKEY. Any suggestions?

Billewisw@oasys.dt.navy.mil

While using the Vesa 256 driver, type RUNDCAD. When it gets back to the DOS prompt, type MEM and notice the largest executable program size. If this is in the 100 to 200 range, then DataCAD is probably still in memory. This has been known to happen with the Vesa 256 driver on some computers, but I'm not very positive of the cause. If this is the case, try using IBM P/S 2 Small Font. If none of this applies, then just try a resolution of at least 800x600 with the Vesa 256 driver. This driver will not always work under 800x600.

Nick Korosi

Try running the standard IBM VGA driver, which should work on every card, to see if the card's problem. Another possibility is the virtual path. DataCAD will toss you right out with no message if the virtual path doesn't exist (where the swap file goes). You mentioned a RAM disk, so be sure it's really the drive letter you've got in the CONFIG, PATHS menu.

David
dpendery@bmfb.com

See INTERNET, page 23

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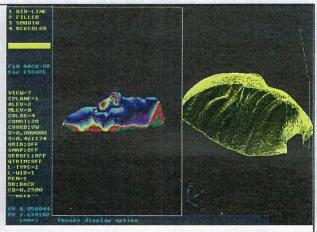

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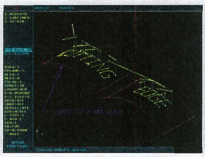

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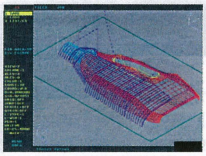

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CIRCLE 211 ON PAGE 2 FORM

Creating a Simple Kitchen Layout

By Carol Buehrens

A good rule of thumb for modeling with DataCAD is to work in small chunks, modeling only what is necessary for the desired results. For example, you might only model the outside if all you'll need are exterior studies; or you might model just a detail for clarification as in this kitchen project. Some users model entire exteriors and interiors with terrific results, showing spacious vaulted ceilings and furniture layouts. Whatever your need, I hope you find this simple modeled block-out of a kitchen cabinet group a good introduction to modeling with DataCAD. To show the versatility of the 2D and 3D systems, this project will mix the two functions.

Before you start

For simplicity, you may either trace over an existing plan you have of a kitchen, using a series of new layers, or follow these steps as closely as possible. You don't need to worry too much about dimensions. To ready your drawing, create the layer that will hold your kitchen, and make that layer active. Set your grid increment to .1" by pressing the [S] key and typing .1, [Enter], [Enter]. Press [X] until grid snap is on. Press [O] until Orthomode is on. Set your Object Snap menu [Shift][X] to EndPnt, MidPnt, Center and Intrsect. Make sure Fast3D is OFF. Press [K] key until the current color is White.

Laying out 3D walls

1. Turn the DataCAD 3D tool bar on by picking Utility, Display, and Menus. Make sure Icons is active, then pick the IconFile option. Pick the DCAD_3D tool bar, then press mouse button 3 (right-most button) three times to exit completely. The 3D tool bar icons should be displayed at the top of your screen.
2. Pick the DataCAD 3D Entity menu tool (the first icon in the bar).
3. Pick the Slab, Vertical options, to draw vertical walls.
4. Pick Bas/Hgt to draw the walls based on your settings of the Z-base and Z-height.
5. Press the [Z] key, and set 0 for the base and 8 for the height, entering for each value.
6. Pick Thickness to set the width of your wall. Type in .6 or pick 6", [Enter].
7. Pick Left. This will cause the wall to be drawn on the left side of the cursor picks.
8. Press the [Insert] key until the input mode is set to Relative Polar. Follow figure 1 to create one side of your kitchen, composed of three wall slabs, each 8 feet long. Press the space bar to input the length and direction of the angled wall.

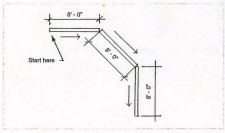

Figure 1

9. Pick the Set Isometric View tool to see how your walls look in 3D and to set Iso as your Parallel view. (Notice that this tool exited you from the slab menu.) Then, pick the Ortho button (found in the lower left of your screen in the control panel) to return to the plan view.

Creating the window void

1. To insert a window into a wall, you first must create a slab indicating the size and location of the opening, then turn that slab into a void.
2. Pick the DataCAD 3D Entity menu tool, then Slab, Vertical.
3. Press the [Z] key again, and change your Z base to 3.6 and your height to 6.8. This will be the size of your window opening. Draw the vertical slab for the window, as shown in Figure 2. Reference the wall corners using the [~] key. Use the space bar to define the distance and angles. Make sure you draw the window slab the same direction as the wall slab.

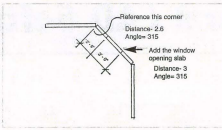

Figure 2

4. Once you've drawn your window slab, pick the Para button (found in the lower left of your screen in the control panel next to Ortho), to see how your window looks in 3D. The Para button allows you to flip to the iso view without dropping you out of the current menu. Then, pick the Ortho button to return to the plan view.
5. Press mouse button 3 (right-most) once to exit back to the Slabs menu, then pick the Voids option.
6. Pick the wall slab containing the window. This is your "master slab."
7. Make sure AddVoid is active, then pick the window slab to add as a void. Once this is done, press mouse button 3 twice to exit. The slab will be processed.
8. Pick the Para button to return to the iso view. Pick the Scroll Forward tool (arrow pointing right), then pick the Hide menu tool. This will allow you to test your model to see if the hole works.
9. Make sure ActLyr is active (process only the active layer) and SaveImg is OFF (save resulting image).
10. Pick Begin. The image should look similar to figure 3.

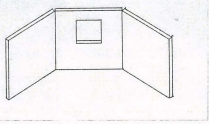

Figure 3

11. Pick the Ortho button to return to the plan view.

Creating the lower cabinets

1. Press [A] to go to the 2D Architect menu.
2. Make Walls, Sides and Caps active.
3. Pick Width and set it to .20 (twenty inches). Press [Enter]. This will be the width of the toe-kick part of the base cabinets.
4. Press the [Z] key and type in 0 for the base, then .4 for the height of the toe-kick.
5. Press the [K] key to set Brown as the current color.
6. Following the dimensions in figure 4, use a combination of picking and object snapping to position your toe-kick base along the wall. Draw it as you would a wall, picking to the inside of the kitchen area to "fatten up" the other side, as shown in this same figure. You'll notice a cap is drawn at the beginning of the "wal.l" When you're through drawing, press mouse button 3 to quit. This will draw a final cap on the last end.

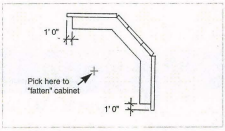

Figure 4

7. Pick the Width option and change the value to 2, for your base cabinets.
8. Press the [Z] key, and set the base to .4 and the height to 2.10. This will leave a couple inches for a counter top.
9. Object snap to the wall corners of the toe-kick, remembering to come out four inches on each side. Again, fatten the "wall" to the inside of the kitchen, as shown in figure 5. Remember that pressing mouse button 3 draws the last cap on the end.

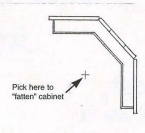

Figure 5

10. Pick the Para button. How is your kitchen looking? Pick the Ortho tool to return to the plan view.

Adding the countertop

1. Pick the Scroll Back tool (arrow pointing left), then pick the DCAD 3D Entity menu tool, and pick Slabs again. You'll use a slab to top your cabinets.This time pick Horizntl.
2. Press [Z] key to set the base to 2.10 and the height to 3.
3. Press [K] to change your color to Lt. Gray.
4. Object snap to all eight corners of the base cabinets, as in figure 6. The slab will "close" when you press mouse button 3 (right-most).

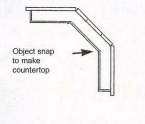

Figure 6

Completing the upper cabinets

1. Press [A] for Architect menu.
2. Pick Width and set it to 1.
3. Press the [Z] key to set the Z base to 4.4 and the height to 7 or 8, depending on whether you want your cabinets to reach the ceiling or want a soffit area.
4. Press [Shift] [K] to turn the color back to Brown.
5. Object snap to the existing cabinets against the wall as shown in figure 7, again widening into the kitchen area. Use the [~] key and polar input to make the upper cabinets clear the window opening. (You'll make two cabinet "walls.") Press mouse button 3 to close the caps on the cabinet ends.
6. Press [Shift] [F] to save your file.

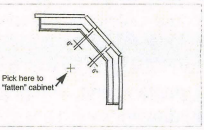

Figure 7

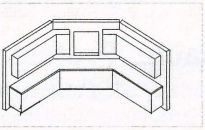

Figure 8

Final views

1. Pick the Scroll Forward tool, then pick the Start Quick Shader tool. The image should look like figure 8.
2. Try different settings. If you have 256 colors set for your shader, you can get nice results by changing the light source. Try LightR and No Edge, then Begin. If you have 16 colors set, you'll want to stick with BlackEdge as the setting.
3. A Perspective image looks much nicer. Pick the Set Perspective tool, pick 20 or so feet to the lower left of the kitchen for the eye point, then pick inside the kitchen as the view point. Once you've achieved a nice perspective, try the Quick Shader again, or complete a Hide and save the image to a new layer.

Closing Note

You can follow the steps in the Elevation Drawings section of the Mastering DataCAD Tutorial to learn techniques for adding windows to your opening. This book is available from CADKEY (phone 800/282-1368 to order). Also, explore the 3D Modeling chapters in the DataCAD for Architects and Designers, available from McGraw/Hill (phone 800/262-4729, ISBN 0-07-008914-0) which covers walls, openings, windows, doors, roofs, 3D viewing and presentation drawings. I hope this gets you off to a good start!

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DataCAD Tech

Productivity Tools

Plotting to Printers

By Ken Clare

With the popularity of printers like the Canon Bubble-jets and the Epson for plotting, it is now possible to output drawings produced in DataCAD directly to the printer without exiting from DataCAD. This is very convenient for quick plots.

The software I use is called "PrintCAD." It works extremely well and is quite easy to use. I first located this shareware program on a BBS here in New Zealand. The developer, Cary Ravitz of Ravitz Software Inc., has been extremely helpful with support to set up the program.

The following brief description of the procedure required for setup shows how easy it is. A detailed description is in the handbook supplied with registration of the software.

You simply select HP-GL Large D or E size in the DataCAD configuration for the plotter. Then, in DataCAD you use color to describe different line widths. You don't have to be afraid to use more than one color for the same width to represent different items. You very quickly remember that white is a particular pen width and yellow another and so on, just like when you used different Rapidograph pens in the ancient days of manual drafting.

Then you copy the file Printcad.exe from PrintCAD GL into the DataCAD 6 directory and edit Rundcad.bat, adding a line (or lines) at the beginning of the file followed by your usual drv lines. The line printcad/1/f7 1,1.0,1/L13.5,22,0,.7/f27,67,0,24/w13579/a0,0 in your Rundcad.bat file gives instructions for printing to C size paper (18" x 24"). Each character in this line gives exact instructions about the printer, paper size, margins, resolution, pen widths, etc.

Then, in the DataCAD plotter menu, do your layout with C size paper, pick To file and, when prompted for the destination file, type pcad and Enter. Printcad.exe intercepts the plot file command, gives a beep to signal that it has received the instruction, rasterizes the file (this takes a few moments depending on the size of the drawing) and prints — all without leaving your drawing!

There are drivers for many different printers and you can have up to five configurations (for different paper sizes, for example). These would all be placed in the rundcad.bat file as above in this order:

printcad/1.....
printcad/2.....
printcad/3.....
printcad/4.....
printcad/5.....

If you have multiple configurations, you simply enter pcad3 (or whichever configuration you require) when prompted for the destination file.

You can make this process easier and smarter by having the different plot configurations appear on the DataCAD plotter menu. To do this, you create a new directory under DataCAD (called PCAD, for example) and create file names using the DOS editor (or any flat ASCII editing program) and save them as empty files. Create as many file names as you have configurations:

pcad1.plt
pcad2.plt
pcad3.plt

Then, in the DataCAD plotter menu when you are prompted for the destination file, select New Path and go to DCAD6\PCAD. You will find PCAD1, PCAD2, etc. displayed on the top menu, so you just pick with the mouse or function key the configuration you need and wait for the printer to begin. When you exit the plotter menu, the above path and file names are saved as the default and automatically appear the next time you go to plot. To create a separate plot file, you would need to change your path back to your normal plot file directory.

For those who use metric paper, make the different configurations for A1, A2, A3, and A4 paper sizes and your displayed names correspond with pcad1, pcad2, pcad3, pcad4 (also appear alongside F1, F2, F3, F4). Very neat and easy to remember! Note that metric users must still configure PrintCAD with inches.

You can get information on PrintGL from Ravitz Software Inc., P.O. Box 25068, Lexington, KY 40524-5068. Fax/BBS 606/268-0577; email 70431.32@compuserve.com

Ken Clare is an architect in Auckland, New Zealand. He can be reached at kclare@nznet.gen.nz

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When DataCAD does not run, do two things. First, verify that your mouse driver is loaded. Second, run Memmaker (DOS6.x) and answer YES to Expanded Memory. (If you don't have DOS 6.x, then buy a Memory Manager. I personally recommend QEMM to anyone who is running Expanded Memory Applications, or anyone with lots of TSRs. QEMM is more forgiving and know-it-all than DOS's Memmaker.)

Patrick J. Shoaf - SCR Associates
scr@infowlx.com

Tips on File Reference in DataCAD

DataCAD does not reference external symbols. Each time a symbol instance is used in the drawing, the internal drawing symbol list is referenced. If the graphical information for that symbol does not exist in the drawing, it is added to the drawing and the list. See Directory/Symbol files for the internal list. Symbols which were once instanced, but the instance was deleted from the drawings, also can exist in this list. The "purge" command will remove these unused symbols from the list.

One big advantage to internally stored symbols is that when your project drawings are archived, then recalled, they will look the same even if external symbols are deleted or changed. When you archive a project, it is not necessary to archive every external symbol file used by the drawing or project (unlike AutoCAD and many other CAD programs, which utilize external symbols or blocks.)

Rick Gleason, AIA
The Gleason Partnership
Architects Sets, LTD

Printing Problems

Can someone give me some information on how to set up the PrintCAD utility to work within DataCAD? I would like to configure it to plot to a HP550C inkjet printer for color plots. How is the PrintCAD driver loaded?

Mark Ellis
Redwood10@aol.com

According to the directions, PrintCAD is loaded as a TSR before running DataCAD. It waits until it "sees" a .PLT file being sent out and redirects it through PrintGL to the printer. Various parameters can be changed on the command line when you start up PrintCAD, but it basically looks at the PrintGL configuration file to get its information. When DataCAD starts to write the .PLT file, you should hear a two-toned beep indicating PrintCAD has been activated.

John Shaw
jshaw@freenet.edmonton.ab.ca

You use PrintGL to get your settings right and then use the Create Batch command to get the command string you need. Then, using an editor, copy and paste this string command into the PrintCAD batch file. The next stage is to load PrintCAD before starting DataCAD. When plotting, send to a file called pcad. This will be intercepted by printgl and your computer will go beep and your printer will take it from there. I load PrintCAD in my autoexec along with the DataCAD drivers. With a 16MB system, I still get 32 pages while working in Windows, and 40 pages while working in DOS, so loading it with the autoexec as a TSR causes no problems. This is achieved using QEMM.

Mark Whiteson
whiteson@netvision.net.il

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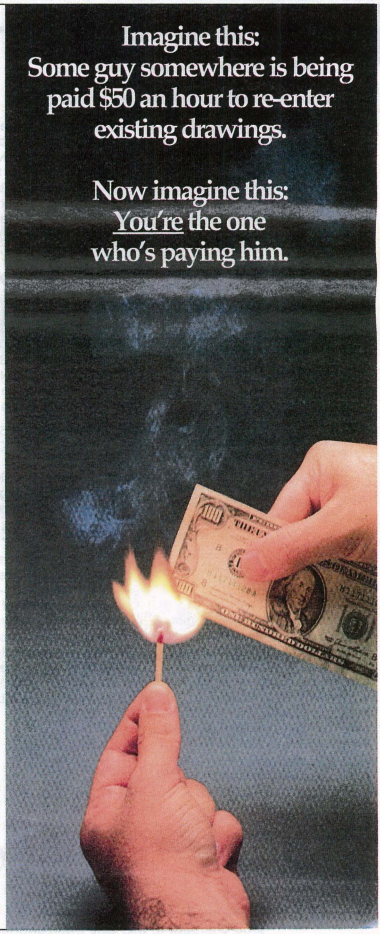

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