

# Cadkey Inc. Unveils New Business Strategy

By John Hayes  
Cadkey Inc.

Cadkey has announced a new business and distribution strategy designed to dramatically extend its reach into new markets. Cadkey intends to expand its market for computer aided design (CAD) and related software by positioning the company as a "software publisher" and including many new business, professional and consumer users. Based on a combination of new products, mass market pricing, and expanded distribution, key elements of the plan are accelerated new product introductions and multiple original equipment manufacturer (OEM) agreements.

## New Products

Multiple product offerings play a large part in Cadkey's new strategy. According to President and CEO Livingston Davies, "We plan to offer many CAD and related software titles developed by Cadkey and other companies. Over the next few months, we will release more than 10 CADKEY® and related software titles. The keys to Cadkey's new positioning as a publishing house are popular prices and increased software selection for the worldwide, enterprise-wide engineering office environment."

Davies also noted that Cadkey Inc., in addition to reaching new types of users, intends to continue developing software for its traditional AEC and mechanical markets. To support

the accelerated product rollout schedule, Cadkey has more than doubled its product development staff by outsourcing, utilizing offshore software development organizations.

OEM agreements are a major part of Cadkey's plan to offer multiple software titles. The company signed its first OEM contract with HighRES Inc. of La Jolla, Calif., in December of last year. The HighRES® product generates a 3D surface model of a physical object. HighRES will affect a wide variety of industries, from manufacturing and industrial design to virtual reality and 3D effects for motion pictures. More will follow throughout 1996.

In addition, several new products (DataCAD 7.0, Cheap-

See CADKEY, page 4 ➔

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VOLUME 5 NUMBER 1

FEBRUARY 1996

## Protect Yourself Against New Techno-Crime

### Memory market demand gives rise to innovative theft

By Robert Basile

A dozen well-dressed men calmly walk into the front lobby of a large corporation. Employees logically assume they're legitimate businessmen on their way to a meeting. Surprising everyone, the "suit-and-tie executives" suddenly pull out automatic weapons and order employees to lay on the floor. In a few terrifying minutes, they pillage the company's computers, remove valuable memory chips and flee with components with an estimated value of \$5-\$12 million!

This is not a scene from a James Bond film or a story of international intrigue. The event actually occurred recently at a company in Irvine Calif. It is just a small part of an expanding phenomenon called "techno-crime." In fact, in California's Silicon Valley alone, it is estimated that \$1 million in components are lost to techno-thieves each week.

According to the Technology Theft Prevention Foundation in Clinton, N.J., overall costs to electronics and insurance firms worldwide are approaching a staggering \$8 billion a year and are expected to soar to \$200 billion by the year 2000. The Foundation was started by insurance companies which, after paying out millions in computer

theft claims, wanted to develop ways to curtail the rising techno-crime wave.

The FBI and other law enforcement agencies which work with the Foundation say that techno-crime can come in many forms. Outright theft, as blatant as the armed robbery described above, is the most obvious. Other types can be difficult to identify and have prices that can't be quantified. Nevertheless, they cost consumers and manufacturers lots of money every year.

Misrepresentation of product quality and functionality is an example of a less-obvious crime. Consumers attracted to flashy packaging may think they're getting a good deal, but, they're frequently getting ripped-off. The product may not live up to the claims on the box. Or it is not uncommon for the product inside to have not been manufactured or assembled by the company shown. Consumers need to know who the real manufacturer is and that it is a reputable company.

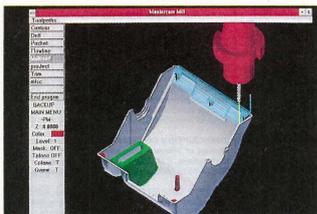
RAM memory is another example. Because SIMMs comprise up to 50 percent of a computer system's cost and provide much of the computing power, the quality of memory is extremely important. This has

See MEMORY, page 9 ➔

- Do some product research. Ask a reputable computer dealer who the best component suppliers are; ask your retailer or supplier if they purchase their DRAMs or UL-approved circuit boards from a major manufacturer. Insist that those brand names appear on both the circuit boards and DRAM chips that comprise SIMM modules, especially if purchasing a "clone" computer.

- Be wary of counterfeit or sub-standard memory components. Bad chips can be remarked to look like better ones. Frequently, on a bogus chip, simple markings on the surface have been sanded off or repainted, altering the original appearance.

- Insist upon a lifetime warranty on all memory components.



The camera housing was designed in Mastercam

By John Boone

President  
CNC Products NY Inc.

As every shop knows, the more flexible you are, the more business you get. My company, CNC Products of Highland, N.Y., routinely accepts jobs other shops

## CAM gives shop flexibility to program jobs others can't touch

must turn down. A recent example of this type of project was a complicated digital camera housing that contained hundreds of surfaces with very difficult intersections. This project had been turned down by several competitors before we were asked to program and machine the housing.

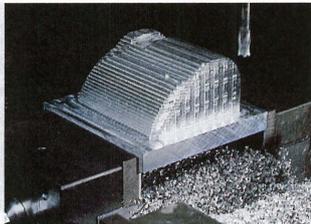
Our Windows-based CAD/CAM software gave us the edge we needed. The programming system we use is Mastercam from CNC Software Inc. of Toland, Conn. It let us quickly generate gouge-free tool paths for the entire part and made it easy to verify the path to ensure an accurate end result. The whole process took only about one week and provided substantial savings compared to the alternative of using a far more expensive workstation-based system.

The part, from Leaf Systems of Southboro, Mass., was designed to house a camera that produces very high resolution digitized color images without film. Design consultant Dave Crabbe, of DKC Associates in Auburn, Mass., directed engineers Steve Nickson and Eddie Morreale who designed the housing. The housing is approximately 6 inches deep, 3 inches wide, 4 inches high with .030 thousandths per inch nominal wall thickness. The part's individual surfaces were small and intersected with many other surfaces, making it very complex. Fine details on the interior made it necessary to have 1/8-inch and 1/16-inch ball nose end mills extending deep into

the cavity and against the side walls. Almost all the surfaces on the part were drafted in several directions. One particularly difficult area involved bosses that protrude out of the base of the housing, which was itself a large radius, not a flat surface.

Nickson created the geometry in CADKEY and then went to several outside contractors to have it machined. None were able to produce an NC program that would cut the part with-

See CAM, page 9 ➔



The housing was modeled in polycarbonate

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123	153	182	212	241	271	300	330	359	389	418
124	154	183	213	242	272	301	331	360	390	419
125	155	184	214	243	273	302	332	361	391	420
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Technical Support	203/298-8888 x8060	Cadkey user group forum	news@cadkey.com

World Wide Web site <http://www.cadkey.com>  
General comments, requests [webmaster@www.cadkey.com](mailto:webmaster@www.cadkey.com)  
Typical e-mail address for staff member [davies@cadkey.com](mailto:davies@cadkey.com)

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# Hot Web Sites for CADD

By Claudia Martin

The Web is becoming more of a significant source of information on CAD every day. Here are a few sites I've become aware of lately. If you know of others, e-mail [claudia.martin@on-ramp.io.com](mailto:claudia.martin@on-ramp.io.com).

## CAENET Supplements CAE Magazine

CAENET, an on-line supplement to Computer-Aided Engineering magazine, has joined the Web at <http://www.penton.com/cae>. In addition to late-breaking industry and technology news (updated every Monday), it contains CAE's entire annual directory of CAM/CAM/CAE/PDM products and services, the CAE Phone Book, popular past articles and columns from the magazine, a calendar of events and links to other sites.

## Darattech Inc.

The <http://www.darattech.com> site includes detailed information about its conferences and general industry information by the renowned research organization.

## Come Fly With Me

A cool tool for "flying" through a 3D database (via DXE 3D Studio and others) using the key pad may be downloaded from <http://www.mhryongreen.com>. A mouse-driven version is available for \$200.

## A Viewing and Markup Package

<http://www.ata.com> is offering a free download of ForReview Lite Express, a full working, viewing and markup package for Windows. It is a large file and takes a while, but works well.

## OS/2 Warp Buffs or Wanabees

The following is posted at <http://www.austin.ibm.com/pdfs/d4-95.html> — "Want to know if your hardware will work with OS/2 Warp? Want to know how to uninstall Windows 95? Want to have OS/2 Warp and Windows 95 co-exist on your computer?" There's also downloadable software

called Just Add OS/2 Warp (a.k.a. Disaster Recovery Kit 95) that will analyze your hardware and advise about your options for adding Warp to your existing system. It also will explain how to add Warp to an existing Windows 95 installation, so you can do some side-by-side comparisons.

## The Copyright Office

The U.S. Copyright office Web page (<http://www.marvelloc.gov:7011/copyright/registrator>) is filled with all the copyright laws and explanations most people could ever want. One section is specifically dedicated to "Architectural Works." You can obtain your own copy of the updated copyright laws pertaining to architectural projects of the architectural section of this Web site.

## On Line Magazine of Interest

3D Artist and the on-line version (a list-server) called "Tess Times" at <http://www.t>

[www.tess.com](http://www.tess.com). Most issues have at least something about either architectural CADD software or a technique for modeling or rendering.

## Summaries of MIT Projects

The Massachusetts Institute of Technology's CAD Lab at <http://cadlab.mit.edu/>, famous for leading the way to new CAD technologies, provides summaries of its projects.

## Nifty Rendering Software

MDW Systems Inc. at <http://www.mdw.com/> offers a high-performance 32-bit 3D modeler and rendering package for Windows that comes highly recommended. Phone 800/325-1427; In Canada 519/432-7577.

## Last but not least

Cadkey's Web page is <http://www.cadkey.com>.

## CAD Shows 1996

AUTOFACT WEST '96  
March 25-28  
Los Angeles Convention Ctr Los Angeles, Calif.  
Information: 800/733-4763

EASTEC - Advanced  
Productivity Exposition  
May 21-23  
Eastern States Exposition Ctr West Springfield, Mass.  
Information: 313/271-2861

AIA Expo '96  
May 10-12  
Minneapolis Convention Ctr Minneapolis/St. Paul, Minn.  
Information: 617/859-4475 or fax 617/8594354.

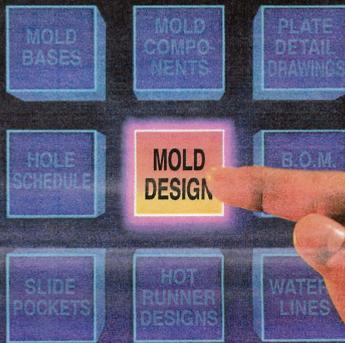
CAT '96  
(Computer Aided Technologies)  
International Conference on Rapid Product Development  
June 10-11  
Stuttgart, Germany  
Information: 49-711-2589-302 or fax 49-711-2589-555

A/E/C Systems '96  
Jan 18-20  
Anaheim Convention Center, Anaheim, Calif.

American Design Drafting Association  
Annual Technical Conference  
June 20-21  
Anaheim, Calif.  
Information: 301/460-6875 or fax 301/460-8591  
e-mail [ADDAatl@aol.com](mailto:ADDAatl@aol.com)

AUTOFACT '96  
Nov. 12-14  
Cobo Center, Detroit, Mich.  
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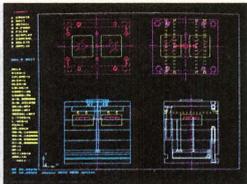
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# CADKEY Communiqué

## CADKEY IN THE NEWS

### ■ OEM Agreement with HighRES

Cadkey recently announced an OEM agreement with HighRES Inc. of La Jolla, Calif. This business development marks the emergence of Cadkey's new "software publishing" business and its distribution strategy to offer multiple software titles for the worldwide, enterprise-wide engineering office environment.

HighRES is 3D modeling software for replicating physical objects. The complete system consists of the HighRES software, CADKEY, FastSURF and a 3D digitizer. HighRES utilizes Cadkey's architecture for the MicroScribe 3D from Immersion, which turns a digitizer into a 3D mouse. Engineers, scientists and creative professionals can generate a three-dimensional surface model of a physical object using a PC and the MicroScribe, which provides user-defined 3D coordinate data to the computer. Special viewing features allow the user to observe the captured 3D data from any viewing perspective.

The point data is processed in CADKEY and then can be passed on to a surface modeling program for surface definition. The 3D model can be output via IGES or DXF to a variety of digital application products. For rapid prototyping, moldmaking and manufacturing applications, the model can be sent via IGES to a CNC or stereolithography machine to create a physical model.

The HighRES solution addresses applications in a variety of industries, from automotive, aerospace, replication, manufacturing and industrial design to entertainment, virtual reality, animation, television and motion picture 3D special effects. HighRES is available in three versions.

HighRES Inc.'s director, Braxton Carter, states, "Our product is the bi-directional gateway between the physical world and the digital world. It is easy enough for an artist to use, but powerful enough to take on the challenges of the aerospace industry. Our price/performance is redefining affordability for industries utilizing replication technology and opens the door to many companies which could not afford the investment in the past."

HighRES Inc., a privately held firm, develops, manufactures, markets and supports productivity-enhancing replication products worldwide. HighRES clients include Mattel Toys, Walt Disney Imagineering, Taylor Made Golf and XCORP/NASA.

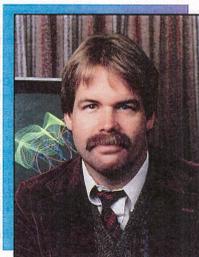
According to Cadkey President and CEO Livingston Davies, "Over the next few months, we will release more than 10 CADKEY-00 and related software titles. HighRES Inc. is a key participant in the launch of our new distribution strategy. HighRES is a powerful PC-based replication solution and will extend our reach to new types of CAD users."

HighRES can be contacted in La Jolla, Calif., at 619/459-9027.

### ■ DataCAD Image Sells Computers

A Tri-Star Computers ad recently published in the most recent issue of 3D Design magazine uses a 3D image created in DataCAD 4 and the first version of David Pendery's Renderman by Bill Riseman. The image of an ancient temple on Gebel Barkal was part of an archeological project. The image is captioned as Exploring Ancient Architecture, produced by the Graphic Alchemy Interactive. <http://www.shadow.net/~alchemy/>.

3D Design is published by Miller-Freeman, San Francisco, Calif., 415/995-2200.



Cadkey Inc. recently announced that we are pursuing a business model which substantially broadens our product line. Many people in the Cadkey community have asked about the implications of this change on our CAD technology development and on our VAR/Dealer distribution channel.

Cadkey Inc. remains committed to providing productivity-enhancing design tools with leading edge capabilities. Over the past two months, we have significantly increased our product development

## PRESIDENT'S PERSPECTIVE

BY LIVINGSTON DAVIES • PRESIDENT, CADKEY

### Expanded Opportunities

staff and have a number of interesting new features in progress for both DataCAD and CADKEY for Windows, our two flagship products. But in addition to continuing development on our flagship products, we intend to dramatically expand the range of products offered by Cadkey Inc. to include other products important in the design or engineering office. Some of these products will be developed by Cadkey Inc. and some will be developed by technology partners. All of these products will continue to be available through authorized CADKEY resellers and will contribute to your productivity. Our challenge is to flesh out this suite of products and make sure they work with sufficient compatibility to assure significant end-user productivity improvements.

I am pleased that within the past two months Cadkey has released a number of new products including DataCAD 7 (with multi-scale plotting) and SoftEngine 3D (3D Display List technology for dramatic graphics speed improvements in CADKEY for Windows).

We also have announced an OEM relationship with HighRES Inc. for incorporation of CADKEY technology into Highlight, Shop, and Studio, their new line of 3D replication software. In addition, our new Advanced Modeler is currently in beta testing and can be downloaded in beta form from our Web site ([www.cadkey.com](http://www.cadkey.com)).

Product development is moving nicely, and we believe that our expanded product set will serve customers, VARs and educators well. Look for further developments soon.

### Cadkey from Page 1

ware-CD tools for DataCAD users, Plan Designer for the home craftsman, and CADKEY 3D Display List) all were shipped in December.

Cadkey intends to focus its development efforts on the Windows 95 and NT operating systems.

### Mass-Market Pricing

Cadkey intends to further increase market share by lowering the price of CADKEY 7 for Windows version 1 from \$795 to \$495. This version is ideal for general purpose CAD applications, such as creating technical illustrations. The current version (CADKEY 7 for Windows version 2), which includes modules for drafting and surfacing, will remain at \$795.

Cadkey pioneered "mass-market" pricing of professional, industrial-strength CAD nearly two years ago when it dropped the price of its flagship CADKEY and DataCAD products from thousands of dollars per copy to a few hundred dollars per

copy. Cadkey's total unit sales increased sevenfold when the company re-priced its products in line with other Windows business software. In the last year, CADKEY's user base has increased over 50 percent.

### Expanded Distribution

Cadkey plans to expand its value-added reseller channel and is actively recruiting VARs and corporate resellers. According to Davies, broad availability of Cadkey's products is a services revenue opportunity for VARs. "Support, training and consulting services offer the best profit margin to VARs. CADKEY is committed to providing products that will allow a VAR to maximize profitability by providing opportunities for high-margin ancillary services."

The VAR channel will be supplemented with retail, direct mail and Internet distribution. According to Davies, Cadkey will develop more

customers to be turned over to the VAR channel by offering low-end products through mass marketing channels. For example, a low-end version of DataCAD (PlanDesigner) is now sold in selected Home Depot outlets for \$49. The company expects the Internet may become a viable distribution channel in the coming year, especially for software updates. Some CADKEY products can be ordered directly through its World Wide Web page.

### New OEM Opportunities

CADKEY's low-cost, easy-to-use developer's tools and large user base (195,000) should attract new third-party developers and OEM arrangements. CADKEY supports CADKEY LISP and Cadkey Dynamic Extensions (CDEs). Developer kits can be obtained by calling Cadkey at 800/394-2231 or downloaded from Cadkey's Web page: <http://www.cadkey.com>.

## CADKEY INC. PRICE LIST

EFFECTIVE THROUGH MARCH 31

U.S. / Canada Master Price List (U.S. Dollars)

To order, contact your local authorized CADKEY/DataCAD dealer or call the CADKEY Sales Dept at 203-298-8888.

Product Name	Suggested Retail Price	Product Name	Suggested Retail Price
<b>CADKEY 7 FOR WINDOWS</b>		<b>CADKEY UPGRADE CONTRACTS - (12 MO.)</b>	
CADKEY / Windows (3-1/2" or CD ROM) - SRP	\$ 795.00	CADKEY Professional (Upgrades for CADKEY and Analysis, Advanced Modeler)	\$ 350.00
<b>CADKEY</b>		CADKEY 7 DOS & WINDOWS	\$ 250.00
CADKEY Professional 7 (3-1/2)	\$ 1595.00		
CADKEY 7 DOS (3-1/2")	\$ 795.00	<b>DataCAD &amp; DataCAD UPGRADES</b>	
CADKEY Light 7	\$ 99.95	DataCAD 7 (3-1/2" or CD ROM)	\$ 249.95
Advanced Modeler (Windows/DOS)	\$ 495.00	DataCAD 7 Upgrade	\$ 99.95
		Estimator	\$ 99.95
<b>SOFTWARE FOR EDUCATION</b>		TOUCH-UP Macro	\$ 95.00
EduCAD America Program - DataCAD & CADKEY		BLOCKER Macro	\$ 95.00
Call for Program Details/Costs			
(Contact: Pete Mancini, Cadkey Education Dept., 203-298-6420 or FAX 203-298-6590) Call for Quote			

## More Cadkey Dealers

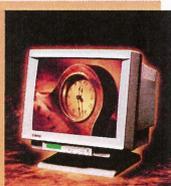
Two Cadkey dealers were inadvertently omitted from the list of dealers published in the December issue of KeySolutions Journal. They are:

North East Wisconsin Technologies  
Bernard Starzewski  
Manitowoc, WI  
414/684-6565

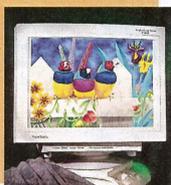
Computer Aided Technology  
Bob Konczak  
3100 Dundee Road, Suite 910  
Northbrook, IL  
708/498-9600

# Monitor Round-up

## Large Monitors Clear Up The Productivity Picture



Smile International CA2111



ViewSonic SonicTron PT81



NEC MultiSync XP21



Iiyama Vision Master8221E



MAG Innovision MX21F



Mitsubishi Diamond Pro

By Claudia Martin

If you spend many hours each day in front of your CAD system, a large format monitor (20-inch or larger) could very well be the best productivity investment you make. In fact, many experts maintain that cutting costs and using smaller monitors will cost you more in the long run. A large format, high-resolution monitor can save you hours of panning and zooming. It also can minimize eye strain and fatigue.

Still, 20-inch or larger monitors are pricey—constituting a major investment ranging from \$1,500 to \$3,000. The good news is that today's monitors are well-built and reliable. In fact, the monitor probably will outlast every other component of your CAD system. You can expect it to last from four to six years, so choosing wisely is in order.

#### Features for CAD

The accompanying detailed glossary should help you find your way around monitor spec sheets and sales literature. In general, the most important considerations for CAD are resolution, refresh rate and bandwidth. The monitor you select should be capable of 1280 x 1024 resolution or better. It also should have the smallest dot pitch (at least .28mm and .26mm is better) and the highest refresh rate you can afford.

Refresh rate is the measurement of the number of times the screen is lit and relit. The higher the refresh rate, the less flicker you see. Flicker is the quickest path to eye strain and fatigue. The refresh rate is determined by both horizontal and vertical scan frequencies. Larger and brighter

monitors show more flicker and will show images better if you have a higher refresh rate. However, people have different sensitivities to flicker. Those with good night vision are more sensitive and may need a refresh rate as high as 95 Hz. For years, the minimum refresh rate was 60 Hz. Now the minimum is 70Hz. The higher the refresh rate, the better the image.

Resolution is the measurement of the number of dots per inch (DPI) on the screen both horizontally and vertically. A resolution of 1280 x 1024 is one commonly used for CAD work, although a few users prefer 1200 x 1600. With larger screens and higher resolutions, you need a higher refresh rate. For example, in the 15-inch monitor category, make sure your monitor has a 60 Hz refresh rate or better at 1280 x 1024 resolution with an auto-scan range of 3064 kHz. 17-inch models should have a 75 Hz rate of better at 1280 x 1024 resolution with an auto-scan range of 30-82 kHz.

#### A few final observations and words of advice:

- Get the very best you can afford.
- Plan for the future by buying up, not down, in quality and features.
- Don't buy just from the specs. Try out the monitor if possible or at least visit where you can see one being used in an application similar to yours.
- Find out about service and support.
- Choose a reliable product. Look at the reliability rating. Look for a display with at least 50,000 to 70,000 hours demonstrated (not calculated) MTBF (mean time between failures).

# got memory?

Type	Pins	Size	\$26/MB
1x3	30	1MB	
1x9	30	1MB	
4x3	30	4MB	
4x9	30	4MB	
1x32	72	4MB	
2x32	72	8MB	
4x32	72	16MB	
8x32	72	32MB	

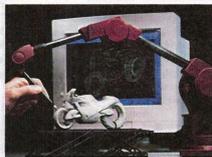
**(509) 299-5502** **MSS**

Memory prices are volatile, and are subject to change without notice. Call for details.

## RevPoint 3D Systems

### Interactive 3D design

Affordable, real time 3D input is available right now. SoftWorld International has taken the best products from Europe and the United States and combined them in an affordable, intuitive package that you can use now.



- Hand held Flexibility
- Portable
- Stable, interactive input
- 0.006" resolution, 0.012" accuracy
- Low cost
- Easy to use real time input and commands (of course it's fully compatible with Cadkey)

You'll be surprised at how affordable the RevPoint 3D System is. Call today for a free brochure and price list.

The RevPoint 3D Systems is a complete package that provides real time 3D input with all of the software you'll need for Reverse Engineering, Rapid Prototyping, 3D Modelling, or Design. As simply as you would use a tablet stylus, place the 3D probe on the surface of an existing part and you are now working in 3D.

**SoftWorld INTERNATIONAL**  
 The 3 Dimensional Solutions Company  
 133 admiral Street, Bridgeport, CT 06601,  
 USA, Tel.: (203) 367-7789 Fax.: (203) 367-8331  
 European office: SoftWorld App.  
 Tel.: 45 45 41 00 77 Fax.: 45 45 42 03 88

# Plug and Play

**Hardware compatibility  
makes life  
a whole lot easier**

By Claudia Martin

Plug and Play is a buzzword you hear a lot these days. It is a compatibility concept proposed by Microsoft and introduced with Windows '95.

Plug and Play is designed to allow the PC system to recognize all hardware components through automatic exchange of information and set the system up appropriately without human intervention. The goal is to simplify the installation of peripheral devices on the PC and optimize their performance.

When it becomes widespread, it will help solve those old PC blues - you know, the difficulties encountered when setting up, expanding, or upgrading a PC system. Ideally, it will reduce the need for technical support, lower overall set-up costs and improve ease of use for overall improved performance.

In the meantime, it's sort of hit and miss, because all the devices in a given loop must be equipped to play the game. For instance, if you buy a Plug and Play monitor, your video card must also be so equipped. Plug and Play peripherals usually have a memory device built into the unit. Monitor manufacturers can build different amounts of information into their product.

Plug and Play monitors communicate with video cards at several levels. At the most basic level of Plug and Play, the monitor identifies its model, screen size, horizontal and vertical timings and polarity. This basic data can be augmented to include information specific to each individual

resolution supported by the monitor, as well as color temperature and many other settings. The degree of user benefit is proportional to the amount of information the vendor builds into the monitor and how it is utilized. The more detailed the information sent to the PC system, the better the performance advantages.

The new Plug and Play standard has been endorsed and evangelized by influential industry players, including Compaq and Microsoft. Most monitor vendors have developed products to support Plug and Play. Because of this wide support and because of its obvious benefits, Plug and Play will become a capability desired by users. It won't hurt to buy a Plug and Play monitor now, even if your current video card won't play. When you upgrade to Windows '95 and get a new video card, you'll be ready.

The next several years should see the number of devices with these capabilities expand quickly and it definitely will make every PC user's life easier.

*Plug and Play  
is endorsed  
and evangelized  
by the industry's  
big players*

## Fact Sheet 21-Inch Monitors

	Hitachi SuperScan Pro™21	Iiyama Vision Master8221E	MAG Innovation MK21F	Mitsubishi Diamond Pro 21TX	NEC MultiSync XP21	Panasonic Pansync/ Pro2192P	Smile Int'l CA2111	ViewSonic SonicTron™ PT81
<b>Screen Attributes</b>								
<b>Dot Pitch</b>	.22mm horizontal .26mm shadow mask Flat Square tube	.28mm Flat square tube	.28mm Flat square tube	.30mm aperture grille Flat square tube	.28mm Flat square tube	.25mm Flat Square tube	.28mm Flat square tube	.30 aperture grille Vertically flat
<b>Technology</b>	Invar shadow mask	.FST shadow mask	Invar shadow mask	aperture grille	Invar shadow mask	Invar shadow mask	Invar shadow mask	aperture grille
<b>Resolutions</b>	1280x1024@80Hz 1600x1200@60Hz	1280x1024@87Hz 1600x1200@76Hz	1280x1024@76Hz 1600x1200@50Hz	1280x1024@80Hz 1600x1200@75Hz	1280x1024@76Hz 1600x1200@70Hz	1280x1024@77Hz 1600x1200@62Hz	1280x1024@75Hz 1600x1200@66Hz	1280x1024@85Hz 1600x1200@73Hz
<b>Frequencies</b>								
<b>Horizontal</b>	31-85 kHz	24.8-94 kHz	30-82 kHz	30-93 kHz	31-89 kHz	30-82kHz	30-82 kHz	30-92kHz
<b>Vertical</b>	50-160 Hz	50-160 Hz	50-120 Hz	50-152 Hz	55-160 kHz	50-160kHz	50-100 kHz	50-120Hz
<b>Bandwidth</b>	160 MHz	200 MHz	135 MHz	180 MHz	190 MHz	135 MHz	130 MHz	200MHz
<b>Screen Coating</b>	Anti-static AR coat	Anti-glare/ static surface	Anti-glare/ static surface	Anti-glare anti-static surface	A/S, A/r (OCL)	AGRA coating - anti-glare anti-reflection/static	ARAS Coating	ARAG Anti-glare coating
<b>Special Features</b>	On-screen display Overscan eliminates borders; 31 microprocessor presets; color calibration; moire reduction	Smallest depth of 19.3"; horizontal 94 kHz scan rate; highest refresh rate available	Zero Border Overscan eliminates image borders; Color temperature control: red/blue/green levels	Diamond Match Color Calibration; on-screen display control system; Diamond control display adjustment	ACCESS.bus On-Screen Manager; Color calibration	DQ-DAF Gun; moire reduction; two-computer connector; self-test function	Convergence adjustment 72 pre-set & user defined modes; LCD status display; full geometric controls	View match color controls; Super Contrast screen
<b>Plug&amp;Play</b>	Yes	Yes	No	Yes	Yes	Yes	No	Yes
<b>Software Controls</b>	Yes	Yes	Yes-optional	Yes	Yes	Yes	No	Yes
<b>Digital Controls</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Emissions</b>	MPR-II	MPR-II	MPR-II	MPR-II	MPR-II	MPR-II	MPR-II	TCO
<b>Energy Standards</b>	Energy Star & VESA DPMS	NUTEK & VESA DPMS	Energy Star & VESA DPMS	Energy Star, NUTEK & VESA DPMS	Energy Star, NUTEK & VESA DPMS	Energy Star & VESA DPMS	Energy Star & VESA DPMS	Energy Star DPMS
<b>Warranty</b>	3-yr parts & labor	3-yr parts & labor 48-hr replacement	3-yr parts/2 CRT/1 labor Extended available	3-yr parts & labor	3-yr CRT, parts & labor	3-yr parts & labor; 1 yr on site; 48-hr replacement	3-yr limited	3-yr parts & labor 48-hr replacement
<b>Suggested Retail</b>	\$1,995	\$2,049	\$2,199	\$2,199	\$2,299	\$1,999	\$1,825	\$2,495

# A GLOSSARY OF MONITOR TERMS

**A/G** Anti-glare screen treatment.

**Aperture grille** A type of monitor screen made up of thin vertical wires; said to be less susceptible to damping than iron shadow masks.

**A/R** Anti-reflective screen treatment. A high-quality treatment, but touching is a no-no, and wipe-downs should be made only with recommended cleaners.

**A/S** Anti-static screen treatment; prevents shock and keeps screen free of dust.

**Bandwidth** In addition to phosphor pitch, bandwidth is a major factor in resolution and the ability of the monitor to display fine detail. Technically, the maximum frequency of color signal that can be displayed, referred to in MHz. The higher the resolution you are running, the higher the bandwidth requirement.

**Color temperature** Selection that determines the overall cast of a display. 9,300 degrees Kelvin is good in fluorescent light environments; 6,500 degrees Kelvin is preferable under incandescent lights.

### DDC Plug and Play compliant

A DDC-compliant monitor can transmit an identifier to the system's video card, after which the maximum refresh rates of the card and the monitor are synchronized and video output is optimized. Both the system and the monitor must be DDC-compliant for this to work.

**Degauss** A feature that disperses the stray magnetic field that can interfere with a monitor's image clarity. Avoid pressing the degauss button multiple times in succession. It need only be pressed once.

**Doming** Results when an iron shadow mask overheats, causing image distortion.

**Dot pitch/strip pitch** The distance (diagonal on shadow mask, horizontal on aperture grille) between two phosphor dots of the same color (measured in millimeters). A crisper image results from smaller pitch. This measurement may also be specified as the spacing of the holes in the shadow mask (internal to the CRT and can't be seen from the outside.) Some manufacturers specify aperture grille spacing instead of dot pitch.

**EPA Energy Star** Monitors that comply with this standard consume less electricity by powering down when not in use.

**Flat-square tube** A tube designed with some curvature at the

corners. Compare with vertically flat tubes (such as Trinitron) whose screens curve at the sides (and which are said to produce crisper images).

### Geometric distortion controls

Let you adjust irregularities in the shape of the monitor's image, including tilt, trapezoid, parallelogram, and pin cushioning.

**Invar** Screens made of this allow resist doming and consequent image degradation.

**ISO 9421** An image quality standard that addresses screen adjustments and controls, character placement and size, glare, jitter and flicker.

**Moire pattern** Wavy distortions,

most obvious in images filled with solid color.

**MPR II** A Swedish standard that specifies a limit of 2.5 milligauss on ELF emission when measured at about 20 inches from the screen.

**Shadow mask** A type of monitor mask that has small holes punched through it. Light shines through these holes to illuminate the monitor's phosphors. Originated with RCA's television screens.

**Silica** High-quality, sprayed and baked-on anti-glare treatment. Look for thin film, because thick film can cause muddied images.

**TCO-92 emissions standard** A Swedish standard that specifies a

limit of 2.5 milligauss on ELF at about 12 inches from the screen.

**Vertical linearity** A control that allows you to set spacing consistently across the monitor. Thus, a shape intended to have a 1-inch diameter will have a 1-inch diameter wherever it appears.

**Vertical refresh rate** The number of times the monitor redraws its screen every second. A too-low refresh rate can result in flicker, causing eyestrain.

**VESA Display Power Management System (VESA DPMS)** A system that results in power consumption of less than 1.5 watts during a monitor's inactive periods

# CADKEY COLLEGE

## "ADVANCED 3D DESIGN"

Spring 1996 Enrollment Deadline: March 10, 1996

Instructor: Dr. Michael Leesley

CADKEY College offers the one-day course "Advanced 3D Design" at these locations

San Diego, CA  
Los Angeles, CA  
San Francisco, CA  
Seattle, WA  
Portland, OR

Monday, March 18  
Tuesday, March 19  
Wednesday, March 20  
Thursday, March 21  
Friday, March 22

Atlanta, GA  
Houston, TX  
Dallas, TX  
Denver, CO  
Phoenix, AZ

Monday, March 25  
Tuesday, March 26  
Wednesday, March 27  
Thursday, March 28  
Friday, March 29

### Curriculum

GENERAL  
MENU REVIEW  
PLANES  
PATTERNS  
PICTURE-IT  
LAYOUT  
SURFACES  
SOLIDS  
EXTRAS  
TROUBLESHOOT  
BONUS

CADKEY-for-DOS compared with CADKEY-for-Windows  
Find out how to use those menu items you've seen and never had time to explore  
Master the power of the combination of PLANES, VW/WLD and DEPTH  
The all new pattern referencing in CADKEY 8  
Get it right the first time  
Fast multi-sheet, multi-view, associative drawings of components and assemblies  
Learn how to represent surfaces with CADKEY, FASTLITE and FASTSURF  
Learn Release 2 Modeller and sneak preview FASTSOLIDS  
A brief look at some of the third party add-ons available with CADKEY 8  
Bring along a troublesome PRT file and as time permits we'll look for solutions  
Answers to our top 20 tech support questions

### Registration

PRE-REQUISITE  
CLASS TIMES  
CATERED BREAKS  
PAYMENT  
CERTIFICATES  
IN-HOUSE-CLASSES  
SIGN-UP

Good working knowledge of CADKEY (this is NOT an introductory class)  
Each one-day class will begin at 8:30 am and end at 5:00 pm  
Mid-morning, lunch, mid-afternoon  
\$250 per person in advance, by check or company PO  
Advanced CADKEY course certificates will be sent within three weeks of your course  
By arrangement, the CADKEY COLLEGE can be presented at your site  
Telephone 800-364-1652, or fax this add to 512-288-8521 for registration forms  
or mail it to CADKEY COLLEGE, 7101 Highway 71 West, Austin, TX 78735

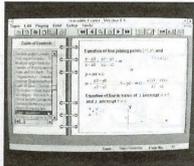
I require \_\_\_\_\_ seats at the \_\_\_\_\_ location. Please send registration forms to fax \_\_\_\_\_  
Attention \_\_\_\_\_ of \_\_\_\_\_ of \_\_\_\_\_ Tel \_\_\_\_\_

## SOFTWARE

### PDM for Small Budgets

Active Sensing Inc. announced ASI Echelon™ Release 1.20, an engineering document control database for small and mid-sized manufacturing companies. ASI Echelon automates many PDM functions, including item number creation, document revision control and efficiency, bill of materials development, and format management of engineering waivers and change notices. It offers workflow rules for defining document paths and approval sequences, and reports these rules for ISO-9000 compliance. ASI Echelon runs on Microsoft Windows 3.1x or Windows NT and is priced at a fraction of the UNIX-based systems. The software is available in single-user (\$895) and multi-user (\$4405) versions with no additional per-user fees.

For information, contact Active Sensing Inc. at 713/288-8430.



Mathematical Center for Windows

### Math/Science Formulas Ready

InfiniText Inc. today introduced a \$39.95 software program that gives engineers, scientists, programmers, technical staff and students instant access to mathematical formulas, a full-featured scientific calculator and other science tools. Scientific Center for Windows is a "point-and-click" reference for those accustomed to thumbing through thick reference books or relying on paper or plastic guides. In addition to describing and illustrating more than 1,600 math formulas, the software features a conversion guide (length, area, volume, energy, etc.) standard and scientific calculator, chemical Periodic Table and on-screen users manual. The program covers every math subject, offers a complete ASCII table and is compatible with popular math and science programs such as Mathematica, Matlab and others.

Contact InfiniText at 714/651-0640.

### Instant 3D for Windows 95

Visual Software announces Instant 3D for Windows 95, a fast new way to add 3D words and graphics to Microsoft Word, PowerPoint and any Windows 95 document or presentation. Instant 3D can be learned in ten minutes and lists for \$49. Instant 3D uses standard Windows "True Type" fonts that can be extruded, beveled, wrapped along a line and deformed using a wide selection of predefined shapes. Users also can choose from hundreds of 3D clip art objects and from hundreds of textures. These 3D objects can be clipped, spun and scaled in a 3D window on the page. Recommended minimum configuration is 486/33DX, 12MB of RAM, 40MB of available disk space, 800 x 600SVGA with 256 colors, Windows 95 and a CD-ROM.

Retail outlets include Computer City, CompUSA, Egghead, Fry's, Micro Center and Media Play.

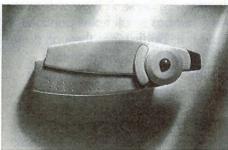
## HARDWARE

### Method Computer Display Card

Method Electronics Inc. introduces the ME1000 plug-in computer card, which allows multimedia presentations to be displayed on a standard TV or recycled on a VCR. The ME1000 automatically detects and switches between 640x480, 320x200, and text modes; is compatible with DOS or Windows applica-

tions; conforms to multimedia standards; outputs CAD drawings without missing lines; has an 80-column text mode; and displays 256 colors.

Contact Methods Electronics Inc. at 800/323-6658 or fax 708/867-3149.



Star-Track

### One-Hand Remote Trackball

Corporation recently introduced Star-Track, the first cordless infrared trackball for remote one-hand cursor operation. Star-Track's infrared technology provides advantages in price and ease-of-use over wireless and other remote infrared devices. It can control PC functions from distance up to 15 feet at 90-degree angles (plus/minus 45 degrees). Designed as an extension of the hand, Star-Track weighs approximately 2 ounces and measures 2.15 inches long and 1.3 inches wide and less than one inch high. The single-unit retail price is \$99.

Contact Corporate Source at 714/582-3821 or fax 714/582-3706.



Optra C color laser

### Optra C Color Laser

Lexmark International Inc. announced the Optra C, the company's first color laser printer. The desktop-size color network laser prints at speeds of 12 pages per minute in black and three pages per minute in colors. Its 600x 600 dpi and continuous tone output provides photographic-quality CMYK color on plain paper with support for the major color or management standards. The estimated street price is \$6,400.

Contact Lexmark at 800/558-5835 or web site <http://www.lexmark.com>

### Summa Expert

Pressure sensitive and customizable menu buttons make the Summa Expert an ideal tool for advanced graphics and CAD professionals. A new cordless four-button articulating cursor is offered as a pointing device option, in which the cross hairs can pivot to either side of the cursor body or retract beneath the cursor. Other pointing device options include a cordless three-button pressure-sensitive pen and a cordless 16-button cursor. Summa Expert includes multiplatform utilities and drivers called SummaSoft for compatibility with most systems. Sensitivity levels of 256 are supported for compatibility with most CAD packages. List price is \$499 for the 12x12-inch and \$899 for the 12x18-inch.

Contact Summagraphics Corp. at 512/853-0900 or fax 512/835-1916.

### 1284Port

The FarPoint Communications 1284Port combines an IEEE-1284 Level II parallel port with two high-speed 16550 serial ports. The parallel port supports a centronics mode as

well as the enhanced parallel port and the extended capabilities port protocols. The 1284Port incorporates a 36-pin mini-connector, which uses clip latches instead of thumbscrews. Printers and peripherals may be up to 30 feet away with no loss of performance when using the optional 1284 compliant cables. The 1284Port is FCC Class B approved. Suggested retail price is \$99.

Contact FarPoint Communications at 805/726-4420 or fax 805/726-4438.



CTX Notebook

### CTX Notebook Based on Cyrix Processor

CTX International is one of the first companies to introduce active matrix color notebooks based on the Cyrix processor. The EzBook 5886 series notebook computers offer higher performance than 486 DX4/100 models at a comparable price. The Ez500T uses the Cyrix 5866-100 MHz processor and the Ez520T uses the Cyrix 5866-120 MHz. These notebooks include write-back cache, 8MB RAM (expandable to 32), an 810MB hard drive and other features. When connected to an external monitor, EzBooks support a maximum resolution of 1024 x 768 at 256 colors. Also included is a slide-out hard drive, a built-in 16-bit stereo sound card, speaker and mic, a 3.5-inch internal floppy drive, and two PCMCIA slots. EzBooks is pre-loaded with Windows 95. Options include a PCMCIA double speed CD-ROM drive, PCMCIA fax/modem card and Ethernet card. Estimated street prices start at \$2,699.

Contact CTX International at 909/595-6146 or 800/888-9052.

## Engineering/Manufacturing

### "Printing" 3D Solid Objects

3D Systems Corporation announces a new technology called Multi-Jet Modeling (MJM). MJM is an inkjet process that builds solid objects in successive layers using a thermoplastic material developed by 3D Systems. Engineers can conceive an idea, design it in CAD and, without leaving the CAD workstation, build a physical model as easily as creating a paper print or plot. The solid-object printer will operate as a network peripheral to computer-aided design workstation, automatically orienting the object to be created, preparing the computer input data, beginning the printing process within minutes of the engineer's request, and notifying the engineer when the job is complete. The price of the commercial unit has not been set.

Contact 3D Systems at 805/295-5600 or fax 805/295-0249.

### Houdini Video Training Kit

Algor Inc. is offering a video training kit for users of Algor's Houdini software. Houdini is an interface that adds automatic eight-node "brick" meshing to CAD solid modeling and finite element analysis (FEA) software. Houdini software is compatible with most popular CAD solid modeling including CADKEY, AutoCAD, Pro/ENGINEER, EDS/Unigraphics/CATIA, Aris, Intergraph and SDRG. The solid models which Houdini creates can undergo finite element analysis using software such as Algor, Ansys, Abaqus,

Cosmos, SDRG, Nastran, Patran, NISA and Procrat. Internet users can preview the video on Algor's home page on the World Wide Web at <http://www.algor.com>.

Contact Algor Inc. at 412/967-2700 or fax 412/967-2781.

### Type Inspection/Simulation for Turrets

DXF5-Tape to Graphics software allows you to inspect your turret programs on a computer screen without setting up your machine to punch a part just to inspect your program. DXF5-TGS will read the tape file and ask you to describe the tooling as it reads the tape. DXF5-TGS then outputs a file for CADKEY. CADKEY's full array of dimension tools then is used as an electronic vernier to inspect your part program on the screen showing exactly what your program or tape will produce on your machine. Rectangles, rounds, lovers, deers and many other tool types and dot numbers are drawn and plotted accurately. Plots can be output to plotters, dot matrix or laser printers. DXF5-TGS supports older systems, even those without graphics abilities or features. DOS and Macintosh only. Windows version under development.

Contact Romance Matrix i/DEA at 203/256-5945 or fax 203/259-7366.

### New Enhancements to Suprastuff

Romer Inc. recently announced two new enhancements to its Suprastuff software for use with the Romer Articulating Arm CMM systems. Surface lift referencing capability (precise referencing of pressed sheet metal) and graphical print-out of band tolerance (allowing visual comparison of measured points to a nominal curve) now are available as part of Suprastuff level 2 software. A free upgrade is available to all current level 2 users.

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

### CAM-POST for Windows 95

CAM-POST for Windows 95 now is available from ICAM Technologies Corp. in Montreal, Quebec. CAM-POST is an NC post-processing generator which transforms the cutter location file of all major CAD/CAM systems into the specific machine codes required to operate a variety of NC machinery.

Contact ICAM Technologies Corp. at 514/697-9035 or fax 514/697-8621 or e-mail [icam@cam.org](mailto:icam@cam.org).

### Cadpipe 3-D Design

Cadpipe 3-D Design allows users to create and edit drawings in plane view or other three-dimensional plane and complements the traditional 2-D CAD packages. Cadpipe 3-D Design can automatically place runs of pipe in a horizontal and vertical direction. Section View automatically creates a section view of any area of the drawing without changing the user coordinate system or using clipping planes. Cadpipe 3-D Design has two collision checking features, isometric pipe, bill of materials and global bill of materials.

Contact International Software Systems Division of Orange Systems at 301/840-9405 or fax 301/977-5362.

### QuickCast

QuickCast is a direct-to-metal solution for time-sensitive manufacturing. QuickCast allows the user to rapidly produce functional metal prototypes before production of hard tooling. QuickCast technology creates quasi-hollow patterns built directly on the SLA from specially formulated resins; the resins is about 80 percent hollow. QuickCast allows the user to work with engineering data longer and commit to casting later with a mature product design, and replaces traditional wax patterns for investment casting.

Contact 3D Systems at 805/295-5600 or fax 805/257-1200.

been a boon to manufacturers who emphasize quality. "Everybody and their brother is slapping together cheap little memory products," explains Jim Wong, president of Micro Solutions Inc. in Corvallis, Ore. Micro Solutions configures systems for highly demanding users with specialized applications.

"You have to be very careful about who you buy from and what you buy," cautions Wong. "I've heard horror stories from people who are now our customers because they can rely on the quality we provide."

Century Microelectronics Inc. of Santa Clara, Calif., an industry leader in the manufacture of computer memory, routinely implements extra measures to ensure its memory modules maintain the highest quality standards. Century deals directly with the largest, most reputable DRAM manufacturers who have strict internal controls. Century then adds its own quality protective measures.

For example, each assembled module bears the Century name to ensure strict accountability. The consumer can clearly identify that the module has been assembled by Century and not a different third-party manufacturer with lower standards. Unless a circuit board manufacturer puts its name on the board as Century does, there is virtually no way to trace the product back to the manufacturer when troubles arise.

Practices such as this have served companies like Century well in a market where wholesalers, retailers and consumers have voiced concern over the affect of technocrime on overall product quality.

"I want to make sure my customers are getting a first-rate part," says Gary Barlow, owner of FRAMTECH, a computer memory supplier in Boulder, Colo. "Most of the time, price is not the issue as long as you're reasonable."

Micro Solutions' Wong agrees with the emphasis on quality. "We have some major clients like Hewlett Packard who buy our memory products for insertion into their own machines, so quality is very important to us," he explains.

Price, not quality, is the primary motivation for less scrupulous suppliers. Competition from makers of cheap "clones" often enhances the need for both supply

## The demand for superior products is ever-growing

and manufacturer to keep costs down. Even well-known original equipment manufacturers (OEMs) occasionally offer to buy back old memory chips as credit toward new memory purchases. These suppliers then reuse the memory which, because it is used, has a shorter life cycle. This may not appear to be an obvious technocrime, but it is a crime in its worst form. The monetary cost is just as severe, but the crime itself is all but impossible to detect.

Sometimes OEMs put pressure on chip suppliers to step up production to meet market demand. To please their OEM customers, memory brokers with limited resources often are tempted to purchase standard parts on the "gray market." A growing concern to manufacturers and consumers, such gray market parts often fail to test to "grade A" specification. Instead of ending up as scrap or in a lower-performance, non-computer application as intended, these chips may be installed in machines they are unable to run. A chip that shows a 60 nanosecond (60ns) rating, for instance, could actually be able to perform at only 70ns. This is normally can't be bothered with checking for quality - substituted memory batches are either mixed with those that passed inspection, or are simply reworked with the higher rating the OEMs require.

Sometimes third-party manufacturers will sand the identifying marks off chips, remark them as higher-performance chips, and resell them to unsuspecting buyers. Then, the manufacturers install the lower-quality components in their machines, trusting that their memory dis-

tributors bench test the chips. Unfortunately, many distributors in need of quick revenue unload the components without testing them. Installed in machines they weren't intended for, these parts fail immediately or after just a few months of use.

If a substandard chip makes a computerized toy go haywire, it's probably not a big deal. But the same chip could just as easily cause a glitch in the navigational system of a commercial airliner or a surgical device malfunction. If even a small percentage of available computer chips is faulty but sold as acceptable, the implications are frightening.

The more common scenario involves an individual consumer who returns a faulty product to the retailer. The retailer sends it back to the manufacturer who, after careful inspection, discovers that their product has been re-worked. The risk is that consumers are forced to trust XYZ Company for purchase or repair, not always knowing where the company has obtained its computers and parts.

Experts say anyone making a computer-related purchase is a potential victim of techno-crime in its more subtle forms, and any individual or company with a large cache of computers is vulnerable to the more obvious techno-theivery.

"People have to create a cash mentality about these things," says Sgt. Keith Lowry of the San Jose Police Department. "These things are gold, so people have to understand that they have to treat them like gold." According to Lowry, both the computer and the chip manufacturer lose money and end up with major headaches due to faulty hardware being returned under warranty.

Technology market analysts say the demand for memory modules likely will remain higher than supply. Computer companies will undoubtedly continue to experience periodic chip shortages, which will drive up the value of memory modules. There may be no relief in sight to the current wave of techno-crime.

Therefore, consumer awareness is sure to increase. In addition, the demand for superior products from the highest-quality manufacturers is expected to be greater than ever.

## CAM from Page 1

out gouging the difficult multiple-surface intersections.

Finally, Crabbe asked CNC Products NY Inc. to attempt to program the part. Our programmer imported the CADKEY wire frame geometry into Mastercam with Mastercam's CADL translator. CNC Products' programmer was immediately impressed at the complexity of the wire frame model. The project contained several complex intersections and a drafted boss that came off a radiused base. The programmer quickly generated surfaces for the entire wire frame using several of Mastercam's surfacing techniques: surface blend, variable and constant radius fillet, sweep, loft, draft, ruled, multi-patch coons, trimmed, revolved, and surface projection.

Mastercam's shading utility was used to generate a realistic image of the part. This simplified the surfacing of the wire frame, making it obvious what was and wasn't surfaced, and which surfaces connected properly.

Wherever possible, the programmer used simpler surfaces, such as sweep and ruled, for the sides of the bosses. For 3D areas, he mainly used Coons patch surfaces, which produce a surface by following the boundaries of a two-, three- or four-sided patch. The program then mathematically blends all the boundaries into one smooth surface, even if one edge is a parabola and another is a point.

One particularly difficult area was the top surface of the part housing where it mated with its cover. Rather than

being flat, this edge had a 0.030-inch wide step so the two halves of the housing fit together like a lap joint. This area would not make a good ruled surface and a Coons patch would be inefficient because it would use too much memory. The software's flat boundary surface, which creates a trimmed surface based on a group of boundaries in a single plane, provided an excellent solution. This type of surface, which is very simple to define, was used in about 25 other flat areas such as tops of bosses and in screw holes areas.

Substantial time savings were achieved by using Mastercam's multi-surface roughing. The part posed a complex roughing problem because of all the drafted walls and the many projections, such as the bosses and an RS-232 plug. It would have been extremely time-consuming to attempt to manually produce a routine that would rough out the part without violating any surfaces.

With Mastercam, the programmer simply designated the interior of the part, specified a 1/4-inch square end mill size and the depth of each vertical step and the program quickly generated the roughing tool path. The roughing routine was directed to enter the work in a helical plunge and step around the section level to be contour-roughed at each level to a user-specified depth.

Producing the finishing tool path also was simple. Mastercam produced a single finishing tool path based on all of the surfaces in the part while automatically avoiding gouges. Mastercam's solids-based tool path verification made it possible to cut the tool path in a piece of "virtual stock" to verify the program. The programmer could rotate, pan and zoom the model to inspect small and hidden features. It showed that the part would be produced perfectly without any violations.

Once the program was completed, CNC Products cut in a block of polycarbonate completely and perfectly in about 30 hours. The program then was used to build aluminum and

optically clear polycarbonate parts that were used by Leaf Systems engineer Eddie Morreale to evaluate the overall performance of the camera.

This project is an excellent example of how CNC programming can contribute to the success of a new product development program. The latest techniques, such as multi-surface roughing and solids-based tool path verification, let us program a highly complex part in minimum time without errors.

For more information on Mastercam, contact CNC Software Inc., 344 Merrimack, Lowell, CT 07044. Phone 203/875-5006 or fax: 203/872-1565.

John Boone is president of CNC Products NY Inc., located in Highland, N.Y.



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CIRCLE 243 ON REPLY FORM

Excerpted from *Using CADKEY and Its Applications* by Paul Restaritis and Gary Bertoline

Masking is a part of CADKEY that some people never take the time to learn. Do not be one of those people! If you don't use masking, you are not taking advantage of one of the greatest and most helpful features of CADKEY. Masking is a filtering method that permits the selection of only those entities for which the mask is set. In CADKEY you can mask by entity type, entity attribute or level.

#### Possible Uses

Frequently, there are multiple entities very close to or overlapping one another in a 3D part. When you want to select one of these entities, it can be difficult without the aid of

masking. For instance, if there are several lines running through a circle and you want to select the circle and not the lines, a mask could be set on the circle and only the circle would be selected. For large parts or parts with many closely placed entities, the speed and reliability of selection are greatly increased by using a mask.

Using the construction of a part as another example, POINT entities often are used to locate strategic placements for other entities. After the entities have been placed, the points must be deleted. It can be time-consuming to delete the points without deleting the entities on top of them. With the aid of a mask on POINT entities, you can do this easily.

The masking menu also is very helpful when selecting entities in order to change

their attributes. For instance, you may want to change the color of all dimensions. Type masking also is very useful in the deletion of notes, dimensions and labels that have been placed on top of or very close to other entities. Some people like to keep different line types on different levels. With the use of attribute masking, you can easily select any line type to be moved to a level of its own.

#### Type Masking

When entities are selected by type, this is referred to as type masking. When choosing the ALL DSP (all displayed) option from the Selection Menu, you have the opportunity to mask BY TYPE or EX TYPE (except type). The BY TYPE option will allow you to select only those details or entities with the attrib-

es you have selected from the Masking Menu. The EX TYPE option will allow you to select any entities except those that have been selected from the masking menu.

You can mask with any of the Selection Menu options whenever you have to select an entity. A commonly used option is the [Ctrl][O] (Single Delete) and [ALT][M] (masking type), which allows you to select specific entity types individually. You have the option of masking by entity or attribute or a combination of both. To set a type mask, you can press the Immediate Mode sequence [ALT][M], which will display the Main Masking Menu or Masking dialog box.

#### Level Masking

Another type of masking is level masking. As with type masking, level masking is very helpful with large complicated drawings with multiple entities on multiple levels. Often, when using different levels, entities are stacked on top of one another. Level masking lets you designate the level from which you wish to select entities. Once a level mask has been set, the only entities that can be selected are those on the level being masked. The current level that is being masked can be found in the Status Window on the left of your display, next to MLEV. The level on which you are masking can be changed at any time by pressing [ALT][N] or selecting MLEV from the Status Window. If no level masking is desired, the MLEV should be set to zero.

There are 256 available levels. If the mask level is set to a positive number between 1 and 256, only that level number may be selected from, regardless of how many other levels are displayed. If the mask level is set to a negative number, the selection is possible from all displayed levels except the negative number.

Using CADKEY and Its Applications, a comprehensive text on CADKEY 6 and 7, is available from Delmar Publishers, 800/998-7498.

## TECH TIP

### New Video Cards With Cadkey

By Bob Messemmer  
Consulting Services Intl

We have had several calls about the newer video cards being inoperable in CADKEY. To understand how these things work, we offer the following:

Cadkey purchases video drivers from Vibrant Graphics Inc. of Austin, Texas. The CADKEY drivers are updated four times per year, supporting the most popular cards. Vibrant also is talking about continuing to write drivers for CADKEY DOS should Cadkey stop buying them from Vibrant.

For Internet subscribers, Vibrant's home page address is <http://www.vibrant.com>. Cadkey's page is <http://www.cadkey.com>. We strongly recommend that you check the list of current cards supported by CADKEY (see list when running config) before you buy a new card.

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By Larry Maldarelli,  
Editor, CALCAD  
Newsletter of the CALCAD User Group

CADKEY has some features that are undocumented or that have incomplete documentation. Here are my comments on a few.

**CTRL-N Toggle** — One of the most useful is the [CTRL][N] toggle. This switch allows dimensions, notes and labels to be viewed from all views. This permits the user to dimension a 3D part and view the dimensions, etc., from an off-axis view (VW 7 for example). This is excellent for illustrations in manuals and the like. With a little practice, you can get the dimensions to appear where you want them

**Grouping Tricks** — Another little-documented feature concerns Grouping of entities. If you group entities on different levels and select the group for moving, all the enti-

ties will move even if some of them are masked or on a level that is turned off. So, if you want some of the entities to stay put, you must degroup them before you move the rest. Of course, when you degroup part of a group, you destroy the group entity and must regroup. In this situation, it is better to Delete the group, as the group name will otherwise remain in the list with zero sub-groups and prevent you from using it again.

**DXF Translations** — AutoCAD, There, I've said it! I don't usually use the A-word, but I have a tip for those who are forced to interface with it. We have heard for some time that there are some peculiarities with the DXF translator. A couple of days ago, I ran into a solution for what appeared to be a particularly annoying one. Frequently, users complain that they cannot change colors or names in the database when they receive a file translated from CADKEY. Apparently the problem arises from the way both programs handle entity properties. AutoCAD is

more global than CADKEY. CADKEY assigns a color to each entity in a way to which most AutoCAD users are not accustomed. By changing the properties of all entities to BY-LAYER, it will become possible to change whatever properties you want.

Another good tip is to make your blank PRT files READ-ONLY. That way you will never again feel the frustration of having wrecked another blank file by forgetting to assign a new name to whatever you are working on before saving. CADKEY will not save the file, but will ask you for another name. The prompt is "Cannot create file, enter another name \_\_ press RETURN." Most hardware does nothing else. My Pentium creates a file of the same name with an extension of \$\$\$ even though it says you must rename the file.

One last thing: Be sure you don't use any reserved names or any DOS commands for PRT or PTN names, things like AUX, for example. It may lock up your machine — or at the least make your part file a mess.

*With a little practice, you can have dimensions appear exactly where you want them*

## Slick CADKEY 3D Techniques

By Larry Maldarelli

One of the most common questions I'm asked by beginners in 3D is, "How to you get from one part to another in an assembly?" I'm going to cover just one technique this month: Line Parallel At Dist.

Let me digress for just a moment. Let's define a Unit as a small part of a larger solid that is itself a complete solid.

I have found, as I have been polishing the methodology of using the Vibrant Icon System, that parts that must be broken up into smaller units for rendering purposes can successfully have these units on the same level if they are in different colors. Picture It will successfully render a solid made up of several units in different colors on the same level, or a solid made up of several units on different levels, or any combination of the above if the Object Masking is set to Levels and Colors at the same time. You have to be careful that you don't get the entities of a single unit on two levels or in different colors on the same level. Picture It can't possibly understand that. Of course, complete solids in different colors can reside on a single level as well.

When a solid must be broken up into units, CADKEY's poor color definition actually can be a benefit. Selection of similar colors (green and lt. green, for example) will yield a coherent solid as Picture It recognizes the different units as solids and you recognize them as a single solid.

To get back to Line Parallel At Dist. First you must be aware of exactly how CADKEY generates parallel lines. A line parallel will be generated in the current construction plane regardless of the setting of the 2D-3D toggle.

Now, suppose you have generated a part that is roughly a rectangular solid (long way horizontal) and you want to make a "Z" bracket to mount it into a wall using the back vertical face as the mounting face. Assume the back face and the wall are in VW 2 and

two mounting holes in your part are already established.

1. Switch to VW 7, change colors, and construct a line center to center using the mounting holes.
2. Set the construction plane to 2 and the depth to the line you just made.
3. Now construct two lines vertically through the center of the mounting holes.
4. Decide how large the mounting face of your bracket is to be, make lines parallel to your construction lines and trim them.
5. Extrude the face outline to the thickness of the bracket material.
6. Now set the depth of the construction plane to the plane of the wall.
7. Assuming you know the overall height of your bracket, construct a line parallel at that distance and use a line in the mounting face as the reference line. The generated line will be in the plane of the wall at the required distance.

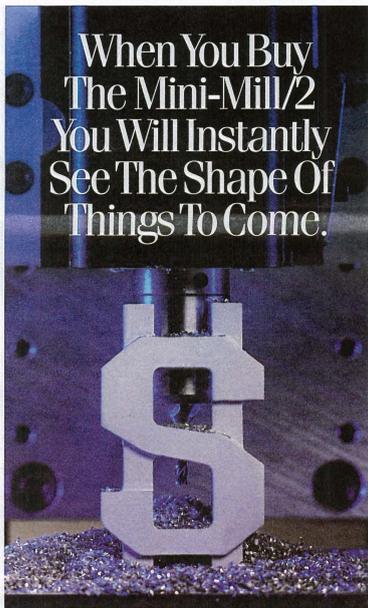
All that remains is to Delta Join this line to the width of the mounting face of the bracket, and Delta Join the resulting four lines to the thickness of the bracket material.

Assuming the two angles of your "Z" bracket are 90 degrees, you only have to join the inside faces of your bracket. Delta Copy these lines up or down as required and add your radii for the bends.

The beauty of Line Parallel is that the line generated is always in the construction plane. Once you have that firmly in your mind, it becomes easy to use to your advantage.

There are many cases where you know a dimension you wish to establish, but the feature you are measuring from is in a different plane. This command gives you a way to get there directly without having to go to any other construction.

Larry Maldarelli is the editor of CALCAD, the newsletter of the Southern California CADKEY User Group. This article first appeared in November 1995.



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Thank You!



# CADKEY FOR WINDOWS

## Frequently Asked Questions

### By Cadkey Technical Staff

**Q:** Help! I've just started using CADKEY for Windows. When I select the Picture-It application to produce a rendering, I can't find my CREATE, XPFORM, MODIFY, LAYOUT, and DETAIL menu icons.

**A:** Picture-It is a CDE (Cadkey Dynamic Extension). When you select Picture-It from the Applications pull-down menu, it takes the place of the CADKEY Applications Toolbar. Simply click on CADKEY in the Applications pull-down menu to bring back the menu icons you are looking for. Since the icons in Picture-It are used so often, you might want to drag them to an empty space on one of the main toolbars. Then you won't have to constantly reload the Picture-It Toolbar when you need a rendering.

**Q:** How can I merge two part files to form an assembly of components?

**A:** To merge the contents of two part files, open one of the part files and export it as a CADKEY pattern file. Then open the second part file and import the pattern file that was just made. By selecting Ent level, you can save the level assignments from the previous file. This technique is extremely useful when using component patterns to build an assembly. Most modelers start assigning levels in their main assembly file at number 10. When creating your component files, if you place the entities on levels starting at 100, you can use the old level information when you import the patterns produced from them into your build files and not worry about overlaying different entity groups on the same level.

**Q:** After tearing off the status windows from their standard position, I have trouble redocking them. Is there an easy way to do this?

**A:** As you move it back into its normal position, look at the border of the interface section you are trying to dock. You'll notice that the border changes from thin to thick lines depending on its position. When the lines turn thin, it will dock. If you release it when the lines are thick, it will remain floating. I personally find it simpler to select Control Bars from the View pull-down menu. I then click on the Default Layout option. This immediately resets your display, docking all of the toolbars in place.

**Q:** With DOS CADKEY, I've grown accustomed to the immediate mode commands. Can I replace the Windows hot-key assignments to my familiar [ALT][A], etc. work for me?

**A:** I also prefer the DOS key assignment set. It's very easy to replace the default windows key assignments with the DOS ones that you're already familiar with. Just click on the Tools pull-down menu. Then select Options. If you click on the Browse button in the Accelerator Keymap section, two options (ekdos.kbd and clwin.kbd) should appear in the File Name scroll box. Select ekdos.kbd, check OK, and exit out of Windows. When you restart Windows, your familiar DOS immediate mode commands will be there to greet you.

**Q:** I like the associativity provided when using layout mode. However, I noticed that when I changed my model after turning on my isometric hidden line rendering, the rendering didn't update. What's wrong?

**A:** Remember that renderings, whether used in model mode or layout mode, are snapshots of your wireframe model at a specific time. As such, they have no direct link to subsequent changes in the model. To update your layout, return to model mode, delete the saved rendering, and process and save a new one to the same level. Now when you go back to layout mode, your rendered image in that particular instance will be updated.

For project record purposes, it's sometimes useful to save the isometric renderings, which represent the progressive stages of rendering. To do this, simply establish a logical sequence of levels on which you can save the progressive renderings. Here's a typical scenario:

Project Revision Number	Isometric Stored on Level BR
1	201 BR
2	202 BR
3	203 BR
4	204 BR

**Q:** I've used DOS CADKEY for many years. In Windows, how do I change Configurations settings? I used to type CONFIG at the c:\CADKEY prompt.

**A:** Things are a lot simpler in Windows. Just click on the Tools pull-down menu and then select Options. You can click on a series of dialog windows that let you change all of the major system parameters.

**Q:** When I save wireframe isometric patterns and retrieve them, they sometimes reappear in cockeyed orientations. What's wrong?

**A:** This is typically caused by failing to pay attention to construction planes that may be active during the process. The easiest way to avoid this problem is to set CP=DV (construction plane equals drawing view) prior to creating a pattern in View 7. Then be sure to also have CP=DV in your new file at the time you retrieve the pattern. You would, of course, also be in View 7 when you perform the retrieval.

**Q:** I have trouble using XPFORM, MIRROR with three-dimensional geometry in View 7. I always seem to use the wrong set of vectors.

**A:** It's very easy to mirror incorrectly in isometric view if you are not careful. A foolproof approach that works every time is to first switch to a system view perpendicular to the plane about which you wish to mirror geometry. Then with CP=DV, perform the mirror operation. For instance, to Xform, Mirror a feature from the right side of a model to the left side of the model, set CP=DV, switch to View 1 or View 2, and then Xform, Mirror the geometry about a center point of the model.

**Q:** When looking at a vertical bore geometry from the front or

side view, the single toolbar interferes with proper visualization of the feature. Is there a simple way to quickly create both horizon lines in either view?

**A:** As you've probably discovered by now, you can't snap a line at the ends of the top and bottom edges because they are really circles viewed on edge! However, there are several ways to approach this situation. Consider the following:

If you produce a dashed rendering of the side view, the wireframe is replaced with a more traditional view with proper horizon lines. In addition, hidden lines are shown as dashed entities. This is ideal for our final drawing, but is not as useful during initial concept work since the rendering is a static image. This image will not immediately represent changes to the associated wireframe model.

You can use Xform, Mirror, Copy in the front view to copy all toolbars from the right side to the left side of each hole (assuming the construction plane you used oriented circle ends at the right side). This must be done individually around the center of each set of concentric cylinders.

You might also break each circle into 90-degree arcs prior to extruding it into a cylinder. You then will create wireframe geometry with four toolbars for each hole or cylinder. The tradeoff is doubled toolbars at the center in each orthogonal view. However, these can be easily blanked (in layout mode) or deleted (in a straight pattern capture) for final drawings.

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# New ASME standards need careful study

By Robert W. Bean and Robert C. Yule

In the December issue of KeySolutions Journal, we presented an article entitled, "New ASME specs help designer say what they want." A few concerns were brought to our attention by John E. Winconek, who is a member of the ASME Y14.5M subcommittee on Dimensioning and Tolerancing. The following summarizes his comments to us with our responses or corrections where required. Please note that the original article was not intended to be an in-depth analysis of the use and application of the new standard, but merely an overview of the changes for users to be aware of.

The primary concern of Mr. Winconek was the original figure (Figure 14), which illustrated the differences and changes to the representation of positional tolerancing. He stated that we "mixed two distinct principles of position tolerancing" and that the figure implies "that compositional positional tolerancing and positional tolerancing using two

single segment control frames are the same." We agree completely with him that they are not the same and had not intended that the figure be interpreted that way. In addition, he pointed out that the second control frame of the two single segment control frames should not contain a tertiary datum, which is correct and was an oversight on our part. The corrected figures appear below (Figures 1 and 2).



Figure 1: Positional Tolerancing Using Two Single Segment Control Frames



Figure 2: Composite Positional Tolerance With Additional Datum References in the Feature Locating Control Frames

The other concerns of Mr. Winconek were less serious. The first was that the new Tangent modifier was missing from the example figure in the original article. This is correct. It was in the original graphics and somehow was missed in the proofing. The corrected example is shown in Figure 3.

The second concern was related to the pointed out Datum Reference Symbol. He felt it should have stated that the new method was



Figure 3: Tangent Plane Modifier Symbol

an "additional method" of indicating the diameter. Our company bias was toward the new method as it solves an internal programming problem related to the size of the datum target symbol. According to the standard, the diameter should be 3.5 x h (h-text height). As can be seen in Figure 4, the diameter text (at height h) would not fit in the upper area of the target symbol. This required that we increase the diameter of the target symbol to fit the text. The new method allows us to conform more to the standard, which is one of our primary goals.

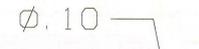


Figure 4: Datum Target Diameter Zone Representation

The third concern involved the original Figure 1 which illustrated the new (familiar to ISO users) ASME datum reference symbol. Mr. Winconek thought we should have included the rest of the dimensions for the correct proportioning of the symbol. Again

this was an oversight on our part, as the figure came from a document prepared to show the changes required for the new versions of DRAFT-PAK® and only the relevant changes were included. Figure 5 shows the complete dimensions for the Datum Reference Symbol.

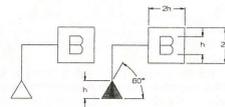


Figure 5: Datum Reference Symbol

Mr. Winconek's final concern was that, in our paragraph on Control Frames, we should have mentioned that the placement of the Datum Feature Symbol on the drawing is very important to the design intent. We agree completely, and it is true that all Geometric Dimensioning and Tolerancing symbol content and placement is critical to capturing correct design intent. That is why Bystate Technologies continually improves the DRAFT-PAK® product to ensure that only correct and compliant symbols are created.

In conclusion, it was never the intent of the article to be an in-depth analysis of the new standard. Our goal was to make readers aware of the changes and be prepared for any impact they might have on their organizations. It is the responsibility of the users of ASME Y14.5M - ASME Y14.5-1994 to procure, review and understand the standard before applying its principles. We hope this clears up any concerns other readers may have had. We welcome any and all comments.

## I / VECTOR Paper to CAD Easy as \$995.

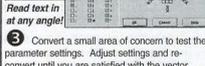
1 Preview the scanned image and select a drawing type. IVECTOR accepts RLC and Group 4 TIFF raster files for conversion.



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



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



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## INDUSTRY BRIEFS

### Informative Graphics Web Site

Informative Graphics Corp. announced its home page on the worldwide web. The URL for the IGC home page is <http://www.inforgraph.com>. The ftp site is <ftp://www.inforgraph.com>. IGC manufactures Myriad™, the leading viewer for electronic document management systems, and InViSo™, a viewer designed for use on the Internet. IGC's site features general information about electronic document management systems, such as lists of EDM organizations and selected trade shows. In addition, the site serves as host for Document Management magazine, a publication dedicated to the automation of document management.

### Mastercam Web Page Offers CAD/CAM Info

NC programmers, engineers and designers who browse the Internet can now get detailed information about Mastercam CAD/CAM software. Mastercam's page on the World Wide Web offers specifics about new releases, product demos, and general information about PC-based CAD/CAM for beginners and experts in NC programming. The address (URL) is <http://www.comatercam.com/mastercam>. The page also offer hot-links to other industry-oriented Web sites such as the National Institute of Standards and Technologies and the Manufacturers Information Net. Also included is an information packet titled "What Every Shop Needs to Know About Choosing a PC-based CAD/CAM System".

### ITI and CAMAX Announce Partnership

International Technogroup Inc. (ITI) of Milford, Ohio, and CAMAX Manufacturing Technologies Inc. of Bloomington, Minn., announce a corporate agreement. The partnership will provide data integration for the suite of computer-aided manufacturing software offered by CAMAX. CAMS developers will create new standard interface capabilities based on ITI's product data exchange library, PDE/Lib™. PDE/Lib is a leading component technology tool kit for data exchange.

### Myriad and Document Intergrate

Informative Graphics Corp. of Phoenix, Ariz., developer of Myriad™ universal document viewing software, today announced its integration with the Documentum Enterprise Document Man-

agement System (EDMS). Myriad software views, redefines and plots more than 100 vector (CAD), raster, word processing, database and spreadsheet formats. The Documentum EDMS is a family of open client/server software products designed to help Fortune 1000-class companies create and reuse their intellectual capital effectively across the enterprise. Integration between Myriad and Documentum allows a whole-product solution for customers who need to access documents in a managed environment.

### A/E/C SYSTEMS Survey Reveal Buying Plans

Building and construction executives announced that the annual A/E/C SYSTEMS Show reported they will spend an average of \$146,000 on information and automation technologies over the next 12 months. The survey, commissioned by show producers, polled a representative sampling of professionals among the more than 20,000 architects, engineers, designers, contractors and facilities managers drawn from the private, institutional and government sectors worldwide. Fifty-five percent of those surveyed at the Atlanta trade show event earlier this year represented companies with 100 or more employees. Strongest areas of product interest among A/E/C SYSTEMS attendees include: multimedia peripherals, graphic displays, personal computers, printers, and storage devices; new operating systems, particularly Windows 95 and Windows NT; application software for architecture and interior design; CAD/AE 3D modeling, animation and rendering; document management, database management, virtual reality and simulation and project management.

### Breakthrough on PC to Telephone Internet Calls

In a major step toward the convergence of the PC and the telephone, IDT, a leading provider of both Internet access and international long distance telephone service, announced it has developed a system that allows people to use their PC to make international phone calls over the Internet and communicate in real-time with people using regular telephones. The implications of this could drop the price of an overseas phone call to as little as 10 cents a minute, radically altering the economics of international telecommunications, as well as the ways the world uses the Internet and the ways people use their personal computers. For additional information, contact Jeff Parness at Internet.Services at 201/883-7949.

## Squiggle

### Squiggle helps user wiggle out of tight spot

By Claudia Martin

If you've seen ads for Insight Development's Squiggle (a software program that makes plot files look like hand-drawn sketches) by making the lines wiggly you may have thought that this product would have little value to you — especially if you don't require such sketches for presentation or artistic purposes. You may have even thought it really

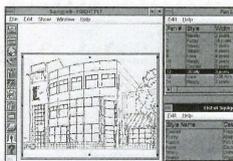
sounded more like an entertaining game than a serious product.

My thoughts were similar until I found a practical use for it when we needed to place several difficult HPGL files in a document. In fact, it made my day by solving some thorny problems and helping us meet a tight deadline.

First, how does Squiggle work? Squiggle reads HPGL or HPGL/2 files and lets you

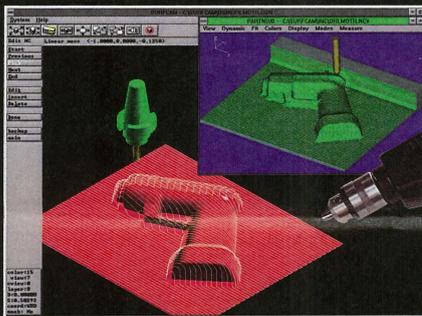
vary the width and color of up to 255 lines/pens. It also lets you apply an unlimited number of "hand-drawn" styles to each line. You can choose from seven preset styles that range from "carefully sketched with a drafting pen" to "scribbled on the back of a napkin." Squiggled drawing can be sent to any Windows system printer, copied to the Windows Clipboard, or exported as a Windows .WMF

See SQUIGGLE, page 17



A screen from Squiggle

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## P54TS

### All-in-one motherboard saves dollars

By Robert Martin

I recently built a Pentium system from "scratch" around a new high-end motherboard from Quick Technology. The P54TS™ Pentium PCI board was truly a Cadillac among boards — truly all in one. The final configuration of the system using the best components I could find included 16MB of RAM and a 1GB hard drive. The total price came in around \$1,800. The best part is that the system "smokes."

The price tag of \$495 for the motherboard is not a low-end price, but I definitely got every penny's worth. The board combines Adaptec® SCSI and Intel® Triton™ technologies and the pricing is actually about 20 percent lower than comparable solution implemented in more than one board. In addition, the board saves on real estate in high-end applications where heat can be a factor.

Available in three models — P54TS (Fast SCSI), P54TSW™ (Wide SCSI), and P54TSW™ (Ultra Wide SCSI), the motherboard features 128MB of memory and offers processor speeds ranging from 75 MHz to 200 MHz using single jumper solutions to set up each individual speed. Each motherboard also includes expansion slots for major industry bus designs including five ISA and 3 PCI slots. Cache size ranges from 256KB to 512KB.

The P54TS supports EDO/Burst EDO DRAM, COAST (Cache On a Stick), pipelined burst synchronous cache SRAM, and high-speed 16550 UART x.2. The board also supports PS/2 mouse and two Intelligent Drive Electronics (IDE) channels with Bus Master/DMA. The P54TS is fully compliant with Enhanced Parallel Port (EPP) and Enhanced Capabilities Port (ECP) IEEE printer for high-speed I/O.

These boards are easy to install in any IBM PC-compatible system. The P54TS measures 13.2 inches x 8.8 inches. All the SCSI motherboards feature a one-year parts/two-year labor warranty.

Orders can be placed directly with Quick Technology at 714/259-4500.

## FELIX

# Ergonomic mouse replacement provides many advantages

By Claudia Martin

When is a mouse not a mouse? When it's a Felix, of course. Felix, not the cat, is an input device that replaces the ubiquitous mouse and offers many advantages — not the least of which is superior ergonomics.

When we received a beta Felix evaluation unit several months ago, we started passing it around to get some varied opinions. It ended up on one person's desk and there it stayed — she wasn't going to part with it. When that employee left the company, her replacement also fell in love with Felix. But, the device developed a technical problem. The Felix user insisted on having another and would not be satisfied with an ordinary mouse. Altra replaced the beta unit with a production version (problem solved) and we avoided a personnel crisis. What caused this fierce loyalty?

Felix combines the best features of the mouse and trackball into a compact stationary unit that provides fingertip cursor control, all in an area of one square inch. The Felix combines a patented finger-activated ergonomic handle with an ingeniously designed tracking system and an intricate on-board micro-processor. By sliding Felix's handle only one inch in any direction, you can move the cursor anywhere on your screen, allowing for better control in maintaining precision and accuracy.

Felix does not take up much desk space. The entire unit is only six inches square — about half the size of most mouse pads, and it

## Felix the mouse

earns fierce  
loyalty from  
regular users

doesn't require a pad or special surface. Felix is so adjustable, you can perch it on a pile of papers, on the arm of your chair or even in your lap.

With the use of a mouse or trackball, you risk developing Carpal Tunnel Syndrome (or other types of RSI (Repetitive Stress Injury) to your wrist, arm or shoulder. Felix is designed to use your finger muscles, which can function hour after hour with no straining. Felix's ergonomic handle is very light and smooth, allowing movement with virtually no effort.

In addition, mice and trackballs pick up dirt and grease as they roll, and require frequent cleaning. Felix is a completely sealed unit, so it requires no cleaning or mainte-

nance. Felix's optical tracking mechanism uses no moving parts that can break or wear out. This makes Felix last more than twice as long as a typical mouse or trackball. In addition, Felix has incredibly high resolution. Compared to the 200 dpi offered by mice and trackballs, Felix operates at 640 dpi. This provides great precision and accuracy.

It must be said that operating the Felix feels really different. At first, it feels slippery — like ice skating compared to snow shoeing. In the beginning, it helps to know the mouse

speed setting in Windows all the way to slow. Even then it takes a little getting used to, but once you've learned the skill, it's great. However, this learning curve may take only a couple of hours.

Felix is available direct from Altra, at computer super stores and through catalogs.

The suggested retail price is \$119 and Felix comes with a full one-year guarantee.

For more information contact, Altra at 307/328-1342, 800/726-6115 or fax 307/328-1346.

**SQUIGGLE** from Page 16  
metafile or Windows .BMP bitmap for import into other applications.

A few months ago we received several plot files that were to be used in an issue of Key Solutions. At first, we converted them to .TIF files, the file format that usually works best for us. The results of this conversion were completely unacceptable. The line weights were so fine that they would not be legible in print and thus were unusable. Since it was not possible to get new files in time to meet our deadlines, we used Squiggle to manipulate the lines before we went to .TIF. Although we kept the lines perfectly straight (no squiggling required), we were able to change the colors and widths of every line until they were perfect for publication.

Once we were satisfied with the drawing

in Squiggle, we exported it as a .BMP and then converted it to .TIF.

The program was very easy to use and it comes with a well-written manual. However, because I am familiar with other graphic Windows programs, I was able to operate the program without even reading the manual and without getting frustrated. Squiggle's new Live Paper Space (LPS) looks and functions like a sheet of paper and acts as a true print preview. Images can be placed anywhere on the LPS and enlarged or reduced simply by dragging the scalable image.

This handy little program has definitely become one of our tools for working with graphic files.

Squiggle 2.0 has a suggested retail price of \$39. It is available from MicroWarehouses at 800/367-7080, software resellers, CAD Dealers and from Insight directly at 800/825-4115.

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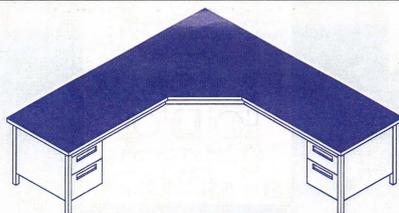
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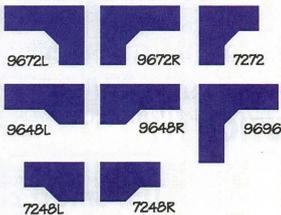
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## UPDATING YOUR CUSTOM TOOL BAR TO DATA CAD 7

By Carol Buehrens

Many people complained about the size of the icon tool bar in DataCAD 6. Now, with DataCAD 7, you can change your icons to smaller sizes. This article deals only in changing the existing .key files you've already customized using these KeySolutions instructional articles, and not creating one from scratch.

The trick to the smaller sizes is the ability to link the tool bar .key file to downsized icon files. There are now three sizes to choose from: large (l), medium (m), and small (s). Each icon size is expressed in its name, such as "change\_l" (large change icon), "change\_m" (medium change icon), "change\_s" (small change icon). As before, all of the icon .pof files reside in \vcdcad\sup\menupof\.

You can look in the new DataCAD reference manual for updated information on the key and pof files. In fact, look at pages 1-10 through 1-15. If you've been following the articles in KeySolutions about customizing your tool bar, you'll find this an extremely interesting new section.

For this exercise, we'll use the .key file you created for your multiple scale dimension setup. (See KeySolutions Journal, February and March 1995.) Part of this file is illustrated below.

You'll want to change the icon names, which appear in the fourth field, to call the new, smaller icons. This file uses only two icons: Dimension and Text. The replacement files are DMENSN\_S and TEXT\_\_S. You'll see these new .pof files if you perform a directory listing of \vcdcad\sup\menupof\.

You can use the Edit DOS option to edit your .key file. First, either shell to DOS from DataCAD or quit DataCAD to return to DOS. Then, type in: cd \vcdcad\sup\menupof and press Enter. (Note: Your DataCAD directory may be called DCAD5, DCAD6 or DCAD7, depending on how you set up your system.)

Copy the key file you want to edit. In this example, we'll use the DIMSETUPKEY file we created in an earlier article. Call the new copy something that indicated the smaller icon size, such as DIMSET\_S.KEY. Type in: copy dimsetup.key dimset\_s.key and press Enter. If you have a printer, print out a directory listing of the pof files for your reference, by typing in: dir \*.pof >prtl and press Enter. Look for the new files that have a "\_s" designator in them.

Now, edit your copied key file. Using our example, we would type in: edit dimset\_s\_key and press Enter.

Using the printout as your reference, find the new small icon files you'll use, and type them in the icon field, making sure that all vertical bars still line up with the first two lines in your file. Your new files may look like the partial file shown below:

```
A| Dimension |DMENSN_S |^+^+^+^F8^F1^S3^F1^.8^$^F9^.6^$^S5^
A| Text |TEXT__S|^+^+^+^S6^F1^L1^$^;^+^+
A| Dimension |DMENSN_S|^+^+^+^F8^F1^S3^F1^.4^$^F9^.3^$^S5
A| Text |TEXT__S|^+^+^+^S6^F1^.6^$^;^+^+
A| Dimension |DMENSN_S|^+^+^+^F8^F1^S3^F1^.2^$^F9^.1.1/2^$^
```

When you are through editing, select the File, Exit, and Yes (to save) options. Either type in exit to return to DataCAD (if you shelled out), or start DataCAD. Go to the Utility, Display, Menu, IconFile options. Then pick up your new file, such as DIMSET\_S.

Note: The first icon in the .key file sets up the size of the tool bar boxes. If the first icon is small, all the boxes in your tool bar will be small. Any large icon files that are still being called won't be displayed (the box will be gray). But, the good news is the tool will still work. Good luck editing your tools bars.

```
!
*|01|
A| Dimension |DMENSN_S|^+^+^+^F8^F1^S3^F1^.8^$^F9^.6^$^S5^
A| Text |TEXT__S|^+^+^+^S6^F1^L1^$^;^+^+
A| Dimension |DMENSN_S|^+^+^+^F8^F1^S3^F1^.4^$^F9^.3^$^S5
A| Text |TEXT__S|^+^+^+^S6^F1^.6^$^;^+^+
A| Dimension |DMENSN_S|^+^+^+^F8^F1^S3^F1^.2^$^F9^.1.1/2^$^
!
*|01|
```

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## A FIRST LOOK AT DATA CAD 7

By Carol Buehrens

The DataCAD 7 release arrived at my doorstep two days prior to my deadline for this article, so I rushed to get it loaded and see what it was all about. I was happy to see it contained all new manuals. It loaded easily, without any surprises. I eagerly printed out the on-line documentation, which lists many of the software's new features, along with some known problems at the time of release.

What follows is a smattering of a few things I discovered about the new software (I didn't get very much time to explore). I will document more in the next issue.

### New messages

You'll notice a change right away. At the opening menu, the current drawing directory is displayed: Currently searching

'CADGACD\PROJ01\ for files matching \*.DCS'. Now, wherever there is a file list (i.e. templates, plot files, etc.), you'll know which directory you're looking in. There are subtle message changes throughout the entire system.

### Small icons

The first feature I wanted to check were the "custom-sized icons," available for the tool bars. I was hoping it was going to be an easy trick to change my large tool bars (which take up entirely too much real estate on my small screen) to a much smaller, compact size. Perhaps it was just a new menu option? Not so. While new tool bars are available with the smaller-sized icons (try picking Utility, Display, Menu, IconFile, then the file called s\_dcad2), any custom bar .key file you've created must be updated. (See the article in

this issue, "Updating your customized icon tool bar.")

### Layer locking

Another anxiously awaited feature is "layer locking," or what some users call "freezing." This new addition, which protects identified layer(s) from modifications, is cleverly executed and straightforward. You simply go to the Layers menu and pick Lock, which displays the list of layers. Once you pick the layer to lock, an X appears over the layer's function key number, as in Figure 1. Now that layer is "frozen" from any changes.

Yes, you can still "object snap to" and "trim to" items on this layer!

One thing is a bit confusing about this fea-

Figure 1: An X appears to indicate the layer is locked

F1	Border
X	Walls
X	Doors
X	Windows
F5	Cabinets
F6	Plumbg
F7	Elect
F8	Dmnsens
F9	Closets
F0	HVAC

ture. You can still Tab to a locked layer to make it active (for no apparent purpose). As a reminder that you're on a locked layer, a small X appears by its name in the status area, as shown in Figure 2. You'll want to pay attention to this X, because even though the layer is active, you cannot build on it. In other words, you can try to draw a wall, but no lines will appear and no message will be displayed. You can also delete part of a line on this layer, but upon refreshing the screen (press Esc), the line will appear whole again. The layer is, indeed, protected.

A word of caution! If you go to an editing option that displays a layer list,

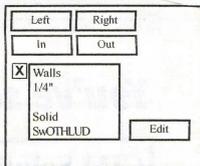


Figure 2: The active layer is locked

such as Copy, ToLayer, the locked layer is displayed (with an X), and you can still pick it. This is a bad maneuver, because you will get "anomalous" results. For example, any item you select for copying (from another layer) really will be copied, but not onto the locked layer! Items are copied to the same layer the original entries reside on. This means many items can be copied on top of themselves. This is a potential hazard and will probably be corrected in the future. (How about a message "The chosen layer is locked, try again?") Other than this "anomaly," layer locking gets "thumbs up!"

### New Walls

I had to get back to work, so I called up a floor plan to add some new walls. The drawing was set to draw walls by "Sides. I pressed the [e] key to change the width to 6", then object snapped to an existing wall corner. After defining a length, I picked on the inside to indicate the "other wall line." Everything seemed normal. Then I defined the next wall length, at which time the entire wall appeared without having to define the inside pick! I continued defining the new walls and they appeared instantly. What a timesaver!

## LET'S FACE IT!

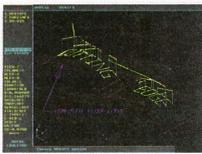
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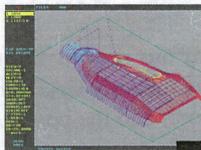
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CIRCLE 211 ON REPLY FORM

See FIRST, page 23 >

## DATA CAD 7: COMMENTS AND QUESTIONS

Will all the macros and third party software be compatible from Ver 6.0 to 7.0? I have many, many cheap "Flicks" disks that I use. Will these be compatible?

**Dick Reinhold Architect**  
reinhold@ic.com

Everything that works for DataCAD 5 and 6 will also be compatible with DataCAD 7 as far as we can determine from our beta testing. There is just one little "bump" in the road in that the new multi-line function in DataCAD 7 (i.e. drawing 3 or 4 lines at once) depends on the definition of the middle line(s) as being "defined by their center. Some of the "infill" type lines that we offer on Chesapeake are defined by drawing them one side or to the other (as we find that easier).

So, we will need to update those a bit to get them to work so that you can use them with the multi-line function to draw walls complete with hatching or infill in one step. In general, DataCAD 7 uses the same file format as the macros in DataCAD 5, so you shouldn't have any problem with most of the add-on stuff also working for 7.

**Evan Shu**  
eshu@world.std.com

Believe it or not, I'm still running DataCAD 6 on my old 386 when I work at home. Will DataCAD 7 run on the 386 as well?

**Alan Kauter**  
akauter@encyclomedia.com

DataCAD 7 has the same system requirements as Ver. 5 and 6, so it will work on your "old" 386. Thank you for your support.

**Mark E. Madura, vice president**  
AEC Product Group Cadkey Inc.  
maduram@cadkey.com

What printers are supported by PrintAPIlot Pro? The list of printers supported by PrintAPIlot Pro is quite extensive and much too long to include here. The list is posted on the CADKEY BBS in the DataCAD area. The filename is PPP\_SPT.ZIP. The ZIP file contains an ASCII file that lists all the printers directly and indirectly supported by PrintAPIlot Pro.

We have been playing around with our DataCAD 7 for the last few days and must say that this is an impressive piece of work. Install went smoothly on staff machines, but minor file cleanup was required for mine (bad filing "ghosts" from the past). The added features are sure to make production and communication with consultants (and each other) easier. The best part, though, is the "Bonus Productivity Pack" from Madura Studios; this alone was worth the price of admission!! "Super Job" to Mark, Rick and crew!

**David K. Sargent**  
Sargent Design Associates, Inc.  
Springfield, MA

The biggest productivity hit for us was the new multi-line wall feature. Interestingly enough, DataCAD will not let you insert doors, windows and provide intersection cleanup functions for entities other than walls. And when I say "walls," I mean items that are created through the drawing of two or more lines at the same time. No longer can you make a line, copy it, and have DataCAD read the item as a wall. This is especially frustrating when you're working on old-fashioned or remodeled projects where there's a little bit of "license" in making as-built. I hope a "fix" is on the way shortly for this item - I'm getting close to reinstalling DataCAD 6 just to avoid this big ol' pain in the

butt. The readme file mentions the cleanup problems but makes no mention that the same problem exists when entering doors or windows.

**Kevin Shertz**  
Alan Sparger & Associates, Architects  
Takoma Park, Maryland

Is it true that the template files can remain on the CD version, thus saving precious hard disk space? Is this an automatic install option, and how does this relate to old drawings?

Yes, you can now keep all your Symbols on the CD-ROM taking up less space on your hard disk. The downside, however, is that you cannot modify or add your own extras to the CD-ROM, as you can if they are on your hard disk. Also, access is a bit slower from CD-ROM. So it really depends on your particular situation, and office practice.

**Ed Wolfstein, AIA, MRAIC, NCARB**  
Burlington, Vermont  
ewolfstc@together.net

Although I try to use walls whenever possible - the reality is that many times you don't have the data you need to assume wall thicknesses. This is especially true in a situation where you're working with as-built conditions, and you can't assume that an interior wall is a 2x4 with 1/2" gyp. board on each side. What if it's plaster? This is a minute example, I know, but it is an example

of some of the limitations that one may encounter. In the past, the ability to read "offset" lines as walls and entities drawn as walls has not been co-existed. All I'm asking is that this is continued in DataCAD 7?

It's correct in that lines created to represent walls in earlier versions of DataCAD cannot have doors/windows inserted or any of the intersection cleanup functions performed on them in version 7, unless they were created as walls (Architect menu) in the earlier versions. If, in an earlier version of DataCAD, you created WALLS and not just lines, these walls will work fine in DataCAD 7. In the past DataCAD did not care if the "walls" were created with the Walls function or just creating a line and making a copy of it, but in Version 7 there is a difference and it becomes necessary for the current version of DataCAD and for future versions to come. The WALLS created in version 7 can be modified (copied, moved, rotated) as a wall or as single entities and still remain intact as a WALL. For those that have older drawings and need to modify entities that represent walls, but were not created using the Walls function, we will be releasing a macro that will allow you to select existing lines and turn them into a specific WALL type. I also believe Bruce Kaplan has a macro or will have one shortly that will allow you to do the same thing. Everyone is screaming for us to advance our technology and this is something we are trying to do. In the process, we may change the way things were

done in the past to improve and enhance the product in the future. Change is one of the hardest things for people to accept, but usually in the long run change is good. Also, on the subject of walls, we have added the ability to save/load walltypes. This feature will be in the next update of DataCAD. Please keep the comments and suggestions coming because WE ARE listening.

**Jim Evans**  
DataCAD Technical Team

Some users have identified a few situations where DataCAD 7 will give a "No walls found to cut" message. These situations have been identified and Cadkey Inc. is working on a corrective action. In order to correct this situation in the interim, ARCHSOFT is pleased to announce that we are including our new "Make Walls" Macro with each DataCAD 7 ordered. The "Make Walls" Macro is found on the ARCHSOFT Bonus disk. For those who have previously ordered from ARCHSOFT, the Macro has been E-mailed to you.\* For those who haven't ordered DataCAD 7 yet, you can request an order form by sending a message to:

**Bruce Kaplan**  
ARCHSOFT  
Burke, VA

73613.2703@compuserve.com

\*"Make Walls Macro"™ 1996 ARCHSOFT is proprietary software distributed for the exclusive use of ARCHSOFT clients. "Make Walls" Macro is neither freeware nor shareware.

### SPIRIT — DataCAD

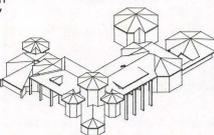
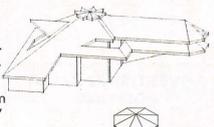
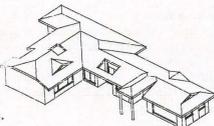
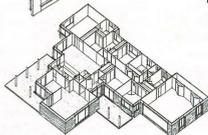
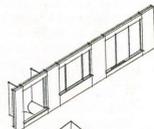
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## WALLS MADE EASY IN DATA CAD 7

By Carol Buehrens

Look out DataCAD 7 users! Drawing specialized walls has never been easier. This new release allows you to create centerlines in your walls automatically, and veneered walls and cavity walls in one fell swoop. How does it work? Let's look at the new Architect menu for clues.

When you first go into this menu you'll notice drastic changes. The first five functions have been changed to these choices: **Walls (on or off)**, **2 LnWall**, **3 LnWall**, and **4 LnWall**. These options work with new options located lower on the menu, F6 through F9, which are displayed depending on the LnWall option you have set. For 2

**LnWall**, the options displayed are: **Width** and **Hilite**. For 3 **LnWall**, the options displayed are: **Width**, **CenterLine** and **Hilite**. For 4 **LnWall**, the options are: **Exterior**, **Interior**, **CenterLine** and **Hilite**. You now have three choices for defining these walls, which appear in S1 to S3: **Outside**, **Inside**, and **CenterWall**.

To practice using these new options, you'll want to follow these steps using a new drawing.

### Two-Line Walls

Create a simple two-line wall, the most similar to the original "wall" functions:

1. Press [A] to go to the Architect menu.
2. Pick the **Walls** option to make it green (active). Pick the **Width** option and set it to 6", then press **Enter**.
3. Pick **2 LnWall** and **Outside**. This will allow you to draw the wall by defining the "outside" wall line.
4. Pick in the drawing area of your screen, using the left-most mouse button

(button 1). Move the cursor to the right about 20 feet and pick to define the length. Now move the cursor up above your wall line and pick again for the inside of your wall. The wall will appear, as in figure 2.

5. Move your cursor up vertically about 20 feet. Pick for the second wall length. The wall will be drawn, with the inside of the wall automatically created on the left side, or what would be the "inside" of your exterior walls, as in figure 2.

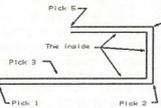


Figure 2

6. Now move the cursor to the left about 10 feet. Pick again, and again the inside wall is created automatically.

7. Using the **Inside** option allows you to define the wall by the inside wall line and using **CenterLine** allows you to create the wall about a center dimension.

### What this option doesn't do

You can't perform a "quick change" from the **Outside** to **Inside** setting as you draw. You must stop the line and start a new line to change offset sides.

### Three-Line Walls

Creating three-line walls is easier than ever. This function is particularly helpful when you wish to either fill a wall with a solid line or with a special linetype, such as insulation.

1. Pick **3 LnWall** and **Outside**.
2. Pick the **CenterLine** option which appears at F7. Now three options, **Color**, **LineWgt** and **LineType** are displayed.
3. Pick the **LineWgt** option. Pick the value you wish to use to create a thick, solid wall. (We used 5.) Press **Enter**.
4. Pick the **Color** option and then the color you wish for the center line, such as Blue.
5. Press the right-most button on your mouse (button 3) to exit this menu, returning to the Architect menu.
6. Pick in the drawing area of your screen to start a new wall. Move the cursor to the right about 20 feet and pick again.

Now move the cursor up above your wall line to pick again for the inside of your wall. The wall will appear, as in figure 3, with the centerline drawn.

7. Move your cursor up vertically about another 20 feet. Pick for the second wall length, as shown in figure 3.

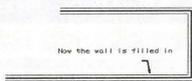


Figure 3

### Three-line insulated walls

This technique can be used with any linetype, but we show insulated walls as an

example.

1. Pick the **CenterLine** option again and pick **Linetype**. Pick the linetype you want the centerline to be, in this case **Insul**.

2. Press the [F] key to set the line factor. Since the wall width is 6", you might want to set the line factor for the insulation line to 2 1/2", so that the line is less wide than the wall. Type in .2/1/2 and press **Enter**.

3. Draw a new wall. Note the insulation centerline is drawn as you create your walls, as shown in figure 4.

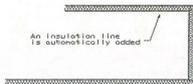


Figure 4

### What this option doesn't do

You can't offset the center line to one side or the other. You can, however, use the next option to achieve this look. (See **Specialty walls, Single-side veneer**.) Also, you can't define another layer for the centerline. (Use **EditSet** to capture these lines, using **Mask by Color** to quickly move these lines to an separate layer if needed.)

### Four-Line Walls

Four line walls are useful in creating specialty walls, such as a cavity wall as in this exercise:

1. Pick **4 LnWall** and **Outside**.
2. Pick the **Exterior** option. This option defines the exterior width, as shown in figure 5. Set the width you desire, such as 6", then press **Enter**.
3. Pick the **Interior** option. This option defines the interior width, as shown in figure 5. Set the width you desire, such as 4", then press **Enter**.
4. Pick the **Cavity** option. This option defines the **Cavity Width**, **Color**, **LineWgt** and **LineType**. The current settings are displayed at the bottom of the screen in the message area.
5. Pick the **Width** option to set the cavity width. Set the width you desire, such as 1", then press **Enter**. Pick the **Color** option and set the color you wish for the two interior cavity lines, such as Green.
6. Pick the **LineWgt** to 1 and the **LineType** to **Solid**.
7. Press the right-most button on your mouse (button 3) to exit this menu, returning to the Architect menu and draw your walls as before, this time noting that your walls are drawn with two interior lines, as shown in Figure 5.

### Two more specialty walls

#### Single-side veneer

1. Pick **4 LnWall** and **Outside**.
2. Pick the **Exterior** option. Set the width you desire for the veneer, such as 1/2", then press **Enter**.
3. Pick the **Interior** option. Set this to 0, then press **Enter**.
4. Pick the **Cavity** option, and set the **Width** to 6" for a 6" wall.
5. Press the right-most button on your mouse (button 3) to exit this menu, returning to the Architect menu, and



Figure 5

draw your walls as before, this time noting that your walls are drawn with a veneer line on the exterior, as shown in Figure 6. This same effect can be achieved by reversing the order of values for the interior wall, or by setting the widths to: **Exterior** = 1/2", **Interior** = 6", **Width** = 0, etc. Remember, whichever value you define as zero, there will be two resulting lines on top of each other.

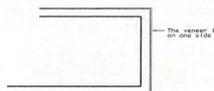


Figure 6

### Double wall with insulation (or other linetype)

This example is for two 4" abutting walls, but can be manipulated as needed.

1. Pick **4 LnWall** and **Outside**.
2. Pick the **Exterior** option. Set the width to 2", then press **Enter**.
3. Pick the **Interior** option. Set this to 4", then press **Enter**.
4. Pick the **Cavity** option, and set the **Width** to 2", then press **Enter**.
5. Press the [F] key to set the line factor. Since you'll fill a 4" space with insulation, set the factor to 1 1/2" and press **Enter**.
6. Draw your walls as before. Note that your lines are not automatically created with an insulation line. When your walls are finished, press [Alt] [C] to go to the **Change** menu. Pick the **LineType** option, and set it to **Insul**. With **Entity** active, pick the lines that will become the insulation lines, as indicated in Figure 7.

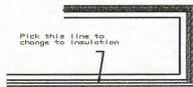


Figure 7

### What this option doesn't do

As with 2 LnWall, you can't define a separate layer for the cavity lines.

### Cleaning up your new walls

2-Line walls and 3-Line walls clean up nicely using both **Clean** in the Architect menu and **CleanUp**, **T-Intersections**, etc. 4-Line walls clean up a little differently. While they trim nicely to the adjoining wall, a gap will not be cut. But this is simple to work around using **Erase**, **Partial** when necessary.

Well, there you have it, some fun things to do with your new Walls menu. I'm sure you'll find of more uses as time goes by this new year. Good luck!

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# AEC TEAM PERSPECTIVE

BY MARK MADURA

VICE PRESIDENT, AEC PRODUCT GROUP

## DataCAD 7 release rounds out a very hectic year



On December 15th, we put the shrink wrap on DataCAD 7. I would like to thank everyone on the AEC team for the hard work and long hours that went into delivering this new product. Veteran DataCAD users will be pleased with the production-oriented enhancements that we have added.

The release of DataCAD 7 rounds out a hectic year end for the Cadkey AEC

team. Since June, we have produced DataCAD Plan Designer, four new DataCAD macros, the DataCAD SPIRIT evaluation CD-ROM, the limited edition Cheapware CD-ROM Vol. One, Cases Templates v2, and DataCAD 7.

### Network of Support

The December issue of Key Solutions represents a first for DataCAD. Not only does it focus on the roll-out of DataCAD 7, but it is the most comprehensive resource for DataCAD users ever published. It has an up-to-date list of U.S. and international dealers and distributors, training centers, user groups, educational dealers and third-party vendors. A condensed version of this support list also is included in the DataCAD 7 package — another first. We are approaching 100,000 registered DataCAD users and I want to

make sure all our customers are informed of all the support available. I hope you find these support listings invaluable to your success with DataCAD.

### DataCAD Plan Designer

If you're in the San Diego area of California, you can get a sneak preview of one of our newest products geared to small contractors and weekend warriors — DataCAD Plan Designer (\$99.95). This product is available at Home Depot stores on the West Coast. Plan Designer is geared to individuals who want to explore CADD designs, but don't require the advanced features of DataCAD 7.

### AEC Demo CD-ROM

We are producing a CD-ROM for Cadkey AEC products and would like to include your DataCAD work in our

CADD gallery. We also would like to feature these images on our World Wide Web home page. If you are interested in submitting your work (with full credit), please contact me directly.

### DataCAD Success Stories

We want to hear about your success with DataCAD. We are always looking for application stories. If you or one of your colleagues is doing something interesting or unique with DataCAD, don't be bashful. Please let us know. In the upcoming months you see some of our latest success stories featured in Architectural and CADD magazines.

Here's to a most prosperous '96, and thank you for supporting DataCAD. Communicate any way you can. As always, e-mail is the best route: [maduram@cadkey.com](mailto:maduram@cadkey.com)

### FIRST from Page 20

I pressed A to go to Architect and discovered a new, redesigned menu, as in Figure 3. [F1] is still Walls on or off, but [F2] through [F4] are three new settings: 2 LnWall, 3 LnWall, and 4 LnWall. \*Sides is replaced with three new options: Outside, Inside, and CntrWall. Though Outside and Inside seem redundant upon actual use, these wall options are very handy.

### Brand new manuals

Even the manuals have been redesigned and reformatted for ease of use. The reference manual appears to have all of the new features added as

well as making the explanations for the existing features easier to understand, adding several steps and illustrations for the actual use of the options.

The new tutorial fits into the redesigned manuals like a glove. The layout is easy to read and follow. The only significant problem I caught with my first impression was that several basic and more advanced features were not covered, as with the original Mastering DataCAD tutorial (included with DataCAD 4 and 5). One big zero to note was in using Default Drawings (never mentioned) and that setting pens is an "Advanced plotting feature."

However, a beginner should be up and running happily in less than two hours with this simple guide.

### More features

Other features that make the new DataCAD 7 update especially attractive are: Direct AutoCAD file importing (DWG drawing files); network file locking; the printing utility software Print-A-Plot Professional; multi-scale plotting; 3D roof framing; support for 50 linetypes; full screen capture to a file using [Ctrl] [F10]; the ability to link templates directly to tool bar icons; tool bars capable of having 50 icons; read-only symbol support (great for CD users); the TextScale option supporting a dynamic scale by using [Page Up] and [Page Down].

Figure 3: The new Architecture menu

F1	Walls
F2	2 LnWall
F3	3 LnWall
F4	4 LnWall
F6	Exterior
F7	Interior
F8	Cavity
F9	Hilite
F0	Change
S1	Outside
S2	Inside
S3	CntrWall
S4	CntrCvty
S5	Clean
S6	Cap
S7	DoorSwng
S8	Windows
S9	CutWall
S0	Exit

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