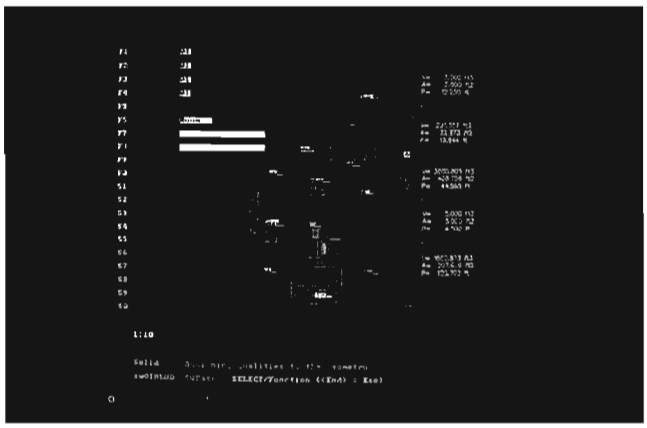
3-D WORLD

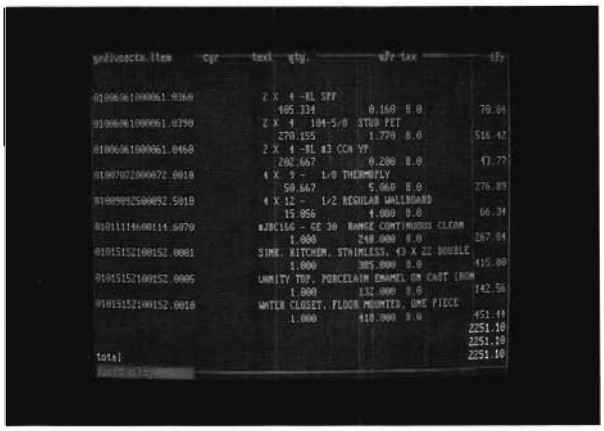
News For The CADKEY/DataCAD User

May/June 1991
Volume 5, Number 3
Annual Subscription: $29.95

Are Estimating and Design Together at Last?



DataCAD drawing with QBIDS Macro activated. The actual numbers on the right side of the drawing are from the QBIDS takeoff illustrated in the photograph on the right side of this page.



Screen view of the non-graphical data taken by QBIDS from the DataCAD architectural drawing (takeoff) identifiying the materials required for the building and their individual and collective costs.

by Peter Haggard

Editor's Note: This article first appeared in the January 1991 issue of **MCN** MICROCAD NEWS, published by Ariel Communications, Inc., Austin, Texas.

For high-volume builders of custom and production homes, the union of CAD-based drawings with an interactive estimating package is a dream come true. CAD-based drawings can provide design accuracy, detail, specificity, and control. The estimating package can identify the materials required to complete a project and calculate costs. Using these packages together, builders can cope with a highly competitive market, escalating costs, increased buyer resistance to cookie-cutter designs, and the need to move quickly from design to project completion.

Bringing together two seemingly compatible entities is not so easy as it might appear, but this is precisely the task that US Home set out to accomplish. Like all builders of residential homes, US Home was faced with the sobering task of thriving in a battered market.

Tying Technologies Together

It was at this point that the corporation's president of South Operations, Michael T. Richardson, and a small support team initiated a project that would tie together two pieces of existing microcomputer-based technology. By combining CAD-based drawings with an integrated estimating package, Richardson reasoned that he could improve the quality and accuracy of the corporation's production and purchasing functions. He was not deterred by the fact that these packages had not yet been successfully melded together in a commercially available turnkey product. But, it looked like a linkage that ought to work. As it turned out, the link not only worked, but it produced additional advantages that enhanced the division's competitive edge.

Because the economic factors were particularly acute in the Texas market, the Dallas division was selected as a beta test site. Based on the volume levels that the Dallas division hoped to maintain, the cost savings that the new system produced would be immediately evident. More importantly, the division's ability to remain economically viable

(Continued on page 3)

IN THIS ISSUE:

TRAINING SCHEDULE AT CADKEY, INC.

We have Training dates scheduled through February, 1991. Please call Customer Service to register: (203) 647-0220, ext. 8030.

Course	May	Jun.	Jul.
Introduction to CADKEY	6-8	10-12	15-17
Introduction to DataCAD	13-15	24-26	29-31
Advanced Geometric Modeling	9-10	13-14	18-19
CADKEY SOLIDS			

CADKEY/DataCAD Training In U.S. & Canada

Many authorized CADKEY and DataCAD Training Centers have scheduled courses in addition to the training available at CADKEY's world headquarters here in Manchester, CT. The following is a list of who is doing what, where, and when:

State	CTC	Location/Contact	Course	Dates
Ala.	Jacksonville State University	Dept. of Engineering Jacksonville, AL Dr. P.S. Yeh (205) 782-5229	Intro. to CADKEY	Jun. 5-7 Jul. 10-12 Jul. 29-31 Aug. 28-30
Ark.	Crowley's Ridge Vo-Tech School	I-40 and Crowley's Ridge Rd. Forrest City, AR Charles Coleman (501) 633-5411	*Intro. to CADKEY*	May 16-17, 22-24 Jun. 8 & 15 Jun. 22 & 29 Jul. 6 & 13 Jul. 20 & 27
Calif.	CAD MicroSystems	5120 W. Goldleaf Cir. Suite 100 Los Angeles, CA Monica Hunter (213) 291-2000	*Intro. to CADKEY*	Call for schedule.
	Consulting Services International	14621 Titus St. Van Nuys, CA Bob Messamer (818) 994-8881	*Intro. to CADKEY* *Advanced CADKEY*	3rd full week of each month. Scheduled on request.
	Desktop Productions	18200 Yorba Linda Bd. Yorba Linda, CA Carol Buehrens (714) 579-3066	*DataCAD for the Architect* (Mon./Wed., Tues./Thur., & Wed./Fri.) *DC Modeler* *Advanced DataCAD* *DataCAD Velocity* *DataCAD Keybd Macros*	May 1-10 May 14-23 Jun. 5-14 Jun. 17-26 Jul. 9-18 Jul. 28-Aug. 2 May 7, 22, 28 Jun. 11, 25 Jul. 10, 23 Scheduled on request. Scheduled on request. May 2, Jun. 4 Jul. 19
	Evergreen Valley College	3095 Yerba Buena Rd. San Jose, CA Loren Fromm (408) 274-7900, x6664	*Intro. to CADKEY* *3-D Design w/CADKEY*	Jun. 17-19 Jun. 20-21

New Contact Person for the San Diego DataCAD Users' Group

Dae Kim of Mostrè Design, Inc. has accepted the role of contact person for the San Diego DataCAD Users' Group in place of Bill Elder. You can reach Dae Kim at Mostrè Design, Inc., 7968 Arjons Drive, Suite A103, San Diego, California 92126. Telephone: (619) 693-3030. Fax: (619) 693-3032.

Why a Smaller Issue of 3-D WORLD This Time?

Managing Automation 2

You may be wondering why this issue of **3-D WORLD** is smaller than usual. We made this issue smaller so that we could get a copy of **Managing Automation 2** to each of you, in a cost-effective manner, at the same time that we sent **3-D WORLD**. This special issue of **Managing Automation** provides exciting features about CADKEY, INC.'s direction and a variety of application stories related to mechanical engineering and reverse engineering which we thought that you would enjoy.

DataCAD and QBIDS

At the same time, a major article by Peter Haggard, a DataCAD(R) customer, describing how he linked DataCAD and QBIDS™, a third-party product, into an integrated architectural-CAD and construction-estimating system, appeared in the January 1991 issue of **MCN MICROCAD NEWS**. Peter Haggard's article is particularly timely right now, and with the approval of Ariel Communications, publishers of **MCN MICROCAD NEWS**, **3-D WORLD** is delighted to reprint it in this issue.

Customer Survey

Moreover, for the first time, **3-D WORLD** is conducting a survey of our readers: CADKEY, DataCAD, and CADDInspector users. Please take the time to fill out and return this survey. We really want to hear from you. The questionnaire is rather long. To encourage you, the name of every customer who returns the survey by August 1, will enter a drawing. In September, the name of one user from each of CADKEY's product families (CADKEY, DataCAD, and CADDInspector) will be drawn to receive a copy of the latest version of the CADKEY product that he/she uses, plus maintenance for one year. Plus, the names of five users in each product family will be drawn to receive vouchers for free training tuition valid for one year. Also, 20 names will be drawn to receive copies of CADKEY's new heat-transfer and stress analysis software shown at NDES '91.

3-D WORLD is published bi-monthly by CADKEY, INC., 440 Oakland Street, Manchester, CT 06040.
Editor: Frank Simpson
Contributing Editors: Maribeth Schneider, Mary Beth Staron
For additional copies, changes in mailing address, information about **3-D WORLD**,
TELEPHONE: (203) 647-0220, ext. 7180
FAX: (203) 646-7120

Estimating and Design

(Continued from page 1)

and competitive in the marketplace would be significantly enhanced.

The project began by setting goals and acquiring the necessary tools to achieve them. The objectives were straightforward:

- Transfer all of the division's drawings into a CAD-based format.
- Integrate CAD-based drawings with a compatible estimating package.
- Develop a supporting database.
- Produce accurate takeoffs that identify the materials required and that furnish their individual and collective costs. (A takeoff is non-graphical information, taken from the design of a building, which identifies one item of material or supply to be used in the construction of the building. A complete list of takeoffs constitutes a bill of materials for the building.)
- Produce drawing-referenced purchase orders that could be generated by the estimating system and sent to vendors.

Twelve-Month Project

Assembling the resources was also straightforward. Richardson hired me as project manager and gave me 12 months to accomplish the objectives. The company purchased an AST 386/25 computer, an Océ 1824 plotter, and a Hewlett-Packard LaserJet Series II printer. For the project's design software, Richardson selected CADKEY's DataCAD™. For the estimating component, he selected QBIDS Professional Estimator™ by Quadric Software (U.S.A.). Both decisions were based on the results of a two-year study of integrated or integratable software that the support team had recently completed. According to the team's findings, DataCAD and QBIDS were completely compatible and could function effectively as a single unit. Richardson was also impressed by the level of product support that both software manufacturers were willing to provide. When Quadric Software confirmed that the current release of QBIDS could produce purchase orders, the company immediately acquired the product.

At this point, the project began to

(Continued on page 4)

CADKEY/DataCAD Training in U.S. & Canada (continued)

State	CTC	Location/Contact	Course	Dates
Calif.	Golden West College	15744 Golden West St. Huntington Beach, CA Jack North (714)895-8209	*Intro. to CADKEY*	Jul. 12-14
	Poelman's Design Service	901 Campisi Way, #360 Campbell, CA Mike Poelman (408)377-3585	*Intro. to CADKEY* *CADL* CADKEY SOLIDS	Jun. 24-26 Aug. 26-28 Jul. 22-26 May 20-22 Sept. 23-25
	Ukiah High School	1000 Low Gap Rd. Ukiah, CA Jim Howlett (707)463-5253, x284	*Intro. to CADKEY*	1st weekend of every month.
Colo.	University of Colorado at Denver	1200 Larimer St. Denver, CO Andreas Vlahinos (303)556-2370	*Intro. to CADKEY* *Advanced CADKEY*	Call for schedule.
Conn.	DATAMAT Program-ming Systems	9 Mott Avenue Norwalk, CT Matt Reuben (203)855-8102	*Intro. to CADKEY*	May 20-24
	University of Hartford	S.I. Ward Coll. of Tech. 200 Bloomfield Av. W. Hartford, CT Don De Bonee (203)243-4763	*Intro. to CADL*	May 22-24
Fla.	Gateway Computer Learning Center	10901B Roosevelt Blvd. St. Petersburg, FL Terri Long (813)576-0549	*Advanced CADKEY* *CADKEY SOLIDS*	Scheduled on request. Scheduled on request.
	Indian River Community College	3209 Virginia Av. Fort Pierce, FL Bill Sigurdson Dean Zirwas (407)468-4700, x4269	*Intro. to CADKEY*	(weekend) Individualized audit courses available.
Ill.	PFB Concepts a.k.a. CADPRO Chicago	2525 E. Oakton Av. Arlington Heights, IL Bob Konczal (708)640-1853	*Intro. to CADKEY* *Advanced CADKEY* *CADKEY SOLIDS* *CADL* (weekend) *CADKEY* *Light PageMaker for CADKEY*	May 8-10 Jun. 5-7 Jun. 19-21 Aug. 21-23 May 23-24 Aug. 1-2 May 18-19 Aug. 17-18 Jun. 14 Jun. 12-13 Aug. 28-29
Iowa	Iowa Lakes Community College	300 South 18th St. Estherville, IA Roger Patocka (712)362-2604	*Intro. to CADKEY*	Special schedules by request.
Mass.	Springfield Technical Community College	1 Armory Square Springfield, MA William White (413)781-7822	*Intro. to CADKEY* *Advanced CADKEY* *CADL*	Jun. 3-5 Jun. 10-11 Jun. 17-18

CADKEY/DataCAD Training in U.S. & Canada (continued)

State	CTC	Location/Contact	Course	Dates
Mass.	Worcester Polytechnic Institute	100 Institute Road Worcester, MA Sean Anzoni Pat Scavone (508)831-5633	*Intro. to CADKEY*	June (2nd or 3rd full week of month) Call for dates.
Md.	Anne Arundel Community College	101 College Parkway Arnold, MD Sina Sepehri (301)541-2435	Intro. to CADKEY	May 20-23 Oct. 18-19 Oct. 25-26
	Catonsville Community College	800 S. Rolling Rd. Catonsville, MD Tom Barrett (301)455-4298	*CADKEY Overview* *Intro. to CADKEY*	May 30-31 Jun. 17-21
Mich.	Future Solutions	5900 N. Lilley Rd. #101 Canton, MI Paul Zwarka (313)981-7455 FAX: (313)981-7473	*Intro. to CADKEY* *Adv. Geo. Modeling*	May 14-16 Jun. 11-13 May 6-7 Jun. 3-4
	Washtenaw Community College	Occupational Ed. Bldg. 4800 E. Huron River Dr. Ann Arbor, MI Belinda McGuire (313)973-3300	*Intro. to CADKEY* *Advanced CADKEY* *CADKEY SOLIDS*	May 13-15 Jun. 3-5 May 16-17 Jun. 6-7 May 21-22 Jun. 11-12
Minn.	Albert Lea Technical Institute	2200 Tech Dr. Albert Lea, MN Larry Gilderhus (507)373-0656	*Intro. to CADKEY* *Advanced CADKEY*	Scheduled on request.
	Anoka Ramsey Community College	11200 Mississippi Blvd. Coon Rapids, MN Tom Loftus (612)427-2600 (Customized classes at CTC or on site scheduled on request.)	*Intermed. CADKEY & DRAFT-PAK* *Intro. to CADKEY* *Intermed. CADKEY* *Adv. Geo. Modeling* *Intro. to DataCAD*	May 6-27 (M & W eve.) Jun. 24-26 Jun. 26-28 Jun. 20-21 Jun. 17-19
	Moorhead State University	Industrial Studies Dept. Moorhead, MN Wade Swenson (218)236-2466	*Intro. to CADKEY* On-site courses	Jun. 3-5 Scheduled on request.
	St. Paul Technical Institute	235 Marshall Ave. St. Paul, MN Michael Haffner (612)221-1307	*Intro. to CADKEY*	Call for schedule.
Miss.	Mississippi Delta Community College	Highway 3, Box 668 Moorhead, MS Tony Honeycutt (601)246-5631, ext.103	*Intro. to CADKEY*	May 20-22 Aug. 12-14 Oct. 28-30
Mont.	Montana School of Min. Sci. & Technology	West Park St. Butte, MT Dick Johnson (406)496-4452	*Intro. to CADKEY* *Advanced CADKEY*	May 15-17 Scheduled on request.

Estimating and Design

(Continued from page 3)

get a bit more challenging. Because the Dallas division had not yet converted to automated designing, all current plans had to be transferred to DataCAD. To do so, I contacted several local architects who use DataCAD, and with their input, I created a complete set of CAD drawings and graphic standards. These were compiled in a CAD-design manual and shared with the CAD-based architects who were selected to participate in the project.

Developing a System

While the architects were busy transforming the division's plans into DataCAD drawings, I installed QBIDS on the AST and began developing the customized database that QBIDS needed to identify and price the materials used to construct the division's product line. I also downloaded the corporation's existing material and pricing data to QBIDS. This download formed the foundation for the customized database. Moreover, by using existing data, I significantly shortened the data-input process and reduced the possibility of input error.

In addition to building a customized database, I worked with the information-systems staff to analyze the field compatibility between QBIDS and the corporation's accounting system. By matching and cross-referencing fields, we were able to ensure that QBIDS could exchange data with the corporation's Honeywell DPS-8 mainframe. This capability made it possible for QBIDS to upload purchase-order-cost groups and cost-group totals. With this data, the accounting department could produce cost analyses and financial statements. Equally important, QBIDS could be used to produce purchase orders that were tied directly to a project's construction drawings. As the flexibility of the software became apparent, the scope of the project began to enlarge.

The arrival of the first DataCAD drawings triggered more systems analysis. I worked with the division's estimator and purchasing manager, Neal Jones, and his staff to identify the process they used to estimate the cost of

(Continued on page 9)

CADKEY Customer Survey

To continue to receive **3-D WORLD**, please answer the questions in this customer survey by putting a check mark next to the appropriate answers. In some cases, more than one answer may apply. For more detailed answers, please use the blank area of page 8. This is the first customer survey ever published by **3-D WORLD**, and it addresses all of you, users of CADKEY™, DataCAD™, and CADDInspector™. Some of you use more than one of our products, e.g., CADDInspector and CADKEY. When you come to questions that distinguish among CADKEY, DataCAD, and CADDInspector, please answer the questions related to each product that you use. Some questions may not apply to all of you.

Please attach the mailing label from the envelope in which you received the May/June 1991 issue of **3-D WORLD** in the space below. If you received more than one copy of **3-D WORLD**, please staple the other mailing label(s) together in the second space provided in this survey.

PLEASE AFFIX MAILING LABEL HERE

1. Is the address on the mailing label above correct?
   ___Yes (101) ___No (102)
2. If the mailing address is not completely correct, please make any necessary corrections below.

Please cut out and staple together in the space below any other mailing labels from envelopes in which you have received the May/June 1991 issue of **3-D WORLD**.

PLEASE AFFIX EXTRA MAILING LABELS HERE

3. Your Employment (Please check all that apply):
   ___Private Industry (301) ___Fortune 100 Firm (302)
   ___Fortune 500 Firm (303)
   ___Fortune 1000 Firm (304)
   ___Large Firm (Not Fort. 1000) (305)
   ___Medium-sized Firm (306)
   ___Small Firm (307)
   ___Minority-owned Firm (308)
   ___Woman-owned Firm (309)
   ___Government (310) ___Federal (311)
   ___State (312)
   ___County (313)
   ___City/Town (314)
   ___Government Contractor (315)
   ___Other (9906) (Please specify. Feel free to use page 8.):

4. Your Job Function (More than one may apply):
   ___Engineer (401)
   ___Engineering Manager (402)
   ___Engineering Consultant (403)
   ___Design / Drafting Technician (404)
   ___Architect (405)
   ___Other A/E/C Professional (9941) (Please specify):
   ___Technical Writer or Illustrator (406)

4. Your Job Function *(continued)*:
   ___Editor (406) ___CADKEY Dealer (410)
   ___Educator (407) ___DataCAD Dealer (411)
   ___Student (408) ___CADDInspector Dealer (412)
   ___3rd-party Developer (409)
   Product(s) (9942) (Please specify. Feel free to use page 8.):
   ___Other (9943) (Please specify. Feel free to use page 8.):

5. Your Application (Please mark all that apply):
   ___Product Design (501) ___Architectural Eng. (506)
   ___Drafting (502) ___Construction Eng. (507)
   ___Reverse Engineering (503) ___Facilities Planning (508)
   ___Inspection (504) ___Civil Engineering (509)
   ___Manufacturing (505) ___Other (9905) (Please specify):

6. Design & Manufacturing Process
   ___Sheet Metal (601) ___Investment Casting (604)
   ___Tool & Die Making (602) ___Modular Housing (605)
   ___Mold Making (603) ___Other (9906) (Please specify):

7. Operating Systems / windowing environment that you use (If possible, give version #):

	VERSION #		VERSION #
___DOS (701)	(9971)	___No windowing (708)	
___DR-DOS (702)	(9972)	___MS-Windows (709)	(9978)
___PC-MOS (703)	(9973)	___X-Windows (710)	(9979)
___OS/2 (704)	(9974)	___Open Look (711)	(9980)
___UNIX (705)	(9975)	___Motif (712)	(9981)
___VMS (706)	(9976)	___DESQview (713)	(9982)
___Macintosh (707)	(9977)	___Other (9917) (Please specify):	

   ___Other (9907) (Please specify. Feel free to use page 8.):

8. Local Area Networks that you use (If possible, version #):

	VERSION #
___3COM (801)	(9983)
___Novell Netware (802)	(9984)
___Banyan Vines (803)	(9985)
___TCP/IP (804)	(9986)
___DECNET (805)	(9987)

   ___Other (9908) (Please specify. Feel free to use page 8.):

9. Hardware platforms that you use:
   ___IBM-compatible PC/XT (901)
   ___IBM-compatible PC/286 (902)
   ___IBM-compatible PC/386 (903)
   ___IBM-compatible PC/486 (904)
   ___Silicon Graphics Personal Iris™ (905)
   ___Sun Microsystems Sparc Station™ (906)
   ___Sony News CISC™ workstation (907)
   ___Data General AViiON 300™ workstation (908)
   ___Hewlett Packard (909)
   ___Digital Equipment Corporation (910)
   ___Other (9909) (Please specify. Feel free to use page 8.):

10. Besides CADKEY, DataCAD or CADDInspector, what other types of software do you use regularly? Please mark all that apply, and please identify the products that you use.
    ___Spreadsheet (1001)
    ___Word Processing (1002)
    ___Desktop Publishing (1003)
    ___Database (1004)
    ___Graphics (drawing, painting, charting) (1005)
    ___Presentation Graphics (slides, overheads) (1006)
    ___Project Management (1007)
    ___Numerical Control (1008)
    ___Finite Element Analysis or Finite Element Modeling (1009)
    ___Design Tools (1010)
    ___Mold Design (1011)
    ___Sheet Metal (1012)
    ___Marine (1013)
    ___Libraries (1014)
    ___A/E/C Applications (1015)

(Continued on next page)

10. Other software products that you use regularly *(continued)*:
___Translators (1016)
___Drafting (1017)
___Scanning (1018)
___Bill of Materials (1019)
___Input Devices / Overlays (1020)
___Productivity Tools (1021)
___Other (9910) (Please Specify. Feel free to use page 8.):

11. Besides CADKEY, DataCAD, or CADDInspector, do you use any other CAD software? (Please mark all that apply.)
___AutoCAD™ (1101)
___Drafix™ (1102)
___Generic CAD™ (1103)
___Personal Designer™ (1104)
___ProEngineer™ (1105)
___VersaCAD™ (1106)
___Anvil 1000™ (1107)
___Anvil 5000 PC™ (1108)
___Anvil 5000™ (1109)
___Microstation™ (1110)
___BRAVO 3™ (1111)
___CADDS4X™ (1112)
___CADAM™ (1113)
___MicroCADAM™ (1114)
___Calma™ (1115)
___Catia™ (1116)
___Other (9911) (Please specify. Feel free to use page 8.):

12. Do you exchange CAD data between different systems? If so, which translators do you use?
___IGES (1201)
___DXF (1202)
___Direct Translator (1205)
(Please mark all that apply.):
___AC™ (1206)
___Almost Anything To CADKEY™ (1207)
___BIG BROTHER™ (1208)
___CADKEY/CADAM™ (1209)
___CADKEY/Wavefront™ (1210)
___CATTRANS™ (1211)
___PDES (1203)
___CALS (1204)
___CGM/CAD™ (1212)
___FirstCUT™ (1213)
___IGES Parser/Verifier™ (1214)
___IGES To Interleaf™ (1215)
___Kinetic CADConvert™ (1216)
___Micro Map & CAD™ (1217)
___VDAFS Interface™ (1218)
___Other (9912) (Please specify. Feel free to use page 8.):

13. In what field of work is your company involved? (Please mark all that apply.)
___Aerospace (1301)
___Automotive (1302)
___Consumer goods (1303)
___Housing (1304)
___Industrial buildings (1305)
___Industrial products (1306)
___Medical products (1307)
___Shipbuilding (1308)
___Other (9913) (Please specify. Feel free to use page 8.):

14. If your company is a manufacturer, what do you manufacture? (Please mark all that apply.)
___Molds (1401)
___Dies / Tooling (1402)
___Prototypes (1403)
___Production parts (1404)
___Finished goods (1405)
___Other (9914) (Please specify):

15. If your company is a manufacturer, approximately what percentage of your company's working time is spent doing design in comparison with manufacturing?
___Design: % (9915)
___Manufacturing: % (9951)

16. During a 40-hour work week, approximately what percentage of your time do you spend using CADKEY, DataCAD, or CADDInspector? If you use more than one of our products, e.g., CADDInspector and CADKEY, please indicate the approximate percentage of time that you spend with each of the products.)

CADKEY	DataCAD	CADDInspector
___None (1601)	___None (1607)	___None (1613)
___ 1%-25% (1602)	___ 1%-25% (1608)	___ 1%-25% (1614)
___26%-50% (1603)	___26%-50% (1609)	___26%-50% (1615)
___51%-75% (1604)	___51%-75% (1610)	___51%-75% (1616)
___75%-99% (1605)	___76%-99% (1611)	___76%-99% (1617)
___Full Time (1606)	___Full Time (1612)	___Full Time (1618)

17. During a 40-hour workweek, approximately what percentage of your time do you spend using other CAD software?
___None (1701)
___ 1%-25% (1702)
___26%-50% (1703)
___51%-75% (1704)
___76%-99% (1705)
___Full Time (1706)

18. When you are using CADKEY, DataCAD, or CADD-Inspector, approximately what percentage of your time do you spend working in 3-D and in 2-D?

3-D	2-D
___None (1801)	___None (1807)
___ 1%-25% (1802)	___ 1%-25% (1808)
___26%-50% (1803)	___26%-50% (1809)
___51%-75% (1804)	___51%-75% (1810)
___75%-99% (1805)	___76%-99% (1811)
___Full Time (1806)	___Full Time (1812)

19. Does your company use computers for any of the disciplines listed below in a production environment (e.g., shop floor)? (Please mark all that apply.)
___Application-Language programming (e.g., C, Fortran) (1901)
___Computer-Aided Design / Drafting (CADD) (1902)
___Computer-Aided Manufacturing (CAM) (1903)
___Computer-Integrated Manufacturing (CIM) (1904)
___Direct Numerical Control (DNC) (1905)
___Computer Numerical Control (CNC) (1906)
___Inspection (1907)
___Numerical-Control programming (e.g., APT, Compact II) (1908)
___Piping (1909)
___Plant layout / Facilities management (1910)
___Presentation graphics (1911)
___Process planning (1912)
___Repetitive manufacturing (1913)
___Simulation / Animation (1914)
___Statistical Process Control (SPC) (1915)

20. Does your company use any of these computerized automation tools? (Please mark all that apply.)
___CNC Milling Machines (2001)
___CNC Lathes (2002)
___CNC Wire Electric-Discharge Machines (EDM) (2003)
___CNC Graphite E-D Machines, a.k.a. *sinkers* (2004)
___Coordinate Measurement Machines (CMM) (2005)
___Data collection systems (2006)
___Flexible manufacturing systems (2007)

21. Do you use CADKEY with CAM software? If so, which CAM software do you use? (Please mark all that apply.)
___ACU.CARV™ (2101)
___Adv. Sys. 2000™ (2102)
___ANICAM™ (2103)
___CAD-LINK™ (2104)
___CAMAND™ (2105)
___CAMTOOL™ (2106)
___CentraPath™ (2107)
___CONCEPT™ (2108)
___EASYCAM™ (2109)
___EasyPATH™ (2110)
___EUCLID™ (2111)
___FAPT CAM™ (2112)
___FastAPT™ (2113)
___GeoCAM™ (2114)
___GeoCIM™ (2115)
___GeoPath™ (2116)
___GEOTEC/NC™ (2117)
___GO-ELAN™ (2118)
___GO-ELAN.C™ (2119)
___GRAFX+™ (2120)
___GRAFX II™ (2121)
___IMAGE™ (2122)
___LICOM-APS™ (2123)
___MAIA-MINC™ (2124)
___Mastercam™ (2125)
___NC-Link™ (2126)
___NC-Link Plus™ (2127)
___Pathtrace™ (2128)
___PG Translator™ (2129)
___PowerCAM™ (2130)
___QuickCAM™ (2131)
___RAMCAM™ (2132)
___Reverse Access™ (2133)
___SHOPCAM™ (2134)
___SmartCAM™ (2135)
___SmartCAM Advanced™ (2136)
___SurfCAM™ (2137)
___UG2™ (2138)
___VERICUT™ (2139)
___XL/NC II™ (2140)
___Other (9921) (Please specify. Feel free to use page 8.):

22. Does your company use any CADKEY-related or DataCAD-related, third-party application software?
___Yes (2201)
___No (2202)
If yes, please specify (9922) (Feel free to use page 8):

23. Does your company do work with surfaces using CADKEY?
___Yes (2301)
___No (2302)
If yes, which surfaces software do you use? (9923) (Please be specific. Feel free to use page 8.):

24. Does your company use other CAD systems for applications that CADKEY, DataCAD, or CADDInspector do not support at the present time?
___Yes (2401) ___No (2402)
If yes, please be specific (9924) (Feel free to use page 8.):

25. Do you think that CADKEY, DataCAD, or CADDInspector could / should support these applications?
___Yes (2501) ___No (2502)
If yes, please be specific (9925) (Feel free to use page 8.):

26. What enhancements, if any, would enable you to use CADKEY, DataCAD, or CADDInspector in areas where you are currently using another CAD system or no CAD system at all? Please be specific (9926) (Feel free to use page 8.):

27. Approximately how many employees does your company have working at your location?
___1-10 (2701) ___101-200 (2705) ___More (9927)
___11-25 (2702) ___201-500 (2706) Please be specific:
___26-50 (2703) ___501-1,000 (2707)
___51-100 (2704) ___1,000-5,000 (2708)

28. Approximately how many CADKEY, DataCAD, or CADD-Inspector users are there at your location?
CADKEY: (9928) DataCAD: (9988) CADDInspector: (9989)

29. Is your company planning to add or upgrade CAD systems?
___Yes (2901) ___No (2902) ___Don't know (2903)
If yes, approximately when?
___Now (2904) ___3-6 mo. (2905) ___6-12 mo. (2906)
Does your company have a maintenance agreement?
___Yes (2907) ___No (2908)

30. Approximately how many CADKEY, DataCAD, or CADD-Inspector systems does your company have at your location?

CADKEY	DataCAD	CADDInspector
___1-10 (3001)	___1-10 (3006)	___1-10 (3011)
___11-25 (3002)	___11-25 (3007)	___11-25 (3012)
___26-50 (3003)	___26-50 (3008)	___26-50 (3013)
___51-100 (3004)	___51-100 (3009)	___51-100 (3014)
___More (3005)	___More (3010)	___More (3015)

If MORE, please be specific (9930):

31. What are your major reasons for buying CADKEY, DataCAD, or CADDInspector? (Please mark all that apply.) If you use more than one product, please identify whether you are answering this question for CADKEY, DataCAD, and/or CADDInspector. Please mark all that apply:
___CADKEY (3101) ___DataCAD (3102) ___CADDInspector (3103)
___Reputation of product (3104)
___Product demonstration (3105)
___Capabilities of the system (3106)
___Strength and knowledge of the dealer (3107)
___Technical support after purchase (3108)
___Availability of training (3109)
___Price (3110)
___Compatibility with existing mainframe or mini-computer-based CAD system (3111)
___Compatibility with existing FEA system (3112)
___Compatibility with existing CAM system (3113)
___Promises of future products (3114)
___Other (9931) (Please specify. Feel free to use page 8.):

32. Would you purchase this product again?

CADKEY	DataCAD	CADDInspector
___Yes (3201)	___Yes (3204)	___Yes (3207)
___No (3202)	___No (3205)	___No (3208)
___Don't know (3203)	___Don't know (3206)	___Don't know (3209)

If you answered any part of question 32 as *No* or *Don't know*, please tell us why. Please be specific (9932). (Feel free to use page 8.)

33. Would you recommend this product to an associate?

CADKEY	DataCAD	CADDInspector
___Yes (3301)	___Yes (3304)	___Yes (3307)
___No (3302)	___No (3305)	___No (3308)
___Don't know (3303)	___Don't know (3306)	___Don't know (3309)

If you answered any part of question 33 as *No* or *Don't know*, please tell us why. Please be specific (9933). (Feel free to use page 8.)

34. How would you rate the training in CADKEY products at CADKEY, INC.?
___I have taken at least one training course at CADKEY (3401)
___I have never taken a training course at CADKEY (3402)

CADKEY	DataCAD	CADDInspector
___Excellent (3403)	___Excellent (3408)	___Excellent (3413)
___Good (3404)	___Good (3409)	___Good (3414)
___Average (3405)	___Average (3410)	___Average (3415)
___Fair (3406)	___Fair (3411)	___Fair (3416)
___Poor (3407)	___Poor (3412)	___Poor (3417)

35. How would you rate the training in CADKEY products in your local area?
___I have taken at least one training course at a CADKEY Certified Training Center (3501)
___I have never taken a training course at a CADKEY Certified Training Center (3502)

CADKEY	DataCAD	CADDInspector
___Excellent (3503)	___Excellent (3509)	___Excellent (3515)
___Good (3504)	___Good (3510)	___Good (3516)
___Average (3505)	___Average (3511)	___Average (3517)
___Fair (3506)	___Fair (3512)	___Fair (3518)
___Poor (3507)	___Poor (3513)	___Poor (3519)
___Not Avail. (3508)	___Not Avail. (3514)	___Not Avail. (3520)

36. How would you rate the Computer-Based Training (CBT) program included as part of our CADKEY product?
___I have used the CBT program (3601)
___I have not used the CBT program (3602)
I found the CADKEY CBT program to be:
___Excellent (3603) ___Average (3605) ___Poor (3607)
___Good (3604) ___Fair (3606)

37. What do you think about the articles in **3-D WORLD**? Please mark all that apply.
___Good mixture of articles (3701)
___Poor mixture of articles (3702)
___Need more CADKEY application stories (3703)
___Need more DataCAD application stories (3704)
___Need more CADDInspector application stories (3705)
___Too many application stories (3706)
___Too few application stories (3707)
___Just about the right number of application stories (3708)
___Too many technical articles (3709)
___Too few technical articles (3710)
___Just about the right number of technical articles (3711)
___Too many third-party articles (3712)
___Too few third-party articles (3713)
___Just about the right number of third-party articles (3714)
___Too much training information (3715)
___Too little training information (3716)
___Just about the right amount of training information (3717)
___Too many advertisements (3718)
___Too few advertisements (3719)
___Just about the right number of advertisements (3720)

38. Where did you first learn of our products?

CADKEY	DataCAD	CADDInspector
___TradeShow (3801)	___TradeShow (3807)	___TradeShow (3813)
___Seminar (3802)	___Seminar (3808)	___Seminar (3814)
___Colleague (3803)	___Colleague (3809)	___Colleague (3815)
___Dealer (3804)	___Dealer (3810)	___Dealer (3816)
___Mag. Story (3805)	___Mag. Story (3811)	___Mag. Story (3817)
___Mag. Ad (3806)	___Mag. Ad (3812)	___Mag. Ad (3818)

If magazine, which one? (9938) (Please specify. Feel free to use page 8):

Please close with tape or staple.

Thank you for taking the time to complete this questionnaire. We really appreciate your interest. Please feel free to use the two blank areas of this page for more detailed answers if you would like.

Please fold on line.

Please fold on line.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 37 MANCHESTER, CT

POSTAGE WILL BE PAID BY ADDRESSEE

CADKEY, INC.
440 Oakland Street
Manchester, CT 06040-9952
U.S.A.

Estimating and Design

(Continued from page 4)

a project. Jones also showed me the methods that were used to construct a project. In some instances, there were significant differences. For example, the estimator might accurately calculate the total number of two-by-fours required to frame a house. But, if the superintendent used two-by-fours for bracing forms and to stabilize the studs during construction, the project manager had to determine and calculate the extent of the discrepancy. Similarly, if the estimator calculated the amount of Thermoply insulation for a project based on the total number of square feet of exterior-wall area minus voided areas, but the installation subcontractor applied the insulation over the voided areas and used 6-inch overlap to ensure continuity, the project manager would have to adjust the estimating formula accordingly.

Testing Each Part of the System

As each piece of the estimating and construction process was clarified, I created corresponding material designations, formulas, and assemblies. These were loaded into QBIDS and tested for input accuracy.

To test for validity, I selected one of the division's designs and ran a prototype takeoff for side-by-side comparison. I tagged all lines in the drawings from framing to interior finishes. QBIDS then identified and priced the materials required to construct the house, and this estimate was then compared with a market-verified estimate from a completed project.

The test was not completely smooth, but the discrepancies were minor and easily corrected. A clean takeoff was produced in October 1990, exactly one year after the project began. The takeoff was shared the following month at the annual Fall corporate division meeting. Considering that the project began without any CAD-based drawings, CAD equipment, CAD or estimating software, a CAD database, or any CAD-trained staff, the corporate leadership was impressed by the rate of the project's development and implementation.

Continued on page 10)

CADKEY/DataCAD Training in U.S. & Canada (continued)

State	CTC	Location/Contact	Course	Dates
N.C.	Entré Computer Center	110 Charlotte Plaza Charlotte, NC John Murphy (704)332-1557	*DataCAD I* *DataCAD II* *DC Modeler*	Scheduled on request.
N.H.	Portsmouth Senior High School	Alumni Drive Portsmouth, NH Kenneth Webber (603)436-7100	*Intro. to CADKEY*	Call for schedule.
N.J.	Advanced Micro Systems	511 River Drive Elmwood Park, NJ Pat Neary (201)703-0404 Fax: (201)703-0546	*Intro. to DataCAD* *Advanced DataCAD*	May 6-8 Jun. 5-7 Jul. 17-19 May 23-24 Aug. 7-9
	Collingswood High School	Collings Avenue Collingswood, NJ Gary Krause (609)962-5701	*Intro. to CADKEY*	May 6-Jun. 10 (Mon. eve. 7-11 p.m.)
	Glassboro State College	Dept. of Technology Glassboro, NJ Michael Guerard (609)863-6203 (work) (609)468-3087 (home)	*Using CADKEY to Solve Special Problems*	May 28-Jun. 27 (5-week, Mon.-Thur. evenings, reg. in person on May 15.)
N.M.	New Mexico State University	P.O. Box 30001 Dept. 3450 Las Cruces, NM Maurice Hamilton (505)646-3501	*Intro. to CADKEY* *Advanced CADKEY*	May 6-8 Jul. 8-10 May 9-10 Jul. 11-12
N.Y.	American Training Center, Inc.	118-21 Queens Blvd. Forest Hills, NY Arkady Kleyner (718)544-8100 (800)273-ATCI (N.Y. only)	*Intro. to CADKEY* *Advanced CADKEY*	May 6-8 Jun. 3-5 Jul. 8-10 Aug. 5-7 May 9-10 Jun. 6-7 Jul. 11-12 Aug. 8-9
			Intro. to DataCAD *Advanced DataCAD*	May 13-15 Jun. 10-12 Jul. 15-17 Aug. 12-14 May 16-17 Jun. 13-14 Jul. 18-19 Aug. 15-16
	Rochester Institute of Technology	1 Lomb Memorial Dr. Rochester, NY Dr. Robert Hefner (716)475-2205	*Intro. to CADKEY* *Advanced CADKEY*	May 29-31 Jun. 17-19 Jul. 22-24 Jun. 3-5 Jul 10-12
Ohio	Progressive Computing Corp., Inc.	6964 Spinach Dr. Mentor, OH Jean Kempton (216)255-0460 (800)473-0460	*Intro. to CADKEY* *Advanced CADKEY*	May 7-8 Jun. 4-5 Jul. 9-10 Aug. 14-15 May 21-22 Jun. 11-12 Jul. 16-17 Aug. 20-21

CADDInpsector Now Works with Sheffield Measurement's Cordax Coordinate Measurment Machine

CADKEY, INC. and Sheffield Measurement demonstrated the new CADDInspector-Cordax 1808M interface at Quality Expo '91, at O'Hare Expo Center, Chicago, Illinois, April 23-25, 1991.

CADKEY/DataCAD Training in U.S. & Canada (continued)

State	CTC	Location/Contact	Course	Dates
Ohio	Progressive Computing Corp., Inc. *(continued)*	6964 Spinach Dr. Mentor, OH Jean Kempton (216) 255-0460 (800) 473-0460	*CADKEY* *SOLIDS* *CADL and Macros*	May 28-29 Jun. 18-19 Jul. 23-24 Aug. 28-29 May 30-31 Jun. 25-26 Jul. 25-26
Okla.	Oklahoma State University	301 Cordell South Stillwater, OK Gerald McClain (405) 744-5709	*Intro. to CADKEY* *Intermed. CADKEY* *Advanced CADKEY*	Jun. 12 Jun. 13-14 Jul. 24-26
Ore.	CTR Business Systems	6420 SW Macadam Av. Portland, OR Sandi McNeil (503) 293-8627	*Intro. to CADKEY* *Advanced CADKEY*	Courses offered every month. Call for schedule.
	Portland Community College	12000 S.W. 49th Av. Portland, OR Thomas Macready (503) 244-6111, x4160	*Intro. to CADKEY* *Intermed. CADKEY* Summer courses	Jun. 10-12 Aug. 12-14 Jun. 13-14 Aug. 15-16 Call for schedule.
Pa.	Butler Community College	College Drive/Oak Hills Butler, PA Mike Aiken (412) 287-8711, x311	*Intro. to DataCAD*	May 22-24
	Computer-Land	1360 Harrisburg Pike Lancaster, PA Lori Fraser (717) 291-2111	*Intro. to DataCAD* *Advanced DataCAD*	Scheduled on request, on site or in house.
	Edinboro University of PA	G-34 Hendricks Hall Edinboro, PA Peter Mathews (814) 732-2592	*Intro. to CADKEY*	May 14-16
	Micro Control Inc.	390 Middletown Blvd. Langhorne, PA. Marion Homan (215) 752-5510	*Intro. to CADKEY* *Advanced CADKEY* *Intro. to DataCAD* *Advanced DataCAD*	May 14-17 Jun. 11-14 Jul. 16-19 May 8-10 May 20-22 Jul. 10-12 May 29-31
S. D.	Northern State University	Industrial Technology Box 705 Aberdeen, SD Jerry Sauer (605) 622-2571	*Intro. to CADKEY* *Intro. to DataCAD*	Continuous courses: 2-wk/M-F/day 4-wk/M,W,Th./evening
Texas	AEC Software	2200 North Lamar Dallas, TX David Demarest (214) 720-0270	*Intro. to DataCAD* *Advanced DataCAD*	Scheduled on request.

Estimating and Design

(Continued from page 9)

Results

The results that the project produced were also impressive and surpassed the original objectives. By combining DataCAD with QBIDS, the Dallas division produced fast, accurate, and complete estimates and purchase orders. Because the POs were linked to construction drawings, any change in the drawings was automatically reflected in the estimate and in the purchase orders. Duplicate data-entry was eliminated, and the possibility of data contamination was substantially reduced. Accounting was happy. Purchasing was happy. And of course, Michael Richardson was happy.

It also became apparent that the project could make the marketing and sales staff happy. Using the link between construction drawings and estimating, the staff could respond positively and quickly to a customer's "what if" questions: "What if I want the brick instead of siding? What if I want tile instead of hardwood, or hardwood instead of carpet? What if I want an extra bedroom?"

Potential for Enhancement

The system's enhancement potential was even more exciting. I explored the possibility of converting the drawings from single-color wire-frame to 3-D textured color. With the system's enhanced capability, marketing would be able to work with a customer in real time. An existing design could be modified to include the items from a customer's "wish list." An on-screen image of the modified design could then be shown to the customer together with an accurate cost estimate to complete the project. If the customer approved of the design and the cost, the sale could be closed and the materials for the project ordered.

Unfortunately, even the anticipated system enhancements will not help the customer decide which design to choose, or settle family disputes over whether to have the skylight or the bay window, or eliminate the need to "go home and think it over." But, the system will be able to provide an individualized 8.5 x 11-inch drawing of the modified plan that the customer can take along to

facilitate the decision-making process!

What the system will definitely do, however, is provide US Home with the design, financial, and administrative tools it needs to give customers what they want in a timely manner. It can aggressively control costs, enhance accountability, improve efficiency, compress construction time, and enhance customer satisfaction with the completed project.

Editor's Notes: Peter Haggard is the director of CAD Operations for US Home in Dallas, Texas. Peter has a broad experience in real estate (8 years), residential construction (5 years), and CAD systems (4 years).

For information about QBIDS™, contact Quadric Software USA, 2200 North Lamar, Dallas, Texas 75202. Telephone: (800) 695-BIDS or (214) 720-0745.

Tech Tip from VALLEY CADKEY USER GROUP

Editor's Note: The VALLEY CADKEY USER GROUP of the San Fernando Valley, California, published a very useful idea from Larry Maldarelli, one of the group's members, in its newsletter of November 30, 1990. **3-D WORLD** thinks that other CADKEY users will find Larry's idea very helpful, too.

If you are using Autoswap and switch to the DOS shell to run another program, it is sometimes difficult to remember that you are not really back in DOS. A problem arises if you turn off the computer without first returning to CADKEY; the Autoswap file (571K long) will remain on your disk, wasting space. The more times that you forget, the more copies will exist. Autoswap automatically deletes this file when you re-enter CADKEY, but you need something to remind you where you are.

Solution: In the batch file that loads CADKEY, add the line: ***PROMPT DOS Shell...pg***, before the lines that load CADKEY, and add the line: ***PROMPT PG*** after those lines.

Now, when you go to the DOS shell from inside CADKEY, the prompt will say "DOS Shell." When you re-enter CADKEY and exit to DOS, the prompt will be returned to normal.

Editor's Note: Larry Maldarelli is President of Lawrence Engineering, of Tustin, California, (714) 731-9277, a contract mechanical engineering and design firm that uses CADKEY and CADKEY SOLIDS exclusively.

CADKEY/DataCAD Training in U.S. & Canada (continued)

State	CTC	Location/Contact	Course	Dates
Texas	MLC CAD Systems	5316 Highway 290 West Austin, TX Barbara Leesley (512) 892-6311 A = Austin D = Dallas H = Houston	*Intro. to CADKEY* *Advanced CADKEY* *CADL*	May 7-9 H May 14-16 A Jun. 11-13 D Jun. 18-20 A May 21-22 A Jun. 25-26 A On request.
	Texas A&I University	Industrial Technology Campus Box 203 Kingsville, TX Herschel Kelley (512) 595-2608	*Intro. to CADKEY*	May 29-31
	Texas Tech University	P.O. Box 4200 Lubbock, TX Mary Bentancourt (806) 742-3451	*Intro. to CADKEY*	May 14-16 Aug. 20-22
Va.	Republic Research Training Center	855 West Main St. Charlottesville, VA Gregg Kendrick (804) 296-9747 (800) 476-4454	*DataCAD I* *DataCAD II* *DataCAD 3-D*	Scheduled on request.
Wash.	Everett Community College	801 Wetmore Av. Everett, WA Stu Barger Kathy Ardmore (206) 388-9429	*Intro. to CADKEY*	Jun. 19-21 Aug. 21-23
Wis.	CAD PROfessionals Inc.	120 Bishops Way, #136 Brookfield, WI Dan Warsh (414) 782-9199	*Intro. to CADKEY* *Intro. to DataCAD* *CADKEY SOLIDS*	2nd & 4th Tues. every month. *CADKEY SURFACES* *CADKEY RENDER*
	Lakeshore Technical College	1290 North Avenue Cleveland, WI Robert Moore (414) 458-4183	*Intro. to CADKEY*	May 21-23
	Milwaukee School of Engineering	1025 N. Milwaukee St. Milwaukee, WI Marvin Bollman (414) 277-7357	*Intro. to CADKEY*	May 21-23
	North Central Technical College	1000 Campus Dr. Wausau, WI Michael Clark (715) 675-3331	*Intro. to CADKEY*	Courses scheduled on request.
Wyo.	University of Wyoming	3085 Engineering Bldg. Laramie, WY Donald Polson Jean Richardson (307) 766-5255	*Intro. to CADKEY*	May 15-17 Jul. 24-26 Aug. 26-28

New Solids Interface, Cutting Edge, Heat/Stress *(Cont. from page 12)*

cost, fill out this coupon, cut it out, and mail it to CADKEY, INC., 440 Oakland St., Manchester, CT 06040-2100.

Name:

Company:

Address: Telephone #:

CADKEY/DataCAD Training in U.S. & Canada (continued)

Prov.	CTC	Location/Contact	Course	Dates
British Columbia	Pacific Marine Training Institute	265 West Esplanade North Vancouver, B.C. Mike Davison (604)985-0622	*Intro. to CADKEY*	Courses scheduled on request.
New Brunswick	New Brunswick Community College	P.O. Box 2100, Sta. A CAD/CAM Dept. 1234 Mountain Rd. Moncton, N.B. Wayne Ritchie (506)856-2169	*Intro. to CADKEY*	Scheduled on request. On-site courses available.
Ontario	Algonquin College	200 Lees Av. Ottawa, Ontario Peter Casey (613)594-3888, x5904	*Intro. to CADKEY* *Advanced CADKEY* *System Customization*	Jun. 5-7 Jun. 12-14 Jun. 19-21
	JB Marketing Associates	82 Spruceside Cresc. Fonthill, Ontario John Bradford (416)892-8025	*DataCAD I* *DataCAD II*	Scheduled on request.
	Klear Concept Data	465 Rogers St. Peterborough, Ontario John Punshon (705)742-3354	*Intro to CADKEY*	Customized training scheduled on request.
	Naylor-McLeod Group	1425 Bishop St. Cambridge, Ontario Brian Naylor (519)622-4495	*Intro. to CADKEY*	Scheduled on request.
	Ryerson Polytechnical Institute, C.A.T.E.	350 Victoria Street Toronto, Ontario K. Doddridge (416)979-5106	*Intro. to CADKEY*	Jun. 3-4 Courses scheduled on request.
Québec	APPLICAD	11956 Blvd. Laurentien Montréal, Québec Walid Hadid (514)336-5959	*Intro. to CADKEY* *Advanced CADKEY* *Intro. to DataCAD*	May 7-8 Jun. 4-5 May 13-14 Jun. 11-12 May 29-30 Jun. 19-20

CADKEY and DataCAD Training Centers that would like dates of scheduled training courses to appear in 3-D WORLD, contact Paul Mailhot, Educational Programs, CADKEY, INC., 440 Oakland Street, Manchester, CT 06040-2100. Telephone: (203) 647-0220. FAX: (203) 646-7120.

Colorado State University Correspondence Course in CADKEY Fundamentals (Versions 1, 1.4, 2.06M, 2.11, and 3.5), Self-paced introduction to CAD. Developed by Terry T. Wohlers and Dr. Paul J. Resetarits. Contact: Division of Continuing Education, Colorado State University, Spruce Hall, Fort Collins, CO 80523. Telephone: (800) 525-4950.

Coming in the July/August Issue
New SOLIDS Interface, Cutting Edge, Heat/Stress

3-D WORLD's July/August issue will feature an article about CADKEY SOLIDS Version 4's new user interface. Also, CADKEY's developments of two, major future products: Cutting Edge™ (CAM) and an exciting technological advance in heat-transfer and stress analysis software, will appear in our July/August issue. If you would like to take part in testing this new technology, at low *(Continued on page 11)*

CADKEY/DataCAD Trade Show Update

See CADKEY® and DataCAD® at these trade shows in 1991:

AIA '91, May 17-19, Convention Center, Washington, DC.

CALS/CE '91, Jun. 11-14, Omni Shoreham Hotel, Washington, DC, Booth #616.

ASEE '91, American Society of Engineering Education, Jun. 16-19, Hyatt Regency Hotel, New Orleans, LA, Booth #211 &#213.

Call Danielle Cote, Events Manager, for the availability of discounted admission tickets one month before the show, (203) 647-0220, ext. 7150.

CADKEY/DataCAD at International Trade Shows

EXPO CAD, May 8-10, Madrid, Spain, FHECOR.

Australia's International Engineering Exhibition '91, May 13-17, Melbourne, Australia, ANZTECH.

CAT '91, May 14-17, Stuttgart, Germany, Advanced Graphics.

SVIAZ '91, May 23-31, Moscow, U.S.S.R., SORICE.

Natal Industrial Trade Show, Jun. 10-14, Natal, South Africa, Intamarket (Pty) Ltd.

CADKEY, INC. Forms Application Consulting Group

CADKEY, INC. announces the formation of an Application Consulting Group as part of our Technical Services Department. CADKEY's Application Consulting Group provides enhancement utilities written in CADL™ (CADKEY Advanced Design Language) based on the real specialized needs and specifications of CADKEY users. For information about the Application Consulting Group, contact CADKEY's Sales Department at (203) 647-0220.

CADKEY, INC. to Move

August 19, 1991, will see CADKEY, INC. in our new, international corporate headquarters: 4 Griffin Road North, Windsor, Connecticut. The new location will be more convenient to Bradley International Airport, making it easier for customers and dealers to visit us.