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KEYSOLUTIONS

THE PROFESSIONAL JOURNAL FOR CADKEY & DATACAD USERS • VOLUME 4 NUMBER 6 • AUGUST 1995

Basilica of Saint Mary of the Immaculate Conception in Norfolk, Va.

DataCAD works miracles for church architects

Info management, flexibility a blessing for design firm

By John Yurko

The decision two years ago to purchase computers and engage the use of CAD did not come easy for CMA Group, a six-person firm specializing in church architecture and furnishings in Asheville, N.C. Two things forced us to take the plunge: the existence of projects nationwide and the need to constantly revise drawings (a costly and time-consuming task when done manually). Some of us had experience using other CAD programs, but a strong recommendation from a friend who had switched his whole firm to DataCAD helped us decide to commit. Since then, we have found DataCAD works well for design and also for many of our specialized tasks.

DataCAD at WORK

Producing sets of construction documents is only a small part of our firm's production and services to our clients. DataCAD's DXF translator does, in fact, allow us to communicate this information freely with clients, consultants and review boards for projects in our area and in faraway states with equal ease. However, a large part of our services

See CHURCHES, page 10 ⇨

Designer, CADKEY make beautiful music together

"Without music life would be a mistake." Friedrich Nietzsche

By John Brombaugh

CADKEY at WORK

Building fine pipe organs, an ancient craft dating back to the Middle Ages, is one that I've taken as my vocation in the purest sense of that word. My small company in Eugene, Ore., custom designs and manufactures traditional tracker-action pipe organs, the type played by great musicians, such as Johann Sebastian Bach. Tracker organs (from the Latin tractus meaning "to pull," as in the English "tractor") use a direct mechanical key linkage to connect the player's fingers to the valves, which let air into the pipes. This original form for the pipe organ, developed before the Middle Ages, began to be replaced by pneumatic or electric systems invented during the Industrial Revolution. These developments made it possible to build very large organs that were supposedly easy to play from keydesks that could be placed far away from the pipe work. However, leading 20th century musicians, beginning with Albert Schweitzer, realized that the musical sensitivity still found in the ancient organs was lost by these new systems. I am pleased to be part of a strong movement around the world to recover the advantages of tracker action.

How did this 20th century man find a life's work like mine? I'm not sure, but I have always been interested in classical organ music — even when I was a kid. My education beyond high school was technical — Electrical Engineering at the University of Cincinnati (bachelor's degree in 1960) and Cornell University (master's degree in electrical engineering in 1963) — but during those college days I was fascinated by the ancient organs that could be heard on LP recordings. My fascination led to moving my family to the greater Boston area in 1964 to begin an apprenticeship with two fine builders of mechanical action organs. After completing an apprenticeship and a "journeyman" period in Hamburg, Germany, I set up shop in 1968 near my hometown in Ohio to design and build tracker organs. In 1977, after I discovered the beauty and charm of the Northwest, we moved the whole operation to Eugene. The combination of my deep interest in organs, involvement in "high-tech" stuff, and an engineering education, laid the foundation for the interesting paradox that has become my business: blending modern and ancient technologies.

The Brombaugh organ at Lawrence University in Appleton, Wisc.

My first CAD program in 1987 was VersaCAD, but times change. VersaCAD is no longer in business and I now have selected CADKEY for its mechanical design strengths. In the old days, I made hand sketches, not even formal drawings, to give to my shop colleagues, but our organs were smaller and simpler then. The large organs we have produced since then would have been almost impossible. CAD also makes possible design upgrades that I probably would not have done if I had been obliged to go through manual redraws. And, now, I can make

See ORGAN, page 22 ⇨

AEC Product Group gears up for new era

By Mark Madura
Vice President
Cadkey AEC Product Group

AEC TEAM PERSPECTIVE

Editor's note: The AEC Team Perspective is a new column in KeySolutions. It is written by Mark Madura, the newly appointed vice president of Cadkey's AEC Systems Group. The column will appear as a regular feature in each issue of KeySolutions.

My appointment as vice president of the Cadkey AEC Product Group is truly an honor. I appreciate all the encouragement I have received — both at Cadkey and from the wider community of DataCAD users. I also am pleased that I will be able to let you know what's happening in the AEC Product Group and discuss some broader AEC concerns in every issue of KeySolutions. The "AEC Team Perspective" will be a regular feature.

This is just the beginning of a whole new era for AEC products at Cadkey. For one thing, it's the first time Cadkey has dedicated a person at the vice president's level solely for AEC products. Frankly, when Cadkey offered me the position, I simply could not refuse. As a longtime user and value-added reseller, my commitment to DataCAD runs deep and this was the perfect opportunity to "make a difference." One of my immediate goals is to draw on my outside experience, assess what is reasonable on the inside and to make decisions that maintain a balance between the two.

I have supported DataCAD for many years, so I think I will be particularly sensitive to the needs of dealers. Dealers should be respected as the people who support the product out on the front line. Going to direct mail had a big impact on DataCAD dealers. It's important they know we appreciate and

See AEC, page 17 ⇨

Contents

AUGUST 1995

KeySolutions

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Customer Service	203/298-8888 x8031	Internet FTP site	ftp.cadkey.com
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101	131	160	190	219	249	278	308	337	367	396																
102	132	161	191	220	250	279	309	338	368	397																
103	133	162	192	221	251	280	310	339	369	398																
104	134	163	193	222	252	281	311	340	370	399																
105	135	164	194	223	253	282	312	341	371	400																
106	136	165	195	224	254	283	313	342	372	401																
107	137	166	196	225	255	284	314	343	373	402																
108	138	167	197	226	256	285	315	344	374	403																
109	139	168	198	227	257	286	316	345	375	404																
110	140	169	199	228	258	287	317	346	376	405																
111	141	170	200	229	259	288	318	347	377	406																
112	142	171	201	230	260	289	319	348	378	407																
113	143	172	202	231	261	290	320	349	379	408																
114	144	173	203	232	262	291	321	350	380	409																
115	145	174	204	233	263	292	322	351	381	410																
116	146	175	205	234	264	293	323	352	382	411																
117	147	176	206	235	265	294	324	353	383	412																
118	148	177	207	236	266	295	325	354	384	413																
119	149	178	208	237	267	296	326	355	385	414																
120	150	179	209	238	268	297	327	356	386	415																
121	151	180	210	239	269	298	328	357	387	416																
122	152	181	211	240	270	299	329	358	388	417																
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																
126	156	185	215	244	274	303	333	362	392	421																
127	157	186	216	245	275	304	334	363	393	422																
128	158	187	217	246	276	305	335	364	394	423																
129	159	188	218	247	277	306	336	365	395	424																
130	189	248	307	366	425																					

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What platform do you use? ❒ DOS ❒ Windows

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CADKEY Communiqué

CADKEY In the News

Success at AEC '95

Cadkey Inc. showed the new CADKEY for Windows and DataCAD 6 with the new Estimator Link at AEC '95 in Atlanta, Ga. More than 20,000 people attended the annual show. According to new AEC product manager Mark Hyjek, "The response to the Estimator Link was extremely positive. Customers view this as an effective time- and cost-saving utility."

Personnel Changes

Andy Hidalgo, formerly of Cadkey Inc. has joined Baystate Technologies as vice president of sales and marketing. His primary responsibility at Baystate will be development of a global distributions channel. Baystate Technologies is the developer of DRAFT-PAK, a drafting and productivity tool with more than 10,000 customers in the CADKEY environment alone. Versions of DRAFT-PAK for AutoCAD®, Microstation® and Ashlar Vellum® also are available.

New AEC Managers at Cadkey

Mark Madura, new vice president of the Cadkey AEC Systems Group, has appointed Mark Hyjek as AEC product manager. During his five years with the AEC technical services group, Mark has been responsible for a variety of technical support, demonstration, quality control, and product development tasks. In his new role, he will be responsible for overseeing the AEC product line development, sales, distribution and marketing programs.

Student Prices for DataCAD

Students currently enrolled in a full- or part-time degree program can purchase DataCAD Pro v.5.0 at $34.95 delivered. For more information, contact Pete Mancini at Cadkey.

CADKEY for Windows NT and 95

Cadkey Inc. is currently shipping CADKEY for Windows NT and Windows 95. This makes Cadkey the first CAD vendor to ship to these platforms.

CADKEY Wins Machine Design Editor's Choice

CADKEY for Windows won the Machine Design Editor's Choice Award for 3D CAD. Machine Design editors wrote, "CADKEY for Windows takes the complexity out of drawing and modeling. Special new features let designers create CAD models with up to 50 percent fewer keystrokes than in other versions."

CADKEY for Windows SDK Released

Cadkey has released the CADKEY for Windows Software Developers Kit (SDK). Developers interested in this program may contact Elaine Jones at 203/298-6439. Potential participants must complete a Strategic Partner Application which asks for product description, target market, and marketing/sale strategies. The CADKEY for Windows SDK is $99.

CADKEY/DataCAD Students Win VICA Gold

Students using CADKEY and DataCAD won gold and silver medals in this year's state VICA (Vocation Industrial Clubs of America) competition in New England. The medalists' next step is the national competition in Kansas City, Mo., this summer.

The talented winners were Jeff Beaule, architectural CAD gold medalist from Lewiston Regional Technical Center, Maine; Jeremy Rathbun, architectural CAD gold medalist from Adios County Voc. Tech Center, Vermont; Tyler Beck, mechanical CAD gold medalist from Addison County Voc. Tech Center, Vermont; Jeannine Fritz, architectural CAD gold medalist from Dover High School, New Hampshire; and Shannon Kastberg and Terry Romero architectural CAD silver medalists (tie) from Dover High School, N.H.

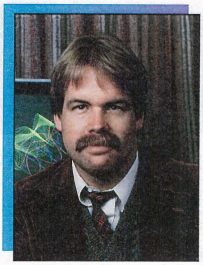
CADKEY for Windows Textbook

MicroComputer Education Systems recently released "The CADKEY Windows Workbook." The training book covers design, title blocks, modeling, detailing sections, and more for CADKEY 7 for Windows. The price is $19.95. For information, call 216/793-2730.

CADKEY & the Technology Program of the Year

Kingswood Regional High School, chosen as the New Hampshire Technology Program of the Year, uses Cadkey products in all subject areas, including wood technology, microcomputer repair, tech drawing, metals technology and computer applications. Students use the program to complete wood projects with a CNC router, design homes, design the chassis used for electricity design projects, and develop drawings to generate drill cycles for drilling PC boards on a CNC mill. The Department of Metals Technology uses CADKEY and CUTTING EDGE to generate and machine components on CNC machines.

The department's goal is to expose the more than 400 technology students to computer-aided design. "We selected Cadkey products as the standard because they are easy to teach and understand," said Charles Horsken in the metals technology department. "Cadkey's educational pricing has made it affordable and the support from the Cadkey representative, Tech Ed Concepts, is outstanding." To reach an area Cadkey education representative, call 800/394-2231.



President's Perspective

By Livingston Davies • President, Cadkey

Virtual crystal ball sees all

In June, I had the pleasure of participating in a panel discussion at Electro '95 in Boston on the subject of "The Next Generation: CAD/CAM/CAE." It was organized by Carl Machover, one of the luminaries in the field of CAD technology and a personal friend. Carl also invited Howard Cohen (president of the Boston Computer Society CAD User Group), Ken Spencer (president of Autodesk MEC Systems), Dick Miller (former vice president of marketing for Aries Technology), and Mike Wheeler (vice president of product development for Rasna, recently acquired by Parametric Technologies Corp.).

Carl's charge to each of the panel members was to look into the future and to describe what we saw. We were not to shrink from controversy. After suitably examining tea leaves or looking into a crystal ball (virtual of course), each of us described our vision of the future.

There is emerging consensus as our market matures. The clear trends on which we all agreed were: 1) the "commoditization" of CAD, 2) the convergence of desktop engineering with office automation, and 3) the end of the operating system wars. These interrelated trends imply substantial change and great opportunity both for suppliers and consumers.

Although there are many new features and flashy technologies being touted by some vendors as the greatest thing since sliced bread, there is clearly an overriding desire by consumers to have popular features at popular prices on common hardware. This is the same trend we saw in the office automation market some years ago. Five years ago, you needed to spend around $2,000 to purchase Microsoft office automation tools. Now you can get the entire suite for less than $200. And what you get for one-tenth the price today contains far more than did the $2,000 product set of yesteryear. It also contains much more than you probably need in your daily work. When was the last time you wrote a macro for your word processor? When was the last time you embedded an e-mail object in your spread sheet? Today, fundamental (and nearly equal) feature sets are provided in essentially all office automation products.

A similar "commoditization" trend is now rapidly occurring in desktop engineering tools. All systems basically provide the same fundamental features. They are differentiated only at the margin. And users are now voting with their wallets that marginal features are not worth thousands of dollars except for specialized applications. Integrated parametric virtual variational rendering may look impressive, but most users want easy-to-use systems which have the features they need on a daily basis and which do not cost more than a few hundred dollars.

The second generally observed trend about CAD is its move toward integration with the office automation market. The market is much larger for products which integrate well with office tools. Engineers and architects do work other than design work, and they want their work to be directly compatible with other tools. The most commonly used tool for engineers is the spreadsheet, not the CAD system.

Fortunately for software developers, the operating systems wars of the past decade are now nearly over. Microsoft has emerged the clear winner. The particular flavor of Microsoft's operating system is not of major importance either to vendors or to end users. Microsoft has stated its intention of having a single operating system a few year hence, so differences between Windows 3.1, Windows 95, and Windows NT should be regarded as temporary. OS-2 and Macintosh OS lost the race because IBM and Apple historically promote proprietary systems in order to leverage hardware sales (recent strategy changes notwithstanding). Unix lost because vendors could not agree on a standard. There are too many incompatible flavors of Unix. The emergence of a defacto standard will simplify things for both users and developers.

The days of the multi-thousand dollar CAD system are nearly over. CAD system prices have defied gravity for years. Cadkey Inc. continues to lead the way with popular functionality at popular prices on popular platforms.

Cadkey Developer's Network on World Wide Web

Cadkey Inc. has opened a Cadkey Developer's Network on the World Wide Web. Cadkey third-party developers can download, at no charge, all the tools necessary to produce software products compatible with CADKEY for Windows.

According to Livingston Davies, president of Cadkey Inc., "This makes state-of-the-art Cadkey development tools available to software developers worldwide. By using Internet, we have lowered costs and improved response to third-party developers."

Cadkey Inc. is a leading producer of 3D CAD software for both mechanical and architectural applications. It maintains one of the world's largest third-party CAD application development networks in the world.

Contact Cadkey Inc. by phone at 203/298-8888, through the World Wide Web at *http://www.cadkey.com*, by e-mail at *info@cadkey.com*, or by snail mail at Cadkey Inc., 4 Griffin Road North, Windsor, CT 06095

Cadkey Inc. Price List Effective through August 30

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*
CADKEY 7 FOR WINDOWS	
CADKEY / Windows (3-1/2" or CD ROM) – SRP	$795.00
CADKEY	
CADKEY Professional 7 (3-1/2")	$1995.00
CADKEY 7 DOS (3-1/2")	$ 795.00
CADKEY Light 7	$ 99.95
SOFTWARE FOR EDUCATION	
EduCAD America Program - DataCAD & CADKEY	
Call for Program Details/Costs	
(Contact: Pete Mancini, Cadkey Education Dept., 203-298-6420 or FAX 203-298-6590)	Call for Quote

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

CADKEY for Windows — What's New (Or how I spent my summer vacation)

By Ken Erman

It may be the dog days of summer, but at Cadkey we have been keeping busy with another update CD scheduled to ship in late July. This update will include the latest version 7 releases of CADKEY for Windows and CADKEY DOS. The DOS version will be CADKEY 7.0.5. Complete details of the changes in CADKEY DOS 7.0.5 will be included in a README.705 file on the CD.

CADKEY for Windows Release 2 will contain several enhancements not available for the original version that shipped this spring. A complete list of CADKEY Windows enhancements will be accessible via a README icon at installation.

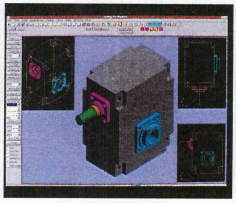
A partial list of changes and enhancements for CADKEY for Windows Release 2 follows.

New Tools Included

- FastLite, a basic surfacing program from FastSURF
- Advanced Drafting Module, the enhanced detailing CDE from Baystate Technologies
- The CKLisp CDE, a LISP interpreter from BitWise Solutions

Enhancements

- Users can assign functions to mouse buttons and assign up to eight additional functions to a three-button mouse.
- CDEs that are no longer necessary can be closed. This will free up RAM.
- Users will be able to install and run the Windows version over a network or CD-ROM.



A screen from CADKEY for Windows

- Filling of True Type fonts is now possible. This will support both display and printing.
- "No problem" support for Windows '95.

Corrections

Release 2 includes a variety of corrections. Due to publishing schedules, this list of corrections is incomplete; more corrections will ship in Release 2.

- A jumpy cursor problem encountered on some systems is resolved.
- A problem with very small fillets becoming full circles was corrected.
- Notes with over 1,000 characters will no longer cause a page fault.
- Placement of Ordinate Dimensions text was modified to utilize cursor snapping.
- A problem with the loss of Windows Resources has been resolved.
- Problems with moving edge dimensions have been resolved.
- Tolerance dimensions with identical values will now stack correctly.
- Control-N now displays True Type fonts correctly.
- Verification of coordinates will display negative values correctly.
- Page faults when verifying certain spline data have been removed.
- The exec command in CADL now functions correctly.
- DXF and DWG have better ISO dimensions support .
- Part files can be loaded from write-protected drives.

The Update CD also will contain images of the 3.5-inch floppy install that can be used to manufacture a set of 3.5-inch disks for both the Windows and DOS versions of Cadkey.

INDUSTRY BRIEFS

Knowledge Revolution Third-Party Program

Knowledge Revolution announced the signing of the first licensees in its new third-party developer program for Working Model, its award-winning kinematics/dynamics analysis software. The third-party developers announced are Mesa Software of Ann Arbor, Mich., and Vanderplaats Research and Development of Colorado Springs, Colo. Mesa will create a new ADAMS file export module for Working Model. VR&D will produce a Working Model optimization module based on its industry standard D.O.T. software. Both products will be available by late summer.

General Signal Acquires Best Power

General Signal Corporation, based in Stamford Conn., announced it has signed a definitive agreement with Best Power Technology Inc. for the acquisition of Best Power. Best Power, based in Necedah, Wis., is a leading manufacturer of uninterruptable power supply (UPS) products. General Signal Corp. is a leading equipment manufacturer for the process control, electrical, and industrial technology industries.

CIRCLE 213 ON PAGE 2 FORM

KeyTalk The road to CADKEY's future is lined with good software

By Bob Martin • Publisher

I'm a gray-haired dude and when I got the new CADKEY for Windows, I was so impressed I began reminiscing about when I started drawing on "the board." (I also walked to school umpteen-eleven miles in the snow barefoot, but I'll tell that story another time.) In those Jurassic days, productivity tools were circle templates, electric erasers, the drop compass, and special erasing shields that turned solid lines into hidden lines or center lines. I practiced for months to develop a lettering style that was clean, neat and legible. Controlling line quality was a technique that required rolling the pencil and knowing when to resharpen the lead. Developing a surface was a tricky technique known as "lofting." Accuracy depended entirely on your skill, experience and knowledge. A "good drawing" not only communicated clearly between the designer and machinist, but was looked at by technicians of that day as a technical "work of art."

The skills that were necessary then to produce neat, clean and accurate mechanical or architectural drawings are being replaced with new skills that belong to a new modern professional — engineer, designer and/or draftsperson. While it's perhaps sad to see "crafts" fall by the wayside, the new tools (computer, software and peripherals) let us produce drawings of a quality that far exceeds those of yesteryear — and a whole lot faster, too.

The point of all this meandering nostalgia is that I hear folks spending lots of time complaining about what their software does and doesn't do. I've been guilty of this myself, but I think we should take stock. The improvements and changes in CAD during the last eight years are nothing short of amazing. The things that CADKEY and DataCAD do are spectacular. The CADKEY Calculator, for instance, quickly does the math that I used to labor over with a slide rule and a hand-held calculator. CAD software has evolved rapidly into a multi-purpose 3D design tool for everything from houses to mechanical parts. This stuff is hot!

Today, consumers and the market put more and more pressure on the software industry to produce software that costs less and is flexible enough to be programmed to support different applications. While the latest version of your CAD software of choice may not seem as good as what you would like it to be, it's a far cry from what was produced for the PC just eight short years ago. Hallelujah!

I'm not saying we should stop asking Cadkey to improve its products. Software must evolve to survive and software companies must be responsive to customers or they won't have any. However, several recent events show Cadkey is listening. Cadkey dramatically lowered the price of the software — which kept its functionality and continues to gain in that area. And look at the new CADKEY for Windows product and other enhancements currently under construction. Mark Madura's addition to the staff as VP of AEC is part of Cadkey's response to the many requests for fuller support and development of the DataCAD product.

So, while we're expecting the software to do everything and, at the same time, making wish lists and giving Cadkey positive input and constructive criticism about how to improve the products (loosely translated as complaining and whining), let's be sure we remember what a good product we have now.

INDUSTRY BRIEFS

New Group Dedicated to Product Development

The recently organized Product Development Forum is quickly becoming the "single source" for information on reducing product development time and costs. The PDF is an exclusive, interactive network of professional members who take advantage of an information request service, 10 PDF reports a year filled with member-contributed articles and tips, and a BBS for questions, tech tips, or short listing of product or service.

For a complimentary copy of the Product Development Forum Report and membership information, fax your request with name and address to 800/395-3208.

Substantial 1995 CAD Growth Predicted

Worldwide CAD/CAM/CAE software revenues will top $3.5 billion in 1995, up a strong 16.2% over 1994, predicts Cambridge, Mass.-based Daratech. Driving growth will be the technology renewals that have been under way at all major vendors over the past two years, as the resulting new releases win user support and begin living up to the visionary promises of their developers, Daratech reports. Forecast to lead industry growth are Synopsys, Parametric Technology, Autodesk and SDRC.

Vibrant, CADKEY Team for Windows Product

Vibrant Graphics Inc., a leader in CAD display technology, has delivered new display list technology for the recently released CADKEY® for Windows ™ version 7. "The Vibrant display list technology provides CADKEY for Windows with unprecedented graphics performance which we are able to offer at a price point that is way ahead of everyone else in the industry," stated Gary Magoon, senior vice president of Cadkey Inc.

Mutoh and Kurta Merge

Mutoh America Inc., a leader in plotter technology and drafting machines in the United States and Canada, has announced its merger with Kurta Corporation, a long-time leader in the design and manufacture of digitizers, graphics tablets and pen-based components. The company will retain the name Mutoh America; the Kurta name and logo will be used for its tablet and digitizer products. Formerly based in Mt. Prospect, Ill., Mutoh America has transferred its operation to Kurta's headquarters in Phoenix, where Kurta was founded in 1979.

In addition to the merger, Mutoh America has announced that it is expanding its business by making its Phoenix manufacturing facilities available to contract manufacturers. The company's manufacturing facility in Phoenix features one of the most advanced Surface Mount Technology (SMT) lines in the southwestern United States for superior automated manufacturing of electronics equipment.

Byers CADNET and HMR Joint Project

Byers CADNET and HMR Inc., two leading providers of software solutions for computer-aided design and engineering, have announced a strategic partnership to jointly develop an input driver for Byers Plot Station for use with HMR's Descartes software. The new driver will be available by mid-year. Byers CADNET provides network plotting solutions for CAD users. HMR Inc. markets Descartes, a complete set of products for imaging, mapping, site analysis, and geographic data management.

NEW PRODUCTS

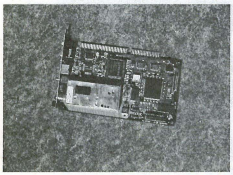
HARDWARE

nFINITY LCD Projector

nView Corporation is offering the nFINITY Series of LCD projectors. Self-contained and weighing only 19 pounds, the nFINITY and its accessories are so compact that they meet FAA regulations for overhead storage on airlines. The nFINITY P110 is capable of displaying computer data only, and the nFINITY P115 is fully equipped for displaying computer and full-motion video images. The nFINITY projector comes standard with both a built-in control panel and an infrared remote control. The control panel offers options such as Source Selection, Mute, Curtain, Sound and Image Adjustment, and the menu also will display commands in four languages. The infrared remote control permits source selection from a distance and has brightness and contrast adjustments as well as volume, mute, curtain, and standby controls. The nFINITY P110 is priced at $6,795 and the nFINITY P115 is priced at $7,295.

Contact nVIEW Corporation at 800/736-8439.

CIRCLE 113 ON PAGE 2 FORM



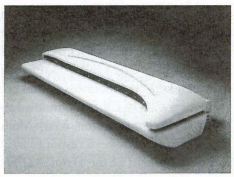
TVideo Television Interface Card

TVideo Television Interface Card

Logicode Technology Inc. introduced the TVideo™ Television Interface Card, which enables the PC to display Picture in Picture (PIP) television and video images on a PC's monitor. The TVideo plays any image from a connected television, VCR, or laserdisk cable, and can be sized to preference. Picture quality is determined by the resolution of the computer monitor. Installation involves inserting the card into an unused slot, installing the software, and plugging the TV/VCR cable into the external connector at the back of the card. Suggested retail price is $379.95, and the TVideo Television Interface Card comes with a two-year warranty.

Contact Logicode Technology Inc. at 805/388-9000 or fax 805/388-8991.

CIRCLE 140 ON PAGE 2 FORM



LaserPress 1800 PostScript Printer

LaserPress 1800 PostScript Printer

XANTE Corp. introduces the LaserPress 1800, a 1800x1800 dpi laser printer with true Adobe PostScript Level 2 and imagesetter quality text, line art, and halftones that can be printed up to 150 lpi. Features include: Adobe PostScript Level 2 Software, high resolution, halftone calibration , multi-purpose paper handling, high-performance controller architecture, simultaneous interfacing, and font handling. The XANTE LaserPress 1800 has a list price of $8,495.

Contact XANTE Corporation at 334/476-8189 or fax 334/476-9421.

CIRCLE 142 ON PAGE 2 FORM

all/IO™

FarPoint Communications introduced the all/IO™ one-slot solution for PC I/O requirements. It features four high-speed serial ports and two EPP/ECP 1284 parallel ports, integrated dual channel IDE controller and floppy drive controller. The all/IO supports connections to CD-ROM drives, pocket LAN adapters, tape backup systems, external hard drives, printers, parallel-to-SCSI adapters and other parallel port peripherals at a data transfer rate up to 2MB per second. The all/IO also supports Centronics interfaces. The all/IO card single-unit price is $139 and features a three-year warranty.

Contact FarPoint Communications at 805/726-4420 or fax 714/556-1216.

CIRCLE 139 ON PAGE 2 FORM

Eagle SLI 3840 Large Format Scanner

ANA Tech introduces the Eagle SLI 3840 Large Format Scanner. Weighing less than 100 pounds and with a depth of less than 17 inches, the Eagle SLI 3840 scans E-sized documents in under 20 seconds, and can capture an entire scan line of 15,200 pixels at a resolution of 400 dpi. It performs on-board thresholding and de-skewing of line art on various media. The Eagle SLI 3840 package includes all cables and software for PC and Windows NT environments and an 18-month return-to-factory warranty program. Price is $12,800.

Contact ANA Tech at 303/973-6722 or fax 303/973-7092 or e-mail jkasten@anatech.ingr.com.

CIRCLE 141 ON PAGE 2 FORM

GlobalNet storage server

GlobalNet Storage Servers

Optisys introduces the GlobalNet family of storage servers, which provide up to 1,024 users access to a wide variety of SCSI mass storage devices over an Ethernet. Installation involves plugging the server into an Ethernet connection, waiting while each server broadcasts itself to the network as another NetWare server, configures itself, and registers itself. The servers can read HPOFS, WORM, and FAT. Prices range from $5,995 to $7,995.

Contact Optisys at 800/327-1271 or fax 602/997-9699 or e-mail rzwick@optisys.com.

CIRCLE 143 ON PAGE 2 FORM

ENGINEERING

Composite Material for Rapid Prototyping

DTM Corporation announced the first composite material available for the rapid prototyping industry. Laserite LNC-7000, a glass-filled nylon, yields parts with the highest properties of stiffness and heat resistance, and exhibits many of the same attributes of standard and fine nylon, including durability, heat resistance, and chemical resistance. LNC-7000 can produce parts with sharp-edge definitions and features as small as 0.02 inch, and the nylon can be finished to a smooth, glossy surface. LNC-7000 meets the requirements of applications such as enclosures, connectors, assemblies, functional mechanical components, and other prototyping applications.

Contact DTM Corporation at 512/339-2922 or fax 512/832-6753.

CIRCLE 124 ON PAGE 2 FORM

JETMACHINING™

OMAX Corporation has introduced its new precision part production system called JetMachining. The system is built around an abrasivejet X-Y machining table combined with a high-accuracy motion controller that contains a model of the abrasive machining process. The process machines complex parts in any material, including metal, plastic, composites, ceramic, or glass, at low cost. It can contour flat materials up to two inches thick with a dimensional tolerance within .005 inch. The OMAX controller does not require a skilled operator or knowledge of the abrasivejet machining process. It is applicable for short-run part production, just-in-time manufacturing, and prototype part development.

Contact OMAX at 800/838-0343.

CIRCLE 126 ON PAGE 2 FORM

PC-DMIS Measurement Systems

Romer Inc. and Automation Software will jointly market PC-DMIS-ready flexible arm measurement systems for the aerospace and automotive industries. The Romer' portable CMM will be offered with Automation Software's PC-DMIS software tailored for arm-type CMM operation. This combination provides an accurate portable CMM with graphics-based inspection software that has extensive curves and surfaces capabilities.

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

CIRCLE 127 ON PAGE 2 FORM

Personal Modeler™

CAD users now can take their designs to 3D creation at the push of a button with BPM Technology's Personal Modeler™. The Personal Modeler's Digital Microsynthesis™ process uses a drop-on-demand piezoelectric jetting system to shoot microscopic particles of molten thermoplastic that freeze when they hit the object being built. Each deskside modeler features a built-in processor and uses a single, multi-axis, robotic head and movable Z-axis platform to translate 3D CAD designs into physical models up to 10x8x6 inches in size. Models are built free-standing and in any geometric shape, and are constructed in either draft "hollow shell" or robust "cross-hatched" modes.

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

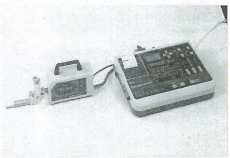
CIRCLE 146 ON PAGE 2 FORM

SummaChrome™

Summagraphics Corporation has introduced a large-format digital printing solution for printing directly onto vinyl without requiring additional processes for UV or moisture resistance. SummaChrome™ eliminates some production steps in creating finished vinyl signs and banners, while providing an alternative to screen printing for short-run jobs. SummaChrome is compatible with leading computer-aided signmaking software and the SummaSign™ series of vinyl sign cutters. The SummaChrome is priced at $27,995 for a Vinyl Technical Model, and $34,995 for a Vinyl Graphics Model.

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

CIRCLE 147 ON PAGE 2 FORM



Mitutoyo's Surftest

Surface Texture Measuring Instruments

Mitutoyo's new SV-400 type Surftests provide detailed analysis of surface roughness texture in 18 separate parameters. Two SV-400 type Surftests are available in either portable or table-top design, and come equipped with a data-analysis unit featuring a built-in thermal printer. Standard parameters provided by the SV-400 Surftests are Ra, Rq, Rz, Ry (ISO), Ry (DIN), Rt, S, Pc, Sm, HSC, tp1, tp3, Rk, Rpk, Rvk, Mr1, Mr2, and Plateau Ratio.

Contact Mitutoyo at 708/820-9666.

CIRCLE 148 ON PAGE 2 FORM

3D Systems Introduces SLA Series

3D Systems Corp. has introduced the SLA-500 30H stereolithography apparatus for epoxy resins. Based on part geometry, the SLA-500 30H increases part throughput by up to 36 percent. The SLA-500 30H incorporates the new high-power Coherent 328 laser, increasing the part-building speed and producing a high level of accuracy needed for

complex geometry.

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

CIRCLE 149 ON PAGE 2 FORM

SOFTWARE

Project Controller™ accounting modules

SDG Project Controller is a family of accounting modules designed to offer accounting and project managers the ability to better manage projects. This program will, among other features, signal an alert when exception conditions arise, such as a project or task going over budget. SDG Project Controller is a Windows client/server product tightly integrated with Solomon IV for Windows™ accounting system. Modules included in Project Controller are: Project Foundation, TimeKeeper, Communicator, Analyzer, Allocator, Flexible Billings, and Integrator.

Contact Smith, Dennis & Gaylord at 408/727-1870 or fax 408/987-5716 or e-mail: sdgsales@ix.netcom.com.

CIRCLE 105 ON PAGE 2 FORM

Working Model version 3.0

Working Model version 3.0, the mechanical simulation software, has many new features. Parametrics allows users to define equations for body geometrics and constraint locations; the Smart Editor™ automatically reconstructs the model between simulation runs; Coordinates Bar can be used to enter geometric information on-screen, without having to access menus or dialog boxes; and Snap Points displays a snap point when the cursor is moved to a geometric location and allows constraints to be snapped to that location. Simulations can be exported to Video for Windows for use in presentations or for networked viewing. The retail price is $2,495 and upgrades from Working Model 2.0 start at $545.

Contact Knowledge Revolution at 800/766-6615.

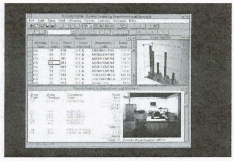
CIRCLE 135 ON PAGE 2 FORM

MetalMan version 1.1

MetalMan version 1.1 includes several improvements and more than 100 "fixes." Improvements include changes in the Universal Coordinate Frame, which is calculated automatically; DXF output now reflects the selected units of measure (in the previous version all output was in inches); and MetalMan's Geometry Export Specification is available to developers who want to provide translation options for users. MetalMan installation disks now include support under Windows 3.1 and Windows for Workgroups 3.11. MetalMan version 1.1 is now shipping at $895 for U.S. and Canadian customers, and $995 for international customers.

Contact MetalMan Corporation at 800/346-5287 or fax 505/247-0208.

CIRCLE 137 ON PAGE 2 FORM



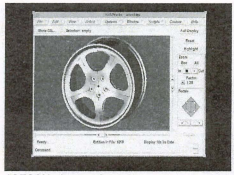
ARCHIBUS management software

ARCHIBUS/FM 10

ARCHIBUS Inc. introduces ARCHIBUS/FM 10, a facilities management software for Windows that allows an organization to share information about its assets and building operations. A Windows interface and step-by-step procedures for performing common tasks make it easy for the user to perform queries and produce reports. Core modules include Space Management for keeping accurate inventory of space and its use, Furniture & Equipment Management for tracking and managing inventories, and Building Operations Management for managing unscheduled and preventative maintenance through work orders and work requests. ARCHIBUS/FM 10 can exchange data with any source that supports ODBC, including dBASE, Microsoft ACCESS, and Paradox. System requirements are 386+ processor, Windows 3.1, 8MB RAM, 20MB hard disk space.

Contact 617/338-1011 or fax 617/338-1012.

CIRCLE 136 ON PAGE 2 FORM



IGES/Works version 3.0

IGES/Works version 3.0

International TechneGroup Incorporated announced the release of IGES/Works version 3.0. Major enhancements include: Solids Display graphically displays IGES solid entities; Data Reduction reduces the number of control points in a NURBS curve or surface; GUI Recorder records mouse operations and places the equivalent command in a script file; Geometry Analysis graphically displays information about certain types of geometry, such as surface normals or NURBS control points; Surface Reversal reverses the surface normal on most IGES surface types.

Contact International TechneGroup Incorporated 513/576-3900 or fax 513/576-3994 or E-Mail info@iti-oh.com.

CIRCLE 138 ON PAGE 2 FORM

MISC

Practical Patenting News

Edited by patent analyst and inventor Greg Aharonian, each issue of the "Practical Patenting News" gives inside information on royalties, licensing, patents, lawsuit filings, and settlements. Published 24 times per year, Practical Patenting News is available for $189 per year.

Contact Associated Business Publications at 317 Madison Avenue, Suite 921, New York, NY, 10017 or fax 212/986-7864.

CIRCLE 117 ON PAGE 2 FORM

American Disabilities Act

ADAHelp by KC Software is an electronic version of the Americans with Disabilities Act handbook. ADAHelp is designed to assist CAD professionals in accessing ADA regulations without leaving their drawing programs. ADAHelp is available for $295.

Contact KC Software at 206/696-2690 or fax 206/573-9458.

CIRCLE 118 ON PAGE 2 FORM

New Titles Published by ISTE

The International Society for Technology in Education announces four new titles for educators: Kindling the Fire-Integrating HyperCard into the Classroom by Michael Muir, ISBN 1-56484-075-1; Increasing Your Expertise as a Problem Solver — Some Roles of Computers by David Moursund, ISBN 1-56484-077-8; Travelers Through Time and Space-Multicultural Activities for the Computer Classroom by Gail Marshall, ISBN 1-56484-050-6; and Tel*Ed'94 Conference Proceedings, ISBN 1-56484-078-6.

Contact ISTE at 503/346-2407.

CIRCLE 144 ON PAGE 2 FORM

USA TODAY On-Line News Service

The USA TODAY on-line news service will have many of the same qualities of the USA Today newspaper, including in-depth sports coverage, comprehensive news, business and entertainment reports and weather forecasts. The service will give readers the opportunity to interact with USA TODAY reporters, editors, and other readers through e-mail and bulletin board services. USA TODAY will be at the World Wide Web on the Internet and can be accessed only through the use of USA TODAY's software. The price will be $14.95 per month for three hours with each additional hour costing $3.95, and billing will only be through credit card.

Contact USA TODAY's subscription department at 800/872-4998.

CIRCLE 145 ON PAGE 2 FORM

Inkjet Technology Drives Extinction of Pen Plotters

Hewlett-Packard Co. discontinued its last large-format pen plotter, the DraftPro Plus plotter, on July 1.

"Since 1991, when we introduced the first large-format inkjet plotter, the HP DesignJet, we have seen tremendous growth in the inkjet plotter market," said Bill R. Higley, manager of HP's U.S. DesignJet marketing center. "We knew the day would come when inkjet would replace pen technology. We believed that so strongly we actually positioned inkjet plotters as pen-plotter replacements while we were still selling pen plotters. Our success in the inkjet market indicates that was the right thing to do." HP will continue to support the DraftPro Plus plotter with supplies and service for five years.

Pen-plotter sales dropped 25 percent in 1994, while inkjet sales increased 250 percent in North America, according to Dataquest, a market research firm based in San Jose, Calif.. In fact, inkjet became the most prevailing plotter technology and captured 64 percent of the North American market in 1994, surpassing pen technology for the first time. Dataquest predicts that inkjet plotters will achieve almost 83 percent market share in 1998.

"The standard for CAD output has risen because of inkjet plotters," Higley said. "DesignJet plotters can produce a drawing in about one-fifth the time of pen plotters with minimal computer lock-out time. Inkjet is much more versatile; at prices close to that of the lowest-priced pen plotters, inkjet offers a much better value. With color inkjets, users can produce virtually any color and do shading or area fills. Pen plotters, however, have eight pens that can only draw lines. There are many other benefits with inkjet as well: network capabilities, unattended operation, and clean, quiet operation."

As the prices of inkjets become increasingly competitive, Hewlett-Packard believes that fewer and fewer users will choose pen plotters. HP's inkjet prices are significantly less than the $3,695 price of a DraftPro Plus plotter. The DesignJet 230 plotter is $2,395, and the DesignJet 250C color plotter is $2,995.

Pen plotters got their start at Hewlett Packard

Hewlett Packard pioneered the technology of pen plotters and their predecessors. HP's involvement in the plotter business began when they acquired E.L. Mosley Co. of Pasadena, Calif.., a developer of X-Y recorders, in 1958. These simple drum devices that plotted analog, two-axis data on A- or B-size paper are the most direct ancestors of present-day pen plotters.

The period between the late 1960s and early 1970s was a period of transition from X-Y recorders to today's drafting plotters. During that time, HP Laboratories developed a way to convert digital signals to analog X-Y output. This enabled HP to produce a series of digital plotters that could produce output for its desktop calculators (computers by today's definition).

Initially, plotters were designed to operate with specific calculators and used custom interfaces. In 1977, HP developed the HP-IB interface (Hewlett-Packard-Interface Bus), which enabled HP plotters to work with many HP devices. HP-IB became the first standard interface, helping to create the beginning of an industrywide plotter market.

In 1981, HP entered the D-size (24-inch-wide) plotter market with the HP 7580 pen plotter. At introduction, this plotter was $15,450 (U.S.) — about half the cost of previous pen plotters. The HP 7580 plotter was twice as fast as previous products and was the first plotter to use grit-wheel technology, which replaced moving pens along both axes by moving the paper instead.

The following year, the HP 7585 pen plotter was introduced in E-size (36 inches wide). These products — 7580 and 7585 plotters — were extremely successful for HP and set the standard for performance and output through the late 1980s. They were so well-built that many of them are still in service today.

Throughout the 1980s, HP continued to announce plotter-market firsts, such as automated material-handling systems; optical sensors for media alignment; and the HP SurePlot Drawing System, which detected and corrected common pen problems.

HP launched the DraftPro line of pen plotters in 1986. These plotters set new standards for price and performance. A year later, HP introduced the DraftMaster series of pen plotters for higher-end users. These products also were very successful. DraftMaster plotters were discontinued in 1994 because high-end pen-plotter customers had turned to inkjet devices such as HP's DesignJet 650C and 600 plotters.

HP is the world's leading supplier of hard copy products that set the standard for technology, performance and reliability. HP has sold more than 30 million LaserJet and DeskJet printers worldwide since 1984. Other HP products include DesignJet large-format printers and plotters, ScanJet scanners, OfficeJet printer-fax-copier devices and HP FAX facsimile machines.

consists of much more specialized work. For example, we typically make up a master plan our client's ultimate development to find out the maximum use of their site. Then, through our cost control consultants, we determine a scheme of phasing, which allows a church group to build a part or parts of their master plan.

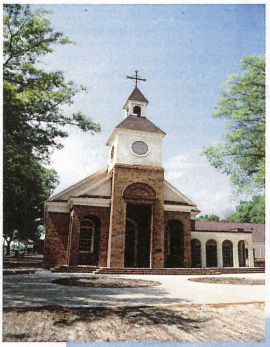
This process requires a massive amount of information: input by individual parishioners regarding their needs, schematic design master plan, current and local costing input, and phasing decisions. DataCAD allows us to manage the graphic information easily, including making quick revisions to the master plan when needed, creating mass models that we can revise instantly, even studying building forms. We can quickly clean up and provide any of these components to the client for fund-raising efforts.

In our acoustical design, we use a complex process to arrive at a desired reverberation time for a particular worship space. Then, we tune it to a particular acoustical preference, whether it be an emphasis on organ music, choral or solo music, or the spoken word. This is done by designing reflective surfaces, usually in the form of walls and calculating the collective acoustical properties of the selected finish materials, including clothed people in the pews, to determine the reverberation time of the room.

Ideal reverberation time is anywhere from 1.75 to 2.25 seconds. We then make subtle adjustments to the materials, such as more upholstery, less carpet, a different coating on the ceiling, baffled walls behind the choir section — whatever it takes to tune the room. All of this information, which is basically square footage amounts, must be managed graphically to ensure that the design of the worship space remains intact. DataCAD's area function allows us to do this in one-tenth the time it took manually.

We also generate all of the shop drawings for our custom furniture on DataCAD, where detailing and dimensioning is a snap. Three-dimensional modeling of furniture is easy as well, and useful for clients to use for memorial fund-raising. We use 3D Views to easily get wireframe interior perspectives to construct hand-drawn sketches, which we liven up with people, furnishings, banners, artwork and instruments.

DataCAD has been a giant boost to our productivity. While we are not sophisticated users, we employ its strengths to help manage the massive amounts of information needed to do our job.



Saint Bartholomew Episcopal Church, Hartsville, S.C. (left); Grace Episcopal Church, St. George, Utah (below).

CADKEY TOOLBOX

Here's a miscellaneous trio of CADL files I created to help me in my work. They're short and sweet, but really handy. The information they get is available in regular CADKEY commands, but these routines go directly to the information you want and don't require so many keystrokes.

Diameter.cdl

```
rem     filename: diameter.cdl
rem     A program to extract and display the diameter of an arc or circle.

:top
   set mask, 3
   getent "Pick Arc/Circle ...", enttype
      if ((@error != 0) || (@key <  -1))
      goto exit

   dia = (@fltdat[3] * 2)
   pause "Diameter = %g ... <Enter for another or <Esc> to quit", dia
      if (@key == -3)
      goto exit

      goto top

:exit
      redraw -1
      clear dia
```

***

Radius.cdl

```
rem     filename: radius.cdl
rem     A program to extract and display the radius of an arc or circle.

:top
   set mask, 3
   getent "Pick Arc/Circle ...", enttype
      if ((@error != 0) || (@key <  -1))
      goto exit

   rad = @fltdat[3]
   pause "Radius = %g ... <Enter> for another or <Esc> to quit", rad
      if (@key == -3)
      goto exit

      goto top

:exit
      redraw -1
      clear rad
```

***

Levelask.cdl

```
rem     filename: levelask.cdl
rem     A program to display the level of an entity.

:top
   getent "What level?  —  Pick the entity ...", enttype
      if (@error != 0) || (@key < -1))
      goto exit

   lev = @intdat[4]
   pause "The level is %g ... <Enter> for another or <Esc> to quit.", lev
      if (@key == -3)
      goto exit

      goto top

:exit
      redraw -1
      clear lev
```

John Frawley is a mechanical designer in Fairport, NY.

CIRCLE 101 ON PAGE 2 FORM

Monitors

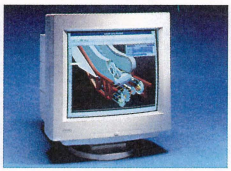
Mitsubishi passes with flying colors

By Bob Martin

We've been running two Mitsubishi monitors, a 17-inch and a 20-inch through heavy-duty graphic hoops. We've worked with them with CADKEY, DataCAD, Windows and desktop publishing on a Macintosh. Both performed without a whimper. The flat screen, non-glare CRT is a joy to work with. These seemingly small things make a significant difference in user productivity by minimizing eye strain and fatigue. In addition, the technology and other features that are not right in your face are superior. These are quality products.

The Diamond Scan 20H we evaluated is designed specifically for top-notch performance in graphic applications — CAD/CAM/CAE, desktop publishing and graphic design. Colors are bright and clear and the resolution (maximum non-interlaced of 1280x1024 at a 75 Hz high-refresh rate) is perfect for complex drawings. Making adjustments on some monitors is sometimes a challenge. We actually found the Mitsubishi microprocessor-based controls user-friendly. We had our choice of on-screen displays or intuitive front-panel buttons. Some of the advanced features include one-button auto calibration, moire´ cancellation, and rotation and purity adjustments.

The Diamond Scan 20H meets all major emission and power management standards, including MPR-II, EPA Energy Star™, DPMS™ and NUTEK. Its Smart Screen power management feature displays a visual representation when it is in power-saving mode.



Mitsubishi Diamond Scan 20H

Mitsubishi offers the industry's broadest selection of high-performance color monitors in terms of both screen size and CRT types, with 18 displays ranging from a 14-inch desktop to a 42-inch multimedia presentation model. Mitsubishi also is one of the world's only manufacturers to offer a flat-square aperture grille, and conventional spherical CRT types. A majority of Mitsubishi monitors are microprocessor-based auto-scanning units equipped with VGA-compatible signal cables. Mitsubishi brand-name products are marketed through a network of distributors and resellers. In addition, Mitsubishi Electronics has been a leading OEM monitor supplier since 1978.

All Mitsubishi 14- to 21-inch models have a three-year limited warranty and range in price from $360 to $2000.

For information, call 800/843-2515.

CIRCLE 146 ON PAGE 2 FORM

HP Plotters

Plotters for the budget-conscious

By Bob Martin

Hewlett Packard, one of the grand daddies of the plotter business, has introduced two low-cost large-format inkjet plotters: the HP DesignJet 250C color plotter and the HP DesignJet 230 monochrome plotter.

Both plotters have three print modes: draft, normal and high. Both produce black output in addressable 600-dpi resolution. A black-only D-size plot takes only about five minutes in normal mode. A similar plot would take 20 minutes or more on a pen plotter. An average D-size color plot at 300 dpi takes about six minutes.

HP expects a typical DesignJet 250C or 230 plotter user to be in a small workgroup of about three people in an engineering, mapping or architectural firm producing about 10 plots in an average day. Small firms need to be able to produce quality plots on a budget. The DesignJet qualifies with prices ranging from $3,995 for a D-size color unit to $2,395 for D-size monochrome unit. E-size plotters also are available.

The standard 4MB buffer is expandable to 36MB. For easy setup, the DesignJet 250C and 230 have a simple front-panel design and a quick reference guide. In addition, users can adjust plotter settings by filling out a small form by hand and feeding it into the plotter. For flexibility in the small-office environment, the plotters can be set up on a table or on an optional floor stand. The stand is $345 for D-size and $395 for E-size.

HP DesignJet 250C Plotter

For more information call 800/851-1170.

CIRCLE 147 ON PAGE 2 FORM

Larger monitors worth the price

By Walt Silva

Your monitor is one of the most important components of your computer system. Unfortunately, most users blindly accept the monitor offered in a standard package deal without considering the options available. In many cases, managers mistakenly assume that only designers doing CAD need large monitors. This is a handy assumption because it is then much easier to meet a preconceived budget ceiling by accepting the display "thrown in" as part of the package. This is a false economy — much like walking over dollars to save dimes.

While graphic design certainly benefits from the reduced "zooming" that results from work on a larger screen, equally impressive productivity is obtained in the use of most applications. Consider the following:

- Spreadsheet users can see more cells at one time.
- In word processing, a whole page can be seen at once in a size large enough in which to work.
- In desktop publishing, the same full page and even two-page layouts allow the user to evaluate layout composition without zooming and panning.

The following numbers illustrate what you get in additional viewing capacity as monitor size increases:

Size	Area Sq. In.	% Area over 14-inch size
14 in	196	—
15 in	225	15%
17 in	289	47%
19 in	361	84%
21 in	441	125%

Naturally, price has to be factored into every purchase decision. However, a quick scan of the latest hardware ads yields a surprising statistic. Incremental cost (over 14 inches) for 17-inch monitors from major system suppliers averages less than $400 at time of purchase. With almost 50 percent more viewing area, the average user immediately realizes a minimum 20-percent productivity improvement. For a $30-per-hour employee working 20 hours per week on the computer, in less than seven weeks the additional monitor cost is recovered.

I wish every payback analysis was that good!

Using CADKEY LISP

Creating polylines

By Ron Brumbarger and Scott Workman

This article is part of a continuing series covering various aspects of the CADKEY LISP programming language. This month, we will discuss one method for creating a polyline from a list of vertex points. If you have suggestions or an idea about areas we should cover in these articles, leave a message via CompuServe – Cserve ID: 72730,3154 or via E-mail: scottw@bit-wise.com

Introduction

Last month we discussed how the vertices of polylines are stored in CADKEY LISP and how to retrieve the vertices by stepping through the DXF codes for each individual vertex. Building on this knowledge, the manner in which to create a new polyline is very straightforward. This month, we will learn how to create a new polyline given a list of vertex points.

Creating vertex points

We saw in the program last month that the individual vertex points of a polyline can be retrieved by repetitively calling the entget function. Each vertex point is returned by consecutive calls to the entget function so that each vertex appears to be an individual point. Creating polylines is very similar to viewing them. The entmake function has been used in past articles to create CADKEY LISP geometry. By using the entmake function repetitively like the entget function, the polyline can be created by specifying individual vertex points.

The entmake function for a polyline must start with a POLYLINE entity type. This informs CADKEY LISP that a polyline is to be created and that vertices will follow. The POLYLINE entity can be used to specify color, layer and other general information, but does not include the actual vertices.

After a POLYLINE entity is recognized by the entmake function, it knows that all consecutive calls to entmake will contain vertex points for the polyline being created. The vertex points are buffered up by the entmake function until all vertices have been specified.

But how does the entmake function know when all of the vertices have been specified? Another entity of type SEQEND is used to mark the end of the polyline vertices. Once this entity has been passed to the entmake function, entmake will read all of the stored vertices and create the polyline. Note that the polyline is not created until the SEQEND entity is created. If the SEQEND is missing, the polyline will never be created.

A simple example of the polyline creation technique follows. We will create a polyline given the three vertex points p1, p2 and p3. A call to entmake is used for the polyline, each vertex and the SEQEND entity.

```
(entmake (list (cons 0 "POLYLINE")))
(entmake (list (cons 0 "VERTEX") (cons 10 p1)))
(entmake (list (cons 0 "VERTEX") (cons 10 p2)))
(entmake (list (cons 0 "VERTEX") (cons 10 p3)))
(entmake (list (cons 0 "SEQEND")))
```

In this example, the polyline header is created with default attributes. Then, each vertex is created with a separate call to the entmake function. The location of the vertex is defined by the DXF code 10 which is the same code used for the X/Y/Z value of a point. Finally, the polyline is created by specifying the SEQEND entity.

Source Code for CREATEPL.LSP

```
;
;
; CADKEY LISP example presented in Key Solutions Magazine, August 1995.
;
; Joins all lines with shared vertices into a single polyline entity.  The lines must
; be joined exactly at the endpoints.  Multiple paths will randomly select one of the
; paths to follow.
;
(defun c:polyjoin ( / lines )
  (setq lines (ssget "X" '((0 . "LINE"))))
  (if (/= lines nil)
    (join lines)
  )
  (princ)
)

; Function to scan through lines and find endpoints. Creates a polyline for each
; sequence of connected lines found.
;
(defun join ( lines / e1 en join idx dxf p1 p2 end1 end2 vt)

  ; repeat for all lines in drawing
  ;
  (while (> (sslength lines) 0)

    (setq e1    (ssname lines 0)
          join  (list e1)
          dxf   (entget e1)
          end1  (cdr (assoc 10 dxf))
          end2  (cdr (assoc 11 dxf))
          vt    (list end1 end2)
          idx   1)

    ; look through rest of lines to find matching endpoints.
    ;
    (repeat (- (sslength lines) 1)
      (setq en  (ssname lines idx)
            idx (1+ idx)
            dxf (entget en)
            p1  (cdr (assoc 10 dxf))
            p2  (cdr (assoc 11 dxf)))

      (if (eqpt end1 p1)
        (setq end1 p2
              join (cons en join)
              vt   (cons p2 vt))
        ;else
        (if (eqpt end1 p2)
          (setq end1 p1
                join (cons en join)
                vt   (cons p1 vt))
          ;else
          (if (eqpt end2 p1)
            (setq end2 p2
                  join (append join (list en))
                  vt   (append vt (list p2)))
            ;else
            (if (eqpt end2 p2)
              (setq end2 p1
                    join (append join (list en))
                    vt   (append vt (list p1)))
            )
          )
        )
      )
    ) ; end repeat

    ; If there is more than one line segment, delete lines
    ; and create a polyline instead.
    ;
    (if (/= (cdr join) nil)
      (progn
        (while (/= (car join) nil)
          (entdel (car join))
          (setq lines (ssdel (car join) lines)
                join  (cdr join))
        )

        (polymake vt)
      )
      ;else
      (setq lines (ssdel (car join) lines)
            join  nil)
    )
  )
  (princ)
)

;  function to create a polyline from a list of points.
;
(defun polymake ( vert / )
  (entmake (list (cons 0 "POLYLINE")))
  (while (/= (car vert) nil)
    (entmake (list (cons 0 "VERTEX") (cons 10 (car vert))))
    (setq vert (cdr vert))
  )
  (entmake (list (cons 0 "SEQEND")))
)

;  Function to test equality of 2D points
;
(defun eqpt ( p1 p2 / )
  (if (and (= (car p1) (car p2)) (= (cadr p1) (cadr p2)))
    t
    nil
  )
)

(princ "\nType 'polyjoin' to join lines into polylines.")
(princ)
```

Program Specifics

The program presented this month is the reverse of last month's program. Last month, we selected polylines, read the vertices and created separate line segments. This month, we will select all of the lines in the drawing, compare the endpoints of the lines and create a polyline for each sequence of lines that share endpoints. Visually the drawing will look the same. However, the number of entities will be reduced by the number of lines replaced by polylines.

The program starts out by using a selection filter in the ssget function to select only the lines in the drawing. This selection set is passed to the join function so that the endpoints of the lines can be compared. The join function removes the first line from the selection set. The endpoints for this line will be compared against the endpoints of all other lines in the selection set. If another line is found to have a common endpoint, the new line is added to a list of lines with common endpoints and the endpoint of the polyline is updated to match the opposite end of the new line. In this way, we can always track the two endpoints of the polyline and store the vertices that are not on the end in a list for polyline creation later.

The "lines" selection set is used to make sure all lines in the drawing are checked. As a new line with a common endpoint is found, it is added to the "join" list and the vertices are added to the "vt" list in the proper order. Note that we have to be careful of the order in which the vertices are stored in the list so that the polyline is created in the proper vertex order. The four if statements in the join function are used to verify which end of the line matches the proper end of the polyline. After all the lines have been found in the sequence, the lines in the sequence are removed from the "lines" selection set so that they are not processed again. The "end1" and "end2" point variables are used to store the current endpoints of the polyline. The join function will continue to run until all lines have been checked or added to a polyline.

After all lines have been found for the polyline sequence, the polymake function is passed the list of vertices in the proper order so that the polyline can be created. The polymake function is not called if there is only one line in the sequence. The polymake function creates the polyline header, then uses a "while" loop to create all vertices in the list. Finally, the SEQEND entity is created so that CADKEY LISP will create the polyline.

The eqpt function is used to compare two points to determine if they contain the same X/Y coordinates. If they do, the function will return T (true). This makes the "if" statements for endpoint comparison easier to read.

To execute the program, create several lines that share common endpoints. This is easily done using the LINE command. Load the program and type polyjoin. All lines that were created with common endpoints now will be replaced with a single polyline. To verify the change, try setting the active color before running the polyjoin program using the COLOR command or try selecting the new polyline entities using the SELECT command.

Conclusion

This month, we expanded on polylines by creating individual vertex points to create a complete polyline. The methods to retrieve polyline vertices and to create a new polyline are identical if the vertex points are viewed as individual entities. By calling the entmake function repetitively, each vertex can be calculated and processed as the polyline is being built.

Source Code Availability

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

Ron Brumbarger is president and Scott Workman is director of technology for BitWise Solutions Inc. BitWise Solutions offers software products and services specializing in the CAD/CAM, Internet and multi-media markets.

CIRCLE 241 ON PAGE 2 FORM

GETTING STARTED WITH CADKEY: The configuration program

By Robert Martin

When CADKEY software is first put on a computer, the installation program copies the files that make the program work, sets up a subdirectory system, and loads some operating defaults, but it's still not ready to be used. In fact, in most cases, it won't work at all until information about the kind of hardware in place is entered. This is done through the Configuration program (often just called "Config"). This small program is copied to the main CADKEY directory as part of the installation process. It is used to set up many operating defaults such as screen color, construction units, memory allocation, and dimensioning standards. It also tells CADKEY what input devices, graphics cards, monitors, printers or plotters you are using.

About the Configuration Program

The Configuration program cannot be run when CADKEY is running. You must completely exit CADKEY to use it. It cannot even be used from the DOS shell inside CADKEY.

The Config Program file is located in the main CADKEY directory. The file name is config.exe. To use Config, at the C:\CADKEY> prompt, type config and press ENTER. Two related files, config.dat and config.bak, also are stored in the main CADKEY directory. The config.dat file stores the default parameters needed to start CADKEY and all the configuration information you enter. For safety, CADKEY makes a backup copy, config.bak, of this information. If you accidentally delete or damage the config.dat file, you can use the DOS COPY command to copy config.bak to config.dat. Then run the Configuration program again.

The Main Menu

The Configuration program main menu has seven main options:

1. Set graphics options
2. Set input device options
3. Set plotter options
4. Set printer options
5. Set program options
6. Set default path names for data files
7. Set automatic file loading options
8. Exit without saving changes
9. Exit and save changes

Defaults — A default is a setting or value assigned by CADKEY to the options defined by the Configuration program. If you're a beginner, you may not have a clue as to what some of them mean. The defaults usually reflect the most common way most people work, so when in doubt, press ENTER. Defaults usually appear in parentheses on the prompt line. To change the default, type the new value or number and press ENTER .

Correcting Errors — If you type the wrong information, but have not yet pressed ENTER, simply press Backspace to delete the entry. Then type the correct information and press ENTER. Be warned that Config is completely linear — there is no backing up after you press ENTER. If you enter incorrect information, you must continue until you return to the Configuration program's Main Menu. Then you get to start over and do it right the next time.

A Quick Start

The Configuration Program has many settings, but it is not necessary to fuss with all of them just to get started. All CADKEY really needs to know is which graphics card and which input device is being used. You can do this quickly and return to the Configuration program later for other settings. Actually, some Configuration program information (such as printers and plotters) can be changed inside CADKEY, but the information entered in Config tells CADKEY where to start each time it is turned on. This is valuable if you want the program set up a certain way almost every time you start. Then you can change the exceptions on the fly. You can skip any option that is not applicable to your hardware setup. For example, if you don't have a plotter, don't select Option 3 from the Main Menu.

Before you begin making configuration choices, you need to know about your input device (mouse or tablet) and your graphics device driver. If you know about your printer or plotter, it also can be done quickly at this time.

Tips for Setting Graphics Options

When the list of graphics device drivers appears, type the number that matches your computer's graphics device driver and press ENTER. In version 7, a list of 231 graphics card drivers is displayed in approximate alphabetical order. "Approximate" means most are alphabetical, but a few are out of order. So you need to look carefully at the entire list if the driver for your graphics card isn't readily apparent. You select one driver for CADKEY to use with your current hardware configuration. If, after searching, a driver for your graphics device truly is not there, Generic VGA almost always works with any hardware system. However, it does not produce the higher resolutions that other graphics devices provide. Cadkey constantly develops new drivers for hardware devices. If you have an older version of CADKEY with a shorter list, updated drivers are available from the CADKEY BBS or on some of the Internet forums. A few graphics card manufacturers have CADKEY-specific drivers.

After you select a graphics device driver, a second screen may appear with resolution and color options. The options will vary because they are dependent upon the graphics device selected. If you select Generic VGA, for instance, you will not see this screen at all. The Config Program automatically sets the graphics display for Generic VGA at 640X480 resolution with 16 colors. A rule of thumb for resolution is the higher the number, the higher the resolution. The higher the resolution, the smaller the objects and text on the CADKEY screen will appear. This means more of the drawing can be displayed at one time. Higher resolutions can reduce the amount of panning and zooming necessary and curves and arcs will appear smoother. However, depending on your monitor and your vision, drawings displayed at higher resolutions may be hard to see. You may have to experiment with resolution to find the best setting.

Graphics Display Monitors — After the graphics device options are set, a list of monitors and their screen sizes is displayed. If your monitor appears on the list, type the corresponding number to select it. If your monitor does not appear on the list or you don't know, choose a monitor with the same screen size, or select Enter Screen Dimensions and enter the dimensions for your monitor. Then a series of questions and prompts for graphics information appears on the screen. The sought-after information includes the size of the CADKEY graphics cursor, the number of entities to display when dynamically rotating a part, the maximum number of horizontal and vertical grid points displayed, and others. For a down-and-dirty quick configuration, or if you don't have a clue what the questions mean, you can simply press ENTER at each question to accept the defaults.

Choose the monitor where the dimensions or model match your monitor or enter the screen dimensions for your monitor and press ENTER. Press ENTER until the Monitor Configuration Screen appears and indicate your monitor configuration. For one-monitor systems, accept the default. For two-monitor systems, choose the monitor you use as the pri-

See CONFIG, page 19 ⇨

CIRCLE 228 ON PAGE 2 FORM

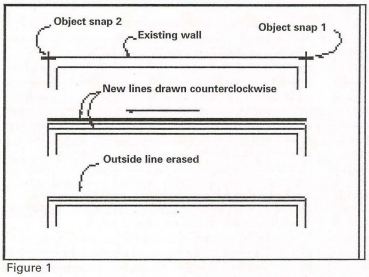


Figure 1

By Carol Buehrens

I've noticed a proliferation of ideas concerning techniques for creating solid walls. The need for more than one technique is related to the desired results. Do you need a blackened wall, a cross-hatched look, or are you trying achieve a poche? Are you using a pen plotter, or a raster output device such as a laser printer? Can the raster image device print a pattern, similar to a dot zip-tone?

Here is yet another technique that many of our friends have used. It may or may not meet your needs, but sometimes it's a real stepsaver. If you're using a pen plotter, this technique can save many hours in the final plots when compared to using crosshatching. However, if you're going for the crosshatched look, as may be desired when showing demolition walls or masonry, this is not the procedure for you; use the hatch menu!

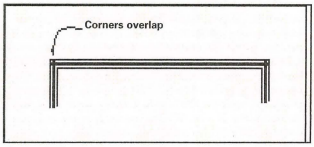


Figure 2

1. Create a layer for your solid fill lines. Name the layer something that makes sense, like 1-POCHE, for poche lines on the first floor walls and make that layer active.

2. If you're using a pen plotter, you'll want to set a color to indicate your thicker pen and a line width to make the wall fill in solid. For example, you may want to set the color to correspond to pen 4, which you've set as your .70 pen, and the width to 7, which may fill your wall in once it's plotted. Remember, also, to set your Width option in the plotter menu prior to plotting so your pen doesn't overlap its stroke too much (15 or 20 may be a good setting).

3. If you're using a raster-type plotter and patterns are available, set your color to the appropriate pen number you'll dedicate for the pattern. Usually plotters that allow pattern assignment also allow you to define a width for your line. Use that width assignment in conjunction with a line width in DataCAD to set the correct width for your wall.

4. Turn on Walls, and set the wall width to the same width of the wall you're filling. Also, turn on Centers in the Architect menu.

5. Now, object snap to the first two outside corners of your wall, going counterclockwise around your building, as illustrated in the top of Figure 1. Two lines will be drawn, one in the center of the wall and another to the outside, shown in the middle of Figure 1. Press the right button on the mouse (button 3) to quit drawing the line, then press the [<] undo button to erase the last line, shown in the bottom of Figure 1. If you drew the line counterclockwise, the outside line will erase. This may take a few tries to get the swing of which side of the wall to object snap to. Sometimes you might have to erase the extra lines using Entity (wait till the end and do them all at once). If you made them all on a separate layer, selecting the extra lines is easy.

6. Continue creating the lines. You'll notice the corners overlap each other, as shown in Figure 2. If you're using a raster plotter, this will allow the pattern to flow evenly to fill the corners. If you're using a pen plotter, the overlap will correct the gap that is normally created when using line widths.

7. If you're using a pen plotter, and want this line to look like poche on your blueprints, use a green ink pen in your carousel. The green ink shows up as a light poche on the final print.

8. You also may want to turn off the display of line weight while you work on your drawing, by using the Utility, Display menus; picking ShowWgt to it off (the L will become small in SWOTHLUD). Remember to turn it back on before plotting.

Good luck with your "solid" walls!

CIRCLE 211 ON PAGE 2 FORM

respect their efforts in supporting Cadkey products. I want to make sure dealers know what is going on. They will be at the top of the list when it comes to mailings and getting product before their clients.

In general, one of the biggest frustrations for longtime DataCAD users has been waiting for new product. Exciting stuff is happening! DataCAD 7 is definitely a "go" for later this year. It addresses, quite nicely, some long-term issues and concerns of DataCAD users. It will read and write DWG (the AutoCAD file format) files. Its multi-scale plotting feature will let you plot portions of a drawing at different scales. For example, you can arrange multiple details or partial plans to be plotted on one sheet. Networking capabilities allow file locking so if you have a drawing open from the server, another person will not be able to open it. DataCAD 7 also will allow Read-only Symbols so your own symbols and third-party symbols can be accessible from a CD-ROM.

We have addressed some other items from the DataCAD users' top 10 wish-list, including multi-line walls (i.e., cavity walls or walls drawn with two, three or four lines) and support for smaller icons. We're also looking at a number of options to increase the number of custom linetypes, perhaps up to 60, or perhaps being able to swap in and out a second set of 20 linetypes on the fly. Greatly expanded printer support (up to 1500 or more is a good possibility) and 3D Roof Framing also are in the works. I don't think there's any question about DataCAD 7 coming out this year. Right now, we're saying fall of '95, but I'll keep you posted.

There have been questions about DataCAD 8 running under MS-DOS. We have contemplated DataCAD 8, strictly based on user demand. However, my expectation is that most users will want to move to Windows.

Right now, our primary concern is Cadkey Architect. I know you all have been waiting patiently (more or less) for a Windows-based architectural product. The good news is that what the programmers have produced so far is excellent. All that is needed now is to decide what features are to be included in the first release and to fine-tune the interface. Once I positively know when the release date will be, I will announce it.

I've got an excellent group of dedicated programmers working solely on completing the first release of Cadkey Architect. I feel very good about the DataCAD and Cadkey Architect development teams. Both are extremely talented and very committed to producing great software. I can help by letting them know what will satisfy your needs. You can help by continuing to send me your suggestions about how we can improve our products.

I'm very confident that the tool sets for Cadkey Architect will be equal or superior to anything that is out there. The development team is working hard to make the Windows version just that. As far as the transition from the DOS version goes, it is likely that features DataCAD users love (such as keyboard interrupts) will be included in Cadkey Architect. As for platform, Cadkey Architect will run under Windows 3.1, Windows '95 or Windows NT as a full 32-bit program.

Please give me feedback. Many users have told me that the old wish lists (asked it seems a million times) never seemed to have a discernible impact. Let me assure you, Cadkey is in a listening mode right now and I have been given the authority to make things happen. I also would like third-party people to "come out of the woodwork" for both DataCAD and for the future Cadkey Architect. Cadkey is going to publish a new Applications Guide soon.

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

DataCAD Training in the U.S.

Here's a list of resources for DataCAD® Training in the U.S. You may contact any of the following people to inquire about DataCAD Training dates, pricing, and available locations. Several of the trainers listed also do on-site training at your facility.

CALIFORNIA
CADDAC - San Jose
Carolyn Bell - (408) 997-3230
Cal. State at Los Angeles - Los Angeles
Virgil Seaman - (213) 343-4550
Nikken Designs Systems - Hacienda Heights
Roy Yoshino - (818) 968-2230
SysCon Technology, Inc. - La Mirada
Glenn Osborne - (714) 739-0981
Talbott & Associates - Mill Valley
Richard Talbott - (415) 388-7634

CONNECTICUT
CIMTECH - Branford
Steve Kidd - (203) 488-3032

FLORIDA
Autumn Technologies - Largo
Peter Augustyniak - (813) 530-0626
David Porter Assoc. Architects - Palm Beach Gardens
David Porter - (407) 694-0100

ILLINOIS
Hagerman & Company, Inc. - Mt. Zion
Dennis Hagerman - (217) 864-2326

INDIANA
Logic & Proportion, Inc. - Indianapolis
John Mahaffey - (317) 251-0533
Tekni - Fort Wayne
Dennis Jeffrey - (219) 478-4014

MASSACHUSETTS
Madura Studios - Boston
Mark Madura - (617) 536-5326

MICHIGAN
Architectural CADD Concepts - Berkley
Tim Murad - (810) 543-1149
Architectural CAD Services - Ann Arbor
R. J. Reinholt - (313) 668-6700

MINNESOTA
Graphic Ideas - Anoka
Steve Rick - (612) 422-0141

NEW JERSEY
BAM Compugraphyx, Inc. - Mt. Laurel
Michael Meighan - (609) 235-1644
Gloucester County College - Sewell
Steve Rosbert - (609) 468-5000 X308

NEW YORK
999 Design Group - Valatie
Vito Mazzariello - (518) 758-9046
CADIMENSIONS - East Syracuse
Pete DiLaura - (315) 434-9787
SAGG Computers - Plainview
Arkady Kleyner - (516) 938-6422

OKLAHOMA
Oklahoma State University - Stillwater
Gerald McClain - (405) 744-5714

OREGON
Rogue Community College - Grants Pass
Del Harris - (503) 479-5541

PENNSYLVANIA
Butler County Comm. College - Butler
Mike Aikens - (412) 287-8711

TENNESSEE
Architectural Intelligence - Memphis
Stewart Brown - (901) 529-8889
Southern College - Collegedale
John Durichek - (615) 288-9126

TEXAS
CADDLINC - Dallas
Liana Handley - (214) 891-3812

VIRGINIA
ARCHSOFT - Burke
Bruce Kaplan - (703) 644-2816

WASHINGTON
TECH-NET, Inc. - Seattle
Joe Brouwer - (206) 623-1403

CIRCLE 203 ON PAGE 2 FORM

Planning Technology in a Rapidly Changing Environment

Multi-level capability and budgets come heavily into play

By David E. Weisberg

We have all heard someone comment that they wanted to hold off on buying their next computer system because something a little better or a little cheaper was just around the corner. And that is true. No sooner do you unpack your latest desktop computer than Intel introduces a faster microprocessor, Gateway 2000 adds more memory to your favorite PC or Compaq unleashes a new product line and prices throughout the industry come tumbling down.

Most of us need to put together long-range business plans that include technology budgets over a multiyear period of time. The first step is to define what we want to accomplish with this technology. It is hoped your organization is no longer satisfied with using entry-level CAD systems as a form of motorized pencils and wants to accomplish more. 3D modeling, solids, visualization, animation, collaborative design and other technologies are becoming increasingly important tools.

> The key in designing a tech plan is to articulate how you want your design group to function, based on how people work together internally and how you communicate electronically.

The key step in putting together a strategic technology plan is to be able to articulate how you want your design organization to function in the future. This needs to be done on the basis of how people will work together internally as well as how you communicate electronically with your customers, vendors and business partners. The primary decision concerns how intensely you want to use this technology.

If highly interactive exchange of design data between multiple offices and organizations is desirable, the level of planning needs to be more extensive than if you are just interested in having advanced design tools available to each user in your organization. The more complex your design setup is, the more you need to be prepared to make the necessary expenditures in management personnel and products. I believe that intense usage of computer technology will result in significant benefits for most organizations. But you have to be willing to make the investment and it is crucial that top management be involved in the decision-making process.

Having decided on the level of technology that is appropriate for your organization, how can you develop multiyear budgets? The problem is that although we can identify the hardware and software tools that are desirable today and we know what they currently cost, we have very little idea what similar products will cost in the future. Not only are hardware costs coming down, but unit software costs are starting to drop rapidly. Offsetting this is the fact that future systems will require more hardware technology and more software packages in order to provide the desired level of functionality

COMMENTARY

The approach most people use today is to define a current level of capability and then try to find the lowest-cost method of providing that capability. You may decide that you need a Pentium PC with 16MB of memory, a 525MB disk, a 20-inch display monitor, graphics accelerator card, CAD and three specific applications for each professional on your staff. Then the question comes up concerning what will this mix of hardware and software cost next year, the year after or even three or four years out. It's virtually impossible to tell with the speed at which technology and prices are changing.

I would like to suggest that you turn the process around. Analyze what different groups of people in your organization do, how much they are being paid and how much you are willing to spend on an annual basis to provide each of these individuals with the appropriate level of technology. Let's say that for a particular class of designer, you are comfortable with spending $3,500 per year. If you feel as I do that hardware should be replaced about every three years and software has a six-year life span, you can play around with these numbers to determine how to invest to support each individual.

As an example, $7,500 of hardware amortized over three years and $6,000 of software amortized over six years amounts to $3,500 per year with an initial investment of $13,500 per designer. This is what you put in your budget. As the staff expands, new personnel are provided with the best available technology that can be purchased at that point in time for $13,500. Using this approach, expenses are predictable and each individual on your staff has the best system then currently available at a cost you feel is appropriate for your organization.

David E. Weisberg is the publisher & editor of "Engineering Automation Report," a monthly newsletter on the use of computer technology in design organizations. He can be reached at 303/770-1728 or e-mail dweisbrg@eareport.com. This commentary first appeared in the May/June 1995 issue of "A/E/C Computer Solutions" and is reprinted with permission.

CONFIG from Page 15

mary monitor with CADKEY. The primary monitor is the one that is active when you boot up your computer. Press ENTER to accept the defaults for each of the following options.

Set Input Device Options

A mouse or a tablet can be used as the input/pointing device for working with CADKEY. Although you can choose a separate and independent input device to use with CADL programs, most people don't except in special situations. When you select either CADKEY or CADL Input Device, an identical set of options and questions is presented. Setting up a tablet can be complex, so for a quick configuration a mouse is the easiest. Special instructions on tablet setup can be found in the CADKEY "Getting Started" manual or with the tablet documentation. If your device is not on the list, it usually will emulate one of the industry standards. Select the standard device your mouse emulates. Depending on the input device you select, you may see a prompt asking you to specify a port for the input device. Type COM1 or COM2 and press ENTER. The Assign Cursor Buttons prompt appears. Press ENTER to skip this option at this time.

More on advanced configuration options next time!

DataCAD Users Share Inkjet Experience

By DataCAD Users

It started with a simple question about using inkjet printers with DataCAD on DBUG for DataCAD on the Internet. Many had knowledge and experience to share. It's a great place, DBUG!

The Question

John Shaw of Edmonton, Alberta, Canada, asked:

"We are considering getting a small format (11x17) printer for check prints, etc. Presently, we are splicing LaserJet prints together. The 11x17 BubbleJet seems to fit our needs, but the DataCAD printer info says it must use the Epson LQ-2500 emulation, which is 180x180 dpi in high resolution versus the 300x300 for a HP LaserJet.

"Would an inkjet be limited to 180x180 with DataCAD? Are there other inkjet brands which emulate HP that can output 300x300? Anything else I should consider? The cost of the 11x17 LaserJet is about 5 times the cost of the 11x17 BubbleJet here." *jshaw@freenet.edmonton.ab.ca*

The Answers

"We use Pacific Data ProTracer for smaller plots. (*Editor's note: The Pacific Data ProTracer was featured in the June issue of KeySolutions.*) This inkjet prints up to 17x22 at 360x360 dpi. The machine, in its basic, stripped form, costs about $1500/US. To do anything worthwhile, you have to bring it up to 8 megs of RAM, and add the Postscript and HPGL cards, which for us made it about twice that. It also has an option for roll feed (highly recommended, based on our experience with our large plotter). The early model we have supports eight customizable pen widths. It works well, if slowly; the output is very crisp and the fine lines are very fine. Call Karen DeLattre at Pacific Data for more information at (619) 597-3154." *KBenj@shore.net*

"All reports I have on the Pacific Data Products ProTracer seem to be good. It is an inkjet plotter that doubles as a printer! The base model only comes (boo, hiss) with an ADI driver. When plotting directly to the device, DataCAD won't set paper sizes for you, but this can be done manually or with a macro to send the data. For those interested, I can send you the macro I use. Just e-mail a request." Edward Blockley *webarch@kern.com*

"You don't have to use a printer that emulates HPGL. You can use a shareware package called "PRINTGL" that will translate HPGL files to any format you like without shelling out to DOS by using the "pcad" command. I personally use the Canon BJ600 and get excellent color prints. You can get this fantastic shareware ($50 registration) from Cary Ravitz BBS 606/268 0577." Mark Whiteson - Israel *whiteson@netvision.net.il or 70431.32@compuserve.com*

"Investigate CalComp's Personal TechJet. Once you get past CalComp's ineptness at marketing what is an excellent product, I am sure you will be happy with it. It comes with HPGL/907 drivers and Postscript. Have used it successfully with AutoCAD LT, Generic CADD and plotted from DATACAD. It has both 300x300 and 180x180 dpi settings and costs under $1000.

"CalComp sells the TechJet Personal for about $579 (It's a BJ230) The $200 buys you an ADI driver (available free) and HPGL/2 compatibility. I'm not sure it buys you much more." *Sean Flanagan*

"Thanks for the advice. I got a shareware copy of PRINTGL which accepts HPGL plot files and outputs to a range of printers, including Canon BubbleJets. I took a sample file into a store and printed a few tests to have a look at line weights and quality. It certainly seems adequate for our in-house check prints. When we get the printer (BJ-230 11x17) I'll try the DataCAD BJ driver as well. PRINTGL will set line weights, percent screens, and can tile large drawings onto small sheets (to scale) for pasteup. It seems a very useful plot-to-print utility." *jshaw@freenet.edmonton.ab.ca*

"I use a Canon BJ230 with excellent results (360x360 dpi). Two cautions: 1) It only has 32K of memory, so you'll probably want a plot spooler. (I'm not using one.) 2) 11x17 just doesn't scale to 24x36. Most of my drawings are 1/4 inch on 24x36 paper and I like to do one-eighth scale check plots. For the check plots, clipping the border is fine, but I also like to provide reduced scale plans to some of the sub-trades, complete with borders/title blocks. If you define a border for the B size, you end up with a lot of white space on the D size. One option is to use a different border for each. The 230 has a maximum print area of 11.44x 16.25 which helps, but then you need 12x18 paper and, of course, it doesn't Xerox to scale.

"DCPrint will support the BJ230, although you may need to download the driver from Cadkey's BBS. Multi-weight lines must be exactly that to print with DCP, which is not good or convenient. Your best result will be using PrintGL (or similar product), a utility which will allow your "printer" to print HPGL, HPGL/2 plots, complete with line (pen) widths and shading. (I lost a lot of data due to a "use upper mem area" switch with the wrong setting, so be sure to adequately test your config before proceeding.) This allows three great advantages: 1) The check plots will be WYSIWYG from your final plots; 2) You only need to create a single HPGL plot file, so you won't need a separate dcprint.prn file; 3) You'll save a lot of disk space since you only create one file , and, since it's HPGL, it'll be about one-half to one-third the size of DCP. *Carmel Gatt Architect*

Where to Get PRINTGL

The PRINTGL utility can be downloaded from the DataCAD web page at: www.cadkey.com/datacad

How to Access DBUG

Send an e-mail message to majordomo@world.std.com. In the body of the message, type: subscribe datacad-dbug.

Balance costs, functionality as you set up your CAD office

With the prices for computer products steadily declining and advances in technology making automated design easier than ever, more and more CAD practitioners are finding it attractive and affordable to set up small, fully equipped businesses. Many established, small design businesses are automating their work for the first time.

Unlike other small offices, where a computer, printer and telephone may be all an entrepreneur needs to launch a business, a CAD office has special requirements. In addition to the basics such as a word processor and spreadsheet program, the CAD entrepreneur needs specialized software and hardware.

To compete with larger businesses, a small CAD office needs to be fully automated, with a PC powerful enough to run memory-intensive CAD software, a large monitor for viewing detailed designs, and a large-format plotter for producing complex designs with accurate detail.

Choosing the Tools/ Counting the Cost

Computer - $2,000 and up

The computer should be fast and powerful enough to run graphics programs. With careful shopping, you can find computers with a math coprocessor (almost always required for CAD) and 8MB of RAM for around $2,000. However, this is really a minimum configuration. Some CAD programs are very slow with this setup. Still, it's a place to start and if you make sure that the entry system can be upgraded (RAM, speed, etc.), you can soup it up later. Fully loaded Pentiums for CAD cost $4,000 and up.

Monitor - $1,000

It is possible to do CAD work on a small monitor, but it can be frustrating. Experienced users recommend using at least a 17-inch color display.

Software - $500

CADKEY and DataCAD users have this one in the bag.

Plotter - $2,000

Pen plotters used to be the standard for CAD designers, but inkjet now has become the technology of choice. It provides much more flexibility and speed, and is simpler to use than pen-plotter technology. Prices for inkjet plotters are comparable to pen plotters. Although most users design on screen in color, the majority of output created is still black-only. Some smaller inkjets can do dual duty as an office printer.

The Bottom Line — $5,500

For as little as $5,500, the CAD entrepreneur can be in business with an entry-level, but fully functional, computerized design system. Since technology moves quickly, entrepreneurs should invest in the most powerful systems they can afford. A more powerful system allows you to go for a longer period without needing to upgrade.

Before purchasing anything, CAD entrepreneurs should plan exactly what equipment they'll need for the kind of work they expect to do and talk to other designers who use the same type of equipment. In addition, they should evaluate the warranty and customer support that vendors provide. Even one day of downtime can cost a great deal if it causes a missed deadline or lost opportunity to bid on a contract. With the right equipment and the right support, output from a one-person shop can rival that of much larger companies.

CIRCLE 212 ON PAGE 2 FORM

ORGANS from Page 1

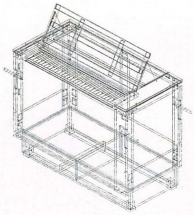
good presentation drawings for proposals.

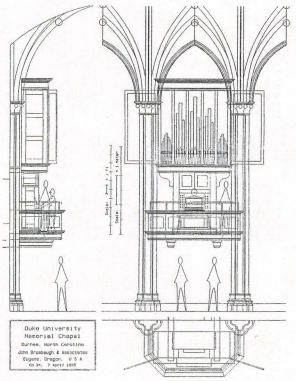
Our organs are located all over the world, primarily in the U.S., with a few in Europe. Locations include Central Lutheran Church in Eugene, Ore.; Christ Episcopal Church, Tacoma, Wash.; Southern Missionary College, Collegedale, Tenn.; Haga Församling, Göteborg; School of Music Recital Hall, Iowa State University, Ames, Iowa; and Christ Church, Christiana Hundred, Greenville, Del.

In May of this year our newest creation, Opus 33, was dedicated at the Conservatory of Music at Lawrence University in Appleton, Wisc. The organ's thousands of moving parts are largely hand-crafted. The fumed white oak casing features 24 decorative carvings, and there are three manuals of 56 notes, each faced with cow bone and ebony. The pipes, ranging in size from a few inches to 32 feet, are painstakingly constructed in the style of the historic Dutch, North German, and Classical French instruments. The architectural design of the main case housing the Great division and some parts of the Pedal division was inspired by an organ built in 1685 for Christ Church Cathedral in Oxford. As one can imagine, a project of this size and complexity is not completed quickly. Our small staff of six completed this organ, from design to installation, in three and one-half years. Our current project is an organ for the Duke University Memorial Chapel patterned after Italian organs built circa 1480-1520. It is the first design in which I will use CADKEY exclusively.

I may be unusual in my design approach, but it works for organs. I design from the outside in. I start with a basic design, add to it, and then go deeper inside. Organ design is multi-faceted; there are many intricate architectural elements on the outside and thousands of complex mechanical parts inside. The organ built for the Dupont family church in Greenville, Del., has more than 10,000 parts. In some ways, the organ's internal parts are like a car engine. You've got a transmission and gears and everything has to fit together. Sometimes you're working in real tight spaces. My job is to design it all. When I complete the design of a part, I give the working drawing to my crew, who manufactures it from scratch, using wood or metal.

One of the most important factors for which I must continually watch out is never to let our modern techniques overshadow and dominate. The musical art always must be at the root of making a fine pipe organ, even though the modern techniques are continually begging to take control! If we are successful at building a fine new pipe organ, I can imagine that it could remain part of the public art heritage for many centuries, just as the great organs in Europe are for us today.





Silicon Snake Oil

Second Thoughts on the Information Highway

BOOK PREVIEW

"Some without a modem worry that they're missing an important part of modern living. Yet few aspects of daily life require computers, digital networks, or massive connectivity. They're irrelevant to cooking, driving, visiting, negotiating, eating, biking, dancing, speaking, and gossiping. You don't need a keyboard to bake bread, play touch football, piece a quilt, build a stone wall, recite a poem, or say a prayer.

"At the other end of the spectrum, I have friends who are on-line 10 or 12 hours a day. They spend a substantial part of their lives answering e-mail, transferring files, playing games, reading netnews, and exploring the Internet. They'd take umbrage at the suggestion that they're missing out on something important: having a rich life.

"Instead, these on-line addicts point out the importance of networks, communications, and home computers. They see the Internet as both tool and community, essential to work and home. I flat-out don't believe them."

— Cliff Stoll

Picture yourself sitting in a dark room illuminated only by a generically bright and eerily familiar radiance. You hear nothing, save a faint buzzing sound and an occasional cacophony of clicks. You feel nothing, except a smooth plastic surface against your fingertips. Sensing a slight disconnection from your physical self, you try to remember if you are creating this rhythmic clicking – a hollow sound that somehow fills the room. You wonder if someone is watching you. And then you remember that dozens of electronic voices are waiting for you to answer their cries. No, you have not entered the Twilight Zone. As Orwellian as this scenario might sound, you are simply answering your electronic mail. Though this description is a mere caricature of on-line communication, many aspects of this disaffected connection to people and places around the globe resonate in the pages of astronomer Cliff Stoll's new book, "Silicon Snake Oil: Second Thoughts on the Information Highway" (Doubleday; $22).

An avid net user for the last 15 years, Stoll has begun to question the ways in which cyberspace – a land devoid of texture – is beginning to encroach upon the more tactile "actual" world in which we live. "While the Internet beckons brightly, seductively flashing an icon of knowledge-as-power," writes Stoll, "this non-place lures us to surrender our time on earth."

Much of Stoll's "increasing ambivalence toward this most trendy community" stems from the tendency for cyberspace communication to focus primarily on accruing information as quickly as possible, thereby shifting our cognitive processes away from more contemplative thought. "Information is not knowledge," Stoll insists. In our quest to embrace this metaphorical community, we are "losing our ability to leapfrog over conceptual walls." Instead of encouraging in-depth discussions, the Internet has sparked bursts of intelligence with little coherent direction; instead of strengthening our creative capacities, the recent explosion of software networks has nourished drones; instead of fostering literacy, on-line communication gives birth to quick, cryptic messages.

The Information Highway is often promoted as the savior of this country's education system, an invention destined to breathe new life into our library systems, create a meeting place for people with common interests, and enhance diversity, novelty and culture. This electronic creation, however, has fallen short of these expectations. "As I contemplate this silicon navel, I see a wide gulf between the real networks that I use daily, and the promised information infrastructure," writes Stoll in "Silicon Snake Oil." Despite the myths that the Internet is an inexpensive, egalitarian method of communication used by millions, computers and on-line accessories remain pricey, and entire segments of the population have yet to log on.

Despite all these criticisms, "Silicon Snake Oil" is far from pedantic. Stoll does expound many virtues of electronic connection and he does not condemn the Internet. Beginning with his own computer dependency and his awe at the technical possibilities that have surfaced in the last decade, Stoll writes with candor and humility about his own on-line journeys and misadventures. The reader of this book is privy to scores of well-researched examples about the ramifications of our increasing reliance on the Information Superhighway and its cyberspace tributaries. Stoll's text also is punctuated with humorous childhood reminiscences about scavenger hunts and archaic video games, college courses in lunar geology, and the author's on-line introduction to Mandarin language study. Stoll uses these metaphors of "actual" experience to illustrate his concerns about, and reliance on, the Internet.

Nevertheless, "Silicon Snake Oil" is sure to shock many readers and incite those who tend to spend their days tuned in, hooked up, and "bathed in the glow of their cathodes" answering e-mail. Thick with description and as satanic as it is scholarly, this is a guidebook of sorts through the electronic web we've created. Stoll's book serves as a reminder that humanity cannot live by virtual experience alone. "Footprints across an artificial reality are as evanescent as data on the Ethernet," cautions Stoll. As valuable as the Internet can be for certain endeavors, such as scientific research and informal business communication, we must not delude ourselves into thinking that computer-generated reality can replace real time, tangible space.

"The Internet began as a technical community, with convivial neighbors who'd help each other," comments Stoll. "Its friendly anarchy promised to revolutionize social interaction and transcend political boundaries." With time, the Internet has devolved into a mass of possibly useful information – a created environment governed by no official monitors that is as addictive and isolating as it is efficient and ultimately democratic, or so the myth goes. However, in the process of wading through simulated junk to retrieve apt information on the Internet, we have begun to lose sight of the subtleties of unprocessed reality. As Henry David Thoreau writes in "Walden:" "Our inventions are wont to be pretty toys, which distract our attention from serious things. They are but improved means to an unimproved end." Just because we've created this ubiquitous global network does not mean that we are any closer to solving our most pressing dilemmas. In fact, the Information Highway just might be furthering the distance between us – a distance measured not in pixels and bytes but metered out in the muddled script and beautifully imperfect lines drawn by human hands.

"Silicon Snake Oil" author Cliff Stoll is an astronomer at the University of California Berkeley who backs up his data every week, pays all his shareware fees, and flosses nightly. He lives in Oakland with three cats that he pretends to dislike.

CIRCLE 243 ON PAGE 2 FORM