CAD/CAM/CAE

Personal CAD and Distribution Channels

Source: Dataquest

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CAD/CAM/CAE

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Personal CAD and Distribution Channels
binder

This binder contains detailed market statistics, including market share and forecasts, of the overall personal CAD market. It also contains *Dataquest Perspectives* dedicated to the personal CAD industry segment as well as a *Dealer Directory* and analysis of the indirect distribution channel.

Other* CAD/CAM/CAE binders are:

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Source: Dataquest
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Contains detailed market statistics, including market share and forecasts, of the overall Asian market. It also contains *Dataquest Perspectives* dedicated to the Asian CAD/CAM/CAE industry.

*All CAD/CAM/CAE subscribers receive the *Dataquest Perspective* and *Source: Dataquest* binders, inquiry privileges, and access to Dataquest's Information Resource Center. In addition, subscribers to individual product or geographical segments receive the segment-specific binders: Mechanical Applications, Electronic Design Applications, AEC and GIS Applications, Personal CAD and Distribution Channels, Europe, and Asia. Each regional service and segment also provides *Dataquest Perspective* and *Source: Dataquest* coverage unique to that region or segment. For more information, contact your Dataquest marketing representative at (408) 437-8000.

CAD/CAM/CAE

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CAD/CAM/CAE Industry

Value-Added Reseller Directory
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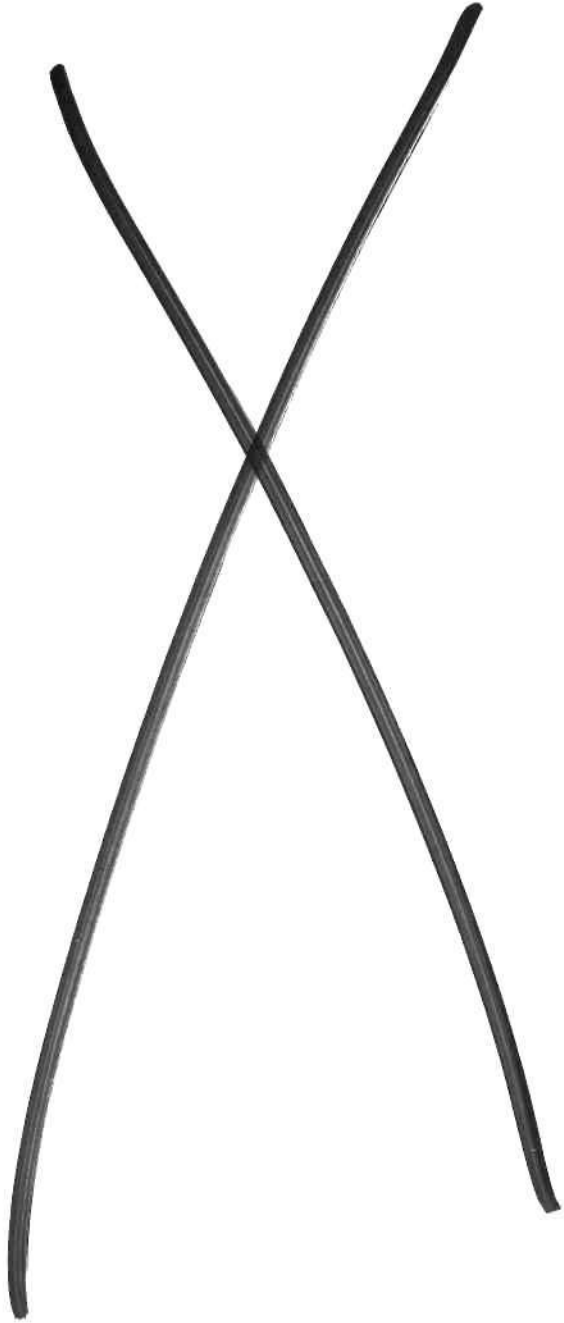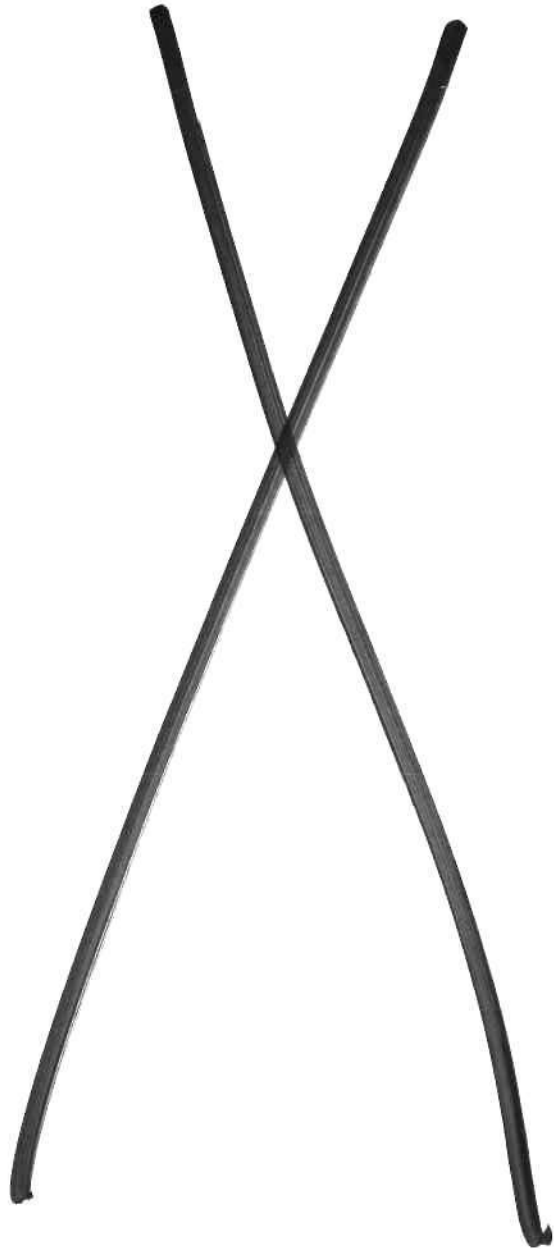
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CAD/CAM/CAE Industry
Value-Added Reseller Directory
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Note: The CAD/CAM/CAE value-added resellers and distributors in this directory were verified by telephone interviews in June 1992. A detailed analysis of these dealers will be presented in a companion volume, *The Needs of CAD/CAM/CAE Resellers in North America.*

CAD/CAM/CAE Industry Value-Added Reseller Directory North America

The CAD/CAM/CAE value-added resellers and distributors in this directory were verified by telephone interviews in June 1992. "NA" indicates either "not applicable" or "no answer." A detailed analysis of these dealers will be presented in a companion volume, *The Needs of CAD/CAM/CAE Resellers in North America*.

3D CADWARE
45690 Murfield
Temecula, CA 92592
Phone: 714-676-3223 Fax: 714-676-3848
Contacts: Mr. Jim Neeley, President;
 Ms. Sara Neeley, Vice President
Software Sold: CADkey
Computers Sold: Silicon Graphics, Everex,
 ALR, proprietary PC Clone
Revenue Range: Less than $1 Million

800 SOFTWARE
918 Parker Street
Berkeley, CA 94710
Phone: 510-412-9020 Fax: 510-644-4886
Contacts: Mr. Ira Wyse, Vice President
Software Sold: Generic CADD
Computers Sold: NA
Revenue Range: NA

A.C.E. CONSULTING FIRM
6399 Wilshire Blvd.
Suite 320
Los Angeles, CA 90048
Phone: 213-658-7080 Fax: 213-658-7097
Contacts: Mr. Mohammad Nour, President;
 Mrs. Oresa Cuthbertson, Vice President
Software Sold: AutoCAD
Computers Sold: Apollo, Compaq, Hewlett-
 Packard, IBM, Macintosh, Sun, PC Clone
Revenue Range: Less than $1 Million

A.I. SYSTEMS
2450 East 7000 South
Salt Lake City, UT 84121
Phone: 801-942-8949 Fax: 801-942-8997
Contacts: Mr. Steve Peterson, President
Software Sold: AutoCAD
Computers Sold: Compaq, Hewlett-Packard,
 Sun, Everex, PC Clone
Revenue Range: $1 to $3 Million

A.S. THOMAS, INC.
355 Providence Highway
Westwood, MA 02090
Phone: 617-329-9200 Fax: NA
Contacts: Mr. Robert Thomas, Manager of
 Automation Systems; Dr. A.S. Thomas,
 President
Software Sold: Nuform systems
Computers Sold: Digital Equipment, DEC
Revenue Range: $1 to $3 Million

A/E MICRO SYSTEMS
10134 Mosteller Lane
West Chester, OH 45069
Phone: 513-772-6700 Fax: 513-672-3191
Contacts: Mr. Chuck Sheridan, President;
 Mr. John Benz, Sales Representative
Software Sold: AutoCAD
Computers Sold: Compaq, Hewlett-Packard,
 IBM, Macintosh, Sun, Intel and RISC, PC
 Clone
Revenue Range: $3 to $5 Million

A/K COMPUTERS
738 Cumberland St.
Lebanon, PA 17042
Phone: 717-274-5005 Fax: 717-274-5794
Contacts: Mr. Don Auker, President;
  Mr. Paul Yutzy, Vice President
Software Sold: NA
Computers Sold: NA
Revenue Range: $1 to $3 Million

ABCOR, INC.
P.O. Box 890247
15718 Craithurst Dr. 77059
Houston, TX 77289-0247
Phone: 713-486-9251 Fax: 713-488-2874
Contacts: Mr. Gerald Bourque, Owner
Software Sold: OrCAD, Tanner Research,
  Hughes Computers, 4-CEEN, SEDCO
Computers Sold: Comet PC Clone
Revenue Range: $1 to $3 Million

ACCESS GRAPHICS TECHNOLOGY, INC.
1426 Pearl Street
Boulder, CO 80302
Phone: 303-938-9333 Fax: 303-938-8210
Contacts: Mr. John Ramsey, President;
  Mr. Glenn Frazer, Vice President of Market-
  ing
Software Sold: NA
Computers Sold: Sun
Revenue Range: More than $10 Million

ACCUDATA, INC.
9555 James Avenue South
Suite 225
Bloomington, MN 55431
Phone: 612-881-0623 Fax: 612-881-5839
Contacts: Mr. Thomas G. Carlson, CEO;
  Mr. Tim Olish, Sales Manager
Software Sold: AutoCAD
Computers Sold: Zenith
Revenue Range: $1 to $3 Million

ACRATECH, INC.
1200 Hwy 146
S. Suite 150
La Porte, TX 77571
Phone: 713-470-1322 Fax: 713-470-1534
Contacts: Mr. Gene Horn, President
Software Sold: Autodesk
Computers Sold: AST, ALR, DTK, PC Clone
Revenue Range: Less than $1 Million

ADC COMPUTER SERVICES, INC.
14825 E. 42nd Street
Independence, MO 64055
Phone: 816-373-1100 Fax: 816-478-6188
Contacts: Mr. Mike Jennings, CAD Consul-
  tant; Mr. Jim Claypool, Vice President
Software Sold: NC Autocode w/AutoCAD,
  third-party development
Computers Sold: Digital Equipment, Acer
  PC Clone
Revenue Range: Less than $1 Million

ADVANCED CADD TECHNOLOGIES
1502 Greenway Cross
Madison, WI 53713
Phone: 608-273-1500 Fax: 608-273-1508
Contacts: Mr. Craig Fonzen, President
. Software Sold: AutoCAD, Generic CADD
Computers Sold: Compaq, IBM, Everex,
  ALR PC Clone
Revenue Range: $5 to $10 Million

ADVANCE COMPUTER SYSTEMS
681 Grape Avenue
Sunnyvale, CA 94087
Phone: 408-732-6200 Fax: 408-749-9449
Contacts: Mr. Imdiaz Ahmed, CEO and
  President
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

ADVANCED DIGITAL GROUP
12062 Valley View Street
Suite 111
Garden Grove, CA 92645
Phone: 714-897-0319 Fax: 714-898-7731
Contacts: Mr. Dennis Jeffers, President
Software Sold: OrCAD, Model Technology
Computers Sold: Sun, Acer PC Clone
Revenue Range: $1 to $3 Million

ADVANCED TECHNOLOGY
DISTRIBUTION
524 Busse Highway
Suite D
Park Ridge, IL 60068
Phone: 708-692-7325 Fax: 708-692-3555
Contacts: Mr. Tom Math, President
Software Sold: AutoCAD, Generic CADD,
  DataCAD
Computers Sold: Compaq, Everex, AST PC
  Clone
Revenue Range: $1 to $3 Million

AHEARN AND SOPER, INC.
7000 Airways Parkdrive
A Member of David Group
East Syracuse, NY 13057
Phone: 315-463-6331 Fax: 315-463-6425
Contacts: Mr. Gary McHugh, Sales Manager;
  Mr. John Paul, President
Software Sold: Cad Overlay
Computers Sold: NA
Revenue Range: $1 to $3 Million

AIDEX CORP.
1802 N. Division
Morris, IL 60450
Phone: 815-942-4299 Fax: 815-942-3248
Contacts: Mr. Gary Rockis, President;
  Ms. Angie Bennett, Sales Representative
Software Sold: Autodesk
Computers Sold: ALTECH PC Clone
Revenue Range: NA

ALDEN COMPUTER SYSTEMS CORP.
Box 4505
Salem, MA 01970
Phone: 508-744-1314 Fax: NA
Contacts: Mr. Robert Whitten, President
Software Sold: Proprietary
Computers Sold: IBM, PC Clones
Revenue Range: Less than $1 Million

ALPHA COMPUTERS, INC.
11635 SW Beaverton-Hillsdale Hwy.
Beaverton, OR 97005
Phone: 503-644-9722 Fax: 503-627-0105
Contacts: Mr. Tom Spangler, Manager
Software Sold: VersaCAD
Computers Sold: Compaq, Macintosh
Revenue Range: Less than $1 Million

ALPHA COMPUTERS, INC.
15110 S.W. Bangy Road
Lake Oswego, OR 97035
Phone: 503-620-7000 Fax: NA
Contacts: Mr. Bernadette Chow, Purchasing
  Agent
Software Sold: VersaCAD
Computers Sold: NA
Revenue Range: $1 to $3 Million

ALPHATECH COMPUTERS
14100 NE 20th
Suite 101
Bellevue, WA 98007
Phone: 206-747-3000 Fax: 206-641-0421
Contacts: Mr. Glenn Pare, Manager
Software Sold: VersaCAD, Power Draw,
  ClarisCAD
Computers Sold: Macintosh
Revenue Range: Less than $1 Million

ALTEK CORP.
12210 Plum Orchard Drive
Silver Spring, MD 20904
Phone: 301-572-2555 Fax: 301-572-2510
Contacts: Mr. Al Cameron, President;
  Mr. Frank Augastino, Vice President of
  Marketing
Software Sold: NA
Computers Sold: NA
Revenue Range: $1 to $3 Million

AMCAD
1325 Whitlock, No. 314
Carrolton, TX 75006
Phone: 214-323-0700 Fax: 214-323-9004
Contacts: Mr. Wade Whitmer, President;
  Ms. Cherie Jo Barns, Vice President of
  Marketing
Software Sold: Drafix, MaxiCAD, Fast,
  DesignCAD, Concurrent plot
Computers Sold: NA
Revenue Range: More than $10 Million

AMERICAN COMPUTER TECHNOLOGY
2721 Prosperity Ave.
Fairfax, VA 22031
Phone: 703-525-0111 Fax: 703-641-9752
Contacts: Mr. Larry Bach, Advertising
  Manager; Mr. Dave Brown, Sales
Software Sold: AutoCAD, Computervision
Computers Sold: Compaq, IBM, Sun
Revenue Range: Less than $1 Million

ANTECH, INC.
788 Myrtle Street
Roswell, GA 30075
Phone: 404-993-7270 Fax: 404-993-7270
Contacts: Mr. Ashok K. Nagrani, President
Software Sold: AutoCAD
Computers Sold: Everex, NEC, Leading
  Edge PC Clone
Revenue Range: Less than $1 Million

APPA BUSINESS COMPUTERS
5864 Interface Drive
Ann Arbor, MI 48103
Phone: 313-769-2727 Fax: 313-769-4727
Contacts: Mr. Arno Poerner, President;
  Mr. Casey Marks, Purchasing
Software Sold: Intergraph Micro Station,
  AutoCAD
Computers Sold: Compaq, IBM, Macintosh,
  Sun, proprietary APPA
Revenue Range: $5 to $10 Million

APPLIED SOFTWARE TECHNOLOGY, INC.
1908 Cliff Valley Way N.E.
Atlanta, GA 30329
Phone: 404-633-8660 Fax: 404-633-0154
Contacts: Mr. Richard Burroughs, President;
  Mr. Jim Moss, Vice President, Sales, and
  Marketing
Software Sold: AutoCAD, Microstation,
  SDRC, Cosmos, CAMAX
Computers Sold: Apollo, Digital Equipment,
  Hewlett-Packard, IBM, Macintosh, Sun,
  ASTI PC Clone
Revenue Range: $5 to $10 Million

APPLIED TECHNOLOGY ASSOCIATES
Division of the Center for Manufacturing
  Tech.
4170 Crossgate Dr.
Cincinnati, OH 45236
Phone: 513-891-6776 Fax: 513-891-6790
Contacts: Mr. Tony Moore, Vice President;
  Mr. Neal P. Jeffries, President
Software Sold: AutoCAD, Supporting
  AutoCAD SW (ASG, Tool)
Computers Sold: PC Clones
Revenue Range: Less than $1 Million

AQUARIAN AGE COMPUTER CENTER
754 3rd Ave.
San Francisco, CA 94118
Phone: 415-386-3980 Fax: 415-386-3722
Contacts: Mr. Richard Teich, Technical
  Manager
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

ARDEN SYSTEMS, INC.
12335 Santa Monica Blvd.
Los Angeles, CA 90025
Phone: 310-479-6707 Fax: 310-477-4658
Contacts: Mr. Ken Doyle, Sales Manager
Software Sold: AutoCAD
Computers Sold: Everex, Step Systems,
  PC Clone
Revenue Range: NA

AUTOMATED INFORMATION
  MANAGEMENT
1155 Dairy Ashford
Suite 101
Houston, TX 77079
Phone: 713-589-8200 Fax: 713-589-2013
Contacts: Mr. Terry Edgerton, President;
  Mr. John Edgerton, Vice President
Software Sold: AutoCAD
Computers Sold: IBM, Sun, Silicon Graphics
Revenue Range: $1 to $3 Million

AUTOMATION IMAGE
2081 Hutton Drive
Suite 311
Carrolton, TX 75006
Phone: 214-247-8816 Fax: 214-243-2814
Contacts: Mr. Palmer Keith, Vice President,
  Operations; Ms. Indira Singla, Vice
  President, Marketing
Software Sold: AutoCAD, Personal CAD
  Systems
Computers Sold: Sun
Revenue Range: $1 to $3 Million

AUTOMATION INTEGRATORS
35526 Grand River
Suite 313
Farmington Hills, MI 48335
Phone: 313-477-6500 Fax: 313-477-6500
Contacts: Mr. Timothy O'Connor, President
Software Sold: Computervision Personal
  Designer, AutoCAD
Computers Sold: Compaq, IBM, DKI,
  Innovative Sys. PC Clone
Revenue Range: Less than $1 Million

AUTOMATION INTELLIGENCE, INC.
850 Trafalgar Ct.
Maitland, FL 32751
Phone: 407-661-7000 Fax: 407-661-6966
Contacts: Mr. Theodroe F. Fluchradt,
  President; Mr. Dave Livingston, Product
Manager, Numeridex CAM Div
Software Sold: Intellipost, Expedite 3D/
  Windows, NICAM IV, IntelliAPT
Computers Sold: Apollo, Compaq, Digital
  Equipment, Hewlett-Packard, IBM, Sun,
  Silicon Graphics, PC Clone
Revenue Range: $5 to $10 Million

AVCOM
777 California Avenue
Suite 100
Palo Alto, CA 94304
Phone: 415-326-8686 Fax: 415-853-8220
Contacts: Mr. Brad Bishop, Vice President;
  Mr. Sam Gibbs, President
Software Sold: AutoCAD, SoftDesk
Computers Sold: Sun
Revenue Range: More than $10 Million

AXIS TECHNOLOGIES
940 Perinton
Hills Office Park
Fairport, NY 14450
Phone: 716-223-4330 Fax: 716-223-8433
Contacts: Mr. Dennis Wentworth, President
Software Sold: Anvil 1000, Anvil 5000, Anvil
  5000 PC, Intergraph Microstation,
  VersaCAD
Computers Sold: Compaq, AST, Tech PC
  Clone
Revenue Range: Less than $1 Million

BECHTEL COMPUTER COMPANY
474 Niagra Falls Blvd.
Buffalo, NY 14223
Phone: 716-833-6815 Fax: 716-833-6829
Contacts: Mr. Harry Styliades, President;
  Ms. Sylvia Styliades, Office Manager
Software Sold: Generic CAD, Fujitsu, Per-
  sonal CAD, VersaCAD
Computers Sold: NA
Revenue Range: $1 to $3 Million

BETA COR ENGINEERING, LTD.
P. O. Box 5398, Station E
Edmonton, AL, CD T5P4C9
Phone: 403-482-1561 Fax: NA
Contacts: Mr. Morgan Barnes, President
Software Sold: AutoCAD
Computers Sold: Everex, Eltech, Vtech,
  in-house PC Clone
Revenue Range: Less than $1 Million

BETA LAMBDA, INC.
919 Highway No. 33, Ste 4647
Freehold, NJ 07728
Phone: 908-446-1100 Fax: NA
Contacts: Mr. Ernie Liu, President; Ms. Carol
  Darazo, Sales Representative
Software Sold: Orcad, QUAD Design,
  Exempler, PSpice
Computers Sold: Sun, WIN Technologies PC
  Clone
Revenue Range: $1 to $3 Million

BLUE CHIP COMPUTER SYSTEM
6733 South Sepulveda
Suite 140
Los Angeles, CA 90045
Phone: 213-410-0126 Fax: 213-410-0952
Contacts: Mr. Ronald C. Herman, President
Software Sold: Autodesk, CADAM, Ver-
  saCAD
Computers Sold: NA
Revenue Range: $1 to $3 Million

BOLDER DESIGNS
617 Lincoln Ave.
2350 Armory St.
Prospect Park, PA 19076
Phone: 215-583-9887 Fax: 215-583-9864
Contacts: Mr. John Rutkowski, Managing
  Partner
Software Sold: AutoCAD
Computers Sold: Macintosh, Everex
Revenue Range: $1 to $3 Million

BROMLEY ENGINEERING, INC.
883 A Cambridge Street
Cambridge, MA 02141
Phone: 617-661-3144 Fax: 617-547-7998
Contacts: Ms. Maria Bromley, Vice President;
  Mr. Peter Bromley, President
Software Sold: NA
Computers Sold: NA
Revenue Range: $1 to $3 Million

BYTE AND WORD SYSTEMS, INC.
336 Haddon Avenue
Westmonte, NJ 08108
Phone: 609-858-8889 Fax: 609-858-4495
Contacts: Ms. Ruth Repici; Ms. Rosalyn
  Davis, President
Software Sold: NA
Computers Sold: NA
Revenue Range: $1 to $3 Million

CAD CRAFT
323 Boston Post Road
Old Saybrook, CT 06475
Phone: 203-388-6657 Fax: NA
Contacts: Mr. Chris Wick, President; Mr. Ray
  Gordon, Sales Manager
Software Sold: Autodesk
Computers Sold: Compaq, Macintosh, Sun,
  PC Clone
Revenue Range: $1 to $3 Million

CAD MICRO SYSTEMS
5120 West Goldleaf Circle
Suite 100
Los Angeles, CA 90056
Phone: 213-291-2000 Fax: 213-291-5556
Contacts: Mr. Ed Johnson, President;
  Ms. Michelle Printz, Marketing Manager
Software Sold: CADkey
Computers Sold: NA
Revenue Range: NA

CAD SOLUTIONS
2141 Junction Ave.
Suite 200
San Jose, CA 95134
Phone: 408-943-1610 Fax: 408-436-9731
Contacts: Mr. Vic Leventhal, President;
  Mr. Steve Steele, Chairman
Software Sold: AutoCAD, Softdesk, SDRC,
  PCAD, Microstation, Personal Designer,
  Cooper and Chyan Tech
Computers Sold: Compaq, IBM, Macintosh,
  Sun, Silicon Graphics, AST PC Clone
Revenue Range: More than $10 Million

CAD SOLUTIONS
4499 Ruffin Rd.
3rd Floor
San Diego, CA 92123
Phone: 619-277-0112 Fax: 619-277-2763
Contacts: Mr. Dennis Bertken, President;
  Ms. Mary Minas
Software Sold: AutoCAD, ARRIS
Computers Sold: Compaq, Hewlett-Packard,
  Sun, AST PC Clone
Revenue Range: $5 to $10 Million

CAD SOLUTIONS
300 Galleria Office Center
Suite 322
Southfield, MI 48034
Phone: 313-356-8150 Fax: 313-356-7976
Contacts: Mr. Mike Connely, Regional
  Manager CAD/CAM
Software Sold: CADkey
Computers Sold: NA
Revenue Range: NA

CAD SOLUTIONS
3 Summit Park Dr.
Independence, OH 44131
Phone: 216-642-3442 Fax: 216-642-3404
Contacts: Mr. Mike Connely, Regional
  CAD/CAM Manager
Software Sold: CADkey, Intergraph,
  AutoCAD, VersaCAD
Computers Sold: IBM, Macintosh, Sun,
  Everex, AST PC Clone
Revenue Range: NA

CAD SOUTHWEST/CAD SOLUTIONS
4602 E. University Drive, Suite 170
Phoenix, AZ 85034
Phone: 602-921-9211 Fax: 602-921-1990
Contacts: Mr. Roger Rusche, General
  Manager
Software Sold: AutoCAD, Intergraph
  Microstation, Computervision, Procadam,
  SDRC
Computers Sold: Compaq IBM, Sun, Silicon
  Graphics, AST PC Clone
Revenue Range: $1 to $3 Million

CAD SYSTEMS, INC.
9040 Roswell Road
Suite 462
Atlanta, GA 30350
Phone: 404-641-8239 Fax: 404-642-8344
Contacts: Mr. Brick Carley, Vice President of
  Marketing
Software Sold: Intergraph Microstation,
  AutoCAD, Cadvance, VersaCAD
Computers Sold: Compaq, Digital
  Equipment, IBM, Macintosh
Revenue Range: $3 to $5 Million

CAD SYSTEMS UNLIMITED, INC.
Techmart Suite 443
5201 Great America
Santa Clara, CA 95050
Phone: 408-562-5762 Fax: 408-562-5774
Contacts: Mr. Robert Pantangco, President;
  Mr. Froi Lomotan, R&D Manager
Software Sold: AutoCAD
Computers Sold: 386
Revenue Range: Less than $1 Million

CAD TRAIN, INC.
5987 Peacock Ridge Road, No. 213
Rancho Palos Verdes, CA 90274
Phone: 213-212-6701 Fax: 213-377-9851
Contacts: Mr. Eric Schmidt, CEO
Software Sold: CAD Train-with CADAM
Computers Sold: PC Clone
Revenue Range: Less than $1 Million

CAD WIRE
950 Denison St.
Markham, ONT L3R3K5
Phone: 416-475-6545 Fax: 416-475-6684
Contacts: Mr. Bill Stoveld, President
Software Sold: CADkey
Computers Sold: Compaq, IBM, Silicon
  Graphics, ALR, AST. PC Clone
Revenue Range: $1 to $3 Million

CAD/CAM, INC.
2844 E. River Road
Dayton, OH 45439
Phone: 513-293-3381 Fax: 513-293-9149
Contacts: Mr. Dennis Wiseman, Sales Man-
  ager; Mr. Bill McEwen, Marketing Manager
Software Sold: AutoCAD, CADkey, SDRC,
  Arris, CADAM
Computers Sold: Sun, proprietary
Revenue Range: $5 to $10 Million

CAD/CAM RESOURCES
12 Michigan Dr.
Natick, MA 01760
Phone: 508-650-4800 Fax: 508-655-3226
Contacts: Mr. Joseph White, President;
  Mr. John Fox, Vice President of
  Marketing/Sales
Software Sold: NA
Computers Sold: Hewlett-Packard
Revenue Range: NA

CAD/CAM TECHNOLOGIES
111 Third Ave. S.
Minneapolis, MN 55401
Phone: 612-339-5870 Fax: 612-339-5965
Contacts: Mr. Paul J. Druckman, President
Software Sold: IBM CAD
Computers Sold: NA
Revenue Range: NA

CAD/CAM TECHNOLOGIES, INC.
140 Second Avenue
Waltham, MA 02154
Phone: 617-895-1500 Fax: 617-890-1408
Contacts: Mr. Dave Jacob, President
Software Sold: Autodesk, Computervision, Intergraph, Parametrics
Computers Sold: NA
Revenue Range: $5 to $10 Million

CADALYST RESOURCES
11122 Aurora Ave.
Des Moines, IA 50322
Phone: 515-278-0800 Fax: 515-278-8040
Contacts: Mr. Joe Stevens, President;
  Mr. George Beougher, Purchasing
Software Sold: AutoCAD, Cadvance, ARRIS, CADkey
Computers Sold: Sun, Silicon Graphics, ALR PC Clone
Revenue Range: $3 to $5 Million

CADCORP, INC.
500 Hood Rd.
Suite 110
Markham, ONT L3R9Z3
Phone: 416-946-9411 Fax: 416-946-9688
Contacts: Mr. Spiros Paliologos, Vice President; Mr. David Frazier
Software Sold: AutoCAD, Cadam, ARRIS, Microstation
Computers Sold: Compaq, IBM, Sun, Silicon Graphics, Everex
Revenue Range: More than $10 Million

CADD CENTERS OF FLORIDA
2003 Cypress Creek
Suite 105C
Ft. Lauderdale, FL 33309
Phone: 305-772-7300 Fax: 305-491-8570
Contacts: Mr. Tim Strickland, Vice President of Sales; Mr. Richard Neiman, President
Software Sold: Autodesk, Intergraph, VersaCAD
Computers Sold: NA
Revenue Range: $5 to $10 Million

CADD CENTRE
P.O. Box 4543
Lynchburg, VA 24502
Phone: 804-239-8193 Fax: NA
Contacts: Mr. Jack L. Thompson, CEO
Software Sold: NA
Computers Sold: NA
Revenue Range: Less than $1 Million

CADD DEVELOPMENT CORPORATION
1718 South Orange Avenue
Orlando, FL 32806
Phone: 407-648-9148 Fax: 407-839-4004
Contacts: Mr. Tom Wilkins, President
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

CADD SERVICES INCORPORATED
Pier 9
San Francisco, CA 94111
Phone: 415-433-7023 Fax: 415-433-6345
Contacts: Mr. Robert Moe, President
Software Sold: ARRIS, AutoCAD, DataCAD, Computervision
Computers Sold: Apollo, Compaq, Hewlett-Packard, IBM, Macintosh, Sun
Revenue Range: NA

CADDTECH PRODUCTIVITY, INC.
4713 Crossroads Park Drive
Liverpool, NY 13088
Phone: 315-453-7116 Fax: 315-453-7209
Contacts: Mr. Tony Chayban, Purchasing;
  Mr. Jagdish S. Agrawal, President
Software Sold: CADvance, MicroCADAM, Autocode, Smartcam
Computers Sold: Compaq, Hewlett-Packard, IBM, Everex, Wyse, NEC, Twinhead, AST, PC Clone
Revenue Range: $3 to $5 Million

CADMASTER, INC.
879 Waterman Ave.
East Providence, RI 02914
Phone: 401-434-2970 Fax: 401-438-0730
Contacts: Mr. Paul Enos, President;
  Mr. Michael Enos, Vice President of
  Marketing/Sales
Software Sold: Autodesk
Computers Sold: Compaq, ACER, PC Clone
Revenue Range: Less than $1 Million

CADPAC
1450 E. American Lane (Zurich Towers)
Suite 1400
Schaumburg, IL 60173
Phone: 708-330-4417 Fax: 708-517-2508
Contacts: Mr. Jerry Held, President
Software Sold: Anvil 5000, Anvil 5000 PC,
  Anvil 1000, Intergraph Microstation,
  AutoCAD
Computers Sold: Apollo, Digital Equipment,
  Hewlett-Packard, Sun, Silicon
Graphics, PC Clone
Revenue Range: $3 to $5 Million

CADPAC
655 Eden Park Drive
Suite 350
Cincinatti, OH 45202
Phone: 800-223-5465 Fax: 513-562-8405
Contacts: Mr. Steve Held, Vice President of
  Sales; Mr. Jerry Held, President
Software Sold: Anvil 5000, AutoCAD, Micro
  Station, SDRC, CADvance
Computers Sold: Apollo, Hewlett-Packard,
  Sun, Silicon Graphics, AST
Revenue Range: $3 to $5 Million

CADPRO
8101 East Prentice Ave
Suite 300
Englewood, CO 80112
Phone: 303-796-0204 Fax: 303-796-7646
Contacts: Mr. Roger Boethin, President
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

CADSULTANTS
4305 Butler Hill Rd.
Suite A
St. Louis, MO 63128
Phone: 314-845-7188 Fax: 314-845-6487
Contacts: Mr. Don Spiegel, President;
  Ms. Lori Sluder, Systems Consultant
Software Sold: VersaCAD, AutoCAD,
  EasyCAD, FastCAD
Computers Sold: Everex, Micronics PC
  Clone
Revenue Range: Less than $1 Million

CADSYS, INC.
20875 Crossroads
Suite 600
Waukesha, WI 53186
Phone: 414-785-9495 Fax: 414-785-1856
Contacts: Mr. Mike Theis, Sales Manager;
  Mr. Jeffry Miller, President
Software Sold: AutoCAD, DCA, SmartCAM,
  Interleaf, Computervision
Computers Sold: Compaq, IBM, Macintosh,
  Sun, Everex
Revenue Range: $5 to $10 Million

CADTEL SYSTEMS, INC.
1715 W Northern Ave. No. 109
Phoenix, AZ 85021
Phone: 602-870-7799 Fax: 602-870-7714
Contacts: Mr. David Lankford, President;
  Mr. Jim Garrett, Vice President of Market-
  ing
Software Sold: REA Package, DSP Package,
  Power Package
Computers Sold: Compaq, IBM, Sun, Zenith
  386 PC Clone
Revenue Range: $3 to $5 Million

CASEY-JOHNSON SALES, INC.
37300 Center Court
A Member of The David Group
Newark, CA 94560
Phone: 510-745-9991 Fax: 510-745-8669
Contacts: Mr. Dave Lawrence, Vice President;
  Ms. Claire Kimble, Telemarketing, Manager
Software Sold: CADoverlay-Image systems
Computers Sold: TeleVideo PC Clone
Revenue Range: $5 to $10 Million

CEMAX, INC.
46750 Fremont Blvd
Suite 207
Fremont, CA 94538
Phone: 510-770-8612 Fax: 510-770-8555
Contacts: Mr. Terry Ross, President;
  Mr. Oran Muduroglu, National Sales
  Manager
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

CENTURY 23
4101 Meadows Lane
Las Vegas, NV 89107
Phone: 702-870-1534 Fax: 702-870-3359
Contacts: Mr. Nick Reese, President;
  Mr. Paul Jepsen, AutoCAD Rep
Software Sold: AutoCAD, MacBravo, Claris,
  Generic
Computers Sold: Macintosh, Everex, PC
  Clone
Revenue Range: Less than $1 Million

CHARLES HILL & ASSOCIATES
/dba CADDCenters
6435 Castle Way West Drive
Suite 141
Indianapolis, IN 46250
Phone: 317-849-9808 Fax: NA
Contacts: Mr. Charles Hill, President
Software Sold: Autodesk
Computers Sold: Compaq
Revenue Range: $1 to $3 Million

CHEMPRO DATA SCIENCES CORP.
507 Southampton Road
Westfield, MA 01085
Phone: 413-562-2353 Fax: 413-562-2355
Contacts: Mr. Norman St. Martin, President
Software Sold: NA
Computers Sold: NA
Revenue Range: $1 to $3 Million

COMPUADD
12303 Technology Blvd.
Austin, TX 78727
Phone: 512-250-2635 Fax: 512-258-8996
Contacts: Mr. Gene Thomas, Marketing
  Manager
Software Sold: NA
Computers Sold: PC Clone
Revenue Range: NA

COMPUSULTING ASSOCIATES, LTD.
P. O. Box 418
Centerport, NY 11721
Phone: 516-261-0488 Fax: NA
Contacts: Mr. Ron Friedman, President
Software Sold: AutoCAD, CADkey,
  TurboCAD
Computers Sold: Acer PC Clone
Revenue Range: Less than $1 Million

COMPUTER AIDED DESIGN SYSTEMS,
INC.
3 Amberwood Crescent
Nepean, ONT K2E 7L1
Phone: 613-225-0411 Fax: 613-225-4339
Contacts: Mr. Greg Philliban, Vice President
  of Marketing; Mr. P. J. Philliban, Owner
Software Sold: AutoCAD, SmartCAM,
  CADkey, GenericCAD, KitchenCAD
Computers Sold: Compaq, IBM, Everex,
  ALR, AST, Olivetti PC Clone
Revenue Range: $1 to $3 Million

COMPUTER IMAGE TECHNOLOGY
321 W. Eighth Street
Davis, CA 95616
Phone: 916-753-9540 Fax: 916-753-9835
Contacts: Mr. David Carroll, President
Software Sold: AutoCAD Proprietary CAD
  Product
Computers Sold: Sun, DELL PC Clone
Revenue Range: $1 to $3 Million

COMPUTER NUMERICAL CONTROL
  CORPORATION
225 Stedman Park Building No. 18
Lowell, MA 01851
Phone: 508-937-0984 Fax: 508-937-2716
Contacts: Mr. George C. Kakridas, President
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

COMPUTER SCIENCES APPLICATIONS
P.O. Box F
Arcadia, CA 91066
Phone: 818-355-8888 Fax: 818-355-8888
Contacts: Mr. Constantine Ananiades,
  President
Software Sold: ORCAD, PCAD, Spice
Computers Sold: Apollo, IBM, Sun, IBM
  Clones PC Clone
Revenue Range: Less than $1 Million

COMPUTER TIME
300 Henry Place
Spartanburg, SC 29301
Phone: 803-585-5004 Fax: 803-585-4447
Contacts: Mr. Cecil Powell, President
Software Sold: AutoCAD
Computers Sold: Apollo, Hewlett-Packard,
  IBM, Sun
Revenue Range: NA

COMPUTER TOWN
430 Winchester Street
Keene, NH 03431
Phone: 603-357-1113 Fax: 603-252-9343
Contacts: Mr. Chaves Walling, President
Software Sold: Autodesk
Computers Sold: NEC Hyndi PC Clone
Revenue Range: Less than $1 Million

COMPUTER-AIDED TECHNOLOGIES,
  INC.
610 Loyola Avenue
New Orleans, LA 70113
Phone: 504-523-2233 Fax: 504-525-2648
Contacts: Dr. Kenneth M. Goldstein, Execu-
  tive Vice President; Ms. Linda F. Goldstein,
  President
Software Sold: AutoCAD, FastCAD,
  VersaCAD
Computers Sold: Compaq, Digital
  Equipment, Hewlett-Packard, IBM,
  Macintosh, Everex, AT&T, Zenith, NEC PC
  Clone
Revenue Range: $1 to $3 Million

COMPUTERAID
E. 14109 Sprague Ave.
Suite No. 8
Spokane, WA 99216
Phone: 509-922-0366 Fax: 509-922-1911
Contacts: Mr. Jim Raschka, President
Software Sold: AutoCAD, Microstation
Computers Sold: Everex Step
Revenue Range: Less than $1 Million

COMPUTERLAND
510 West Cordova Road
Santa Fe, NM 87501
Phone: 505-988-8800 Fax: 505-982-4673
Contacts: Mr. Brent Bonwell, General Man-
  ager; Mr. Peter MacDonald, Sales Manager
Software Sold: AutoCAD, ClarisCAD
Computers Sold: Compaq, IBM, Macintosh,
  PC Clone
Revenue Range: Less than $1 Million

COMPUTERLAND
5964 West Las Positas Boulevard
Pleasanton, CA 94566
Phone: 510-734-4000 Fax: NA
Contacts: Ms. Marianne Northcut, Vice
  President of Marketing; Ms. Kris Thomp-
  son,
Catalog Manager
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

COMPUTERLAND
2255 John F. Kennedy Rd.
Dubuque, IA 52002
Phone: 319-556-6515 Fax: 319-556-5690
Contacts: Mr. Kevin Hougham, General
  Manager
Software Sold: Generic CAD, Autosketch
Computers Sold: Compaq, IBM, 386,
  Mitsubishi, NEC PC Clone
Revenue Range: Less than $1 Million

COMPUTERLAND OF EAU CLAIRE
3408 Oakwood Mall Dr.
Eau Claire, WI 54701
Phone: 715-835-8082 Fax: 715-835-1844
Contacts: Ms. Kerry Regez, Support
  Manager
Software Sold: AutoCAD, all Autodesk
  product lines, VersaCAD
Computers Sold: Compaq, Hewlett-Packard,
  IBM, AT&T PC Clone
Revenue Range: $1 to $3 Million

COMPUTERLAND-INFOSYSTEMS
19950 Mariner Avenue
Torrance, CA 90503
Phone: 310-214-4200 Fax: 310-214-4210
Contacts: Mr. Zeb Bhatti, Vice President
Software Sold: AutoCAD, VersaCAD,
  Powerdraw
Computers Sold: Compaq, Hewlett-Packard,
  IBM, Macintosh, AST PC Clone
Revenue Range: Less than $1 Million

COMPUTERS & CONCEPTS INC.
3248 Orchard LK
Orchard Lake, MI 48324
Phone: 313-681-7722 Fax: 313-681-9632
Contacts: Mr. Taher F. Rasheed, President;
  Mr. Darryl Ware, Sales Representative
Software Sold: Autodesk, CADAM
Computers Sold: Compaq, Hewlett-Packard,
  IBM
Revenue Range: Less than $1 Million

COMPUTERS FOR DESIGN
1430 Larimer Square
Denver, CO 80202
Phone: 303-629-7474 Fax: 303-825-7706
Contacts: Ms. Connie Davis, Technical
  Support; Mr. Tom Grady, Sales Manager
Software Sold: Intergraph, Cadvance,
  Hitachi Cadcore, Hybrid
Computers Sold: Compaq, Hewlett-Packard,
  Sun, AST PC Clone
Revenue Range: NA

COMSTRAND INC.
2852 Anthony Lane South
Minneapolis, MN 55418
Phone: 612-788-9234 Fax: 612-788-7218
Contacts: Mr. Bob Van Den Berg, President
Software Sold: Orcad, Bobcat, Tanner
Computers Sold: IBM, Macintosh
Revenue Range: NA

COMTEC COMPUTER SERVICES CO., INC.
10000 Old Katy Rd.
Suite 150
Houston, TX 77055
Phone: 713-935-3600 Fax: 713-935-3650
Contacts: Mr. Robert M. Muntatchy,
  President
Software Sold: AutoCAD, Intergraph
Computers Sold: IBM, PC Clone
Revenue Range: Less than $1 Million

CONCAD TECHNOLOGIES, INC.
123BA Menomonie Street
Eau Claire, WI 54703
Phone: 715-835-8331 Fax: NA
Contacts: Mr. Gerald Revelle, President;
  Mr. Andrew Revelle, Service Manager
Software Sold: Autodesk
Computers Sold: NEC, ALR, SUNRIVER PC
  Clone
Revenue Range: Less than $1 Million

CONCURRENT CORPORATION
1870 Madison Road
Cincinnati, OH 45206
Phone: 513-281-2000 Fax: NA
Contacts: Mr. Thomas Widlar, President;
  Ms. Kathy Widlar, Sales Representative
Software Sold: Generic CADD
Computers Sold: Everex, Data General and
  Zenith PC Clone
Revenue Range: Less than $1 Million

CONNECTING POINT/Intelligent Elect
5340 South Quebec St.
Suite 300
Inglewood, CO 80111
Phone: 303-779-6026 Fax: 303-779-6555
Contacts: Mr. Jim Ciccarelli, President;
  Ms. Katie O'Donnell, Sr. Product Manager
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

COOPERATIVES COMPUTER CENTER
5159 Woodlane Circle
Tallahassee, FL 32303
Phone: 904-562-0121 Fax: 904-562-3241
Contacts: Mr. Don J. Stockten, President
Software Sold: AutoCAD, Integraph
Computers Sold: proprietary
Revenue Range: Less than $1 Million

CORNERSTONES-WRIGHT, INC.
315 Park Ave.
Box 4904 DTS
Portland, ME 04102
Phone: 207-772-3900 Fax: 207-772-0877
Contacts: Mr. Glen Bates, President
Software Sold: NA
Computers Sold: NA
Revenue Range: Less than $1 Million

CORPORATE DEVELOPMENT
  ASSOCIATES
641 East Butterfield
Suite 408
Lombard, IL 60148
Phone: 708-719-1600 Fax: NA
Contacts: Ms. J. R. Reid, Vice President of
  Marketing; Ms. Phyllis Anderson,
  President
Software Sold: AutoCAD
Computers Sold: Compaq, Digital
  Equipment, IBM, Silicon Graphics,
  Intel, OPUS (SUN CLN) PC Clone
Revenue Range: Less than $1 Million

CORPORATE SOFTWARE
275 Dan Road
Canton, MA 02021
Phone: 617-828-7727 Fax: 617-821-5688
Contacts: Mr. Joel Blenner, Vice President of
  Marketing
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

CREATIVE CONNECTIONS, INC.
3407 E. Lawrence
Duluth, GA 30136
Phone: 404-476-7322 Fax: 404-476-7028
Contacts: Mr. Ian Albritton, President
Software Sold: PCAD-CADAM
Computers Sold: Everex, DOS Clone
Revenue Range: Less than $1 Million

CTR BUSINESS SYSTEMS, INC.
6420 Southwest Macadam Ave
Portland, OR 97201
Phone: 503-293-2414 Fax: 503-293-8600
Contacts: Mr. Edward Israel, President;
  Mr. Tom McKasson, Vice President and
  CAD/CAM Manager
Software Sold: CADkey
Computers Sold: Compaq, ALR, Silicon
  Graphics, PC Clone
Revenue Range: $1 to $3 Million

CUSTOM COMPUTER SPECIALISTS, INC.
1775 Express Drive
Hauppauge, NY 11788
Phone: 516-582-6699 Fax: 516-582-6012
Contacts: Mr. Gregory Galdi, President;
  Mr. Mario Cavallaro, Vice President of
  Marketing
Software Sold: VersaCAD
Computers Sold: NA
Revenue Range: NA

DATA AUTOMATION
7966 Arjons Dr.
San Diego, CA 92126
Phone: 619-693-4070 Fax: 619-695-0306
Contacts: Mr. Richard Hackworth, CEO
Software Sold: DGS 2000
Computers Sold: Hewlett-Packard, 386 PC
  Clone
Revenue Range: Less than $1 Million

DATA HANDLING
3105 San Pedro, N.E.
Albuquerque, NM 87110
Phone: 505-884-0284 Fax: 505-884-0286
Contacts: Mr. Ray Rachowski, President;
  Ms. Rocky Abakovi, Administrative
  Assistant
Software Sold: Autodesk—Softdesk,
  Cosmos—Third-party, Woodborne—
  Third-party, MCS
Computers Sold: NA
Revenue Range: Less than $1 Million

DATA POWER, INC.
8704 Royal Lane
Irving, TX 75063
Phone: 214-929-4000 Fax: 214-929-0326
Contacts: Mr. Don Maly, Executive Vice
  President and General Manager; Mr. Chris
  Sales, President
Software Sold: Microstation,
  Computervision, AutoCAD, Cadam,
  P-CAD
Computers Sold: Compaq, IBM, Sun, AST
  PC Clone
Revenue Range: $5 to $10 Million

DATAPOWER
8704 Royal Lane
Irving, TX 75063
Phone: 214-915-0012 Fax: 214-929-0326
Contacts: Mr. Austin Sides, Sales Manager
Software Sold: AutoCAD, Microstation,
  Personal Designer
Computers Sold: Sun, PC Clone
Revenue Range: NA

DATEC, INC.
401 Whitney Avenue
Suite 100
Gretna, LA 70056
Phone: 504-368-2097 Fax: NA
Contacts: Mr. William Reagan, Vice
  President
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

DECI ASSOCIATES
50 Elm Street
Huntington, NY 11743
Phone: 516-549-1511 Fax: NA
Contacts: Mr. Donald E. Clark, President
Software Sold: AutoCAD, Full Autodesk
  Lines, Companion products of AutoCAD,
  CADpartner
Computers Sold: 386, Acer, Everex, AST PC
  Clone
Revenue Range: Less than $1 Million

DECISION VISION
7054 Convoy Court
San Diego, CA 92111
Phone: 619-541-2000 Fax: 619-541-2655
Contacts: Mr. David Gmach, Owner
Software Sold: AutoCAD, SmartCAM, NC
  Polaris, Autosolid, True Vision Products
Computers Sold: NEC, AST, Everex, ALR
  PC Clone
Revenue Range: Less than $1 Million

DESIGNLAB
10 East 9th Street
Lawrence, KS 66044
Phone: 913-841-1510 Fax: 913-841-3097
Contacts: Mr. James Surber, President
Software Sold: AutoCAD, Cadvance,
  Datacad
Computers Sold: Compaq, Wyse, AST,
  MEGA PC Clone
Revenue Range: $1 to $3 Million

DEVTRON RUSSELL INC.
301 North Bowery Avenue
P O Box 385
Gladwin, MI 48624
Phone: 517-426-6574 Fax: NA
Contacts: Mr. Edward J. Russell, President;
  Mr. Lee Decker, Vice President of
  Operations
Software Sold: Autodesk, KETIV, DCA,
  EYCO
Computers Sold: Sun, AST, Group-10, PC
  Clone
Revenue Range: $1 to $3 Million

DGA ASSOCIATES INC.
400 West Cummings Park
Woburn, MA 01801
Phone: 617-935-3001 Fax: 617-935-2467
Contacts: Mr. Don Glass, President;
  Mr. Kevin Baker, Sales
Software Sold: Protel, Cupl, Capilano,
  Router Solutions, Ashlar Vellum
Computers Sold: NA
Revenue Range: $1 to $3 Million

DICKENS DATA SYSTEMS
3155 Medlock Bridge
Suite 120
Northcross, GA 30071
Phone: 404-417-4635 Fax: 404-242-6233
Contacts: Mr. Jack Smith, Vice President
Software Sold: Cadam, Design Bid
Computers Sold: IBM
Revenue Range: $5 to $10 Million

DISKOVERY EDUCATIONAL SYSTEMS
1860 Old Okeechobee Road No. 105
West Palm Beach, FL 33409
Phone: 407-683-8410 Fax: 407-683-8416
Contacts: Mr. Dan Wechsler, Vice President
Software Sold: Generic CADD, ClarisCAD
Computers Sold: IBM
Revenue Range: NA

DTI TECHNOLOGIES
10 Commerce Park North, Unit 13-3
Bedford, NH 03110
Phone: 603-626-7799 Fax: 603-626-7981
Contacts: Mr. Dan Dolan, President;
  Mr. Ron Heestand, Operations Manager
Software Sold: AutoCAD
Computers Sold: Digital Equipment, Sun,
  Proprietary PC Clone
Revenue Range: $1 to $3 Million

DYNABYTE MICROAGE
801 W. Main St.
Charlottesville, VA 22901
Phone: 804-296-7560 Fax: NA
Contacts: Mr. Dave Watkins, Branch
  Manager
Software Sold: Autodesk
Computers Sold: NA
Revenue Range: NA

EAST COAST COMPUTER SYSTEMS INC.
1 Sheila Drive
Building 6A
Tinton Falls, NJ 07724
Phone: 908-747-6995 Fax: NA
Contacts: Ms. Marbeth Shay, President;
  Mr. Danny Lee, Vice President of Market-
  ing
Software Sold: Autodesk
Computers Sold: NA
Revenue Range: $1 to $3 Million

EBERHARD ENGINEERING
27 Pine Ridge Drive
Smithtown, NY 11787
Phone: 516-436-5800 Fax: 516-436-5805
Contacts: Mr. Ronald Eberhard, President
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

EGGHEAD DISCOUNT SOFTWARE
P.O. Box 7004
22011 SE 51st Street
Issaquah, WA 98027-7004
Phone: 206-391-0800 Fax: 206-392-2771
Contacts: Ms. Judy Meleliat, Vice President
  of Marketing
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

EKJ DESIGN AND DRAFTING, INC.
5726 Southwyck Blvd.
Suite 200
Toledo, OH 43614
Phone: 419-865-0500 Fax: 419-865-4506
Contacts: Mr. Greg Johns, President;
  Mr. Jim Wolfe, Sales Manager
Software Sold: AutoCAD, third-party
  programs
Computers Sold: Apollo, Hewlett-Packard,
  Everex, NEC, PC Craft, PC Clone
Revenue Range: Less than $1 Million

ELCOR ASSOCIATES INC.
1800 Wyatt Drive No. 10
Santa Clara, CA 95054
Phone: 408-980-8868 Fax: 408-980-8653
Contacts: Mr. Bob Weeks, President
Software Sold: Orcad, Quad design, Logic
  Automation
Computers Sold: Apollo, Compaq, Hewlett-
  Packard, IBM, Macintosh, Sun, Everex, PC
  Clone
Revenue Range: $1 to $3 Million

ELECTRONICS BOUTIQUE
1345 Enterprise Drive
West Chester, PA 19380
Phone: 215-430-8100 Fax: 215-430-6574
Contacts: Ms. Donna Dunlap, Systems
  Coordinator; Mr. Jeff Griffith, Vice
  President of Merchandising
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

ENGINEERING DATA SYSTEMS
  CORPORATION
Clock Tower West
Suite G
Dubuque, IA 52003
Phone: 319-556-8392 Fax: 319-556-5321
Contacts: Mr. John Biver, Vice President;
  Mr. Dennis George, Vice President of
  Finance and Administration
Software Sold: AutoCAD, third-party Civil
  Engineering, Microstation
Computers Sold: Compaq, Digital
  Equipment, IBM, Sun, Everex, ALR,
  AST PC Clone
Revenue Range: $1 to $3 Million

ENTRE COMPUTER CENTER
17950 Preston Road No. 75
Dallas, TX 75252
Phone: 214-248-1200 Fax: 214-248-4669
Contacts: Mr. Arlo Bates, CAD Sales
  Manager
Software Sold: AutoCAD, DataCAD,
  MaxRoute, Pads
Computers Sold: Compaq, Hewlett-Packard,
  IBM, Macintosh, Sun
Revenue Range: Less than $1 Million

ENTRE COMPUTER CENTER
3812 Rochester Road
Troy, MI 48083
Phone: 313-528-3770 Fax: 313-528-3573
Contacts: Mr. Frank L. Sabina, President;
  Mr. Rocky Pisto, Sales Manager
Software Sold: AutoCAD, Computervision
  Personal Machinist, Aries, MicroCADAM,
  IBMCAD
Computers Sold: Compaq, Hewlett-Packard,
  IBM, ALR PC Clone
Revenue Range: $1 to $3 Million

ENTRE DATAPLEX
7006 S. Alton Way Bldg. A
Englewood, CO 80112
Phone: 303-850-0433 Fax: 303-741-5103
Contacts: Mr. Bob Hoffmister, Sales;
  Mr. Joe Wicker, President
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

EVERGREEN SYSTEMS, INC.
13433 NE 20th
Suite U
Bellevue, WA 98005
Phone: 206-455-0825 Fax: 206-562-0843
Contacts: Mr. Mark Astengo, President
Software Sold: AutoCAD
Computers Sold: Everex PC Clone
Revenue Range: NA

EXECUSOFT, INC.
2875 Northwind Drive
Suite 218
East Lansing, MI 48823
Phone: 517-332-3414 Fax: 517-332-1598
Contacts: Mr. Jim Topper, President
Software Sold: AutoCAD, DCA, LandCAD
Computers Sold: Compaq, SUPER STATION
  (own brand PC Clone)
Revenue Range: Less than $1 Million

FIGGIE INTERNATIONAL
4420 Sherwin Road
Willoughby, OH 44094
Phone: 216-946-9000 Fax: 216-953-2791
Contacts: Mr. Vince Chiarucci, President
Software Sold: NA
Computers Sold: NA
Revenue Range: $3 to $5 Million

FINITE GRAPHICS
5251 Verdugo Way
Suite L
Camarillo, CA 93012
Phone: 805-987-6033 Fax: NA
Contacts: Mr. Darryl Erlandson, President
Software Sold: AutoCAD, ClarisCAD,
  Computervision
Computers Sold: Compaq, Macintosh,
  Everex, AST, ARL PC Clone
Revenue Range: $5 to $10 Million

FORTUNE TECHNOLOGIES CORP.
5706 West 74th Street
Indianapolis, IN 46278
Phone: 317-290-0080 Fax: 317-290-8440
Contacts: Mr. Mike Puckett, Regional
  Manager; Mr. Bill Bartley, Vice President
  of Sales and Marketing
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

FRANSWORTH COMPUTERS
120 W. North Avenue
Villa Park, IL 60181
Phone: 708-941-3444 Fax: 708-941-9883
Contacts: Mr. Luke Snyder, President;
  Mr. Dan Snyder, Sales Manager
Software Sold: CADkey
Computers Sold: NA
Revenue Range: $1 to $3 Million

FRANTEK/INGRIM MICRO-D
6 Gurdwara Road
Suite No. 200
Nepean, CN K-2E8A3
Phone: 613-228-3386 Fax: 613-523-9129
Contacts: Ms. Annette Bolster, Sales Person
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

G & R DISTRIBUTING
980 Corporate Woods Pkwy
A Member of The David Group
Vernon Hills, IL 60061
Phone: 708-537-8777 Fax: 312-913-5595
Contacts: Mr. William Rychel, President;
  Mr. Thomas Gust, Vice President of
  Marketing/Sales
Software Sold: NA
Computers Sold: Mitsubishi PC Clone
Revenue Range: $5 to $10 Million

GENERAL COMPUTER CENTERS INC.
R.D. No. 3, Box No. 7
Route 309
Tamaqua, PA 18252
Phone: 717-668-1595 Fax: 717-386-3817
Contacts: Mr. Ralph L. Bzura, President
Software Sold: Autodesk
Computers Sold: NA
Revenue Range: $1 to $3 Million

GEOCAD, INC.
P.O. Box 186
Laurel Road
Pound Ridge, NY 10576
Phone: 914-764-4072 Fax: 914-764-5322
Contacts: Mr. Rudolph Horowitz, President
Software Sold: GeoCAD, Geovue, Geoest
Computers Sold: PC Clone
Revenue Range: NA

GRADIENT TECHNOLOGIES
550 Shelby Lane
Los Altos, CA 94022
Phone: 415-949-5434 Fax: NA
Contacts: Dr. Joseph Binkowski, President
Software Sold: Cosmos
Computers Sold: NA
Revenue Range: NA

GRAPHICS TECHNOLOGIES
7615 Golden Triangle Drive
Suite G
A Member of The David Group
Eden Prairie, MN 55344
Phone: 612-944-1121 Fax: 612-944-6328
Contacts: Mr. Steve Herold, President;
  Mr. Jeff White, Marketing Supervisor/
  Purchasing
Software Sold: NA
Computers Sold: Acer and Mitsubishi
  PC Clone
Revenue Range: More than $10 Million

GREENWICH BUSINESS SYSTEMS
2364 Post Rd.
Warwick, RI 02886
Phone: 401-732-1123 Fax: 401-738-1580
Contacts: Mr. George Head, Vice President,
  CAD/CAM
Software Sold: AutoCAD, NCPolaris
Computers Sold: Proprietary (GBS)
Revenue Range: $1 to $3 Million

HCS CORPORATION
2900 South State St.
Salt Lake City, UT 84115
Phone: 801-483-1000 Fax: 801-485-3891
Contacts: Mr. W. L. Pulsipher, Vice President,
  Marketing; Mr. Memory Sheen, Operations
  Manager
Software Sold: Autodesk Family, third-party
  suppporting products
Computers Sold: Digital Equipment, Everex,
  Zenith, NEC PC Clone
Revenue Range: $1 to $3 Million

HIGHLAND DIGITAL
1001 Elwell Cr
Palo Alto, CA 94303
Phone: 415-493-8550 Fax: 415-493-4506
Contacts: Mr. Scott Holmgren, President;
 Mr. Michael Lash, Vice President
Software Sold: Terradyne, Prance GT, Oasis,
 Microtec
Computers Sold: Sun, DEC, MIPS
Revenue Range: More than $10 Million

HLA COMPUTERS
5700-J Sunnyside Avenue
Beltsville, MD 20705
Phone: 301-345-8170 Fax: 301-345-8852
Contacts: Mr. Howard Lefkowitz, President
Software Sold: IBMCAD
Computers Sold: IBM
Revenue Range: $1 to $3 Million

HM SYSTEMS, INC.
18221-A Flower Hill Way
Gaithersburg, MD 20879
Phone: 301-921-0711 Fax: 301-948-3851
Contacts: Ms. Sharon Dennison, Sales and
 Marketing; Mr. Henry Marraffa, President
Software Sold: Microstation, VersaCAD
Computers Sold: Compaq, Macintosh, Acer,
 AST, Wyse, NEC PC Clone
Revenue Range: Less than $1 Million

HOME & BUSINESS
597 E. Calaveras Blvd
Milpitas, CA 95035
Phone: 408-945-2985 Fax: 408-945-6579
Contacts: Mr. Ross Paxton, Principal;
 Mr. Dave Durant, Technical Support
Software Sold: ClarisCAD, Douglas
Computers Sold: Macintosh
Revenue Range: NA

HOME BUSINESS & NETWORK
 CMPTRS INC.
711 East Main Street
Bridgewater, NJ 08807
Phone: 908-469-8800 Fax: 908-469-8803
Contacts: Mr. Tom Neston, President
Software Sold: Evolution Computing,
 Generic Software
Computers Sold: NA
Revenue Range: NA

ICG
4032 Clipper Court
Fremont, CA 94538
Phone: 510-657-0200 Fax: 510-657-8879
Contacts: Ms. Mary Carvarlho, Marketing
 Manager
Software Sold: NA
Computers Sold: NA
Revenue Range: More than $10 Million

ICONIX, INC
9201 East Bloomington Freeway
Suite BB
Minneapolis, MN 55420
Phone: 612-888-3030 Fax: 612-888-3010
Contacts: Mr. Paul Morley, Vice President of
 Marketing
Software Sold: AutoCAD
Computers Sold: Sun, Everex
Revenue Range: $3 to $5 Million

INACOMP COMPUTER CENTER
1800 West Maple Road
Troy, MI 48084
Phone: 313-649-0910 Fax: 313-649-3074
Contacts: Ms. Marca Brown, Marketing
 Manager
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

INACOMP COMPUTER CENTER
1347 Florin Road
Suite A and B
Sacramento, CA 95831
Phone: 916-427-8993 Fax: 916-371-3415
Contacts: Mr. Steve Arosteguy, Owner
Software Sold: AutoCAD, Pegasus
Computers Sold: Compaq, IBM, Macintosh
Revenue Range: $1 to $3 Million

INFINITE GRAPHICS
4611 East Lake Street
Minneapolis, MN 55406
Phone: 612-721-6283 Fax: 612-721-3802
Contacts: Mr. Clifford Stritch, CEO
Software Sold: IGI-2100 panelization
 software, Racal-Redac, Automatic testing
 software, ProCAD
Computers Sold: Apollo, Hewlett-Packard,
 IBM
Revenue Range: $3 to $5 Million

INFOMAX/COMPUTERLAND
1000 Broadway
Suite A100
Oakland, CA 94607
Phone: 510-452-1900 Fax: 510-836-4340
Contacts: Ms. Karen Burcher, Marketing
  Manager
Software Sold: AutoCAD, VersaCAD
Computers Sold: Compaq, IBM, Macintosh
Revenue Range: Less than $1 Million

INGRAM COMPUTERS INC.
2128 Elmwood Avenue
Buffalo, NY 14207
Phone: 716-874-1874 Fax: 716-874-4586
Contacts: NA
Software Sold: Generic CADD
Computers Sold: NA
Revenue Range: NA

INGRAM MICRO D
1600 East St Andrew Place
Santa Ana, CA 92705
Phone: 714-566-1000 Fax: NA
Contacts: Mr. Steve McHale, Manager of
  CAD/CAM Marketing Group
Software Sold: Drafix Windows CAD,
  GeneriCAD, Autosketch, Vellum for Mac
  VersaCAD
Computers Sold: Everex, ALR, AST, Packard
  Bell PC Clone
Revenue Range: More than $10 Million

INNOVA BUSINESS SYSTEMS
2701 St. Louis Avenue
Signal Hill, CA 90806
Phone: 310-427-6726 Fax: NA
Contacts: Mr. Mark Fowle, President
Software Sold: AutoCAD, GeneriCAD
Computers Sold: IBM Clones PC Clone
Revenue Range: Less than $1 Million

INSYNC SYSTEMS, CORP.
County Road 172
Alvin, TX 77511
Phone: 713-331-2024 Fax: 713-585-6239
Contacts: Mr. Romeo F. Goddard III,
  President
Software Sold: AutoCAD, ProCAD
Computers Sold: PC Clone
Revenue Range: $1 to $3 Million

INTEGRATED COMPUTER GRAPHICS,
  INC.
1120 Hope Road
Suite 100
Atlanta, GA 30305
Phone: 404-552-8800 Fax: 404-552-8808
Contacts: Mr. Steve Bate, President
Software Sold: ARRIS, Builders Cad
  (proprietary)
Computers Sold: Digital Equipment, IBM,
  Sun, ACER, IBM Clones PC Clone
Revenue Range: $3 to $5 Million

INTEGRATED GRAPHICS SYSTEMS, INC.
625 Fair Oaks Avenue
Suite 100
South Pasadena, CA 91030
Phone: 818-799-4128 Fax: NA
Contacts: Mr. P. Douglas Josephson,
  President
Software Sold: Soft Master, Soft Master/
  Redline, Soft Master/PC
Computers Sold: IBM, AST PC Clone
Revenue Range: Less than $1 Million

INTEGRATED INFO. MGT. SYSTEMS INC.
Rockland Professional Center
Suite 100
1940 North 13th Street
Redding, PA 19604
Phone: 215-478-8010 Fax: NA
Contacts: NA
Software Sold: NA
Computers Sold: NA
Revenue Range: $1 to $3 Million

INTEGRATED SOLUTIONS
11211 E. Arapahoe
Englewood, CO 80112
Phone: 303-790-7030 Fax: 303-799-9297
Contacts: Mr. Joe Campana, President;
  Mr. Bob Darveaux, General Manager
Software Sold: NA
Computers Sold: NA
Revenue Range: $1 to $3 Million

INTEGRITY COMPUTERS ELECTRONICS
2245 Losantiville Road
Cincinnati, OH 45237
Phone: 513-531-8324 Fax: 513-531-8372
Contacts: Mr. Phillip G. Waller, Owner
Software Sold: NA
Computers Sold: NA
Revenue Range: $1 to $3 Million

INTEK
1400 New Hope Road
Waynesboro, VA 22980
Phone: 703-949-8376 Fax: 703-942-2856
Contacts: Mr. Don McLear, Director of
  CAD/CAM
Software Sold: Anvil, Intergraph, Anvil
  1000, Computervision, Smartcam
Computers Sold: Compaq, Hewlett-Packard,
  IBM, Sun, Silicon Graphics, Everex, Intel,
  Dell PC Clone
Revenue Range: $1 to $3 Million

INTELLIGENT IMAGES, INC.
4920 Niagra Rd. No. 100
College Park, MD 20740
Phone: 301-345-5544 Fax: 301-220-2328
Contacts: Mr. Martin Fries, Owner;
  Ms. Kristie Nelson, Account Manager
Software Sold: Autodesk
Computers Sold: Compaq, Sun, Everex,
  Image series-own brand PC Clone
Revenue Range: $1 to $3 Million

INTERCAD
101 Metro Drive
Suite 680
San Jose, CA 95110
Phone: 408-727-2929 Fax: 408-452-4533
Contacts: Mr. Jim Schwartz, President
Software Sold: AutoCAD, Pro/Engineer,
  SmartCAM, Auto PCB
Computers Sold: Sun
Revenue Range: $5 to $10 Million

INTERCAD GRAPHICS SYSTEMS
116 Desense Highway
Annapolis, MD 21401
Phone: 301-224-2926 Fax: 301-261-8358
Contacts: Mr. Thomas O. Mills, Vice
  President; Mr. Dan Ulin, Director of
  Marketing
Software Sold: Illustrator II, Quik Edit,
  Red-Liner, Mechanical Drafting Plus
Computers Sold: NA
Revenue Range: $3 to $5 Million

INTERFACE ELECTRONICS, INC.
37500 Enterprise Court
Farmington Hills, MI 48331
Phone: 313-553-9820 Fax: 313-553-2013
Contacts: Mr. Ketan Bakshi, Vice President,
  Marketing; Mr. Kirit Bakshi, President
Software Sold: Aries, Computervision,
  COSMOS, SPC-SDS for quality engineering
Computers Sold: Compaq, PC Clone
Revenue Range: $1 to $3 Million

ITAL BUSINESS COMPUTER SYSTEMS,
  LTD
6425 Hollywood Blvd.
Suite 300
Los Angeles, CA 90028
Phone: 213-466-0552 Fax: NA
Contacts: Mr. Douglas Richards, President
Software Sold: AutoCAD, Ideas, VersiCAD
Computers Sold: Compaq, IBM, Sun, Silicon
  Graphics, proprietary PC Clone
Revenue Range: $5 to $10 Million

J.R. SYSTEMS WHOLESALERS
1618 17th St.
Washington, DC 20009
Phone: 202-785-8924 Fax: 202-797-8354
Contacts: Mr. Douglas Lang, President;
  Mr. Mark Cohen, Vice President of
  Marketing
Software Sold: Autodesk, Generic CADD
Computers Sold: NA
Revenue Range: NA

J.Z.A. SYSTEMS SERVICES, INC.
102 Greyfriar Drive
Pittsburgh, PA 15215
Phone: 412-963-7780 Fax: NA
Contacts: Mr. Jim Zaenger, President
Software Sold: AutoCAD, Engineering Data
  Systems, Enable
Computers Sold: Clones PC Clone
Revenue Range: Less than $1 Million

JONATHAN'S COMPUTER CENTERS
444 W. Route 70
Marlton, NJ 08053
Phone: 609-983-0668 Fax: 609-983-6361
Contacts: Mr. Mahmoud Jishi, General
  Manager
Software Sold: Autodesk, VersaCAD
Computers Sold: NA
Revenue Range: $1 to $3 Million

K & R CUSTOM SOFTWARE, INC.
11048 Warwick Blvd.
Suite 202
Newport News, VA 23601
Phone: 804-595-5400 Fax: 804-595-4896
Contacts: Mr. Thomas H. Rees, President
Software Sold: NA
Computers Sold: NA
Revenue Range: $1 to $3 Million

KC/CAD
P.O. Box 82336
Bakersfield, CA 93380
Phone: 805-393-2223 Fax: 805-393-0595
Contacts: Mr. Michael Largent, Vice
  President, Marketing and Sales; Mr. Gary
  Coats, President
Software Sold: Autodesk
Computers Sold: Sun, DTK, NEC
Revenue Range: NA

KDS ENGINEERING
2319 J Street
Sacramento, CA 95816
Phone: 916-446-3310 Fax: 916-446-4915
Contacts: Mr. David Berry, President
Software Sold: AutoCAD
Computers Sold: Sun, Everex, Microsys PC
  Clone
Revenue Range: $1 to $3 Million

KELAR
910 Irwin St.
San Rafael, CA 94901
Phone: 415-258-9411 Fax: 415-258-0803
Contacts: Mr. Bruce Poropat, CAD
  Consultant
Software Sold: AutoCAD, AEC Architecture,
  AutoShade
Computers Sold: Compaq, IBM, Macintosh,
  AST
Revenue Range: NA

KELAR CORP.
5456 McConnell Avenue
Los Angeles, CA 90066
Phone: 310-827-1200 Fax: 310-305-8091
Contacts: Mr. Ed Maghboul, CAD Manager;
  Mr. Kambiz Taleghani, President
Software Sold: Autodesk, Civilsoft,
  Computervision, Mega CADD, Timberline
Computers Sold: NA
Revenue Range: NA

KENFIL DISTRIBUTION
16745 Saticoy Street
Van Nuys, CA 91406
Phone: 818-785-1181 Fax: 818-780-5472
Contacts: Ms. Marianne Carlson, Director of
  Purchasing
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

KETIV TECHNOLOGIES
6601 NE 78th Court, C-2
Suite A8
Portland, OR 97218
Phone: 503-252-3230 Fax: 503-252-3668
Contacts: Mr. Robert Palioca, CEO,
  Chairman; Mr. Craig Dodge, Vice President
  of Software
Software Sold: Autodesk line, Sigma Design,
  Timberline, third-party software, (Ketiv),
  Smartcam
Computers Sold: Compaq, Hewlett-Packard,
  Macintosh, Sun, NEC, Everex, PC Clone
Revenue Range: $5 to $10 Million

KHAN, PHILLIPS & ASSOCIATES, INC.
1420 Kensington Rd.
Suite 337
Oak Brook, IL 60521
Phone: 708-572-2223 Fax: 708-572-0209
Contacts: Mr. Sam Khan, President;
    Ms. Ellen Schlinsog, Marketing Director
Software Sold: Autodesk full line,
    Computervision Personal Designer,
    MicroCADAM, Smartcam, Frame
Computers Sold: Compaq, Hewlett-Packard,
    IBM, Sun, Everex, AST PC Clone
Revenue Range: $1 to $3 Million

LANGHAM/MATHIS
941 Berryessa Road
Suite E
San Jose, CA 95133
Phone: 408-453-0568 Fax: 408-453-4583
Contacts: Mr. Steve Langham, President
Software Sold: Skok
Computers Sold: NA
Revenue Range: NA

LECHMERE
275 Wildwoods Street
Woburn, MA 01801
Phone: 617-935-8320 Fax: 617-938-6380
Contacts: Mr. Marty Lobkowits, Vice
    President of Marketing
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

LODESTAR
1243 Alpine Rd
Suite 109
Walnut Creek, CA 94596
Phone: 510-939-7993 Fax: 510-939-7998
Contacts: Mr. Greg Eyrich, Vice President
Software Sold: AutoCAD Imaging products
Computers Sold: Apollo, Compaq, Hewlett-
    Packard, IBM, Macintosh, ALR PC Clone
Revenue Range: Less than $1 Million

LODESTAR SYSTEMS, INC.
1420 N. Claremont Blvd. No. 102-A
Claremont, CA 91711
Phone: 714-625-7961 Fax: 714-625-7968
Contacts: Mr. Gerald Eyrich, President
Software Sold: AutoCAD
Computers Sold: Compaq, IBM, Macintosh,
    ALR PC Clone
Revenue Range: $1 to $3 Million

LOOKING GLASS MICROPRODUCTS
4233 W. Eisenhower
Loveland, CO 80537
Phone: 303-669-2681 Fax: 303-663-6462
Contacts: Mr. Philip Kreiker, Vice President
Software Sold: AutoCAD, AEC Architectural
Computers Sold: Various
Revenue Range: $1 to $3 Million

M.I.B. CHOCK
1048 24th Street
Santa Monica, CA 90403
Phone: 213-828-4788 Fax: NA
Contacts: Ms. Margaret Chock, CEO
Software Sold: Picture Image Data
    Management Sys.
Computers Sold: NA
Revenue Range: Less than $1 Million

MAINE SURVEYORS/SOLUTIONS
    COMPUTER
28 US Rt. 1
Yarmouth, ME 04096
Phone: 207-846-5143 Fax: 207-846-3674
Contacts: Mr. Gus McDonald, President
Software Sold: AutoCAD, DCA, VersaCAD,
    Smartcam
Computers Sold: Hewlett-Packard, Sun,
    DESTINY PC Clone
Revenue Range: $1 to $3 Million

MARFAM COMPUTER SOLUTIONS
329 Copco Lane
San Jose, CA 95123
Phone: 408-363-1651 Fax: 408-363-1652
Contacts: Mr. John Marler, President;
   Mr. Jay Gary, VP Marketing
Software Sold: Design Cad 3D, AutoCAD
   V11, P-CAD
Computers Sold: Compaq, IBM, DTK PC
   Clone
Revenue Range: Less than $1 Million

MEASUREMENT MASTERS
711 West 17th Street
Suite E11
Costa Mesa, CA 92627
Phone: 714-631-6950 Fax: 714-631-6953
Contacts: Mr. Steve Bertken, Vice President
   of Marketing
Software Sold: Proprietary
Computers Sold: PC Clone
Revenue Range: NA

MEDIA SOFT INC.
(doing business as MicroAge)
7510 Broadway Extension
Suite 206
Oklahoma City, OK 73116
Phone: 405-843-8739 Fax: 405-843-5682
Contacts: Mr. Robert H. Alfson, President;
   Mr. Jim Mohr, Vice President of
Marketing
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

MERISEL
200 Continental Blvd
El Segundo, CA 90245
Phone: 213-615-3080 Fax: 213-615-1238
Contacts: Mr. John Connors, President;
   Ms. Karen Fuller, Vice President of
   Marketing
Software Sold: Generic CADD
Computers Sold: NA
Revenue Range: NA

METROPOLITAN CAD SYSTEMS, INC.
P.O. Box 561
Route 1005 Eastpark Blvd.
Cranburry, NJ 08512
Phone: 609-655-1771 Fax: 609-655-1686
Contacts: Mr. Michael Basch, President
Software Sold: Autodesk, Cimatron
Computers Sold:
Revenue Range: $5 to $10 Million

MICRO CITY COMPUTERS
1985 Ohio St
Lisle, IL 60532
Phone: 708-810-0066 Fax: 708-810-0570
Contacts: Mr. Wayne Lou, President
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

MICRO COMPUTER COMPANY, INC.
12115 Parklawn Dr
Rockville, MD 20852
Phone: 301-816-2104 Fax: 301-816-2406
Contacts: Mr. Steven Hulsey, President
Software Sold: AutoCAD, Autodesk all lines
Computers Sold: Everex, PC Clone
Revenue Range: $1 to $3 Million

MICRO CONTROLS
390 Middletown Blvd.
Lanhorn, PA 19047
Phone: 215-752-5510 Fax: 215-752-3446
Contacts: Mr. Barry Bennett, President
Software Sold: ProEngineer, CADkey
Computers Sold: Hewlett-Packard, IBM,
   Sun, Silicon Graphics, PC Clone
Revenue Range: $5 to $10 Million

MICRO D
1600 East St. Andrews Place
Santa Ana, CA 92705
Phone: 714-566-1000 Fax: 714-540-1943
Contacts: Ms. Rebecca Ortega, Marketing
   Manager
Software Sold: Generic CADD
Computers Sold: NA
Revenue Range: NA

MICRO ENGINEERING SOLUTIONS, INC.
470 Murdock Avenue
Meriden, CT 06450
Phone: 203-630-3630 Fax: 203-630-3348
Contacts: Mr. Mitch Slater, President;
  Mr. Michael Schary, Vice President
Software Sold: AutoCAD, SmartCAM,
  CADkey
Computers Sold: Digital Equipment,
  Hewlett-Packard, IBM, Sun, Everex, PC
  Clone
Revenue Range: $3 to $5 Million

MICROAGE
5301 North 7th St.
Suite No. 400
Phoenix, AZ 85014
Phone: 602-265-0065 Fax: 602-265-0160
Contacts: Mr. Jim Schulze, Account
  Executive; Mr. Dick Hapman, President
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

MICROAGE COMPUTER CENTER
5810 East Skelly Drive
Tulsa, OK 74135
Phone: 918-663-8000 Fax: 918-621-2199
Contacts: Mr. Steve Gallagher, CAD Sales
Software Sold: AutoCAD, Aries, ASG,
  CADpipe
Computers Sold: Compaq, IBM, Sun,
  Everex, AST
Revenue Range: $5 to $10 Million

MICROAGE COMPUTER STORES INC.
4300 Youree Drive
Suite No. 300
Shreveport, LA 71105
Phone: 318-865-3563 Fax: 318-869-6951
Contacts: NA
Software Sold: AutoCAD
Computers Sold: Compaq, IBM, Epson PC
  Clone
Revenue Range: Less than $1 Million

MICROCAD TECHNOLOGIES
1805 East Dyer Rd
Suite 313
Santa Ana, CA 92705
Phone: 714-756-0588 Fax: 714-756-0985
Contacts: Mr. Nader Khoshaiyati, CEO
Software Sold: Personal Designer
Computers Sold: Sun
Revenue Range: NA

MICRODEC COMPUTER CENTER
3065 Nutley Street
Fairfax, VA 22031
Phone: 703-280-1600 Fax: 703-573-2184
Contacts: Ms. Janet S. Comfort, President;
  Mr. Edward H. Comfort, Manager
  Operations
Software Sold: AutoCAD
Computers Sold: NA
Revenue Range: $1 to $3 Million

MICROPLUS SYSTEMS TECHNOLOGY
1020 E. El Camino Real
Sunnyvale, CA 94087
Phone: 408-737-2525 Fax: 408-737-2402
Contacts: Mr. Bui Han, President
Software Sold: AutoCAD, P-CAD
Computers Sold: 386, AST PC Clone
Revenue Range: $1 to $3 Million

MICROSOLUTIONS DIV. OF
  COMPUSERVE
10670 North Central, Suite 110
Dallas, TX 75231
Phone: 214-361-5578 Fax: 214-368-5113
Contacts: Mr. Greg Blatt, General Manager
Software Sold: NA
Computers Sold: NA
Revenue Range: $1 to $3 Million

MICROSOURCE
1555 West 10th Place
Suite 106
Tempe, AZ 85281
Phone: 602-967-1421 Fax: 602-829-3648
Contacts: Mr. Harman Cadis, President
Software Sold: AutoCAD
Computers Sold: INTEL, ACER, NEC PC
   Clone
Revenue Range: NA

MICROSOURCE CAD/CAM, INC.
400 W. Cummings Park
Woburn, MA 01801
Phone: 617-935-3320 Fax: 617-933-8963
Contacts: Mr. Charles Skeele, President;
   Mr. Drew Davis, Director of Marketing
Software Sold: Autodesk, Computervision,
   Microstation, Aries, Personal CAD Systems
Computers Sold: Compaq, IBM, Sun, AST
   PC Clone
Revenue Range: More than $10 Million

MICROSOUTH
645 Hembree Pkwy
A Member of The David Group
Roswell, GA 30076
Phone: 404-442-6060 Fax: 404-641-7168
Contacts: Mr. Tom Woolsey, President
Software Sold: NA
Computers Sold: ACER PC Clone
Revenue Range: More than $10 Million

MICROWARE COMPUTING
17971 Skypark Circle
Suite E
Irvine, CA 92714
Phone: 714-250-0511 Fax: 714-250-7093
Contacts: Mr. Donald Geller, President
Software Sold: NA
Computers Sold: NA
Revenue Range: $1 to $3 Million

MID STATES CAD SUPPLY, INC.
4182 Fisher Rd.
Columbus, OH 43228
Phone: 614-351-1111 Fax: 614-351-1754
Contacts: Mr. David Dikeman, President
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

MIDWEST BUSINESS SYSTEMS
24660 Lahser Road
Southfield, MI 48034
Phone: 313-358-0890 Fax: 313-358-2361
Contacts: Mr. Ken Markowits, Sales
   Manager, CAD/CAM Division
Software Sold: Autodesk line, Computer-
   vision, Aries, Smartcam
Computers Sold: Compaq, Hewlett-Packard,
   Sun, AST PC Clone
Revenue Range: More than $10 Million

MIDWEST CAD SERVICES
620 S.E. 291 Highway
Lee's Summit, MO 64063
Phone: 816-525-5767 Fax: 816-525-9471
Contacts: Mr. Roger Roberts, President;
   Ms. Cheryl Thompson, Marketing Director
Software Sold: Autodesk, Computervision,
   Aries
Computers Sold: Hewlett-Packard, Sun,
   Everex, ACER, WTH Grace, PC Clone
Revenue Range: $1 to $3 Million

MLC CAD SYSTEMS
7101 Highway 71 West
Suite 205
Austin, TX 78735
Phone: 512-288-9126 Fax: 512-288-6645
Contacts: Ms. Pat Stutz, Operation Manager
Software Sold: CADkey, Mastercam
Computers Sold: MAMX (Company's own
   brand PC clone)
Revenue Range: $1 to $3 Million

MONTEREY COMPUTER CONSULTING
149 Bonifacio Place
Monterey, CA 93940
Phone: 408-646-1146 Fax: 408-646-1118
Contacts: Mr. Jerry C. McConnell, President,
   Owner
Software Sold: AutoCAD, PCAD, Micro-
   CADAM, Generic CADD
Computers Sold: Compaq, Hewlett-Packard,
   IBM, PC Clone
Revenue Range: $1 to $3 Million

NATIONAL NUMERICAL CONTROL
  APPLICATIONS
2401 North Forest Rd.
Getzville, NY 14068
Phone: 716-692-0368 Fax: 716-837-8199
Contacts: Mr. Dennis Wrazen, President
Software Sold: Autodesk, CADkey
Computers Sold: NA
Revenue Range: NA

NEURO SYSTEMS INC.
P O 8426
South Charleston, WV 25303
Phone: 304-744-8138 Fax: 304-744-8227
Contacts: Mr. Max Damaschko, President;
  Mr. Cliff Humphries, Vice President of
  Engineering
Software Sold: AutoCAD, Microstation
Computers Sold: PC Clone
Revenue Range: $1 to $3 Million

NIELSEN ASSOCIATES INC.
One Circle West
Stamford, CT 06902
Phone: 203-359-1000 Fax: 203-978-0111
Contacts: Mr. James Oliver, President
Software Sold: Autodesk
Computers Sold: NA
Revenue Range: $1 to $3 Million

NUMERAX, INC.
3924 Linden Avenue
Long Beach, CA 90807
Phone: 213-426-6339 Fax: NA
Contacts: Mr. Walt Legrand, President
Software Sold: NA
Computers Sold: NA
Revenue Range: $1 to $3 Million

NUMERICAL CONTROL COMPUTER
  SCIENCES
17321 Murphy Ave.
Irvine, CA 92714
Phone: 714-474-7444 Fax: 714-474-0421
Contacts: Mr. Donald Schultz, President
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

O/E SYSTEMS
3290 West Big Beaver Road
Suite 116
Troy, MI 48084
Phone: 313-643-7220 Fax: 313-643-7882
Contacts: Mr. Tom Sieja, CADAM Market
  Manager
Software Sold: MicroCADAM
Computers Sold: NA
Revenue Range: $1 to $3 Million

OMICRON ELECTRONICS
11240 East 9 Mile Road
Warren, MI 48089
Phone: 313-757-8192 Fax: NA
Contacts: Mr. Michael Tattan, President
Software Sold: AutoCAD, Tango PCB,
  McCAD-VAMP
Computers Sold: Macintosh, proprietary PC
  Clone
Revenue Range: Less than $1 Million

OMNI COMPUTER STORE
4702-J Johnson Street
Lafayette, LA 70503
Phone: 318-981-9124 Fax: NA
Contacts: Ms. Frances Garrard, Owner
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

ONLINE COMPUTERS PLUS INC.
6789 N. Blackstone
Fresno, CA 93710
Phone: 209-432-4324 Fax: NA
Contacts: Mr. Merrill C. Oberg, Owner
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

OPTIMIZED DESIGN SERVICES, INC.
10431 Perry Highway
Phoenix Centere
Wexford, PA 15090
Phone: 412-935-0670 Fax: 412-935-8277
Contacts: Mr. R. Scott Theissen, President;
  Mr. Gerald J. Hattrup, Vice President
Software Sold: MicroCADAM, Professional
  CADAM, IBM CAD
Computers Sold: IBM, PC Clone
Revenue Range: Less than $1 Million

PACIFIC DATAWARE
15840 S.W. Upper Boones Ferry Road
Lake Oswego, OR 97035
Phone: 503-620-9858 Fax: 503-684-3519
Contacts: Mr. Richard Grossman, Vice
  President
Software Sold: VersaCAD
Computers Sold: ACER
Revenue Range: $1 to $3 Million

PERSONAL COMPUTER RESOURCES INC.
2100 Washington Street
Hanover, MA 02339
Phone: 617-871-5396 Fax: 617-871-3623
Contacts: Mr. George Hamrah, President;
  Mr. Lee Adler, Vice President and Sales
  Manager
Software Sold: VersaCAD
Computers Sold: NA
Revenue Range: $1 to $3 Million

PERSONAL COMPUTER SERVICES INC.
26 West 23rd Street.
Between 5th and 6th Ave.
New York, NY 10010
Phone: 212-255-7600 Fax: 212-255-9257
Contacts: Mr. Alan Waxenburg, Vice
  President
Software Sold: MacTopaz, Model Shop,
  Swivel Man, Ashlar Vellum, ClarisCAD
Computers Sold: IBM, Macintosh, Clones,
  NeXT PC Clone
Revenue Range: $1 to $3 Million

PERSONAL WORKSTATIONS, INC.
10632 North East 37th Circle
KIRKLAND, WA 98033
Phone: 206-828-4223 Fax: 206-827-5895
Contacts: Mr. Barry Anderson, President
Software Sold: Anvil 5000, Computervision,
  AutoCAD
Computers Sold: Compaq
Revenue Range: $1 to $3 Million

PFB CONCEPTS
2525 Oakton St.
Suite SC-33
Arlington Heights, IL 60005
Phone: 708-640-1853 Fax: 708-640-1868
Contacts: Mr. Paul Bergetz, President;
  Mr. Bob Roberman
Software Sold: CADkey, Aries, Euclid IS,
  Alias, Cutting Edge
Computers Sold: Digital Equipment,
  Hewlett-Packard, Silicon Graphics, Opus,
  PC Clone
Revenue Range: $1 to $3 Million

PIEDMONT CAD/CAM, INC.
814 Tyvola Road
Suite 126
Charlotte, NC 28217
Phone: 704-523-2400 Fax: 704-523-7764
Contacts: Mr. Mitch Lemons, President
Software Sold: AutoCAD, Pro-Engineer,
  Cimline, Sigma Design, MCS
Computers Sold: Compaq, IBM, Sun
Revenue Range: $3 to $5 Million

PMX, INC.
3444 Eastlake Rd.
Building 410
Palmharbor, FL 34685
Phone: 813-785-1496 Fax: 813-787-0425
Contacts: Mr. Jerry Peterson, Owner;
  Mr. Jim Clack, Owner
Software Sold: ShopCAM, XLNC, Tape
  Management Systems ED
Computers Sold: NA
Revenue Range: $1 to $3 Million

POELMAN'S DESIGN
42 West Campbell Ave
Suite 201
Campbell, CA 95008
Phone: 408-378-9980 Fax: 408-378-9384
Contacts: Mr. Mike Poelman, President
Software Sold: CADkey
Computers Sold: NA
Revenue Range: NA

PRACTICAL MICRO DESIGN, INC.
105 Clermont Ave
Alexandria, VA 22304
Phone: 703-823-2531 Fax: 703-823-6829
Contacts: Mr. Stephen C. Stallings, President
Software Sold: PADS Software
Computers Sold: ACER PC Clone
Revenue Range: Less than $1 Million

PREMIER DESIGN SYSTEMS, INC.
11400 Suite A Cronridge Dr
Owings Mills, MD 21117
Phone: 410-581-8080 Fax: 410-581-8088
Contacts: Mr. Brice P. Schaeffer, President;
   Ms. Jean Schaeffer, Vice President,
   Marketing
Software Sold: AutoCAD
Computers Sold: Compaq, PDS (own brand)
   PC Clone
Revenue Range: $1 to $3 Million

PROFESSIONAL CONTROL
   CORPORATION
P.O. Box 130
Germantown, WI 53022
Phone: 414-251-3000 Fax: 414-251-7334
Contacts: Mr. Tony Fleistchman, Technical
   Manager
Software Sold: Pro-Engineer, AutoCAD,
   SmartCAM
Computers Sold: Hewlett-Packard, Sun, PC
   Clone
Revenue Range: $3 to $5 Million

QUANNON COMPUTER PRODUCTS
6101 Baker Rd.
Suite 204
Minnetonka, MN 55345
Phone: 612-935-3367 Fax: NA
Contacts: Mr. John McLeod, President;
   Mr. Jim Zink, Sales Manager
Software Sold: CADkey, AutoCAD,
   MasterCAM, Cadvance Ultra CAM
Computers Sold: Compaq, Hewlett-Packard,
   Sun, Silicon Graphics, Everex, PC Clone
Revenue Range: $1 to $3 Million

QUANNON COMPUTER PRODUCTS, INC.
6101 Baker Rd.
Suite 204
Minnetonka, MN 55345
Phone: 612-935-3367 Fax: 612-935-0409
Contacts: Mr. John S. McLeod, President
Software Sold: CADkey, AutoCAD,
   MasterCAM, CADvance, Autodesk
Computers Sold: Silicon Graphics, Everex,
   ACER, AGI PC Clone
Revenue Range: $1 to $3 Million

RADIO SHACK
A Division of Tandy Corporation
1500 One Tandy Center
Fort Worth, TX 76102
Phone: 817-390-3011 Fax: 817-390-3802
Contacts: Ms. Kate Titsworth, Express Order
   Buyer; Ms. Ann Kennemer, Computer
   Buyer
Software Sold: NA
Computers Sold: Tandy
Revenue Range: NA

RAND TECHNOLOGIES
540 Willow Brook Office Park
Fairport, NY 14450
Phone: 716-383-0160 Fax: 716-383-0615
Contacts: Mr. Steven Beyer, General
   Manager
Software Sold: Parametric Technology,
   Patran, Cimatron
Computers Sold: Compaq, Digital
   Equipment, Hewlett-Packard, Sun, Silicon
   Graphics
Revenue Range: More than $10 Million

RAND TECHNOLOGIES
5285 Solar Drive
Mississauga, ON L4W5B8
Phone: 416-695-2000 Fax: 416-695-2007
Contacts: Mr. Brian Semkiw, President;
   Mr. Dan Marinac, Director of Manufactur-
   ing
Software Sold: Parametric Technology,
   P/CONCEPT Analysis, Cimatron 90,
   CADRA, Mechanica, AutoCAD, Alias
Computers Sold: Compaq, Digital
   Equipment, Hewlett-Packard, IBM,
   Sun, Silicon Graphics, PC Clone
Revenue Range: More than $10 Million

RESEARCH ENGINEERS, INC.
1570 North Batazia St.
Orange, CA 92667
Phone: 714-974-2500 Fax: 714-974-4771
Contacts: Mr. Amrit Das, President
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

ROBEC DISTRIBUTORS, INC.
425 Privet Road
Horsham, PA 19044
Phone: 215-675-9300 Fax: 215-675-9747
Contacts: Mr. Robert H. Beckett, CEO;
  Mr. Robert Beckett Jr., Vice President of
  Product Marketing
Software Sold: NA
Computers Sold: NA
Revenue Range: $5 to $10 Million

ROBERT MCNEEL & ASSOCIATES
3670 Woodland Park Ave. North
Seattle, WA 98103
Phone: 206-545-7000 Fax: 206-545-7321
Contacts: Mr. Robert McNeel, President
Software Sold: Autodesk
Computers Sold: NA
Revenue Range: NA

ROGERS PRODUCTS COMPANY, INC.
438 E Katella
Suite G
Orange, CA 92667
Phone: 714-771-0514 Fax: 714-771-0517
Contacts: Mr. James E. Rogers, President;
  Larry Daily, Sales Manager
Software Sold: AutoCAD, EMT, ASG
Computers Sold: Compaq, Hewlett-Packard,
  AST, CSS PC Clone
Revenue Range: Less than $1 Million

RRG ENGINEERING
975 Jefferson Road
Rochester, NY 14623
Phone: 716-424-7492 Fax: 716-424-7372
Contacts: Mr. Tom Schwarzweller, CAD
  Consultant; Mr. Robert A. Giese, President
Software Sold: AutoCAD, Interleaf, IBM
  CIEDS, Generic CADD, Iconnex
Computers Sold: Compaq, IBM, Sun, AST,
  RG-DATA, PC Clone
Revenue Range: $3 to $5 Million

SARCOM
600 B Lakeview Plaza Blvd
Worthington, OH 43085
Phone: 614-431-2228 Fax: 614-431-3386
Contacts: Mr. Randy Wilcox, President
Software Sold: Autodesk, Sigma Design,
  VersaCAD
Computers Sold: NA
Revenue Range: $1 to $3 Million

SAVVY—A DIVISION OF COMPUTER
  ATTIC
2750 El Camino Real
Redwood City, CA 94061
Phone: 415-599-5500 Fax: 415-363-0342
Contacts: Mr. Dave Gravlin, President
Software Sold: AutoCAD, VersaCAD,
  Architrion, McBravo Schlumberger
Computers Sold: Compaq, Macintosh, Sun,
  AST PC Clone
Revenue Range: NA

SCIENTIFIC DEVICES DISTRIBUTORS
180 Bergen Turnpike
Ridgefield Park, NJ 07660
Phone: 201-440-1400 Fax: 201-440-4470
Contacts: Mr. Ray Lefenfeld, Vice President
  of Sales
Software Sold: Point Control, VersaCAD
Computers Sold: NA
Revenue Range: NA

SECAD
7236 S.W. 42 Terrace
Miami, FL 33155
Phone: 305-266-4434 Fax: NA
Contacts: Mr. Dale Smalley, Sales Manager
Software Sold: Autodesk, VersaCAD
Computers Sold: Digital Equipment, ALR
  PC Clone
Revenue Range: Less than $1 Million

SECTOR SYSTEMS CO.
416 Ocean Avenue
Marblehead, MA 01945
Phone: 617-639-2625 Fax: NA
Contacts: Mr. J. Lehto, President
Software Sold: Generic CADD, Proprietary
Computers Sold: Unisys PC Clone
Revenue Range: $1 to $3 Million

SELTECH INC.
14155 SW Brigedoon Ct.
Suite D
Beaverton, OR 97005
Phone: 503-643-9202 Fax: 503-643-9351
Contacts: Mr James Fisher, President
Software Sold: Orcad
Computers Sold: NA
Revenue Range: NA

SIERRA RESOURCE
3739 Meadow Wood Road
Carson City, NV 89701
Phone: 702-885-8106 Fax: NA
Contacts: Mr. Don Asp, President
Software Sold: AutoCAD, Autoshade, AEC
  Architectural, AEC Mechanical, complete
  Autodesk line
Computers Sold: Compaq, IBM, Everex PC
  Clone
Revenue Range: Less than $1 Million

SIGMA DYNAMICS CORPORATION
6909 South Holly Cir.
Suite 200
Englewood, CO 80112
Phone: 303-793-0352 Fax: 303-793-0862
Contacts: Mr. Bill Bollinger, President
Software Sold: Standalone hydraulics,
  Polaris, AutoCAD
Computers Sold: PC Clone
Revenue Range: Less than $1 Million

SIMUTEK
4897 E. Speedway
Tucson, AZ 85712
Phone: 602-323-9391 Fax: 602-327-7723
Contacts: Mr. Richard Nast, President
Software Sold: Claris CAD
Computers Sold: Macintosh
Revenue Range: Less than $1 Million

SOFTMART INC./OAKLANDS CORP.
467 Creamery Way
Exton, PA 19341
Phone: 215-524-7440 Fax: 215-363-1438
Contacts: Mr. Michael Hoehl, Technical
  Support
Software Sold: AutoCAD, WindowsCAD,
  Design CAD 3D, Auto Sketch
Computers Sold: IBM, Everex
Revenue Range: NA

SOFTWARE CITY
26 West Forest Ave.
Englewood, NJ 07631
Phone: 201-569-8900 Fax: 201-569-7180
Contacts: Mr. Larry Moran, Vice President
  of Marketing; Ms. Yolanda Giavanneti,
  Vice President of Products
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

SOFTWARE ETC.
7505 Metro Blvd.
Minneapolis, MN 55436
Phone: 612-893-7821 Fax: 612-893-7250
Contacts: Mr. Bob McKenzie, Productivity
  Product Buyer
Software Sold: Drafix
Computers Sold: IBM, Macintosh
Revenue Range: NA

SOFTWARE GALLERIA AT WESTWOOD
10405 Town & Country Way
Suite 306
Houston, TX 77024
Phone: 713-467-4849 Fax: 713-467-4416
Contacts: Mr. Felix Alexis, President
Software Sold: Autodesk
Computers Sold: NA
Revenue Range: NA

SOFTWARE MANAGEMENT
P.O. Box 767010
Roswell, GA 30076
Phone: 404-998-8281 Fax: NA
Contacts: Mr. Robert Skor, President
Software Sold: AutoCAD
Computers Sold: Proprietary PC Clone
Revenue Range: Less than $1 Million

SOUTHERN CAD/CAM INC.
215 Center Park Drive
Suite 100
Knoxville, TN 37922
Phone: 615-966-3956 Fax: 615-675-0668
Contacts: Mr. Darell Galde, Vice President
Software Sold: Autodesk, Computervision,
  Pro-Engineer, Intergraph Microstation,
  CADAM, SDRC, DCA
Computers Sold: Digital Equipment,
  Hewlett-Packard, IBM, Silicon Graphics,
  Tatung
Revenue Range: $3 to $5 Million

SPEC SYSTEMS CORP.
1088 Bishop St.
The Executive Centre
Suite 310
Honolulu, HI 96813
Phone: 808-531-2511 Fax: 808-528-3823
Contacts: Mr. Gregory Kosky, President;
    Ms. Margot Sharer, Vice President of
    Marketing
Software Sold: Autodesk line except solids,
    Sigma Design
Computers Sold: Compaq, IBM, Sun,
    Everex, ALR, Acer PC Clone
Revenue Range: Less than $1 Million

STEPHEN & ASSOCIATES
8681 Magnolia Ave. N
Suite E
Santee, CA 92071
Phone: 619-562-5803 Fax: 619-562-3728
Contacts: Mr. Gerry Stephen, President
Software Sold: AutoCAD, third-party
    AutoCAD
Computers Sold: Compaq, Acer,
    custom-built items
Revenue Range: Less than $1 Million

STRATEGIC TECHNOLOGIES
5625 Dillard Dr.
Suite 105
Cary, NC 27511
Phone: 919-859-4004 Fax: 919-859-0657
Contacts: Mr. Mike Shook, President;
    Mr. William Shook, Vice President of Sales
Software Sold: AutoCAD, ARIES, SDRC
Computers Sold: Compaq, Sun, ACER PC
    Clone
Revenue Range: $1 to $3 Million

SUMMIT COMPUTER SYSTEMS
270 Lafayette Street
New York, NY 10012
Phone: 212-334-8087 Fax: NA
Contacts: Mr. Stephan K. Swaney, Partner;
    Mr. Charles Finder, Partner
Software Sold: AutoCAD, Arris, CAdvance,
    Softdesk
Computers Sold: Digital Equipment, IBM,
    Sun, Silicon Graphics, Everex, PC Clone
Revenue Range: $1 to $3 Million

SUNGRAF AUTOMATED SYSTEMS
325 W. Ansin Blvd.
Hallandale, FL 330093183
Phone: 305-458-5100 Fax: 305-454-2266
Contacts: Mr. James Quinn, President
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

SUPPORT SYSTEMS
514 Parquet Street
Sebastopol, CA 95472
Phone: 707-829-0569 Fax: 707-829-9569
Contacts: Mr. Clay Von Mueller, President
Software Sold: ProCAD, Tango
Computers Sold: PC Clone
Revenue Range: Less than $1 Million

SYNERGIS
593 Skippack Pike
Blue Bell, PA 19422
Phone: 215-643-9050 Fax: 215-643-4356
Contacts: Ms. Martha Lubo, Marketing
Software Sold: Autodesk
Computers Sold: NA
Revenue Range: NA

SYSTEMS DESIGN
45 Colvin Avenue
Albany, NY 12206
Phone: 518-438-8410 Fax: NA
Contacts: Mr. Pierre Douyon, Partner;
    Ms. Gloria Herbuld, Manager
Software Sold: NA
Computers Sold: ALR
Revenue Range: NA

TECH DATA CORP.
5350 Tech Data Drive
Clearwater, FL 34620
Phone: 813-539-7429 Fax: 813-538-7088
Contacts: Ms. Lauren , Product Marketing
Software Sold: NA
Computers Sold:
Revenue Range: More than $10 Million

TECHEXPRESS INC.
31200 Labaya
Suite 301
Westlake Village, CA 91362
Phone: 800-743-7074 Fax: NA
Contacts: Mr. Edward Labudd, Vice
  President
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

TECHNICAL SERVICES GROUP/PCSI,
INC.
26 West 23rd St.
New York, NY 10010
Phone: 212-255-7600 Fax: 212-255-9257
Contacts: Mr. Vic Caron, President
Software Sold: Autodesk, Mega Cadd,
  VersaCAD
Computers Sold: NA
Revenue Range: NA

TECHNICAL SOFTWARE, INC.
4555 Emery Industrial Pkwy. No. 102
Cleveland, OH 44128
Phone: 216-765-1133 Fax: 216-765-1703
Contacts: Mr. Greg Malkin, President
Software Sold: Autodesk, Ideas
Computers Sold: Compaq, IBM, Sun, Silicon
  Graphics, proprietary PC Clone
Revenue Range: $3 to $5 Million

TECHNIDATA, LTD.
1087 Kentwood Avenue
Cupertino, CA 95014
Phone: 408-255-1317 Fax: 408-255-7192
Contacts: Mr. Michael Landis, President
Software Sold: AutoCAD
Computers Sold: Proprietary PC Clone
Revenue Range: Less than $1 Million

TEKGRAF INC.
6721 Portwest
Suite 100
A Member of The David Group
Houston, TX 77024
Phone: 713-868-9330 Fax: 713-861-1395
Contacts: Mr. Martyn Cooper, President
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

TELECAD
1615 Alverado St.
San Leandro, CA 94577
Phone: 510-352-9322 Fax: 510-352-1089
Contacts: Mr. Richard Martini, President
Software Sold: MicroCADAM
Computers Sold: Hewlett-Packard, AST,
  Wyse, own brand PC Clone
Revenue Range: NA

THE ALLIED GROUP, INC.
701 Hebron Avenue
Glastonbury, CT 06033
Phone: 203-659-4235 Fax: 203-659-1402
Contacts: Mr. Irvin Miglietta, President;
  Mr. Tom Colleary, Sales and Marketing
  Manager
Software Sold: AutoCAD, ARRIS, Adra,
  Aries, Interleaf
Computers Sold: Digital Equipment, Sun
Revenue Range: $3 to $5 Million

THE CAD ROOM INC.
4747 East Kellogg
Suite 400
Witchita, KS 67218
Phone: 316-685-6444 Fax: 316-685-2344
Contacts: Mr. Jim Clough, President
Software Sold: Microcadam, Generic CAD,
  DesignCAD
Computers Sold: IBM, AST, MEGA PC
  Clone
Revenue Range: Less than $1 Million

THE FUTURE NOW
9455 Delcats
Indianapolis, IN 46240
Phone: 317-846-5996 Fax: 317-844-4128
Contacts: Mr. Paul Jensen, Sales
  Representative
Software Sold: AutoCAD
Computers Sold: Compaq, Hewlett-Packard,
  IBM
Revenue Range: $1 to $3 Million

THE HIGH TECHNOLOGY STORE, USA
1210 18th St. NW 3rd Floor
Washington, DC 20009
Phone: 202-223-8211 Fax: 202-797-8354
Contacts: Mr. Douglas Lang, President
Software Sold: AutoCAD, Generic CADD,
  Mega CAD, VersaCAD, Data CAD
Computers Sold: Compaq, IBM, Everex,
  ALR
Revenue Range: Less than $1 Million

THE MICROCOMPUTER CENTER INC.
7668 Belair Road
Baltimore, MD 21236
Phone: 301-668-2600 Fax: 301-668-0194
Contacts: Mr. Jack D. Snell, President;
  Mr. Larry Nohy, Chief of Operations
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

THE SOFTWARE FIRM
4341 South Westnedge Ave
Suite 1101
Kalamazoo, MI 49008
Phone: 616-381-4527 Fax: NA
Contacts: Mr. Frank Lucatelli, President
Software Sold: CADkey, DataCAD
Computers Sold: Silicon Graphics, Everex,
  Detk PC Clone
Revenue Range: $1 to $3 Million

THE SOFTWARE GUILD
3821 South Bristol
Santa Ana, CA 92704
Phone: 714-641-0332 Fax: 714-641-9708
Contacts: Mr. Suri Rao, Manager; Mr. Robert
  Ferreira, Technician
Software Sold: Design CAD 2D
Computers Sold: ALR, AST, Leading Edge
  PC Clone
Revenue Range: Less than $1 Million

TIME COMPUTER DISTRIBUTION
4402 S. 800 E.
Zionsville, IN 46077
Phone: 317-769-6183 Fax: 317-873-6541
Contacts: Mr. Bob Lueck, President, Owner
Software Sold: Autodesk, AutoCAD,
  Parametrics
Computers Sold: Compaq, Hewlett-Packard,
  IBM, Sun
Revenue Range: Less than $1 Million

TKF SYSTEMS
5478 Harpers Farm Road
Suite A3
Columbia, MD 21044
Phone: 301-730-3542 Fax: NA
Contacts: Mr. Ted Fryberger, President
Software Sold: Electronic Shape Library,
  Algor Supersap
Computers Sold: IBM Clones
Revenue Range: NA

TODAYS COMPUTERS BUSINESS CENTER
210 Gateway
Suite 150
Lincoln, NE 68505
Phone: 402-466-8191 Fax: 402-466-8875
Contacts: Mr. Elden Ehrlich, Sales Manager
Software Sold: AutoCAD, Hitachi Cadcore
Computers Sold: Compaq, Hewlett-Packard,
  IBM
Revenue Range: $1 to $3 Million

TOTAL SUPPORT COMPUTER SYSTEMS
4421 Church Ave.
P.O. Box 15395
Tampa, FL 33614
Phone: 813-876-5990 Fax: 813-871-2783
Contacts: Mr. Gib Gerard, President;
  Mr. Steve Gerard, Vice President
Software Sold: AutoCAD, A/E
  Microsystems, Civilsoft, DCA
Computers Sold: Sun, PC Clone
Revenue Range: $1 to $3 Million

TOTAL SYSTEMS INTEGRATION
1720 Willow Creek Cir.
Eugene, OR 97402
Phone: 503-345-7395 Fax: 503-343-6293
Contacts: Mr. David Shipway, President
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

TRC COMPUTER, INC.
2246 Sunrise Blvd.
Rancho Cordova, CA 95670
Phone: 916-638-0588 Fax: 916-638-2674
Contacts: Mr. Henry Pham, Owner
Software Sold: Dynaperspective, MiniCAD,
  ClarisCAD
Computers Sold: Compaq, Macintosh
Revenue Range: NA

TUSAR CORPORATION
15150 N. Hayden Rd. No. 110
Scottsdale, AZ 85260
Phone: 602-998-3688 Fax: 7641
Contacts: Mr. Lynn Andrade, Sales
  Representative
Software Sold: Orcad, Quad Design,
  Simucad, Model Technologies
Computers Sold: Sun
Revenue Range: Less than $1 Million

US CAD INC.
19000 MacArthur Blvd., No. 650
Irvine, CA 92715
Phone: 714-752-7630 Fax: 714-752-1380
Contacts: Mr. Bob Coan, President; Mr. Tony
  Olmestead, Service Manager
Software Sold: NA
Computers Sold: Macintosh, Sun, DEC
Revenue Range: NA

VALCOM COMPUTER CENTER
302 S 16 Street
Omaha, NE 68102
Phone: 402-345-6020 Fax: 402-345-7254
Contacts: Mr. Brad Queck, General Manager
Software Sold: AutoCAD
Computers Sold: NA
Revenue Range: NA

VAR-SOURCE INC.
120 Pennsylvania Ave.
Oreland, PA 19075
Phone: 215-887-2200 Fax: 215-887-4018
Contacts: Mr. Scott Reuter, President
Software Sold: AutoCAD, VersaCAD
Computers Sold: PC Clone
Revenue Range: $5 to $10 Million

VEGRZYN SARVER ASSOCIATES
218 W. Laffayette Street
Ottawa, IL 61350
Phone: 815-434-7225 Fax: 815-434-2831
Contacts: Mr. Gene Sarver, Vice President;
  Ms. Sheila Lietz, Marketing Rep
Software Sold: Research Engineers
Computers Sold: PC Clone
Revenue Range: Less than $1 Million

WALDEN SOFTWARE
201 High Ridge Road
Stamford, CT 06904
Phone: 203-352-2116 Fax: 203-352-2398
Contacts: Mr. Ray Robinson, Buyer;
  Mr. Tom Burich, Buyer
Software Sold: Generic CADD
Computers Sold: NA
Revenue Range: Less than $1 Million

WAREFORCE
1750 East Holly Ave
El Segundo, CA 90245
Phone: 310-607-0001 Fax: 310-607-0088
Contacts: Mr. Orie Rechtman, President;
  Ms. Anita Gabriel, CEO
Software Sold: Autodesk
Computers Sold: NA
Revenue Range: NA

WASHINGTON COMPUTER SERVICES
155 Avenue of the Americas
New York, NY 10013
Phone: 212-741-2320 Fax: 212-206-6759
Contacts: Mr. Jeffrey Goldberg, President
Software Sold: AutoCAD
Computers Sold: Digital Equipment, Sun,
  Everex, NEC PC Clone
Revenue Range: $5 to $10 Million

WESTERN DATAGRAPHICS CORP.
6 Faraday
Irvine, CA 92718
Phone: 714-768-3345 Fax: 714-768-5262
Contacts: Mr. Steven Jester, President
Software Sold: NA
Computers Sold: NA
Revenue Range: NA

WOLF COMPUTER
105 N. Santa Cruz Avenue
Los Gatos, CA 95030
Phone: 408-354-1210 Fax: 408-354-2287
Contacts: Mr. Donald A. Wolf, President
Software Sold: AutoCAD, VersaCAD, Power
  Draw, ME10
Computers Sold: Hewlett-Packard,
  Macintosh, Tanden
Revenue Range: $1 to $3 Million

WORKGROUP TECHNOLOGIES, INC.
140 Second Avenue
Waltham, MA 02154
Phone: 617-895-1500 Fax: 617-890-1408
Contacts: Mr. Steven Root, Account
  Manager; Mr. James Carney, Chair Person
Software Sold: Personal Designer,
  Configuration Management System
Computers Sold: Sun
Revenue Range: $5 to $10 Million

XCEL COMPUTER SYSTEMS
1415 Lincoln Way West
Suite T
Osceola, IN 46561
Phone: 219-674-2920 Fax: 219-674-2925
Contacts: Mr. Kevin Macarthy
Software Sold: AutoCAD
Computers Sold: Compaq, ACER PC Clone
Revenue Range: Less than $1 Million

CAD/CAM/CAE Resellers by State

Arizona

CAD SOUTHWEST/CAD SOLUTIONS,
  Phoenix, AZ
CADTEL SYSTEMS, INC., Phoenix, AZ
MICROAGE, Phoenix, AZ
MICROSOURCE, Tempe, AZ
SIMUTEK, Tucson, AZ
TUSAR CORPORATION, Scottsdale, AZ

California

3D CADWARE, Temecula, CA
800 SOFTWARE, Berkeley, CA
A.C.E. CONSULTING FIRM,
  Los Angeles, CA
ADVANCE COMPUTER SYSTEMS,
  Sunnyvale, CA
ADVANCED DIGITAL GROUP,
  Garden Grove, CA
AQUARIAN AGE COMPUTER CENTER,
  San Francisco, CA
ARDEN SYSTEMS, INC., Los Angeles, CA
AVCOM, Palo Alto, CA
BLUE CHIP COMPUTER SYSTEM,
  Los Angeles, CA
CAD MICRO SYSTEMS, Los Angeles, CA
CAD SOLUTIONS, San Diego, CA

CAD SOLUTIONS, San Jose, CA
CAD SYSTEMS UNLIMITED, INC.,
  Santa Clara, CA
CAD TRAIN, INC.,
  Rancho Palos Verdes, CA
CADD Services Incorporated,
  San Francisco, CA
CASEY-JOHNSON SALES, INC.,
  Newark, CA
CEMAX, INC., Fremont, CA
COMPUTER IMAGE TECHNOLOGY,
  Davis, CA
COMPUTER SCIENCES APPLICATIONS,
  Arcadia, CA
COMPUTERLAND, Pleasanton, CA
COMPUTERLAND-INFOSYSTEMS,
  Torrance, CA
DATA AUTOMATION, San Diego, CA
DECISION VISION, San Diego, CA
ELCOR ASSOCIATES INC.,
  Santa Clara, CA
FINITE GRAPHICS, Camarillo, CA
GRADIENT TECHNOLOGIES,
  Los Altos, CA
HIGHLAND DIGITAL, Palo Alto, CA
HOME & BUSINESS, Milpitas, CA
ICG, Fremont, CA
INACOMP COMPUTER CENTER,
  Sacramento, CA
INFOMAX/COMPUTERLAND,
  Oakland, CA
INGRAM MICRO D, Santa Ana, CA
INNOVA BUSINESS SYSTEMS,
  Signal Hill, CA
INTEGRATED GRAPHICS SYSTEMS, INC.,
  S. Pasadena, CA
INTERCAD, San Jose, Ca
ITAL BUSINESS COMPUTER SYSTEMS,
  LTD, Los Angeles, CA
KC/CAD, Bakersfield, CA
KDS ENGINEERING, Sacramento, CA
KELAR, San Rafael, CA
KELAR CORP., Los Angeles, CA
KENFIL DISTRIBUTION, Van Nuys, CA
LANGHAM/MATHIS, San Jose, CA
LODESTAR, Walnut Creek, CA
LODESTAR SYSTEMS, INC.,
  Claremont, CA
M.I.B. CHOCK, Santa Monica, CA

MARFAM COMPUTER SOLUTIONS,
San Jose, CA

MEASUREMENT MASTERS,
Costa Mesa, CA

MERISEL, El Segundo, CA

MICRO D, Santa Ana, CA

MICROCAD TECHNOLOGIES,
Santa Ana, CA

MICROPLUS SYSTEMS TECHNOLOGY,
Sunnyvale, CA

MICROWARE COMPUTING, Irvine, CA

MONTEREY COMPUTER CONSULTING,
Monterey, CA

NUMERAX, INC., Long Beach, CA

NUMERICAL CONTROL COMPUTER
SCIENCES, Irvine, CA

ONLINE COMPUTERS PLUS INC.,
Fresno, CA

POELMAN'S DESIGN, Campbell, CA

RESEARCH ENGINEERS, INC.,
Orange, CA

ROGERS PRODUCTS COMPANY, INC.,
Orange, CA

SAVVY - A DIVISION OF COMPUTER
ATTIC, Redwood City, CA

STEPHEN & ASSOCIATES, Santee, CA

SUPPORT SYSTEMS, Sebastopol, CA

TECHEXPRESS INC., Westlake Village, CA

TECHNIDATA, LTD., Cupertino, CA

TELECAD, San Leandro, CA

THE SOFTWARE GUILD, Santa Ana, CA

TRC COMPUTER, INC,
Rancho Cardova, CA

US CAD INC., Irvine, CA

WAREFORCE, El Segundo, CA

WESTERN DATAGRAPHICS CORP.,
Irvine, CA

WOLF COMPUTER, Los Gatos, CA

Colorado

ACCESS GRAPHICS TECHNOLOGY INC.,
Boulder, CO

CADPRO, Englewood, CO

COMPUTERS FOR DESIGN, Denver, CO

CONNECTING POINT/INTELLIGENT
ELECT, Inglewood, CO

ENTRE DATAPLEX, Englewood, CO

INTEGRATED SOLUTIONS,
Englewood, CO

LOOKING GLASS MICROPRODUCTS,
· Loveland, CO

SIGMA DYNAMICS CORPORATION,
Englewood, CO

Connecticut

THE ALLIED GROUP, INC.,
Glastonbury, CT

MICRO ENGINEERING SOLUTIONS,
INC., Meriden, CT

CAD CRAFT, Old Saybrook, CT

NIELSEN ASSOCIATES INC.,
Stamford, CT

WALDEN SOFTWARE, Stamford, CT

Florida

AUTOMATION INTELLIGENCE INC.,
Maitland, FL

CADD CENTERS OF FLORIDA,
Ft. Lauderdale, FL

CADD DEVELOPMENT CORPORATION,
Orlando, FL

COOPERATIVES COMPUTER CENTER,
Tallahassee, FL

DISKOVERY EDUCATIONAL SYSTEMS,
West Palm Beach, FL

PMX, INC., Palmharbor, FL

SECAD, Miami, FL

SUNGRAF AUTOMATED SYSTEMS,
Hallandale, FL

TECH DATA CORP., Clearwater, FL

TOTAL SUPPORT COMPUTER SYSTEMS,
Tampa, FL

Georgia

ANTECH, INC., Roswell, GA

· APPLIED SOFTWARE TECHNOLOGY,
INC., Atlanta, GA

CAD SYSTEMS INC., Atlanta, GA

CREATIVE CONNECTIONS, INC.,
Duluth, GA

DICKENS DATA SYSTEMS,
Northcross, GA

INTEGRATED COMPUTER GRAPHICS,
INC., Atlanta, GA

MICROSOUTH, Roswell, GA

SOFTWARE MANAGEMENT, Roswell, GA

Hawaii

SPEC SYSTEMS CORP., Honolulu, HI

Iowa

CADALYST RESOURCES, Des Moines, IA
COMPUTERLAND, Dubuque, IA
ENGINEERING DATA SYSTEMS CORP.,
 Dubuque, IA

Illinois

ADVANCED TECHNOLOGY
 DISTRIBUTION, Park Ridge, IL
AIDEX CORP., Morris, IL
CADPAC, Schaumburg, IL
CORPORATE DEVELOPMENT
 ASSOCIATES, Lombard, IL
FRANSWORTH COMPUTERS,
 Villa Park, IL
G & R DISTRIBUTING, Vernon Hills, IL
KHAN, PHILLIPS & ASSOCIATES, INC.,
 Oak Brook, IL
MICRO CITY COMPUTERS, Lisle, IL
PFB CONCEPTS, Arlington Heights, IL
VEGRZYN SARVER ASSOCIATES,
 Ottawa, IL

Indiana

CHARLES HILL & ASSOCIATES,
 Indianapolis, IN
FORTUNE TECHNOLOGIES CORP.,
 Indianapolis, IN
THE FUTURE NOW, Indianapolis, IN
TIME COMPUTER DISTRIBUTION,
 Zionsville, IN
XCEL COMPUTER SYSTEMS, Osceola, IN

Kansas

DESIGNLAB, Lawrence, KS
THE CAD ROOM INC., Witchita, KS

Louisiana

COMPUTER-AIDED TECHNOLOGIES,
 INC., New Orleans, LA
DATEC, INC., Gretna, LA
MICROAGE COMPUTER STORES INC.,
 Shreveport, LA
OMNI COMPUTER STORE, Lafayette, LA

Massachusetts

A.S. THOMAS, INC., Westwood, MA
ALDEN COMPUTER SYSTEMS CORP.,
 Salem, MA

BROMLEY ENGINEERING, INC.,
 Cambridge, MA
CAD/CAM RESOURCES, Natick, MA
CAD/CAM TECHNOLOGIES, INC.,
 Waltham, MA
CHEMPRO DATA SCIENCES CORP.,
 Westfield, MA
COMPUTER NUMERICAL CONTROL
 CORP., Lowell, MA
CORPORATE SOFTWARE, Canton, MA
DGA ASSOCIATES INC., Woburn, MA
LECHMERE, Woburn, MA
MICROSOURCE CAD/CAM, INC.,
 Woburn, MA
PERSONAL COMPUTER RESOURCES
 INC., Hanover, MA
SECTOR SYSTEMS CO., Marblehead, MA
WORKGROUP TECHNOLOGIES, INC.,
 Waltham, MA

Maryland

ALTEK CORP., Silver Spring, MD
HLA COMPUTERS, Beltsville, MD
HM SYSTEMS, INC., Gaithersburg, MD
INTELLIGENT IMAGES, INC.,
 College Park, MD
INTERCAD GRAPHICS SYSTEMS,
 Annapolis, MD
MICRO COMPUTER COMPANY, INC.,
 Rockville, MD
PREMIER DESIGN SYSTEMS, INC.,
 Owings Mills, MD
THE MICROCOMPUTER CENTER INC.,
 Baltimore, MD
TKF SYSTEMS, Columbia, MD

Maine

CORNERSTONES - WRIGHT, INC.,
 Portland, ME
MAINE SURVEYORS/SOLUTIONS
 COMPUTER, Yarmouth, ME

Michigan

ACCUDATA INC., Bloomington, MN
APPA BUSINESS COMPUTERS,
 Ann Arbor, MI
AUTOMATION INTEGRATORS,
 Farmington Hills, MI
CAD SOLUTIONS, Southfield, MI

COMPUTERS & CONCEPTS INC.,
  Orchard Lake, MI
DEVTRON RUSSELL INC., Gladwin, MI
ENTRE COMPUTER CENTER, Troy, MI
EXECUSOFT, INC., East Lansing, MI
INACOMP COMPUTER CENTER,
  Troy, MI
INTERFACE ELECTRONICS, INC.,
  Farmington Hills, MI
MIDWEST BUSINESS SYSTEMS,
  Southfield, MI
O/E SYSTEMS, Troy, MI
OMICRON ELECTRONICS, Warren, MI
THE SOFTWARE FIRM, Kalamazoo, MI

Minnesota

CAD/CAM TECHNOLOGIES,
  Minneapolis, MN
COMSTRAND INC., Minneapolis, MN
GRAPHICS TECHNOLOGIES,
  Eden Prairie, MN
ICONIX, INC, Minneapolis, MN
INFINITE GRAPHICS, Minneapolis, MN
QUANNON COMPUTER PRODUCTS,
  INC., Minnetonka, MN
SOFTWARE ETC., Minneapolis, MN

Missouri

ADC COMPUTER SERVICES, INC.,
  Independence, MO
MIDWEST CAD SERVICES,
  Lee's Summit, MO
CADSULTANTS, St. Louis, MO

North Carolina

PIEDMONT CAD/CAM, INC.,
  Charlotte, NC
STRATEGIC TECHNOLOGIES, Cary, NC

Nebraska

TODAYS COMPUTERS BUSINESS
  CENTER, Lincoln, NE
VALCOM COMPUTER CENTER,
  Omaha, NE

New Hampshire

COMPUTER TOWN, Keene, NH
DTI TECHNOLOGIES INC., Bedford, NH

New Jersey

BETA LAMBDA INC., Freehold, NJ
· BYTE AND WORD SYSTEMS, INC.,
  Westmonte, NJ
EAST COAST COMPUTER SYSTEMS
  INC., Tinton Falls, NJ
HOME BUSINESS & NETWORK
  COMPUTERS INC., Bridgewater, NJ
JONATHAN'S COMPUTER CENTERS,
  Marlton, NJ
METROPOLITAN CAD SYSTEMS, INC.,
  Cranbury, NJ
SCIENTIFIC DEVICES DISTRIBUTORS,
  Ridgefield Park, NJ
SOFTWARE CITY, Englewood, NJ

New Mexico

COMPUTERLAND, Santa Fe, NM
DATA HANDLING, Albuquerque, NM

Nevada

CENTURY 23, Las Vegas, NV
SIERRA RESOURCE, Carson City, NV

New York

AHEARN AND SOPER, INC.,
  East Syracuse, NY
AXIS TECHNOLOGIES, Fairport, NY
BECHTEL COMPUTER COMPANY,
  Buffalo, NY
CADDTECH PRODUCTIVITY, INC.,
  Liverpool, NY
COMPUSULTING ASSOCIATES, LTD.,
  Centerport, NY
CUSTOM COMPUTER SPECIALISTS, INC.,
  · Hauppauge, NY
DECI ASSOCIATES, Huntington, NY
EBERHARD ENGINEERING,
  Smithtown, NY
GEOCAD, INC., Pound Ridge, NY
INGRAM COMPUTERS INC., Buffalo, NY
NATIONAL NUMERICAL CONTROL
  APPLICATIONS, Getzville, NY
PERSONAL COMPUTER SERVICES INC.,
  New York, NY
RAND TECHNOLOGIES, Fairport, NY
RRG ENGINEERING, Rochester, NY

SUMMIT COMPUTER SYSTEMS,
New York, NY
SYSTEMS DESIGN, Albany, NY
TECHNICAL SERVICES GROUP/PCSI,
INC., New York, NY
WASHINGTON COMPUTER SERVICES,
New York, NY

Ohio

A/E MICRO SYSTEMS, West Chester, OH
APPLIED TECHNOLOGY ASSOCIATES,
Cincinnati, OH
CAD SOLUTIONS, Independence, OH
CAD/CAM INC., Dayton, OH
CADPAC, Cincinatti, OH
CONCURRENT CORPORATION,
Cincinnati, OH
EKJ DESIGN AND DRAFTING, INC.,
Toledo, OH
FIGGIE INTERNATIONAL, Willoughby,
OH
INTEGRITY COMPUTERS ELECTRONICS,
Cincinnati, OH
MID STATES CAD SUPPLY, INC.,
Columbus, OH
SARCOM, Worthington, OH
TECHNICAL SOFTWARE, INC.,
Cleveland, OH

Oklahoma

MEDIA SOFT INC., Oklahoma City, OK
MICROAGE COMPUTER CENTER,
Tulsa, OK

Oregon

ALPHA COMPUTERS INC., Beaverton, OR
ALPHA COMPUTERS INC.,
Lake Oswego, OR
CTR BUSINESS SYSTEMS, INC.,
Portland, OR
KETIV TECHNOLOGIES, Portland, OR
PACIFIC DATAWARE, Lake Oswego, OR
SELTECH INC., Beaverton, OR
TOTAL SYSTEMS INTEGRATION,
Eugene, OR

Pennsylvania

A/K COMPUTERS, Lebanon, PA
BOLDER DESIGNS, Prospect Park, PA

ELECTRONICS BOUTIQUE,
West Chester, PA
GENERAL COMPUTER CENTERS INC.,
Tamaqua, PA
INTEGRATED INFORMATION
MANAGEMENT SYSTEMS INC.,
Redding, PA
J.Z.A. SYSTEMS SERVICES, INC.,
Pittsburgh, PA
MICRO CONTROLS, Lanhorn, PA
OPTIMIZED DESIGN SERVICES, INC.,
Wexford, PA
ROBEC DISTRIBUTORS, INC.,
Horsham, PA
SOFTMART INC./ OAKLANDS CORP.,
Exton, PA
SYNERGIS, Blue Bell, PA
VAR-SOURCE INC., Oreland, PA

Rhode Island

CADMASTER, INC., East Providence, RI
GREENWICH BUSINESS SYSTEMS,
Warwick, RI

South Carolina

COMPUTER TIME, Spartanburg, SC

Tennessee

SOUTHERN CAD/CAM INC.,
Knoxville, TN

Texas

ABCOR INC., Houston, TX
ACRATECH, INC., La Porte, TX
AMCAD, Carrolton, TX
AUTOMATED INFORMATION
MANAGEMENT, Houston, TX
AUTOMATION IMAGE, Carrolton, TX
COMPUADD, Austin, TX
COMTEC COMPUTER SERVICES CO.,
INC., Houston, TX
DATA POWER, INC., Irving, TX
DATAPOWER, Irving, TX
ENTRE COMPUTER CENTER, Dallas, TX
INSYNC SYSTEMS, CORP., Alvin, TX
MICROSOLUTIONS DIVISION OF
COMPUSERVE, Dallas, TX
MLC CAD SYSTEMS, Austin, TX
RADIO SHACK, Fort Worth, TX

SOFTWARE GALLERIA AT WESTWOOD,
  Houston, TX
TEKGRAF INC., Houston, TX

Utah

A.L SYSTEMS, Salt Lake City, UT
HCS CORPORATION, Salt Lake City, UT

Virginia

AMERICAN COMPUTER TECHNOLOGY,
  Fairfax, VA
CADD CENTRE, Lynchburg, VA
DYNABYTE MICROAGE,
  Charlottesville, VA
INTEK, Waynesboro, VA
K & R CUSTOM SOFTWARE, INC.,
  Newport News, VA
MICRODEC COMPUTER CENTER,
  Fairfax, VA
PRACTICAL MICRO DESIGN, INC.,
  Alexandria, VA

Washington

ALPHATECH COMPUTERS, Bellevue, WA
COMPUTERAID, Spokane, WA
EGGHEAD DISCOUNT SOFTWARE,
  Issaquah, WA
EVERGREEN SYSTEMS, INC.,
  Bellevue, WA
PERSONAL WORKSTATIONS, INC.,
  Kirkland, WA
ROBERT MCNEEL & ASSOCIATES,
  Seattle, WA

Washington, D.C.

J.R. SYSTEMS WHOLESALERS,
  Washington, DC
THE HIGH TECHNOLOGY STORE, USA,
  Washington, DC

Wisconsin

ADVANCED CADD TECHNOLOGIES,
  Madison, WI
CADSYS, INC., Waukesha, WI
COMPUTERLAND OF EAU CLAIRE,
  Eau Claire, WI
CONCAD TECHNOLOGIES, INC.,
  Eau Claire, WI
PROFESSIONAL CONTROL
  CORPORATION, Germantown, WI

West Virginia

NEURO SYSTEMS INC.,
  South Charleston, WV

Canada

BETA COR ENGINEERING, LTD.,
  Edmonton, AL
CAD WIRE, Markham, ONT
. CADCORP, INC., Markham, ONT
COMPUTER AIDED DESIGN SYSTEMS,
  INC., Nepean, ONT
FRANTEK/INGRIM MICRO-D,
  Nepean, ONT
RAND TECHNOLOGIES,
  Mississauga, ONT

Largest CAD/CAM/CAE Resellers

CAD/CAM/CAE Revenue Greater than $10 Million

ACCESS GRAPHICS TECHNOLOGY INC.,
  Boulder, CO
AMCAD, Carrolton, TX
AVCOM, Palo Alto, CA
CAD SOLUTIONS, San Jose, CA
CADCORP, INC., Markham, ONT
GRAPHICS TECHNOLOGIES,
  Eden Prairie, MN
HIGHLAND DIGITAL, Palo Alto, CA
ICG, Fremont, CA
INGRAM MICRO D, Santa Ana, CA
MICROSOURCE CAD/CAM, INC.,
  Woburn, MA
MICROSOUTH, Roswell, GA
MIDWEST BUSINESS SYSTEMS,
  Southfield, MI
RAND TECHNOLOGIES,
  Mississauga, ONT
RAND TECHNOLOGIES, Fairport, NY
TECH DATA CORP., Clearwater, FL

CAD/CAM/CAE Revenue of $5 to $10 Million

ADVANCED CADD TECHNOLOGIES,
  Madison, WI
APPA BUSINESS COMPUTERS,
  Ann Arbor, MI
APPLIED SOFTWARE TECHNOLOGY,
  INC., Atlanta, GA

AUTOMATION INTELLIGENCE INC.,
Maitland, FL
CAD SOLUTIONS, San Diego, CA
CAD/CAM INC., Dayton, OH
CAD/CAM TECHNOLOGIES, INC.,
Waltham, MA
CADD CENTERS OF FLORIDA,
Ft. Lauderdale, FL
CADSYS, INC., Waukesha, WI
CASEY-JOHNSON SALES, INC.,
Newark, CA
DATA POWER, INC., Irving, TX
DICKENS DATA SYSTEMS,
Northcross, GA
FINITE GRAPHICS, Camarillo, CA
G & R DISTRIBUTING, Vernon Hills, IL
INTERCAD, San Jose, CA
ITAL BUSINESS COMPUTER SYSTEMS,
LTD, Los Angeles, CA
KETIV TECHNOLOGIES, Portland, OR
METROPOLITAN CAD SYSTEMS, INC.,
Cranbury, NJ
MICRO CONTROLS, Lanhorn, PA
MICROAGE COMPUTER CENTER,
Tulsa, OK
ROBEC DISTRIBUTORS, INC.,
Horsham, PA
VAR-SOURCE INC., Oreland, PA
WASHINGTON COMPUTER SERVICES,
New York, NY
WORKGROUP TECHNOLOGIES, INC.,
Waltham, MA

CAD/CAM/CAE Revenue of $3 to $5 Million

A/E MICRO SYSTEMS, West Chester, OH
CAD SYSTEMS INC., Atlanta, GA
CADALYST RESOURCES, Des Moines, IA
CADDTECH PRODUCTIVITY, INC.,
Liverpool, NY
CADPAC, Schaumburg, IL
CADPAC, Cincinatti, OH
CADTEL SYSTEMS, INC., Phoenix, AZ
FIGGIE INTERNATIONAL,
Willoughby, OH
ICONIX, INC, Minneapolis, MN
INFINITE GRAPHICS, Minneapolis, MN
INTEGRATED COMPUTER GRAPHICS,
INC., Atlanta, GA
INTERCAD GRAPHICS SYSTEMS,
Annapolis, MD
MICRO ENGINEERING SOLUTIONS,
INC., Meriden, CT
PIEDMONT CAD/CAM, INC.,
Charlotte, NC
PROFESSIONAL CONTROL
CORPORATION, Germantown, WI
RRG ENGINEERING, Rochester, NY
SOUTHERN CAD/CAM INC.,
Knoxville, TN
TECHNICAL SOFTWARE, INC.,
Cleveland, OH
THE ALLIED GROUP, INC.,
Glastonbury, CT

Dataquest

Personal CAD and Distribution Channels Forecast Update

October 26, 1992

Source: Dataquest

Market Statistics

CAD/CAM/CAE

Personal CAD and Distribution Channels

CCAM-PER-MS-9203

Dataquest

Personal CAD and Distribution Channels
Forecast Update

October 26, 1992

Source:
Dataquest

Market Statistics

Dataquest®

CAD/CAM/CAE
CCAM-PER-MS-9203

Personal CAD and Distribution Channels Forecast Update

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Note: All tables show estimated data.

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Personal CAD and Distribution Channels Forecast Update

Introduction

Proving no more immune to the current economic environment than the economy as a whole, the CAD/CAM/CAE/GIS market turned in a relatively sluggish performance during the first half of 1992—continuing the trend of 1991. Financial results comparing first-half 1992 results for a select group of publicly held CAD/CAM/CAE/GIS companies showed flat-to-negative growth results. As a result of this and other factors, the updated compound annual growth rate (CAGR) for CAD/CAM/CAE/GIS total factory revenue during the forecast period, 1991 to 1996, has been lowered to 7 percent from our previous forecast of more than 9 percent last spring. Table 1 shows the updated forecast for the CAD/CAM/CAE/GIS market by region.

This forecast update is based on the CAD/CAM/CAE/GIS group's recently updated market information. (The 1991 market totals will match in both the market share tables and forecast tables.) Any changes in market conditions have also been incorporated into this updated forecast. The following analysis outlines the reasons supporting this CAD/CAM/CAE/GIS market forecast.

This document contains Dataquest's detailed forecast information on the CAD/CAM/CAE/GIS industry. Included in this document are the following:

- Five-year historical data

- Five-year forecast data

Table 1
CAD/CAM/CAE/GIS Market, by Region

	1991	1992	1993	1994	1995	1996	CAGR (%) 1991-1996
Worldwide							
Revenue	14,850	15,303	16,311	17,740	19,411	21,050	7.2
Systems	589,615	650,470	729,670	810,890	881,380	945,880	9.9
Seats	619,932	674,800	750,780	829,200	897,430	960,090	9.1
North America							
Revenue	5,027	5,141	5,415	5,834	6,313	6,803	6.2
Systems	240,985	265,850	290,470	315,390	336,940	358,450	8.3
Seats	252,860	275,470	298,720	322,610	343,350	364,230	7.6
Europe							
Revenue	5,486	5,689	6,122	6,666	7,325	7,929	7.6
Systems	208,812	229,300	261,950	294,250	320,240	340,700	10.3
Seats	219,677	238,080	269,800	301,100	326,300	346,100	9.5
Asia							
Revenue	4,039	4,131	4,370	4,768	5,219	5,673	7.0
Systems	124,271	135,870	152,540	170,120	185,890	200,850	10.1
Seats	130,964	141,020	156,790	173,630	188,830	203,330	9.2
Rest of World							
Revenue	298	343	404	472	553	645	16.7
Systems	15,547	19,450	24,710	31,130	38,310	45,880	24.2
Seats	16,430	20,230	25,470	31,850	38,950	46,420	23.1

Source: Dataquest (October 1992)

More detailed data on this marked may be requested through our client inquiry service.

Forecast Assumptions

Following are the main forces, worldwide and by region, driving the CAD/CAM/CAE/GIS forecast.

Worldwide Forecast Drivers

The worldwide CAD/CAM/CAE/GIS market will maintain consistent, steady growth during the next five years. Figure 1 shows the forecast change in mix among hardware, software, and services.

The following are the main forces driving the CAD/CAM/CAE/GIS worldwide forecast:

- Globalization of world markets is driving economic restructuring for the major regions—the United States, the European Community (EC) and Japan—to a degree unprecedented since the 1930s. Growth will be limited in the short term as CAD/CAM/CAE/GIS buyers assess market conditions. There is a sense of cautious optimism that the world economy will gradually improve, rather than get worse, beginning in mid-1993.

- CAD/CAM/CAE/GIS systems will continue to give buyers a competitive edge. As time-to-market requirements shrink, demand for design automation tools will continue to increase.

- The recent currency fluctuations, specifically the sharp decline of the U.S. dollar in relation to many European currencies and the Japanese yen, will offset sluggish economic growth for multinational corporations, particularly those with a high percentage of costs denominated in dollars. While many companies are hedging their profits to limit the effects of the currency fluctuations, some are utilizing the changes in exchange rates to reprice their products. In the current period of a rapidly declining dollar, U.S.-based multinationals may lower overseas prices to stimulate demand. This would be particularly true of the PC companies, which

are striving to rapidly increase unit volume gains. For companies that have much of their cost structure denominated in dollars, the impact of currency will be highly leveraged. In the case of more mature companies that for the most part have established major manufacturing facilities overseas and therefore much of their cost structures are in foreign currency, the leverage from the change in the dollar is much less. Recent currency-rate changes may drive CAD/CAM/CAE/GIS growth internationally in the short term; long-term effects could be highly variable.

- Market demand will be limited by vendors' inability to fully meet demand for highly integrated software systems. We believe that the industry business model is evolving to a structure where large software vendors will function increasingly as application software integrators. Much of the innovation in new niche products can be expected to come from the small software vendors, who will be dependent on their OEM relationships with major software vendors. These alliances will ultimately reduce the total cost of software development, thus strengthening industry profitability. However, design problems being addressed will become increasingly complex, and meaningful success in integrating software will lag market demand.

- Increased flexibility in software portability will improve market stability during the next few years. Because the majority of software vendors have ported their products to multiple platforms, platform choice has become less of an issue. Software vendors are now poised to leverage their portability as new, faster hardware platforms become available. Those software vendors that do so will have a selling advantage.

- The "late majority" buyers for CAD/CAM/CAE/GIS will be coming to market during the next five years, driving additional growth. However, conservative buyers will favor market leaders. These conservative buyers are the "late majority" buyers who do not buy until the weight of the majority seems to legitimize the product. For vendors, therefore, the value of having high market share as well as financial clout will increase.

Percentage

Year	Service	Unbundled Software	Bundled Software	Hardware
1987	13.8%	13.2%	11.8%	61.2%
1988	15.0%	13.9%	12.3%	58.8%
1989	15.3%	13.2%	14.2%	57.3%
1990	16.1%	14.6%	14.1%	55.2%
1991	16.6%	16.5%	13.6%	53.3%
1992	18.0%	17.5%	13.2%	51.3%
1993	19.2%	18.4%	12.9%	49.5%
1994	20.1%	19.2%	12.7%	47.9%
1995	20.9%	19.8%	12.7%	46.5%
1996	21.6%	20.2%	12.8%	45.4%

Note: Columns may not add up to 100 percent because of rounding.

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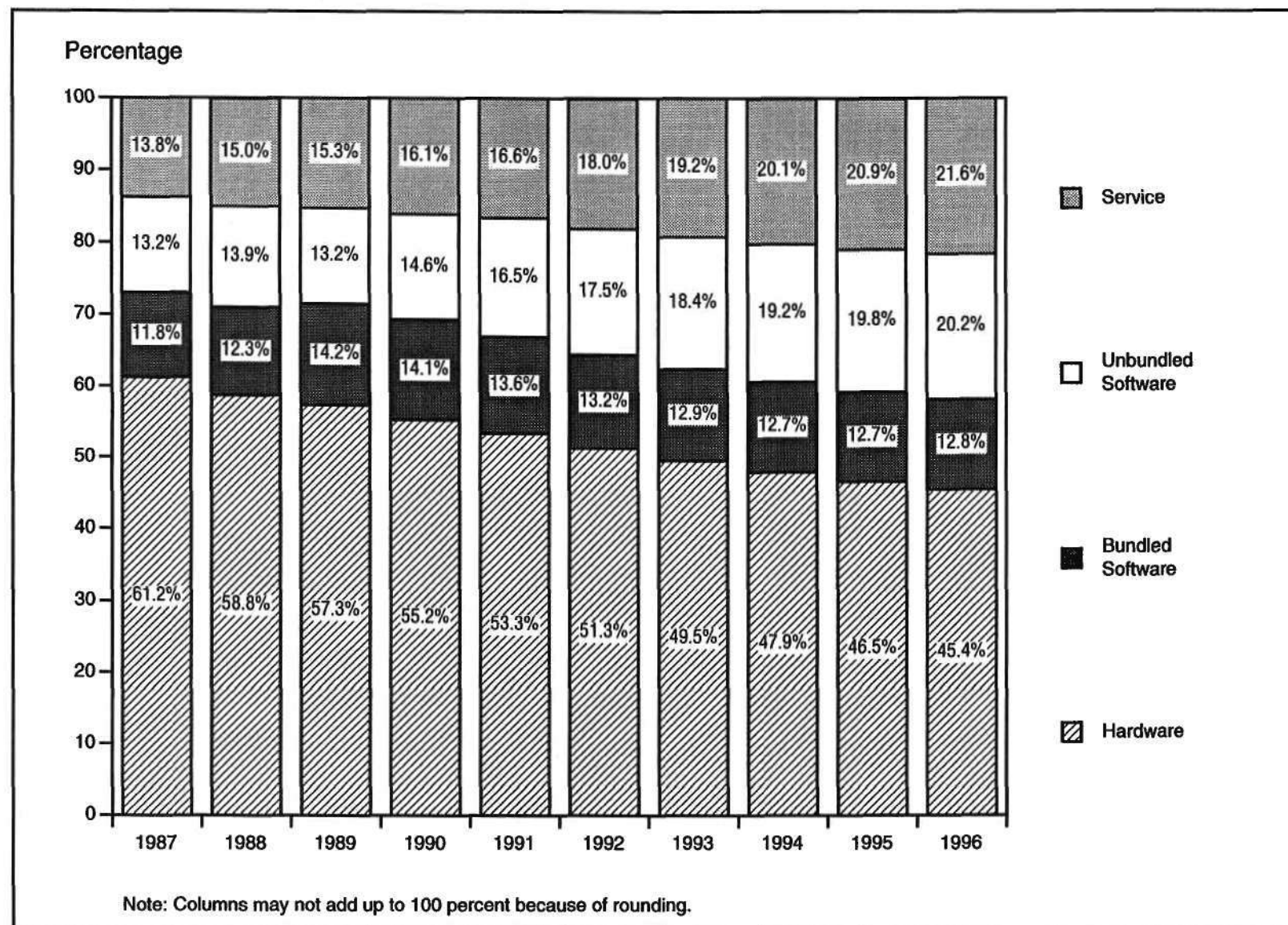
North American Forecast Drivers

The North American market was flat in 1991 at $5.0 billion and is forecast to grow at a 6 percent CAGR through 1996 (see Figure 2). The main factors driving the North American forecast are the following:

- According to The Dun & Bradstreet Corporation's latest monthly survey of 1,000 manufacturers' nationwide, manufacturers modest expectations for improvements in operating conditions were essentially unchanged, despite reports of improved conditions in the past few months. However, the one bright spot in the recent survey is that manufacturers' expectations to increase capacity in the next three months rose sharply. This bodes well for increases in capital spending. With the cost of capital so low, many companies are seeking to invest in systems and equipment that boost productivity. Market growth will increase as manufacturers invest in CAD/CAM/CAE/GIS systems.

- Market growth will be limited for the second half of 1992 and most of 1993 as businesses wait for the outcome of the November election and the implementation of new fiscal policies. Fiscal policy proposals include restoring investment tax credits, accelerating depreciation for many investments, and reducing capital gains. The budget deficit issue will also have to be addressed. Most likely, after the elections, some form of tax increases and/or spending cuts will occur. A Republican win would favor defense spending, which would help EDA and mechanical sales; a Democratic win would favor infrastructure spending (such as roads and bridges), which is more likely to benefit sales to AEC and GIS applications. Businesses will postpone purchases until they have a better indication of what the new policies will be and how they will affect their investment decisions.

- Market growth will be reduced because of decreasing average selling prices (ASPs). The United States is a large market with more developed distribution channels and larger order sizes than in other regions. Streamlined distribution channels leave fewer places for profit to hide; therefore, ASPs have declined more sharply. In contrast, Europe is the sum of many smaller country markets, each with its own customs and

requirements. Because of these special requirements, ASPs have not been as pressured to decline in European markets; therefore, North American unit shipments will continue to grow significantly, while revenue will grow at a slower rate because of strong price competition.

- Market growth will be limited because of lower defense spending. Spending cuts for the defense budget of 25 to 30 percent during the next five years are being proposed by the U.S. administration. In the United States, both Republicans and Democrats are seeking to balance defense spending cuts against the large forecast loss of jobs that will occur when such reductions are incurred. Most likely, the U.S. Department of Defense will encourage continued growth in R&D spending, while severely limiting the number of programs that would ultimately make the transition to production. CAD companies heavily dependent on direct or indirect government defense spending contracts increasingly will have limited growth opportunities.

European Forecast Drivers

The European market grew 4 percent in 1991 to $5.5 billion and will reach $7.9 billion by 1996. This market is forecast to have an 8 percent CAGR for revenue through 1996. The main issues driving the European forecast include the following:

- Growth will steadily increase in Eastern Europe. The collapse of the Soviet Union as an export market has complicated the difficult situation already facing other Central and Eastern European countries as they make the transition to market economies and establish new international trading arrangements. Poland, Hungary, and more recently Czechoslovakia have made impressive progress in shifting exports to other markets. In all these countries, prices have been set free and inflation seems to be coming under control. The initial groundwork toward adopting market economies has been laid. GDP/GNP growth is forecast to turn positive during the 1992 to 1993 period and reach strength toward 1994. As these countries' economies become market economies, CAD/CAM/CAE/GIS opportunities will increase, also.

Figure 2
CAD/CAM/CAE/GIS Market, by Region
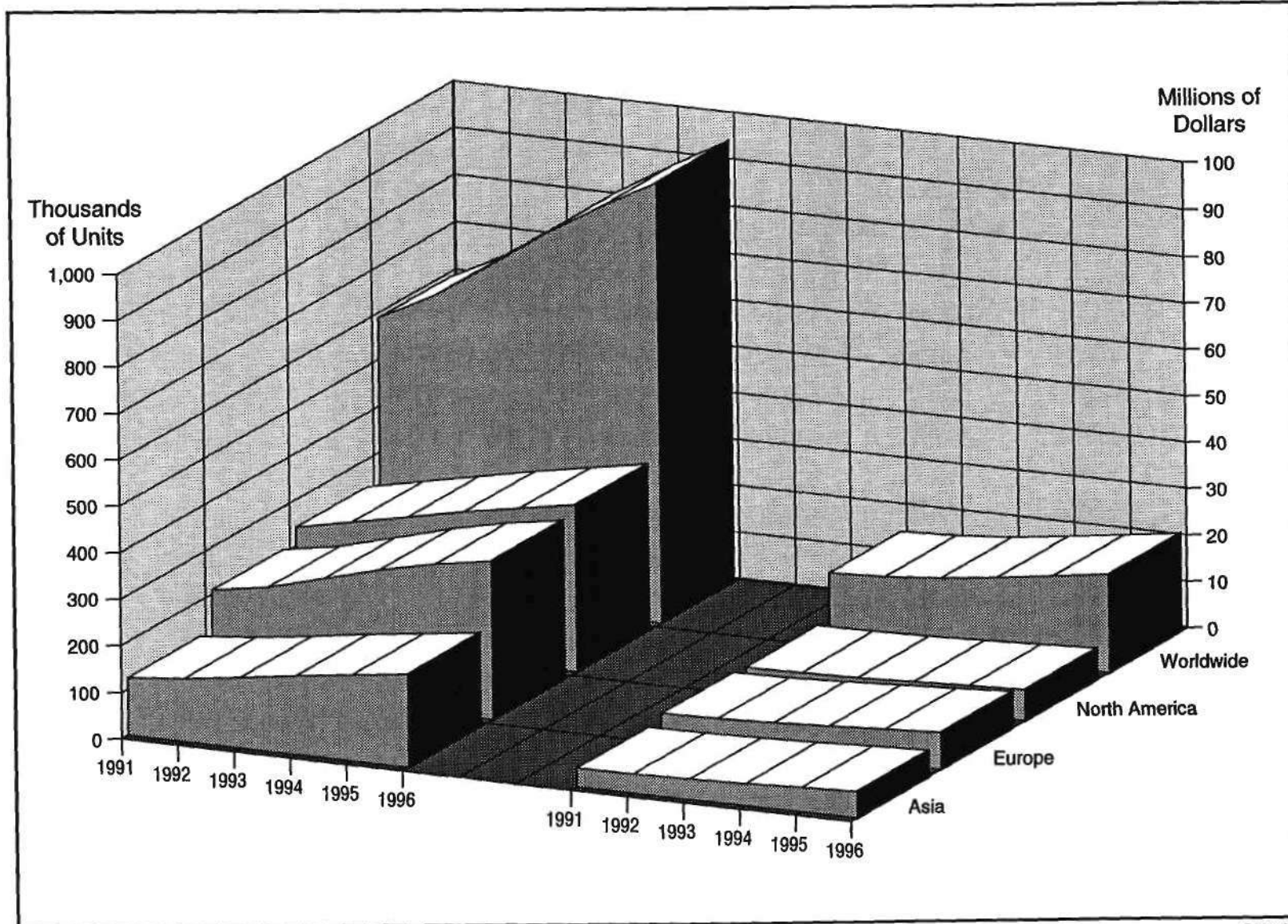
Source: Dataquest (October 1992)

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- Growth will be relatively unaffected by the advent of the EC. The effects of 1992 will be evolutionary, not revolutionary. Growth is expected for European vendors as they expand into other European markets. To date, many European vendors have competed often only in their country of origin. During the next forecast period, European vendors increasingly will expand their operations to become more competitive across the European community. Furthermore, German companies and German subsidiaries of international companies increasingly are expanding into Eastern European countries.

Asian Forecast Drivers

The Asian market grew 4 percent in 1991 to $4.0 billion and its forecast CAGR for revenue is 7 percent through 1996. The main issues driving the Asian forecast are as follows:

- In Japan, unexpected sluggishness has resulted from an abrupt end to the long boom of private fixed investment. This has followed a marked erosion of business confidence, partly associated with a continued unwinding of speculative activities in asset markets. CAD/CAM/CAE/GIS market growth will be limited in the short term as Japan recoups from these recent changes.

- Shifting labor costs will affect growth among countries. Labor costs in Japan, Korea, Taiwan, and Hong Kong will continue to increase, which will result in growing demand for productivity tools including CAD/CAM/CAE/GIS. Industries with blue-collar workers will transfer operations to Indonesia, Malaysia, the Philippines, Thailand, and the Republic of China; Japan, Korea, Taiwan, and Hong Kong will grow based on the work of the white-collar workers. Remote design and manufacturing sites also will encourage the growth of electronic-data sharing and thus CAD/CAM/CAE/GIS across Asia.

- Growth is less likely in some Asian countries because of the lack of stringent intellectual property rights. Most Asian countries, with the exception of Japan, have few laws governing intellectual property rights. Many companies will be hesitant to invest or set up operations in a region where they will receive no design protection.

Applications

Table 2 shows the CAD/CAM/CAE/GIS market software revenue forecast by application, as well as the forecast change in mix between bundled and unbundled software revenue. Figure 3 shows the CAD/CAM/CAE/GIS forecast by application.

Mechanical

The mechanical software market grew 7 percent in 1991, and its forecast CAGR for the 1991 to 1996 period is 5 percent. The main issues driving the mechanical forecast are as follows:

- Mechanical CAD/CAM/CAE indispensability is increasing. Market pressures to produce higher-quality, ergonomically correct designs with shorter production cycles is making mechanical CAD/CAM/CAE a necessity in all manufacturing industries. Several recent end-user surveys indicate the levels of drafting, conceptual, and detail design work done with mechanical CAD/CAM/CAE tools have surpassed 90 percent at many sites. The use of mechanical CAD/CAM/CAE tools in various departments also has high-market penetration. As the complexity of the design increases, the need to share information increases, and the benefits of automation improve dramatically. This results in an increase in the level of indispensability.

- Integration is driving significant savings. A hidden benefit when all potential users at a site have full access to mechanical CAD/CAM/CAE comes from the elimination of redundant processes or systems. Unfortunately, this is difficult to accomplish in a mechanical design and manufacturing environment because so many people need to have access to some part of the engineering database. It is difficult to even identify everyone, let alone actually set up a system that totally replaces the manual operation; but, it is happening. Slowly, a number of users are building integrated systems that effectively share engineering data between departments and supplier companies. Some vertical markets have taken this to the level of implementing standards for the sharing of data for a whole industry. The German automobile industry is a good example.

Table 2

CAD/CAM/CAE/GIS Market, by Application

	Revenue ($M)						CAGR (%)	Percent Distribution (%)					
	1991	1992	1993	1994	1995	1996	1991-1996	1991	1992	1993	1994	1995	1996
All Applications													
Total Software	4,466	4,701	5,104	5,667	6,319	6,946	9.2	100.0	100.0	100.0	100.0	100.0	100.0
Bundled Software	2,020	2,019	2,103	2,259	2,473	2,683	5.8	45.2	42.9	41.2	39.9	39.1	38.6
Unbundled Software	2,446	2,682	3,001	3,408	3,846	4,263	11.7	54.8	57.1	58.8	60.1	60.9	61.4
Mechanical													
Total Software	2,040	2,098	2,202	2,329	2,464	2,574	4.8	100.0	100.0	100.0	100.0	100.0	100.0
Bundled Software	1,138	1,122	1,139	1,171	1,215	1,247	1.8	55.8	53.5	51.7	50.3	49.3	48.5
Unbundled Software	902	976	1,063	1,158	1,249	1,326	8.0	44.2	46.5	48.3	49.7	50.7	51.5
AEC													
Total Software	660	726	834	964	1,104	1,246	13.6	100.0	100.0	100.0	100.0	100.0	100.0
Bundled Software	307	334	380	443	511	579	13.5	46.6	46.1	45.5	46.0	46.3	46.5
Unbundled Software	352	392	454	521	593	667	13.6	53.4	53.9	54.5	54.0	53.7	53.5
GIS/Mapping													
Total Software	556	634	743	896	1,105	1,315	18.8	100.0	100.0	100.0	100.0	100.0	100.0
Bundled Software	276	311	358	426	528	639	18.3	49.6	49.1	48.2	47.5	47.8	48.6
Unbundled Software	281	323	385	470	577	676	19.2	50.4	50.9	51.8	52.5	52.2	51.4
Electronic CAE													
Total Software	686	700	752	841	933	1,024	8.3	100.0	100.0	100.0	100.0	100.0	100.0
Bundled Software	131	104	95	90	86	90	-7.2	19.1	14.8	12.6	10.7	9.2	8.8
Unbundled Software	555	597	657	751	847	934	11.0	80.9	85.2	87.4	89.3	90.8	91.2
IC Layout													
Total Software	196	206	224	255	287	322	10.4	100.0	100.0	100.0	100.0	100.0	100.0
Bundled Software	32	27	26	25	23	22	-7.4	16.3	13.3	11.5	9.7	8.2	6.8
Unbundled Software	164	178	198	230	264	300	12.9	83.7	86.7	88.5	90.3	91.8	93.2
PCB/Hybrid/MCM													
Total Software	328	338	348	382	425	466	7.3	100.0	100.0	100.0	100.0	100.0	100.0
Bundled Software	136	121	105	105	108	107	-4.8	41.5	35.7	30.2	27.4	25.4	22.9
Unbundled Software	192	217	243	277	317	360	13.3	58.5	64.3	69.8	72.6	74.6	77.1

Source: Dataquest (October 1992)

Figure 3
History and Forecast for the CAD/CAM/CAE/GIS Market, by Application

Billions of Dollars

Mechanical ● AEC ■ GIS/Mapping ▲ ECAE ◆ IC Layout ✕ PCB/Hybrid/MCM ⬡
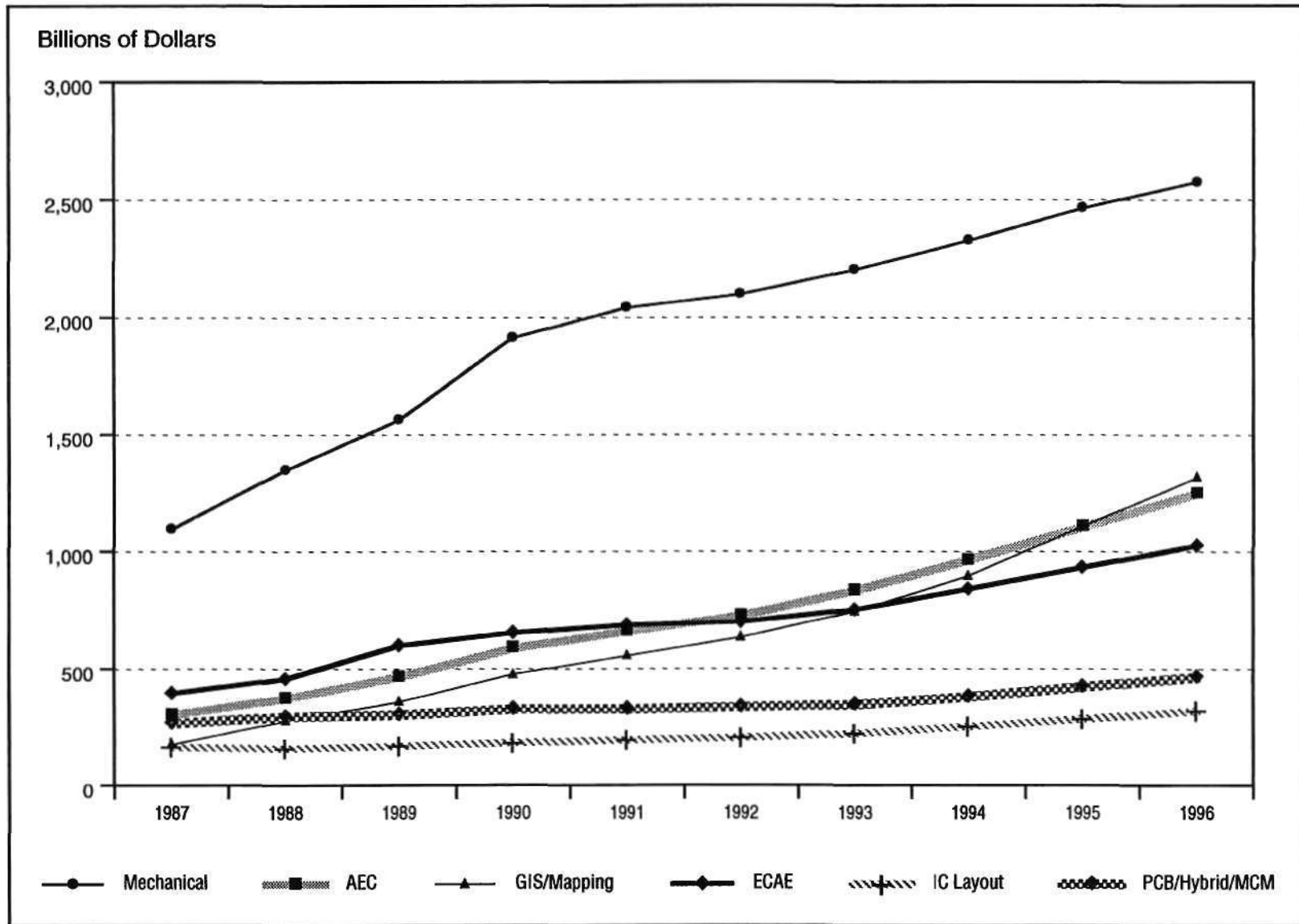
Source: Dataquest (October 1992)

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- The mechanical CAD/CAM/CAE market is evolving toward a replacement market. The next five years will see the mechanical CAD/CAM/CAE market evolve toward a replacement market where the new unit sales will be balanced by system retirements. This trend is inevitable. The only remaining question is when. We forecast 1997 or 1998 as the balance point. Considering the plethora of forces at work in emerging technologies, world economics, competitive issues, and software development, this should be considered a rough estimate.

- Significant changes are occurring for modeling technologies. Two-dimension-only systems are on a steady decline. Three-dimension capability is available for a minimal cost premium. Even if a user has few occasions for a 3-D application, the minimal expense and common availability on all platform types makes a 3-D-based product a reasonable alternative to 2-D-based products. Only a few recent 2-D-only products have added a significant amount of enhancements for parametric-user input and constraint-based modeling that may keep a significant market presence. This discussion does not intend to minimize the value or necessity of providing high-performance production drafting capabilities. The general message, however, is that the vendor revenue from this application is on the decline.

- Solid modeling has been promised for many years as the panacea for the design environment. More complete data structure with improvements in performance is rapidly building a strong following. Add-on applications that use part or assembly information are still less than optimal, but progress is being made in integration between the model and analysis applications, between the model and documentation, and further into manufacturing applications. Ease of use, performance, and the ability to accurately model any object independent of shape or manufacturing process continue to challenge all solid-modeling products.

- Knowledge-based engineering (KBE) is a productivity multiplier for any mechanical CAD/CAM/CAE system. The rules developed can drive automated applications, capture design intent, and automate sharing of data between applications and departments.

Every production operation has task and procedural structures that can be automated and optimized with KBE. The needed improvements in ease of use, cost of implementation, and availability of interface to a variety of mechanical CAD/CAM/CAE software products will improve with time. Two years ago, our first in-depth look at KBE made some wild predictions. We expected the market to grow by a factor of four in the next two years. A preliminary analysis now shows that this prediction was a bit optimistic. Doubled growth in two years would be closer to the truth. The general market softness has had an impact, but the underlying market dynamics are unchanged. In fact, the applications marked for early implementation are proving to be more successful than previously imagined.

- The promise of virtual reality (VR) and multimedia in an engineering environment is real. The practical applications are many. Training is a prime target for these technologies both as an aid to the proper use of other computer tools and in job content to make better engineers and designers. The state of the art in VR has reached the experimentation level of a new high-performance visual experience. The next phase will add the ability to do more than just fly around in your data. Dynamic editing will be required. Imagine doing cable routing by grabbing the end of a wire and flying through the engine compartment of your car.

AEC

The AEC CAD software market, which is forecast to grow at a 14 percent CAGR for 1991 to 1996, will enjoy healthy underlying demand during the forecast period because of the following factors:

- We anticipate increased demand for electronic design data from designers' clients and partners in the building process—from the U.S. government to the small commercial developer. Designers in the AEC industry are finding themselves in markets that are more regionally and globally competitive, markets that favor partnering across design disciplines. The designer with no CAD capability increasingly will be dropped from consideration as a partner or supplier.

- We anticipate increased demand from designers' clients and partners to reduce uncertainty and risk; that is, to build what the client had in mind, on time, and within budget. Meeting this challenge will require electronic design data throughout the design/construction process.

These two factors will continue to stimulate growth in the AEC CAD market during the next five years, even in a recession. Tempering this growth will be the following fundamental factors that discourage purchases:

- Despite significant consolidation and partnering among users, the design and construction process will still often be divided among several companies representing different aspects of the design process. Because automation systems are considerably harder to implement across companies than within companies, the pencil as a design tool will not be eliminated during the next five years.

- Because AEC is built primarily on a "one design/one build" model, proven economic benefits of CAD use will remain smaller than in mechanical and electronic applications, where automated quantity manufacture can more readily leverage improved designs. This fact both discourages CAD use and drives users to focus on electronic drafting. Drafting software is nearly a commodity typically sold on PCs and commands a relatively low price.

GIS/Mapping

GIS software revenue is forecast to grow at a robust 19 percent CAGR during the next five years, primarily because of the following factors:

- Bread-and-butter prospects in government and utilities are charged with maintaining information on land and assets in perpetuity. Many of these prospective buyers are still using paper maps, which will degrade. This creates a certain inevitability to moving from paper maps to computer maps—the first step to building a GIS.

- Inexpensive spatial data—both public and private—are accumulating, and their reuse will help dissolve a traditional obstacle to growth in GIS.

- Several new technologies will drive growth in the GIS market. Currently, advances in global positioning systems (GPS) and aerial photography are making it possible to create GIS systems significantly more accurate than existing paper maps, giving experienced users some compelling reasons to reinvest. Increasingly portable computers, multimedia, and better compression of satellite imagery will create opportunities to develop more useful GIS.

- Opportunities for growth exist in new applications, industries, and regions. During the forecast period, slow sales in one area will generally be balanced with higher sales in another.

Two factors seriously threaten the long-term expansion of the GIS market, as follows:

- The uncertain (but certainly high) cost of creating a working GIS.

- The impact of applications stuck in the pilot phase, both in terms of halted purchases at the troubled project, and the negative publicity these projects create.

Electronic Design Automation

The electronic design automation (EDA) industry produced a lackluster 1 percent growth in total factory revenue in 1991 and a 5 percent growth in software revenue. This has as much to do with fundamental changes occurring within the top suppliers as with the following economic factors:

- Product transitions of top EDA suppliers have caused a significant stagnation in the purchase of new EDA tools. Buyers are prolonging their evaluation process. This problem is further exacerbated by the global recession and political and economic infrastructure changes in North America and Europe.

- The final vestiges of platform dependence are being removed from the EDA industry. This has a had a short-term negative effect on the market, but should improve the profitability of EDA tool suppliers.

Fueling the fires of growth in the coming years will be the ever-increasing demands to shorten the design cycles of electronic systems.

EDA tools will continue to be purchased in hopes to gain competitive advantages. Application markets that will contribute to this growth include the following:

- Advanced analysis tools for IC and PCB designs. Increasing clock frequencies will require tighter design tolerances and sophisticated analysis tools will be needed to ensure proper operation.

- Architectural-level tools to improve designer productivity. While top-down design is now being adopted by the majority of electronic designers, architectural-level tools will emerge during the next two to five years.

- Emerging higher service content. A higher service content will emerge in the EDA industry as large suppliers shift their business models toward solutions and selling integration services.

Notes on Forecast

For the 1991 publishing cycle, Dataquest's CAD/CAM/CAE/GIS group added server as a platform. The platform categories now include technical workstation, host-dependent, server, and personal computer. Revenue formerly classified in technical workstations, host-dependent, or personal computer may now be more accurately classified, where appropriate, in the server category. However, because of this reclassification, data and growth rates for the other platform areas were affected. Figure 4 depicts the revised platform distribution.

Forecast Methodology

Fundamental to the way Dataquest conducts its research is an underlying philosophy that says the best data and analyses come from a well-balanced program. This program includes the following: balance between primary and secondary collection techniques; balance between supply-side and demand-side analysis; balance between focused, industry-specific research and coordinated, "big-picture" analysis aided by integration of data from the more than 25 separate high-technology industries Dataquest covers; and balance between the perspectives of experienced industry

professionals and rigorous, disciplined techniques of seasoned market researchers.

Dataquest also analyzes trends in the macroenvironment, which can have major influences on both supply-side and demand-side forecasting. In addition to demographics, analysts look at GNP growth, interest rate fluctuation, currency fluctuation, business expectations, and capital spending plans. In the geopolitical arena, the group looks at trade issues, political stability or lack thereof, tariffs, nontariff barriers, and such factors as the effect on Europe of the events of 1992. Figure 5 depicts the building blocks for the CAD/CAM/CAE/GIS forecast.

Figure 6 is a diagram of the CAD/CAM/CAE/GIS forecasting model. The overall forecasting process uses a combination of forecasting techniques such as time series and technological modeling. Market estimates and forecasts are derived using the following research techniques:

- "Bottom-up" aggregation—This method involves adding all relevant vendor contributions to arrive at total market estimates for all historical data.

- Segment forecasting—For each application segment tracked by the CAD/CAM/CAE/GIS group, individual forecasts are derived following the basic information model defined previously. Specifically, each design phase covered within each application is segmented by channel, product, region, and platform. In this way, each application segment incorporates its own set of unique assumptions.

- Demand-based analysis—Market growth is tracked and forecast in terms of the present and anticipated demand of current and future users. This requires the development of a total available market (TAM) model and a satisfied available market figure to accurately assess the levels of penetration. Installed base is also evaluated. Rates of product retirement are primarily based on input from end users in our ongoing survey programs. Figure 7 shows the CAD/CAM/CAE/GIS installed base by platform. In addition, Dataquest analysts factor in the acceptance or ability for users to consume new technology.

Figure 4
CAD/CAM/CAE/GIS Revised Platform Distribution
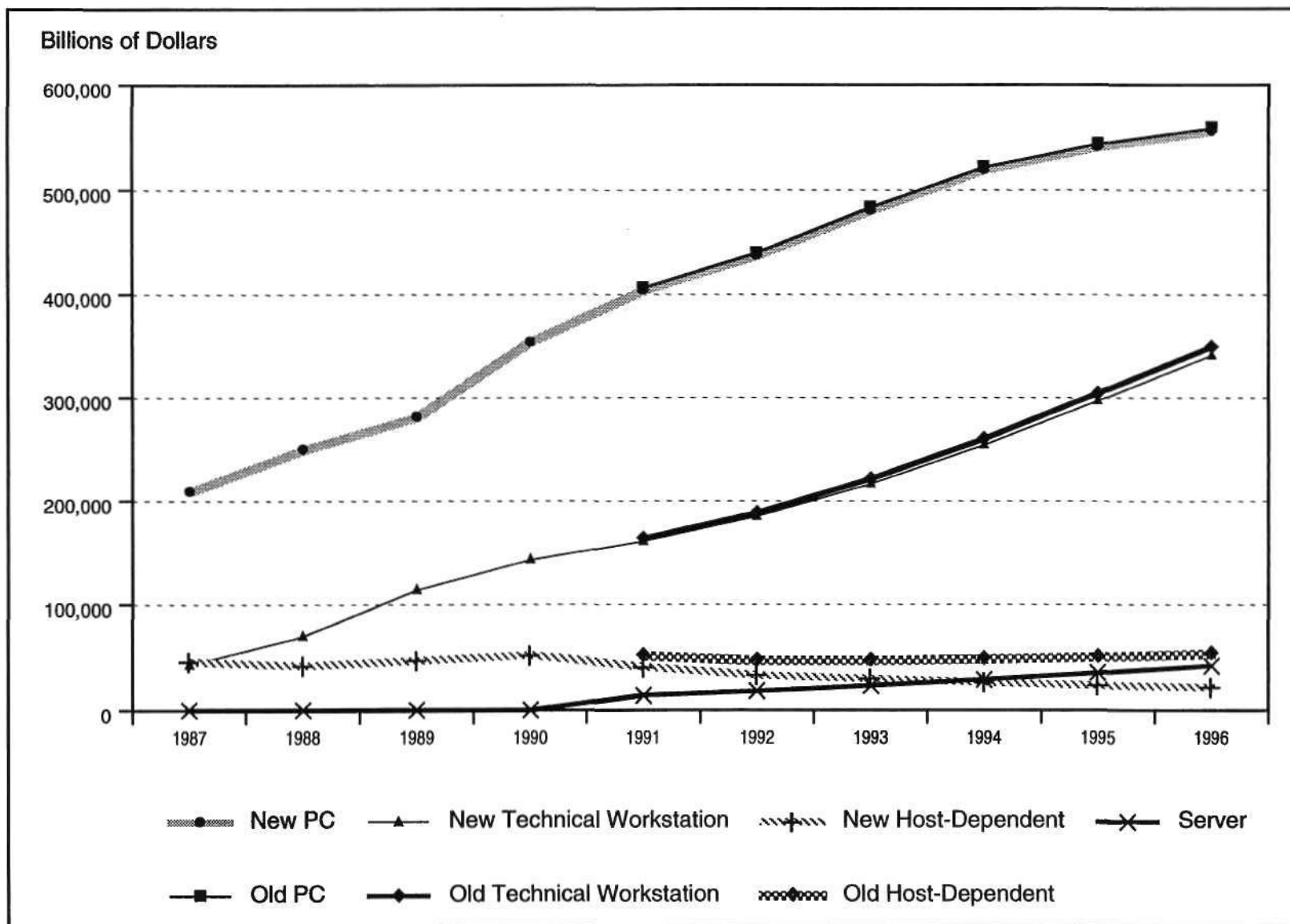
Source: Dataquest (October 1992)

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Figure 5
Dataquest's Building Blocks for CAD/CAM/CAE/GIS Market Forecasting

What Goes In ...

Dataquest Insights and Expert Opinion

Environmental Trends

Technological Developments

Vendor/Supply-Side Data

User/Demand-Side Data

| 1991 | 1992 | 1993 | 1994 | 1995 | 1996 |

What Comes Out ...   Market Sizing, Five-Year Market Forecasts
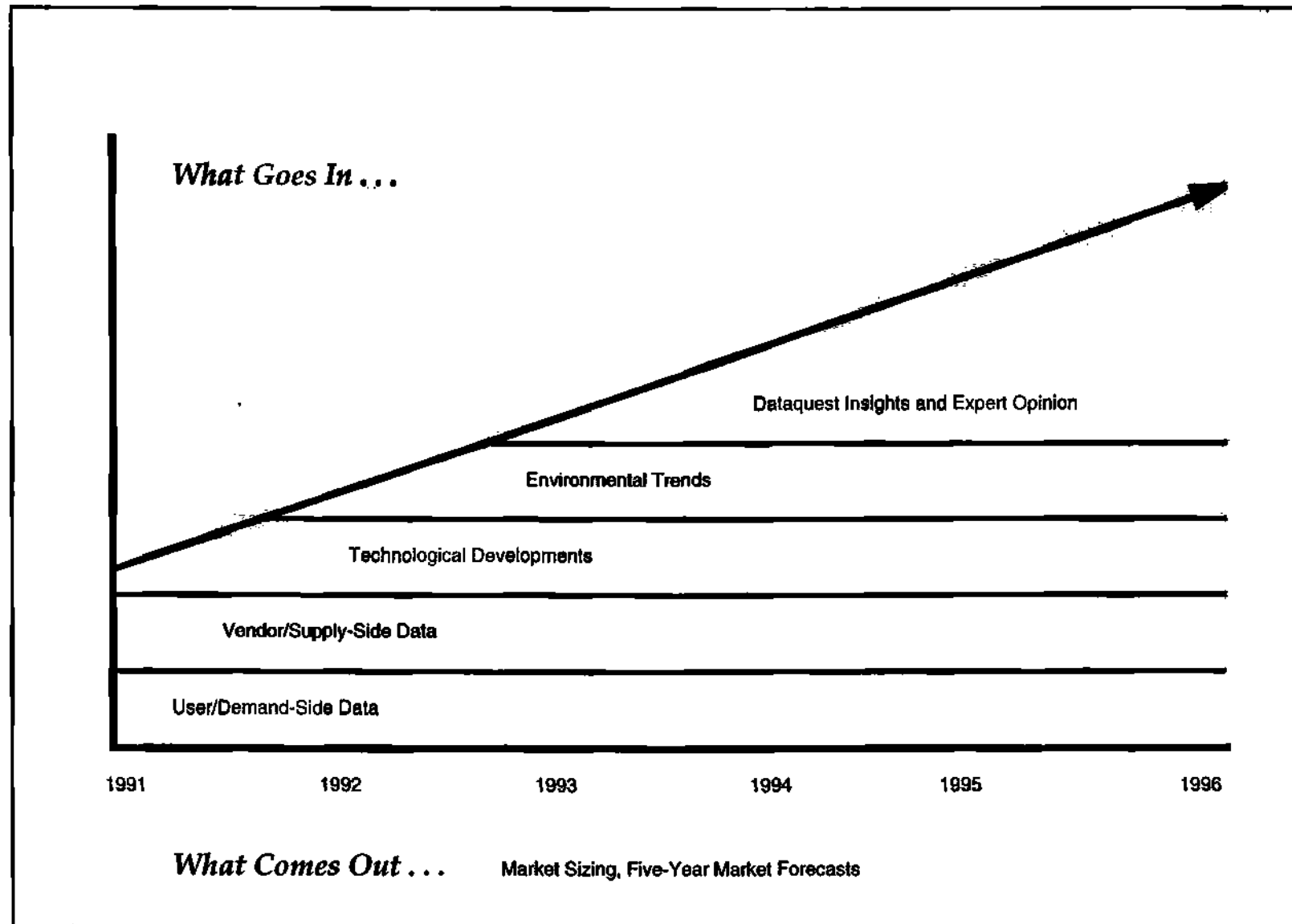
Source: Dataquest (October 1992)

Figure 6
CAD/CAM/CAE/GIS Market Forecasting Model

User/Demand-Side Data

❑ Projected Budget Growth and Allocations
❑ Business and System Requirements
❑ Purchasing Procedures
❑ Criteria for Selection
❑ Regular Application End-User Surveys

Vendor/Supply-Side Data

❑ Product Shipment Projections
❑ Factory Revenue
❑ Strategic Alliances
❑ Marketing Strategies

**Market Sizing
and
Market Projections**

Technology Assessments

❑ Technology Developments
❑ Standards Development
❑ Price/Performance Development

Environmental Analysis

❑ Economic Forecasts
❑ Industry/Competitive Climate

Source: Dataquest (October 1992)

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Figure 7
CAD/CAM/CAE/GIS Installed Base
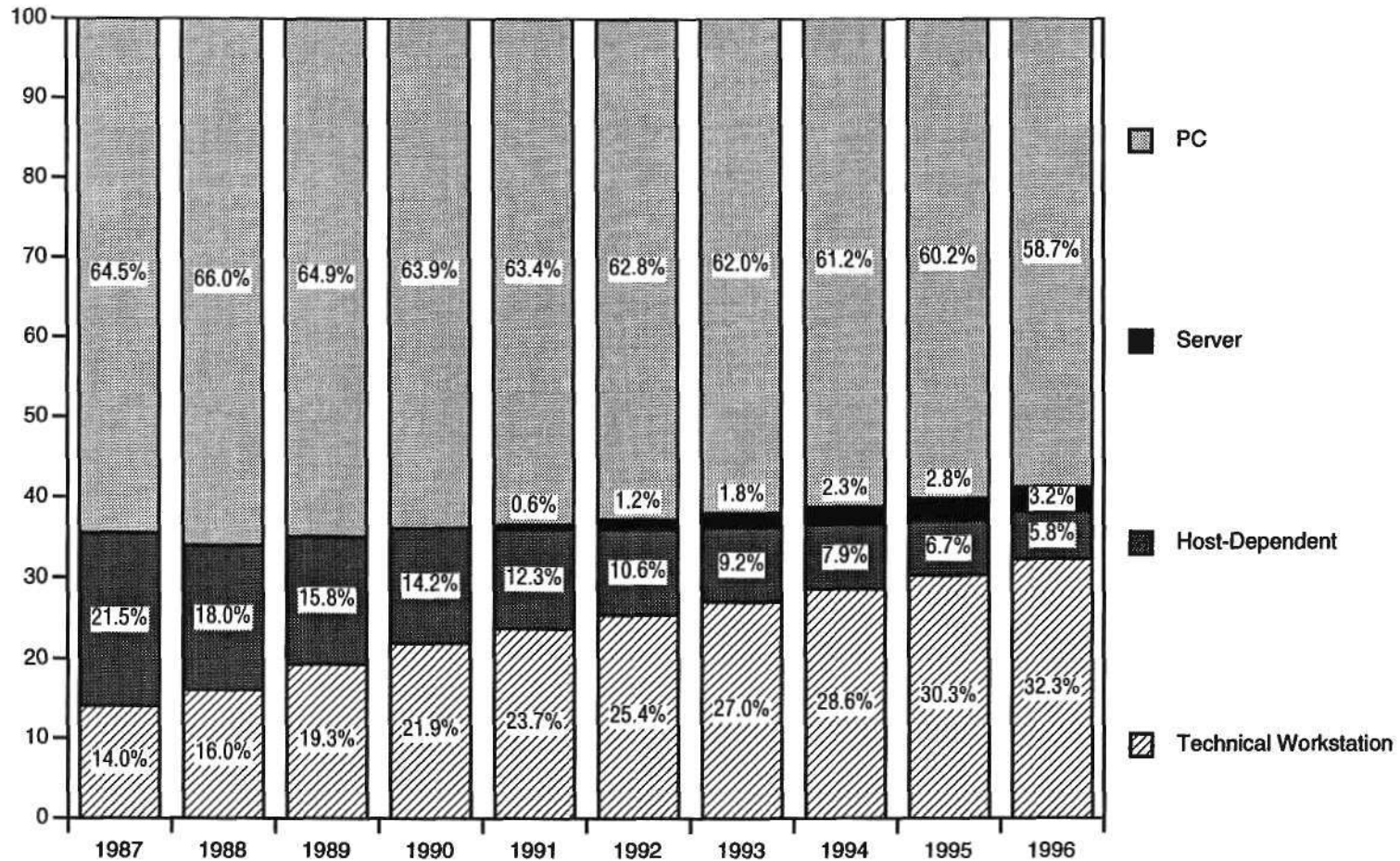
Note: Segments may not add up to 100 percent because of rounding.

Source: Dataquest (October 1992)

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- Capacity-based analysis—This method involves identifying future shipment volume constraints. These constraints, or "ceilings," can be the result of component availability, manufacturing capacity, or distribution capacity. In any case, capacity limitations are capable of keeping shipments below the demand level.

Segmentation

Dataquest defines CAD/CAM/CAE/GIS as systems used in the mechanical; architecture, engineering, and construction (AEC); GIS/mapping; and EDA application areas. The CAD/CAM/CAE/GIS market is defined according to the following segmentation scheme:

- CAD/CAM/CAE/GIS
  - Mechanical
  - AEC
  - GIS/Mapping
  - EDA
    - Electronic CAE
    - IC Layout
    - PCB/Hybrid/MCM

In addition, more detailed information by subapplication is available and usually published in *Dataquest Perspectives*.

Definitions

This section lists the definitions that are specific to this document.

Application definitions are as follows:

- Mechanical—This segment refers to computer-aided tools used to design, analyze, document, and manufacture discrete parts, components, and assemblies.

- Architecture, Engineering, and Construction (AEC)—This segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.

- Geographic Information Systems (GIS)/Mapping—This is a computer-based technology, composed of hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.

- Electronic Design Automation (EDA)—This segment covers computer-based tools that are used to automate the process of designing an electronic product including printed circuit boards, ICs, and systems. EDA includes ECAE, IC Layout, and PCB/Hybrid/MCM, as follows:

  - Electronic Computer-Aided Engineering (CAE)—These are computer-aided tools used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the product). Examples of electronic CAE applications are schematic capture and simulation.

  - IC Layout—This is a software application tool that is used to create and validate the physical implementation of an integrated circuit (IC). The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), design verification tools (DRC/ERC/logic-to-layout), compilers, and module development tools.

  - Printed Circuit Board (PCB)/Hybrid/Multichip Module (MCM)—This segment covers products that are used to create the placement and routing of the traces and components laid out on a printed circuit board. Also, included in this category are thermal analysis tools.

Regional definitions are as follows:

- North America—Includes United States and Canada

- Europe—Includes the United Kingdom, Scandinavia, Benelux, France, Germany, Italy, Spain, and Rest of Europe

- Asia—Includes Japan, Singapore, Taiwan, Korea, China, and Hong Kong

- Rest of World—All other countries including Australia, New Zealand, Oceania, Africa, Central America, South America, and the Middle East

Platform definitions are as follows:

- Technical Workstation—A single-user computer that is distinguished from a personal computer by its features and by the user's potential range of expansion on the platform. Features include a virtual, multitasking operating system (UNIX, VMS, Domain); the computer is designed by the manufacturer to run high-performance graphic applications in a multiuser/multitasking environment.

- Host-Dependent—A shared logic system in which the external workstations' functions are dependent on a host computer.

- Server—A computer that transparently provides its resources for use by other computer systems. It is a system on a network that provides specific functionality to other computer systems: the clients. Functions include file storage, database access, compute capability, and others. Dataquest tracks the following major categories of servers used for CAD/CAM/CAE and GIS applications:

  - Compute Servers—These systems provide capabilities for solving numerical problems (for example, simulations, statistical calculations, and simultaneous partial differential equations). System features usually include high-speed computational capabilities (for example, vector and parallel processing) and large memories.

  - Print Servers—These systems provide access to printers, specialized printing applications software, and print-spooling resources to a network.

  - File Servers—These systems provide mass storage capability to clients on a network. Services can range from temporary storage of working files to long-term backup and archive systems.

  - Database Servers—These systems manage databases as a shared resource to a network. These servers handle such functions as physical data storage, data security, and high-level queries and can access stored information at the record level.

- Personal Computer—A single-user computer that is distinguished from a technical workstation by its features and by the

user's potential range of expansion on the platform. Features found in technical workstations (such as a virtual operating system, networking, high-performance graphics, multiuser/multitasking capability) are optional rather than integrated by the manufacturer.

Line item definitions are as follows:

- Average selling price (ASP) is defined as the average price of a product, inclusive of any discounts.

- CPU installed base is defined as the total number of CPUs in active, day-to-day use.

- CPU revenue is the portion of revenue derived from a system sale that is related to the value of the CPU. (In the case of technical workstations and personal computers, CPU revenue contains the terminal revenue.)

- CPU shipment is defined as the number of CPUs delivered.

- Hardware revenue is defined as the sum of the revenue from the hardware system components: CPU revenue, terminal revenue, and peripherals revenue.

- Installed seats are defined as the total number of seats in active, day-to-day use.

- Peripherals revenue is defined as the value of all the peripherals of a turnkey sale. (Peripherals in this category typically are input and output devices.)

- Service revenue is defined as revenue derived from the service and support of CAD/CAM/CAE or GIS systems. Service revenue can be calculated in the tables by subtracting hardware and software revenue from total revenue.

- Software revenue is revenue derived from the sale of bundled (part of a turnkey system) and unbundled software.

- Terminal revenue is defined as revenue derived from the sale of terminals that are used to graphically create, analyze, or manipulate designs. The term is applicable only to the host-dependent platform, as terminal revenue is contained within CPU revenue for technical workstations and PCs.

- Total factory revenue is defined as the amount of money received by a manufacturer for its goods measured in U.S. dollars.

Total factory revenue does not include
revenue that a company may receive from
products that are sold to another company
for resale (OEM revenue).

- Unit shipment is defined as the number of
products delivered (that is, seats).

Table 3

CAD/CAM/CAE/GIS History and Forecast Update

Application: All Applications
Region: Worldwide
Platform: Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	208,400	249,009	280,309	353,076	404,239	437,670	480,760	519,030	540,600	554,910	18	7
Unit Shipments or Seats	208,400	249,009	280,309	353,076	404,239	437,840	480,940	519,220	540,790	555,090	18	7
CPU Installed Base	417,880	646,302	876,584	1,133,303	1,387,537	1,620,600	1,847,210	2,064,270	2,255,720	2,415,800	35	12
Installed Seats	417,880	646,302	876,584	1,133,303	1,387,537	1,620,600	1,847,210	2,064,270	2,255,720	2,415,800	35	12
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	16.0	20.9	19.5	19.5	14.0	12.5	11.1	10.4	9.9	9.5	-3	-7
Hardware-Only ASP	4.3	4.7	4.8	4.6	4.2	3.9	3.6	3.3	3.2	3.0	-1	-7
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	1,043	1,343	1,570	1,863	1,895	1,862	1,856	1,866	1,831	1,790	16	-1
CPU Revenue	953	1,204	1,458	1,732	1,767	1,745	1,749	1,765	1,738	1,705	17	-1
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	90	139	112	131	128	116	107	101	93	85	9	-8
Software Revenue	545	616	767	902	1,000	1,063	1,147	1,234	1,321	1,392	16	7
Bundled	142	115	140	139	144	131	120	110	101	92	0	-9
Unbundled	403	501	627	763	855	932	1,028	1,124	1,221	1,300	21	9
Service Revenue	74	88	130	156	167	197	234	272	306	335	22	15
Total Factory Revenue	1,662	2,047	2,466	2,921	3,061	3,122	3,238	3,372	3,458	3,518	16	3
Increase over Prior Year (%)	21	23	20	18	5	2	4	4	3	2		

Note: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (October 1992)

Table 4
CAD/CAM/CAE/GIS History and Forecast Update

Application:	Mechanical
Region:	Worldwide
Platform:	Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	108,830	125,231	123,360	155,873	165,366	176,290	186,170	193,780	196,120	196,160	11	3
Unit Shipments or Seats	108,830	125,231	123,360	155,873	165,366	176,420	186,290	193,890	196,220	196,240	11	3
CPU Installed Base	214,714	330,171	428,548	535,228	624,531	700,070	767,030	826,390	874,480	909,380	31	8
Installed Seats	214,714	330,171	428,548	535,228	624,531	700,070	767,030	826,390	874,480	909,380	31	8
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	17.2	23.2	20.9	20.2	15.5	13.7	12.4	11.8	11.3	11.0	-3	-7
Hardware-Only ASP	4.2	4.4	4.8	4.6	4.2	3.9	3.6	3.4	3.2	3.1	0	-6
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	568	671	693	846	811	778	746	722	689	656	9	-4
CPU Revenue	504	577	631	771	740	717	690	670	640	611	10	-4
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	64	94	63	75	71	61	56	52	49	45	3	-9
Software Revenue	230	260	324	348	388	397	400	398	396	386	14	-0
Bundled	99	78	88	81	86	76	69	62	55	49	-3	-11
Unbundled	132	182	236	267	301	321	332	337	340	337	23	2
Service Revenue	40	33	56	68	70	81	92	102	110	115	15	10
Total Factory Revenue	838	965	1,073	1,262	1,269	1,256	1,238	1,222	1,194	1,157	11	-2
Increase over Prior Year (%)	35	15	11	18	1	-1	-1	-1	-2	-3		

Note: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (October 1992)

CAD/CAM/CAE—Personal CAD and Distribution Channels

Table 5

CAD/CAM/CAE/GIS History and Forecast Update

Application: AEC
Region: Worldwide
Platform: Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	52,307	62,271	81,183	102,707	128,575	144,230	168,220	191,450	212,010	228,530	25	12
Unit Shipments or Seats	52,307	62,271	81,183	102,707	128,575	144,280	168,280	191,520	212,090	228,610	25	12
CPU Installed Base	107,832	164,074	231,784	309,602	399,744	490,310	588,650	692,360	796,890	897,460	39	18
Installed Seats	107,832	164,074	231,784	309,602	399,744	490,310	588,650	692,360	796,890	897,460	39	18
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	16.7	17.7	17.3	17.9	11.3	10.2	9.2	8.6	8.1	7.8	-9	-7
Hardware-Only ASP	4.1	4.8	4.7	4.5	4.1	3.8	3.5	3.3	3.1	3.0	0	-6
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	236	325	446	516	570	586	625	666	697	717	25	5
CPU Revenue	224	306	420	487	542	558	596	636	666	687	25	5
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	12	19	26	29	27	28	29	30	31	30	23	2
Software Revenue	115	149	202	263	285	315	364	413	463	513	26	12
Bundled	18	18	27	28	27	30	32	33	33	32	10	4
Unbundled	96	131	175	235	258	285	333	380	431	481	28	13
Service Revenue	10	25	35	41	42	55	72	89	108	126	44	25
Total Factory Revenue	361	499	683	819	897	956	1,061	1,169	1,269	1,357	26	9
Increase over Prior Year (%)	13	38	37	20	9	7	11	10	9	7		

Note: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (October 1992)

Table 6
CAD/CAM/CAE/GIS History and Forecast Update

Application: GIS/Mapping
Region: Worldwide
Platform: Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	9,549	14,446	28,980	38,983	45,430	52,890	63,560	76,420	89,760	100,110	48	17
Unit Shipments or Seats	9,549	14,446	28,980	38,983	45,430	52,890	63,560	76,420	89,770	100,110	48	17
CPU Installed Base	12,175	26,479	54,577	90,747	129,522	169,630	212,250	258,870	309,950	362,840	81	23
Installed Seats	12,175	26,479	54,577	90,747	129,522	169,630	212,250	258,870	309,950	362,840	81	23
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	16.8	25.4	25.5	21.3	18.9	16.1	14.4	13.5	12.7	12.2	3	-8
Hardware-Only ASP	4.7	4.9	4.9	4.6	4.2	3.9	3.6	3.4	3.2	3.1	-3	-6
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	51	82	152	193	206	219	240	270	299	319	41	9
CPU Revenue	47	76	147	187	199	213	235	264	293	313	43	9
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	4	5	5	6	6	6	6	6	6	6	11	-1
Software Revenue	36	54	69	96	115	134	163	200	239	272	34	19
Bundled	7	8	7	9	9	9	9	9	9	9	7	-1
Unbundled	29	46	62	87	106	125	154	191	230	263	39	20
Service Revenue	3	5	9	13	15	21	29	39	48	58	54	32
Total Factory Revenue	90	141	230	303	336	374	432	508	586	648	39	14
Increase over Prior Year (%)	132	57	64	32	11	11	16	18	15	11		

Note: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (October 1992)

CAD/CAM/CAE—Personal CAD and Distribution Channels

Table 7

CAD/CAM/CAE/GIS History and Forecast Update

Application: Electronic Design Automation
Region: Worldwide
Platform: Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	37,714	47,062	46,786	55,514	64,868	64,260	62,800	57,380	42,700	30,120	15	-14
Unit Shipments or Seats	37,714	47,062	46,786	55,514	64,868	64,260	62,810	57,390	42,710	30,130	15	-14
CPU Installed Base	83,158	125,578	161,675	197,726	233,740	260,580	279,290	286,650	274,390	246,120	29	1
Installed Seats	83,158	125,578	161,675	197,726	233,740	260,580	279,290	286,650	274,390	246,120	29	1
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	11.1	14.8	18.2	19.4	13.0	11.9	10.4	9.8	9.2	9.0	4	-7
Hardware-Only ASP	4.7	5.3	5.1	5.0	4.4	4.0	3.7	3.5	3.3	3.2	-2	-6
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	187	265	278	308	309	279	245	209	147	99	13	-20
CPU Revenue	177	245	260	287	285	257	229	196	138	94	13	-20
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	10	20	18	21	24	22	16	12	8	5	24	-28
Software Revenue	165	153	171	195	211	217	220	223	223	221	6	1
Bundled	18	11	19	20	22	16	10	7	4	2	5	-40
Unbundled	146	142	153	175	189	200	210	216	219	219	7	3
Service Revenue	22	24	30	33	40	40	42	42	40	37	16	-2
Total Factory Revenue	374	443	480	537	560	536	507	474	409	356	11	-9
Increase over Prior Year (%)	-3	18	8	12	4	-4	-5	-7	-14	-13		

Note: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (October 1992)

Table 8
CAD/CAM/CAE/GIS History and Forecast Update

Application:	Electronic CAE
Region:	Worldwide
Platform:	Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	19,068	23,601	34,705	42,299	46,928	47,640	48,610	45,210	32,980	22,890	25	-13
Unit Shipments or Seats	19,068	23,601	34,705	42,299	46,928	47,630	48,590	45,200	32,970	22,890	25	-13
CPU Installed Base	53,379	73,247	100,163	129,767	159,211	184,210	204,550	215,230	208,120	187,460	31	3
Installed Seats	53,379	73,247	100,163	129,767	159,211	184,210	204,550	215,230	208,120	187,460	31	3
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	12.3	19.3	24.0	21.7	14.1	12.7	11.3	10.6	9.9	9.6	3	-7
Hardware-Only ASP	4.7	5.2	5.1	4.9	4.3	4.0	3.7	3.5	3.3	3.2	-2	-6
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	95	134	200	224	215	199	185	161	111	74	23	-19
CPU Revenue	90	124	186	212	204	189	176	154	107	71	23	-19
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	5	9	13	13	11	10	9	8	5	3	19	-25
Software Revenue	82	92	122	146	161	165	172	178	183	185	18	3
Bundled	9	7	15	16	18	12	8	5	3	1	17	-40
Unbundled	73	85	106	130	144	153	165	173	180	184	19	5
Service Revenue	12	15	22	25	29	29	31	33	31	30	24	1
Total Factory Revenue	190	240	344	396	405	393	389	372	325	289	21	-7
Increase over Prior Year (%)	-31	26	43	15	2	-3	-1	-4	-13	-11		

Note: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (October 1992)

CAD/CAM/CAE—Personal CAD and Distribution Channels

Table 9

CAD/CAM/CAE/GIS History and Forecast Update

Application:	IC Layout
Region:	Worldwide
Platform:	Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	1,739	1,427	487	342	536	520	400	310	240	170	-25	-21
Unit Shipments or Seats	1,739	1,427	487	342	536	540	420	330	250	180	-25	-20
CPU Installed Base	2,396	3,785	4,082	3,927	3,628	3,170	2,660	2,290	2,020	1,750	11	-14
Installed Seats	2,396	3,785	4,082	3,927	3,628	3,170	2,660	2,290	2,020	1,750	11	-14
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	6.0	15.6	23.6	27.0	26.8	24.0	21.6	20.3	19.4	18.5	45	-7
Hardware-Only ASP	5.0	5.0	3.7	3.1	2.3	2.1	1.9	1.8	1.7	1.7	-18	-6
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	8	9	3	3	3	3	2	1	1	0	-22	-32
CPU Revenue	8	8	3	2	3	3	2	1	1	0	-23	-33
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	0	0	0	0	0	0	0	0	0	0	-5	-32
Software Revenue	16	5	3	1	1	1	1	0	0	0	-47	-27
Bundled	1	1	1	0	0	0	0	0	0	0	-67	-100
Unbundled	15	4	2	1	1	1	1	0	0	0	-46	-27
Service Revenue	1	0	0	0	0	1	0	0	0	0	-27	-12
Total Factory Revenue	25	14	6	4	5	5	3	2	1	1	-34	-29
Increase over Prior Year (%)	266	-45	-53	-36	14	-2	-34	-29	-33	-41		

Note: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (October 1992)

Table 10
CAD/CAM/CAE/GIS History and Forecast Update

Application:	PCB/Hybrid/MCM
Region:	Worldwide
Platform:	Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	16,906	22,033	11,594	12,873	17,404	16,090	13,800	11,860	9,490	7,060	1	-17
Unit Shipments or Seats	16,906	22,033	11,594	12,873	17,404	16,090	13,800	11,860	9,490	7,060	1	-17
CPU Installed Base	27,383	48,545	57,430	64,033	70,901	73,210	72,080	69,130	64,250	56,910	27	-4
Installed Seats	27,383	48,545	57,430	64,033	70,901	73,210	72,080	69,130	64,250	56,910	27	-4
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	11.0	10.7	12.3	16.1	11.2	10.6	9.0	8.4	8.0	7.7	0	-7
Hardware-Only ASP	4.6	5.4	5.4	5.3	4.5	4.1	3.8	3.6	3.5	3.3	-1	-6
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	84	123	75	81	91	77	58	46	34	24	2	-23
CPU Revenue	79	112	71	73	78	66	51	41	31	22	-0	-22
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	4	11	4	8	13	11	7	5	3	2	32	-30
Software Revenue	67	57	47	48	49	50	47	44	40	36	-7	-6
Bundled	8	4	3	4	4	4	3	2	1	0	-13	-38
Unbundled	59	53	44	44	44	46	44	42	39	35	-7	-5
Service Revenue	9	9	8	8	11	11	10	9	8	7	6	-9
Total Factory Revenue	159	189	130	137	150	138	115	99	83	67	-1	-15
Increase over Prior Year (%)	53	19	-31	6	10	-8	-17	-14	-17	-20		

Note: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (October 1992)

CAD/CAM/CAE—Personal CAD and Distribution Channels

Table 11

CAD/CAM/CAE/GIS History and Forecast Update

Application:	All Applications
Region:	North America
Platform:	Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	109,628	141,725	129,427	145,652	175,632	189,530	201,290	212,020	217,890	222,900	13	5
Unit Shipments or Seats	109,628	141,725	129,427	145,652	175,632	189,530	201,290	212,020	217,890	222,900	13	5
CPU Installed Base	235,563	364,235	463,941	554,440	647,404	729,400	806,060	879,130	944,010	997,970	29	9
Installed Seats	235,563	364,235	463,941	554,440	647,404	729,400	806,060	879,130	944,010	997,970	29	9
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	17.0	25.7	17.1	19.3	14.5	12.5	11.1	10.4	9.6	9.2	-4	-9
Hardware-Only ASP	3.9	4.0	4.8	4.5	4.1	3.8	3.5	3.2	3.1	3.0	1	-6
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	452	572	625	667	722	718	700	693	675	662	12	-2
CPU Revenue	436	569	608	648	705	702	686	679	663	651	13	-2
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	16	3	17	20	17	16	15	14	12	11	1	-8
Software Revenue	216	260	305	358	387	412	442	478	511	531	16	7
Bundled	20	7	6	5	4	4	3	3	3	3	-32	-9
Unbundled	196	253	299	353	383	408	438	475	509	529	18	7
Service Revenue	22	33	43	48	51	61	73	86	97	108	23	16
Total Factory Revenue	690	866	974	1,073	1,160	1,192	1,215	1,256	1,284	1,302	14	2
Increase over Prior Year (%)	6	25	12	10	8	3	2	3	2	1		

Note: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (October 1992)

Table 12

CAD/CAM/CAE/GIS History and Forecast Update

Application: All Applications
Region: Europe
Platform: Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	59,570	66,843	93,225	119,257	143,697	156,990	178,200	197,240	206,130	208,880	25	8
Unit Shipments or Seats	59,570	66,843	93,225	119,257	143,697	156,950	178,150	197,190	206,100	208,850	25	8
CPU Installed Base	109,973	172,400	253,419	347,692	450,238	547,910	647,330	745,350	830,950	899,130	42	15
Installed Seats	109,973	172,400	253,419	347,692	450,238	547,910	647,330	745,350	830,950	899,130	42	15
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	10.2	13.9	24.9	25.4	19.2	17.0	15.4	14.6	14.1	13.7	17	-7
Hardware-Only ASP	4.5	5.3	5.0	4.9	4.3	4.0	3.7	3.4	3.2	3.1	-1	-6
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	304	398	530	648	685	683	702	724	713	689	23	0
CPU Revenue	273	370	481	590	626	629	653	676	668	648	23	1
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	31	28	49	58	59	54	49	48	45	42	18	-7
Software Revenue	181	207	258	302	338	378	435	487	537	579	17	11
Bundled	34	33	33	29	25	29	29	28	27	25	-8	0
Unbundled	146	174	225	273	313	349	406	458	510	553	21	12
Service Revenue	28	33	44	55	61	75	94	113	130	143	22	19
Total Factory Revenue	512	637	832	1,005	1,084	1,136	1,232	1,324	1,380	1,411	21	5
Increase over Prior Year (%)	43	24	30	21	8	5	8	8	4	2		

Note: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (October 1992)

Table 13

CAD/CAM/CAE/GIS History and Forecast Update

Application: All Applications
Region: Asia
Platform: Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	34,573	36,492	51,762	79,827	72,800	76,020	82,020	85,490	86,710	87,480	20	4
Unit Shipments or Seats	34,573	36,492	51,762	79,827	72,800	76,240	82,250	85,720	86,920	87,690	20	4
CPU Installed Base	64,747	98,466	142,958	208,199	257,483	299,590	336,190	365,050	385,900	401,070	41	9
Installed Seats	64,747	98,466	142,958	208,199	257,483	299,590	336,190	365,050	385,900	401,070	41	9
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	24.4	28.7	18.2	18.2	13.1	11.4	10.2	9.4	8.9	8.4	-14	-9
Hardware-Only ASP	5.5	7.0	4.7	4.3	4.2	3.8	3.5	3.3	3.1	3.0	-7	-7
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	266	351	384	509	437	401	383	367	346	327	13	-6
CPU Revenue	224	244	339	457	385	355	341	328	311	296	15	-5
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	43	107	45	53	52	46	42	39	35	31	5	-10
Software Revenue	141	143	190	224	250	242	233	225	220	217	15	-3
Bundled	86	75	100	105	114	97	87	78	70	63	7	-11
Unbundled	55	68	90	119	135	145	146	147	150	154	25	3
Service Revenue	24	20	40	50	52	56	61	64	67	69	22	6
Total Factory Revenue	431	514	615	784	738	699	677	656	633	612	14	-4
Increase over Prior Year (%)	26	19	20	28	-6	-5	-3	-3	-4	-3		

Note: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (October 1992)

Table 14
CAD/CAM/CAE/GIS History and Forecast Update

Application:	All Applications
Region:	Rest of World
Platform:	Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	4,628	3,949	5,894	8,341	12,111	15,130	19,250	24,280	29,880	35,650	27	24
Unit Shipments or Seats	4,628	3,949	5,894	8,341	12,111	15,130	19,250	24,280	29,880	35,650	27	24
CPU Installed Base	7,596	11,201	16,267	22,971	32,412	43,700	57,640	74,740	94,870	117,630	44	29
Installed Seats	7,596	11,201	16,267	22,971	32,412	43,700	57,640	74,740	94,870	117,630	44	29
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	9.8	11.4	16.3	9.4	6.6	6.0	5.5	5.2	4.9	4.9	-9	-6
Hardware-Only ASP	4.4	5.5	5.0	4.6	4.3	4.0	3.6	3.4	3.3	3.1	-1	-6
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	21	22	30	39	52	60	70	83	97	112	25	17
CPU Revenue	20	22	30	38	51	59	69	82	96	111	26	17
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	1	1	1	1	1	1	1	1	1	1	-3	6
Software Revenue	7	7	13	18	24	30	37	44	52	65	37	22
Bundled	2	1	1	0	1	1	1	1	1	0	-13	-13
Unbundled	5	6	12	18	23	29	37	43	52	65	45	23
Service Revenue	1	1	2	2	3	4	6	9	12	16	32	40
Total Factory Revenue	29	30	46	59	79	94	114	136	161	192	29	20
Increase over Prior Year (%)	76	5	52	29	33	19	21	19	19	19		

Note: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (October 1992)

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13930

Personal CAD
Final Market Share
September 7, 1992

Source:
Dataquest

Market Statistics

CAD/CAM/CAE
Personal CAD and Distribution Channels

Dataquest

CCAM-PER-MS-9202

Personal CAD
Final Market Share

September 7, 1992

Source:
Dataquest

Market Statistics

CAD/CAM/CAE
Personal CAD and Distribution Channels

CCAM-PER-MS-9202

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Personal CAD Final Market Share

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Note: All tables show estimated data.

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IC Layout

Note: All tables show estimated data.

Personal CAD Final Market Share

Introduction

CAD/CAM/CAE/GIS systems have dramatically changed the methods by which designers and production managers originate and implement products. CAD and CAE systems allow designers to create, draft, analyze, test, and manipulate products on a screen in two and three dimensions. As CAD/CAM/CAE/GIS systems continue to decrease in cost, they become more available and cost justifiable to new users.

In order to provide a comprehensive view of the CAD/CAM/CAE/GIS industry, Dataquest's CAD/CAM/CAE/GIS group maintains a large database of industry information. The type of information contained in the database is depicted in Figure 1.

Figure 1
CAD/CAM/CAE/GIS Market Database
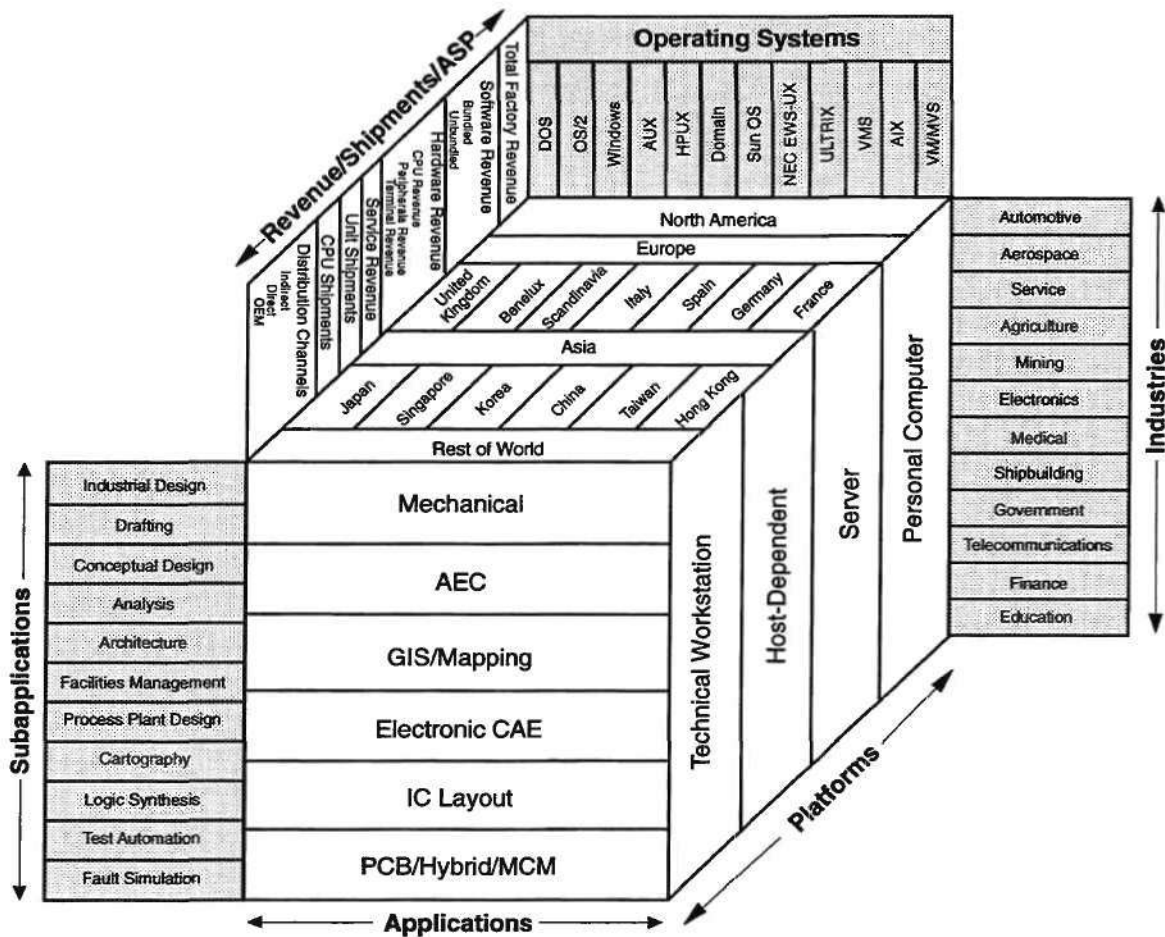
Source: Dataquest (September 1992)

G2000995

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Market Analysis

Analysis of Dataquest's final 1991 market share information shows that the entire worldwide CAD/CAM/CAE/GIS market grew at a 3.0 percent rate in 1991, to $14.8 billion. The software market portion grew by more than 7 percent, to $4.5 billion. Causes of the downward revision are examined in the following section.

Figure 2 depicts the market size and market growth rate of segments in the CAD/CAM/CAE/GIS software industry. In Figure 2, the size of the bubble reflects the size of the market, and the bubbles are centered over both their market size, and their market growth rate last year. For example, mechanical applications, valued at slightly more than $2.0 billion, grew close to the industry average, at 7 percent; while the considerably smaller GIS market grew at a brisk 16.8 percent rate. Each shade

in the figure represents a different market segmentation: segments by application are clear; segments by region have light shading, and segments by platform have diagonal lines. The sum of any one type of shading equals the total $4.5 billion software market. Corresponding to this figure, Table 1 lists market size and 1990-to-1991 growth rates by segment, for both software revenue and total revenue.

In 1991, the platform category of servers was created. Most of the revenue for servers came from what had formerly been classified as technical workstations, which depressed the apparent growth rate of technical workstations. In reality, workstations are the largest market platform, and had a better-than-average growth rate. In the illustration, workstations and servers are combined. In total, computer hardware sold into CAD/CAM/CAE/GIS remained flat with 1990 revenue.

Figure 2
CAD/CAM/CAE/GIS Market Portfolio
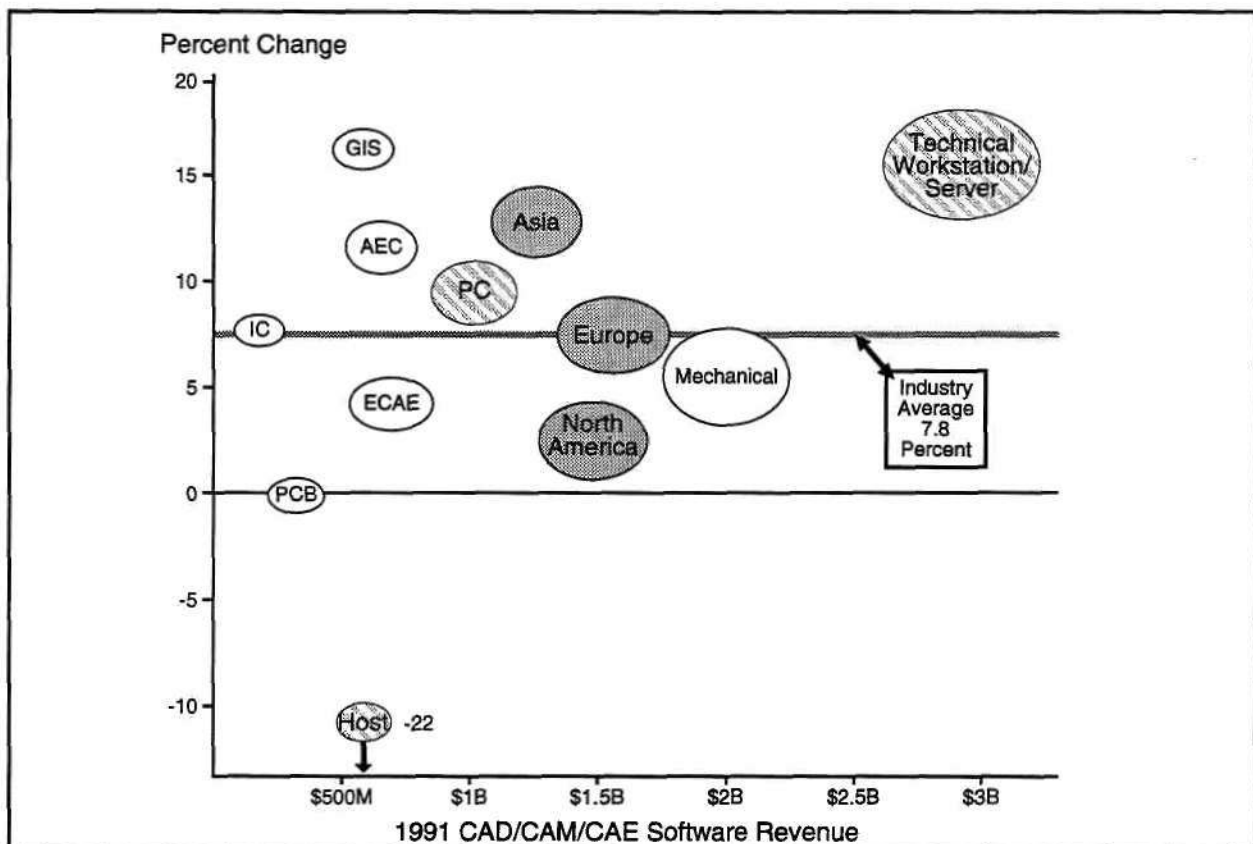
Source: Dataquest (September 1992)   G2000996

Table 1
CAD/CAM/CAE/GIS 1991 Market Summary

	Software Revenue 1990 ($M)	Software Revenue 1991 ($M)	Growth Rate (%)	Total Revenue 1990 ($M)	Total Revenue 1991 ($M)	Growth Rate (%)
Application						
Mechanical	1,910.5	2,040.1	6.8	7,176.5	7,238.5	0.9
AEC	589.4	659.5	11.9	2,173.6	2,330.0	7.2
GIS/Mapping	476.2	556.3	16.8	1,652.7	1,843.6	11.6
Electronic CAE	653.7	686.3	5.0	1,778.5	1,763.9	-0.8
IC Layout	184.5	195.8	6.1	527.1	574.7	9.0
PCB/Hybrid/MCM	328.0	328.3	0.1	1,089.8	1,086.1	-0.3
Total	4,142.2	4,466.3	7.8	14,398.2	14,836.8	3.0
Region						
North America	1,480.7	1,520.3	2.7	5,012.2	5,026.7	0.3
Europe	1,492.7	1,617.7	8.4	5,251.4	5,472.4	4.2
Asia	1,105.3	1,247.7	12.9	3,867.4	4,039.0	4.4
Rest of World	63.6	80.6	26.8	267.3	298.6	11.7
Total	4,142.2	4,466.3	7.8	14,398.2	14,836.8	3.0
Platform						
Technical Workstation	2,478.3	2,684.9	8.3	7,634.8	7,923.0	3.8
Host Dependent	761.8	593.1	-22.1	3,856.1	2,875.5	-25.4
Server	0	188.7	NA	0	991.1	NA
Personal Computer	902.1	999.6	10.8	2,907.3	3,047.1	4.8
Total	4,142.2	4,466.3	7.8	14,398.2	14,836.8	3.0

NA = Not applicable
Source: Dataquest (September 1992)

In contrast, Dataquest's research in our computer systems group shows that worldwide computer revenue declined 7 percent throughout the same period. So things could be worse—software was one of the few growth areas in some very tough economic times, and CAD software clearly boosted revenue for a few hardware suppliers.

About This Update

Since the preliminary market share numbers were published, eight more new companies have been added to the database, bringing the total new companies added this year to 15. The market share numbers also have been rechecked and verified for all vendors worldwide. Year-end 1991 financial results released this past spring have also been checked and incorporated into the final numbers.

The most important change affecting the market share numbers for this update was the

significant downward revision of revenue for most of the major vendors. Of the top 20 vendors listed in Table 2, 18 companies' revenue was revised downward, 10 of them significantly, based on final fourth-quarter financial results. Looking at software alone, Table 3 also portrays a primarily downward revision trend. In all cases, however, these changes have produced very small changes in any company's market position.

Two companies, Electronic Data Systems Corp. (EDS) and Computervision Corp., revealed previously unavailable information in 1992. EDS' market position was significantly lowered due to new reporting structure put in place after its purchase from McDonnell Douglas, which eliminated considerable revenue from service and consulting that has been reclassified as a separate, non-CAD activity. Computervision's revenue was also revised downward almost $90 million based on the company's final published results in conjunction

Table 2
1991 Top Twenty CAD/CAM/CAE/GIS Vendors Total Revenue

	Preliminary Total Revenue ($M)	Final Total Revenue ($M)	Revenue Change ($M)	Final Market Share (%)	Share Change (%)
IBM	1,762.0	1,712.1	-49.9	11.5	0.4
Intergraph	1,156.8	1,148.0	-8.8	7.7	0.4
Computervision	982.9	890.5	-92.4	6.0	-0.2
Hewlett-Packard	850.0	830.2	-19.8	5.6	0.2
Digital	926.7	816.1	-110.6	5.5	-0.4
Sun	679.7	674.3	-5.4	4.5	0.2
Fujitsu	491.8	442.9	-48.9	3.0	-0.1
Mentor	406.5	396.1	-10.4	2.7	0.1
Compaq	433.1	394.3	-38.8	2.7	-0.1
NEC	462.0	342.4	-119.6	2.3	-0.6
EDS	419.8	287.2	-132.6	1.9	-0.7
Autodesk	278.4	279.5	1.1	1.9	0.1
Siemens Nixdorf	309.0	267.5	-41.5	1.8	-0.2
Cadence	233.6	233.9	0.3	1.6	0.1
Apple	231.5	231.5	0.0	1.6	0.1
Nihon Unisys	245.4	210.9	-34.5	1.4	-0.1
Silicon Graphics	172.5	189.8	17.3	1.3	0.2
Hitachi	210.0	180.0	-30.0	1.2	-0.1
Control Data	160.2	176.3	16.1	1.2	0.2
Valid Logic	152.1	152.1	0.0	1.0	0.1
380 Other Companies	5,227.5	4,981.2	-246.3	33.6	0.5
All Companies	15,791.5	14,836.8	-954.7	100.0	0.0

Source: Dataquest (September 1992)

Table 3
1991 CAD/CAM/CAE/GIS Software Market

Company	Preliminary Software Revenue ($M)	Final Software Revenue ($M)	Revenue Change ($M)	Final Software Share (%)	Share Change (%)
IBM	369.0	378.8	9.8	8.5	0.7
Intergraph	282.4	280.3	-2.1	6.3	0.3
Autodesk	278.4	279.5	1.1	6.3	0.4
Computervision	272.9	247.3	-25.6	5.5	-0.3
Cadence	195.2	184.3	-10.9	4.1	0.0
Mentor Graphics	170.7	146.4	-24.3	3.3	-0.3
Fujitsu	134.4	119.6	-14.8	2.7	-0.1
Valid	109.6	108.5	-1.1	2.4	0.1
SDRC	93.5	101.1	7.6	2.3	0.3
EDS	146.6	100.1	-46.5	2.2	-0.9
Siemens Nixdorf Infosysteme	109.1	94.3	-14.8	2.1	-0.2
NEC	103.5	83.4	-20.1	1.9	-0.3

(Continued)

Table 3 (Continued)
1991 CAD/CAM/CAE/GIS Software Market

Company	Preliminary Software Revenue ($M)	Final Software Revenue ($M)	Revenue Change ($M)	Final Software Share (%)	Share Change (%)
ESRI	82.5	77.5	-5	1.7	0.0
Hitachi	88.2	75.6	-12.6	1.7	-0.2
Racal-Redac	67.6	70.6	3	1.6	0.2
Zuken	62.8	62.8	0	1.4	0.1
Hewlett-Packard	72.7	61.0	-11.8	1.4	-0.1
MacNeal-Schwender	52.8	53.6	0.8	1.2	0.1
CADAM	48.3	51.3	3	1.2	0.2
Schlumberger	60.9	50.9	-10	1.1	-0.2
Parametric Technology	43.4	43.4	0	1.0	0.1
Toshiba—No OEM	51.5	40.0	-11.5	0.9	-0.2
Matra Datavision	37.6	35.8	-1.8	0.8	0.0
Wacom	32.3	32.3	0	0.7	0.0
Viewlogic Systems	30.7	32.0	1.3	0.7	0.0
PDA Engineering	24.9	30.4	5.5	0.7	0.2
Synopsys	31.4	30.1	-1.3	0.7	0.0
Sharp System Products—No OEM	29.9	29.9	0	0.7	0.1
Control Data	28.2	29.3	1.1	0.7	0.1
Swanson Analysis	28.8	28.5	-0.3	0.6	0.0
ISICAD	27.6	27.6	0.9	0.6	0.0
Nihon Unisys	31.9	27.4	-4.5	0.6	-0.1
Alias Research	27.0	27.0	0	0.6	0.0
Mutoh Industries—No OEM	31.0	26.7	-4.3	0.6	-0.1
STI-Straessle	26.1	26.1	0	0.6	0.0
Nemetschek	24.0	24.7	0.6	0.6	0.1
COMPASS Design Automation-VLSI	28.1	23.9	-4.2	0.5	-0.1
Landmark Graphics	20.7	23.2	2.5	0.5	0.1
Auto-Trol	19.6	21.3	1.7	0.5	0.1
Harris EDA	19.1	20.1	0.8	0.4	0.0
IEZ	33.7	19.8	-13.9	0.4	-0.3
Hakuto	22.0	18.9	-3.2	0.4	-0.1
EEsof	18.1	18.1	0	0.4	0.0
Cimlinc	17.7	18.0	0.3	0.4	0.0
PAFEC	19.4	17.9	-1.5	0.4	0.0
MCS	17.2	17.2	0	0.4	0.0
Kewill Systems	17.1	17.1	0	0.4	0.0
CADKEY	14.8	16.4	1.6	0.4	0.1
Xilinx	16.2	16.2	0	0.4	0.1
CADIX	16.1	16.1	0	0.4	0.1
Tokyo Electron—No OEM	15.1	15.1	0	0.3	0.0
170 Other Companies	1,120.6	1,072.4	-58.5	23.8	0.1
Total	4,722.9	4,466.3	-256.6	100.0	0.0

Source: Dataquest (September 1992)

with the company's recapitalization. Both Digital Equipment Corporation and NEC Electronics Inc. are significant computer suppliers in the CAD/CAM market, so our reduced revenue estimates here produced a significant dollar drop. Changes to these four companies (EDS, Computervision, Digital, and NEC) account for approximately 50 percent of our market size reduction.

Final financial results for most Asian-based and European-based companies, which are not usually available until midspring, were also overoptimistically estimated (by the companies themselves and Dataquest) in January. The worldwide economic slowdown, much of which occurred in the fourth quarter of 1991, was significantly underestimated.

On the software side, most of the changes to vendor revenue were again downward, with fewer balancing upward adjustments (see Table 3). Beyond the companies already mentioned, Mentor Graphics Corp. revenue was adjusted to reflect a lower proportion of software in 1991, based on delayed shipment of a new software release—with a resulting reductions in software revenue. Here, too, changes to our software revenue produced almost insignificant changes to any company's market share.

In addition to these changes, the CAD/CAM/CAE/GIS group significantly refined its database model for tracking sales through the OEM distribution channel. This model change affected many of the major hardware vendors' market position by application as we tried to match their hardware OEM sales going through to turnkey vendors. This model change has been adjusted for historical information also and will continue to be refined each update.

Dataquest's policy is to continually update its market information, for current and past years, with any new data received in order to arrive at the most accurate market representation possible.

Dataquest Perspective

The market dynamics in the total CAD/CAM/CAE/GIS market comprises many factors based on application-specific market needs, diverse geographical issues, and the amazing growth

of computing and graphics resources. A more detailed analysis of each application area must be made to thoroughly understand the forces driving the entire market. Dataquest will discuss these forces and will provide an in-depth analysis of CAD/CAM/CAE/GIS regional issues, technology trends, and company analyses in future publications.

About This Document

This document contains Dataquest's detailed market share information on the CAD/CAM/CAE/GIS industry. Following is a description of the information reported in the *Market Share* book for each segment:

- Source—All companies in database; overview of industry

- Mechanical Applications—All companies in database with mechanical revenue

- AEC and GIS Applications—All companies in database with AEC or GIS revenue

- Electronic Design Automation Applications—All companies in database with EDA (electronic CAE, IC layout, PCB/hybrid/MCM) revenue

- Europe—All Europe-based companies and all other companies with more than $1 million in European revenue

- Asia—All Asia-based companies and all other companies with more than $1 million in Asian revenue

- Personal CAD and Distribution Channels—All companies in database with personal computer revenue

More detailed data on this market may be requested through our client inquiry service.

Segmentation

Dataquest defines CAD/CAM/CAE/GIS as systems used in the mechanical; architecture, engineering, and construction (AEC); GIS/mapping; and electronic design automation (EDA) application areas. The CAD/CAM/CAE/GIS market is defined

according to the following segmentation scheme:

- CAD/CAM/CAE/GIS

  - Mechanical

  - AEC (Architecture, Engineering, and Construction)

  - GIS/Mapping (Geographic Information Systems)

  - EDA (Electronic Design Automation)

    - Electronic CAE

    - IC Layout

    - PCB/Hybrid/MCM

In addition, more detailed information by subapplication is available and usually published in *Dataquest Perspectives*.

Definitions

This section lists the definitions that are specific to this document.

Application definitions are as follows:

- Mechanical—Mechanical CAD/CAM refers to computer-aided tools used to design, analyze, document, and manufacture discrete parts, components, and assemblies.

- Architecture, Engineering, and Construction (AEC)—This segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.

- Geographic Information Systems (GIS)/Mapping—This is a computer-based technology, composed of hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.

- Electronic Design Automation (EDA)—This segment covers computer-based tools that are used to automate the process of designing an electronic product including printed circuit boards, ICs, and systems. EDA

includes ECAE, IC Layout, and PCB/Hybrid/MCM, as follows:

- Electronic Computer-Aided Engineering (CAE)—These are computer-aided tools used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the product). Examples of Electronic CAE applications are schematic capture and simulation.

- IC Layout—This is a software application tool that is used to create and validate the physical implementation of an integrated circuit (IC). The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), design verification tools (DRC/ERC/logic-to-layout), compilers, and module development tools.

- Printed Circuit Board (PCB)/Hybrid/Multichip Module (MCM)—This segment covers products that are used to create the placement and routing of the traces and components laid out on a printed circuit board. Also, included in this category are thermal analysis tools.

Regional definitions are as follows:

- North America—Includes United States and Canada

- Europe—Includes the United Kingdom, Scandinavia, Benelux, France, Germany, Italy, Spain, and Rest of Europe

- Asia—Includes Japan, Singapore, Taiwan, Korea, China, and Hong Kong

- Rest of World—All other countries including Australia, New Zealand, Oceania, Africa, Central America, South America, and the Middle East

Platform definitions are as follows:

- Technical Workstation—This is a single-user computer that is distinguished from a personal computer by its features and by the user's potential range of expansion on the platform. Features include a virtual, multitasking operating system (UNIX, VMS, DOMAIN); the computer is designed by manufacturer to run high-performance graphic applications in a multiuser/multitasking environment.

- Host-Dependent—This is a shared logic system in which the external workstations' functions are dependent on a host computer.

- Server—A server is a computer that transparently provides its resources for use by other computer systems. It is a system on a network that provides specific functionality to other computer systems: the clients. Functions include file storage, database access, compute capability, and others. Dataquest tracks the following major categories of servers used for CAD/CAM/CAE/GIS applications:

  - Compute Servers—These systems provide capabilities for solving numerical problems (for example, simulations, statistical calculations, and simultaneous partial differential equations). System features usually include high-speed computational capabilities (for example, vector and parallel processing) and large memories.

  - Print Servers—These systems provide access to printers, specialized printing applications software, and print spooling resources to a network.

  - File Servers—These systems provide mass storage capability to clients on a network. Services can range from temporary storage of working files to long-term backup and archive systems.

  - Database Servers—These systems manage databases as a shared resource to a network. These servers handle such functions as physical data storage, data security, and high-level queries and can access stored information at the record level.

- Personal Computer—This is defined as a single-user computer that is distinguished from a technical workstation by its features and by the user's potential range of expansion on the platform. Features found in technical workstations (such as a virtual operating system, networking, high-performance graphics, multiuser/multitasking capability) are optional rather than integrated by the manufacturer.

Revenue/shipments/ASP definitions are as follows:

- Total factory revenue is defined as the amount of money received by a manufacturer for its goods measured in U.S. dollars. Total factory revenue does not include revenue that a company may receive from products that are sold to another company for resale (OEM revenue).

- Unit shipment is defined as the number of products delivered (that is, seats).

- Software revenue is revenue derived from the sale of bundled (part of a turnkey system) and unbundled software.

- Service revenue is defined as revenue derived from the service and support of CAD/CAM/CAE/GIS systems. Service revenue can be calculated in the tables by subtracting hardware and software revenue from total revenue.

Market Share Methodology

Dataquest uses both primary and secondary sources to produce our market share data. In the fourth quarter of each year, we survey all major participants in each industry. Each vendor is offered the opportunity to self-report the information required. Although there is a primary contact for each company, large companies are surveyed across product lines and across geographic regions. Thus, there is a corresponding increase in the number of contacts at large companies. (Dataquest maintains a large contact database on all sources of information). Examples of the job titles of people contacted for information are the following:

- President and CEO

- Vice President and General Manager

- Vice President of Marketing

- Vice President, Strategic Product Planning

- Director of Strategic Planning

- Director of Marketing

- Director of Market Development

- Manager, CAD/CAM/CAE/GIS Marketing Programs

- Market Research Analyst

We resurvey select companies during the second quarter of the following year to verify final annual results and then publish final market share information based on this updated information. Our annual delivery schedule is as follows:

- First Quarter (January 31)—Preliminary market data are available. All tables will be published and distributed to clients. Historical database is opened for changes for a six-month period.

- Second Quarter (March 31)—We provide complete preliminary forecast tables, including a new five-year forecast period.

- Third Quarter (July 1)—We send complete, final updated market share tables based on additional data collection and analysis over the previous six months. At this point, the market share database is frozen and will not be changed until the end of the year. For the next six months, supplementary market data will be based on these final market data.

- Fourth Quarter (October 1)—We provide complete final forecast tables, taking into consideration changes in the market during the previous six months.

The Audit Process

Data supplied by vendors are evaluated against information drawn from many sources, including the following:

- Revenue published by major industry participants

- Estimates made by knowledgeable and reliable industry spokespersons

- Government data or trade association data

- Published product literature and price lists

- Interviews with knowledgeable manufacturers, distributors, and users

- Relevant economic data

- Information and data from online data banks

- Articles in both the general and trade press

- Annual reports, SEC documents, credit reports

- Company publications and press releases

- Reports from financial analysts

- User studies

- Reseller and supplier reports and reports from a vendor's competitors

In addition, Dataquest sums vendor revenue across other industries covered by Dataquest to make sure that revenue is not credited twice and checks with multiple sources at one company to cross-check data on that company.

Dataquest analysts have many years of experience in how to apply the above tools to get the most accurate information possible on a particular company (such as what to use when and what industry averages are). We believe that the estimates presented here are the most accurate and meaningful generally available today. It is the CAD/CAM/CAE/GIS group's policy to continually update our market information for any year, based on any new data received, in order to arrive at the most accurate market representation possible.

Dataquest's CAD/CAM/CAE/GIS market numbers are often higher than those reported by other sources. We survey worldwide, which involves more vendors, higher total market revenue, lower market share per vendor, and a more accurate market picture—particularly useful when comparing regions or applications.

Notes on Market Share

For the 1991 market share cycle, Dataquest's CAD/CAM/CAE/GIS group added server as a platform. The platform categories now include technical workstation, host-dependent, server, and personal computer. Revenue formerly classified in technical workstations, host-dependent, or personal computer may now be more accurately classified, where appropriate, in the server category. However, because of this reclassification, data and growth rates for the other platform areas were affected.

Finally, please note that despite the care taken in gathering and analyzing the available data and in attempting to categorize those data in a meaningful way, careful attention must be paid to the definitions and assumptions used herein when interpreting the estimates presented in this document. Various companies, government agencies, and trade associations may use slightly different definitions of product categories and regional groupings, or they may include different companies in their summaries. These differences should be kept in mind when making comparisons between these data and those provided by others.

Table 4
1991 CAD/CAM/CAE/GIS Final Market Share

Application: All Applications
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Compaq	394.3	394.3	.0	76,897	12.9%	21.0%	.0%	19.1%
Autodesk	250.8	.0	250.8	0	8.2%	.0%	25.1%	.0%
IBM	246.5	234.1	.0	58,536	8.1%	12.5%	.0%	14.6%
Apple Computer	231.5	203.7	.0	48,504	7.6%	10.8%	.0%	12.1%
Hewlett-Packard	143.5	114.7	.0	27,889	4.7%	6.1%	.0%	6.9%
NEC	110.4	92.7	8.8	15,568	3.6%	4.9%	.9%	3.9%
CADAM	90.4	30.0	51.3	6,000	3.0%	1.6%	5.1%	1.5%
Fujitsu	70.9	45.2	18.6	2,354	2.3%	2.4%	1.9%	.6%
Hitachi	61.2	29.4	25.7	3,025	2.0%	1.6%	2.6%	.8%
Hakuto	43.8	26.3	17.5	1,499	1.4%	1.4%	1.8%	.4%
Wacom	42.5	8.4	29.5	719	1.4%	.4%	2.9%	.2%
Mutoh Industries—NO OEM	37.4	21.0	14.6	1,329	1.2%	1.1%	1.5%	.3%
Dell Computer	30.9	30.9	.0	7,905	1.0%	1.6%	.0%	2.0%
Intergraph	30.4	.0	28.6	0	1.0%	.0%	2.9%	.0%
Investronica SA	28.1	22.5	2.8	1,125	.9%	1.2%	.3%	.3%
Viewlogic Systems	22.1	.0	17.3	0	.7%	.0%	1.7%	.0%
Toshiba—NO OEM	20.6	10.3	8.3	1,990	.7%	.5%	.8%	.5%
Wiechers Datentechnik	20.0	11.4	6.0	577	.7%	.6%	.6%	.1%
Everex Systems	17.3	17.3	.0	7,627	.6%	.9%	.0%	1.9%
Cadtron	16.3	8.1	6.5	251	.5%	.4%	.6%	.1%
Xilinx	16.2	.0	14.6	0	.5%	.0%	1.5%	.0%
Vero International Software	15.5	.0	14.1	0	.5%	.0%	1.4%	.0%
Research Machines	15.0	15.0	.0	2,420	.5%	.8%	.0%	.6%
LPKF	15.0	9.8	3.8	650	.5%	.5%	.4%	.2%

(Continued)

Table 4 (Continued)
1991 CAD/CAM/CAE/GIS/GIS Final Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Nemetschek	14.9	5.8	8.6	288	.5%	.3%	.9%	.1%
Tebis	14.5	2.2	10.1	80	.5%	.1%	1.0%	.0%
Computervision	14.0	.0	13.3	163	.5%	.0%	1.3%	.0%
Ziegler Informatics	13.9	.0	13.9	0	.5%	.0%	1.4%	.0%
Altera	13.7	.0	11.6	0	.4%	.0%	1.2%	.0%
CADKEY	13.6	.0	13.6	0	.4%	.0%	1.4%	.0%
Andor	12.8	3.2	9.1	116	.4%	.2%	.9%	.0%
ISICAD	12.8	.0	12.8	0	.4%	.0%	1.3%	.0%
Soft-Tech Software Technologie	11.5	2.9	7.5	765	.4%	.2%	.7%	.2%
ESRI	11.0	.0	11.0	0	.4%	.0%	1.1%	.0%
Orcad	10.5	.0	10.5	0	.3%	.0%	1.0%	.0%
Design Automation	10.2	.0	10.2	0	.3%	.0%	1.0%	.0%
Mitsubishi Electric	10.1	6.6	3.4	974	.3%	.4%	.3%	.2%
ACTEL	10.0	.0	9.0	0	.3%	.0%	.9%	.0%
CPU	9.4	.0	8.6	0	.3%	.0%	.9%	.0%
CNC Software	9.2	.0	9.2	0	.3%	.0%	.9%	.0%
Strategic Mapping	9.0	.0	9.0	0	.3%	.0%	.9%	.0%
PADS Software	8.7	.0	7.4	0	.3%	.0%	.7%	.0%
Cinatron	8.0	3.6	3.6	417	.3%	.2%	.4%	.1%
Infocel	8.0	1.6	6.0	174	.3%	.1%	.6%	.0%
BATISOFT	7.9	1.2	4.0	325	.3%	.1%	.4%	.1%
Aucotec	7.9	1.3	5.1	328	.3%	.1%	.5%	.1%
Elsof	7.8	.0	7.0	0	.3%	.0%	.7%	.0%
DAT Standard info systems	7.6	.0	7.2	0	.2%	.0%	.7%	.0%

(Continued)

Table 4 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: All Applications
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Microsim	7.6	.0	7.1	0	.2%	.0%	.7%	.0%
Point Control	7.4	.0	7.4	0	.2%	.0%	.7%	.0%
ETAK	7.4	.4	7.0	18	.2%	.0%	.7%	.0%
Softdesk	7.3	.0	7.3	0	.2%	.0%	.7%	.0%
MapInfo	7.2	.0	5.8	0	.2%	.0%	.6%	.0%
Ground Modelling Systems	7.0	3.9	2.9	58	.2%	.2%	.3%	.0%
Micrografx	7.0	.0	7.0	0	.2%	.0%	.7%	.0%
Data I/O	7.0	.0	7.0	0	.2%	.0%	.7%	.0%
Hochtief	6.5	1.0	4.6	81	.2%	.1%	.5%	.0%
Serbl	6.5	.0	6.5	0	.2%	.0%	.6%	.0%
Moda CAD	6.0	1.5	4.2	50	.2%	.1%	.4%	.0%
Sweet's Electronic Publishing	5.9	.0	4.8	0	.2%	.0%	.5%	.0%
RIB/RZB	5.7	.5	4.7	39	.2%	.0%	.5%	.0%
Aspen Technology	5.6	.0	5.0	0	.2%	.0%	.5%	.0%
Kloeckner-Moeller	5.4	1.1	3.8	44	.2%	.1%	.4%	.0%
Claris	5.4	.0	5.4	0	.2%	.0%	.5%	.0%
Swanson Analysis	5.3	.0	5.3	0	.2%	.0%	.5%	.0%
nb Programme	4.9	2.4	1.7	117	.2%	.1%	.2%	.0%
Technovision	4.8	.0	4.8	0	.2%	.0%	.5%	.0%
Olivetti	4.7	4.0	.0	793	.2%	.2%	.0%	.2%
Anilam Electronics	4.7	1.4	2.8	58	.2%	.1%	.3%	.0%
BETRONEX	4.6	.5	4.1	86	.2%	.0%	.4%	.0%
Microway	4.6	2.8	1.4	58	.1%	.1%	.1%	.0%
Algor Interactive Systems	4.6	.0	4.0	0	.1%	.0%	.4%	.0%

(Continued)

Table 4 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: All Applications
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
International Software Systems	4.5	.0	4.5	0	.1%	.0%	.5%	.0%
American Small Business Comp.	4.0	.0	4.0	0	.1%	.0%	.4%	.0%
Computer Services Consultants	4.0	.0	4.0	0	.1%	.0%	.4%	.0%
Pathtrace	4.0	.9	2.6	60	.1%	.0%	.3%	.0%
Racal-Redac	3.9	.0	3.9	0	.1%	.0%	.4%	.0%
MCS	3.9	.0	3.5	0	.1%	.0%	.3%	.0%
ADRA Systems	3.7	.0	3.0	0	.1%	.0%	.3%	.0%
Robocom	3.6	.0	3.6	0	.1%	.0%	.4%	.0%
Innovative Data Design	3.5	.0	3.5	0	.1%	.0%	.4%	.0%
Mitsui Engineering	3.4	2.4	.7	58	.1%	.1%	.1%	.0%
Datagraphic	3.4	1.7	1.4	55	.1%	.1%	.1%	.0%
GeoGraphix	3.3	.0	2.4	0	.1%	.0%	.2%	.0%
Engineering Mechanics	3.2	.2	2.7	392	.1%	.0%	.3%	.1%
PacSoft	3.1	.0	3.1	0	.1%	.0%	.3%	.0%
Superdraft	3.1	1.4	1.5	168	.1%	.1%	.2%	.0%
ASG—Archsoft	2.9	.0	2.9	0	.1%	.0%	.3%	.0%
Whessoe Computing Systems	2.9	.0	2.9	0	.1%	.0%	.3%	.0%
Accel Technologies	2.8	.6	2.5	18	.1%	.0%	.3%	.0%
ERDAS	2.6	.0	1.8	0	.1%	.0%	.2%	.0%
Sigma Design	2.6	.0	2.4	0	.1%	.0%	.2%	.0%
Generation 5 Technology	2.5	.0	2.5	0	.1%	.0%	.3%	.0%
ALDEC	2.5	.0	2.5	0	.1%	.0%	.3%	.0%
Sharp System Products—NO OEM	2.5	1.3	1.2	31	.1%	.1%	.1%	.0%
Visionics	2.4	.0	1.8	10	.1%	.0%	.2%	.0%

(Continued)

Table 4 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: All Applications
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Aries Technology	2.4	.0	2.2	0	.1%	.0%	.2%	.0%
ALS Design	2.4	.0	2.4	0	.1%	.0%	.2%	.0%
Facility Mapping Systems	2.3	.0	2.1	0	.1%	.0%	.2%	.0%
Micro Engineering Solutions	2.3	.7	1.5	35	.1%	.0%	.2%	.0%
Carrier Corporation	2.3	.0	2.3	0	.1%	.0%	.2%	.0%
Teradyne	2.2	.0	1.7	0	.1%	.0%	.2%	.0%
Elstree Computing	2.2	1.0	1.2	60	.1%	.1%	.1%	.0%
CADWorks	2.1	.0	1.8	0	.1%	.0%	.2%	.0%
Accugraph	2.1	.1	1.8	10	.1%	.0%	.2%	.0%
CAD-UL	2.1	.0	2.1	0	.1%	.0%	.2%	.0%
Evolution Computing	2.0	.0	2.0	0	.1%	.0%	.2%	.0%
Infinite Graphics	2.0	.0	2.0	0	.1%	.0%	.2%	.0%
Integrated Computer Graphics	2.0	1.0	.8	114	.1%	.1%	.1%	.0%
Foresight Resources	2.0	.0	1.8	0	.1%	.0%	.2%	.0%
Harris EDA	1.9	.1	1.2	2	.1%	.0%	.1%	.0%
PAFEC	1.9	.0	1.9	0	.1%	.0%	.2%	.0%
Terra Sciences	1.8	.0	1.8	0	.1%	.0%	.2%	.0%
Massteck	1.8	.0	1.8	0	.1%	.0%	.2%	.0%
Lamp Software	1.7	.3	1.3	73	.1%	.0%	.1%	.0%
Engineered Software	1.7	.0	1.7	0	.1%	.0%	.2%	.0%
Genasys II	1.6	.6	1.0	13	.1%	.0%	.1%	.0%
Intera Tydac	1.5	.0	1.5	0	.0%	.0%	.2%	.0%
LandCadd	1.5	.0	1.4	0	.0%	.0%	.1%	.0%
Radian Corporation	1.5	.0	.9	0	.0%	.0%	.1%	.0%

(Continued)

Table 4 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

| | | | | | Market Share | | | |
Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Research Engineers—Civilsoft	1.5	.0	1.5	0	.0%	.0%	.1%	.0%
FEA	1.4	.3	.4	13	.0%	.0%	.0%	.0%
Tanner Research	1.4	.0	1.2	0	.0%	.0%	.1%	.0%
ISDATA	1.4	.0	1.2	0	.0%	.0%	.1%	.0%
GRAPHSOFT	1.4	.0	1.4	0	.0%	.0%	.1%	.0%
Schlumberger	1.3	.3	.6	39	.0%	.0%	.1%	.0%
Kork Systems	1.3	.1	.9	19	.0%	.0%	.1%	.0%
Rasna Corporation	1.3	.0	1.3	0	.0%	.0%	.1%	.0%
Compact Software	1.3	.0	1.3	0	.0%	.0%	.1%	.0%
Integer	1.2	.0	1.0	0	.0%	.0%	.1%	.0%
Aucos elektronische Gerate	1.2	.4	.8	116	.0%	.0%	.1%	.0%
MacNeal-Schwendler	1.1	.0	1.1	0	.0%	.0%	.1%	.0%
Mucke Software	1.1	.6	.4	26	.0%	.0%	.0%	.0%
Spectrum Software	1.1	.0	1.1	0	.0%	.0%	.1%	.0%
Mega CADD	1.0	.0	1.0	0	.0%	.0%	.1%	.0%
Caddlink	1.0	.0	1.0	0	.0%	.0%	.1%	.0%
Cascade Graphics	1.0	.0	1.0	0	.0%	.0%	.1%	.0%
Aura CAD/CAM Systems	1.0	.0	.9	0	.0%	.0%	.1%	.0%
Intrinsix	1.0	1.0	.0	10	.0%	.1%	.0%	.0%
Geometria GIS Systems House	1.0	.2	.2	14	.0%	.0%	.0%	.0%
S.T.L.D. s.r.l.	1.0	.0	1.0	0	.0%	.0%	.1%	.0%
Omation	.9	.0	.9	0	.0%	.0%	.1%	.0%
ARKTEC	.9	.2	.6	30	.0%	.0%	.1%	.0%
Cadisys	.9	.0	.9	0	.0%	.0%	.1%	.0%

(Continued)

Table 4 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Vision 3D	.9	.5	.2	6	.0%	.0%	.0%	.0%
Maptech	.9	.0	.9	0	.0%	.0%	.1%	.0%
Terr-Mar Resource Info Svs	.9	.4	.5	22	.0%	.0%	.0%	.0%
CAMTEK	.9	.0	.7	0	.0%	.0%	.1%	.0%
Contract Data Research	.9	.0	.6	0	.0%	.0%	.1%	.0%
Number One Systems	.8	.2	.6	62	.0%	.0%	.1%	.0%
A.I. Systems	.8	.0	.8	0	.0%	.0%	.1%	.0%
CAD Lab	.8	.0	.6	0	.0%	.0%	.1%	.0%
Dynaware	.8	.0	.8	0	.0%	.0%	.1%	.0%
Douglas Electronics	.8	.0	.8	0	.0%	.0%	.1%	.0%
INS Engineering	.7	.5	.1	16	.0%	.0%	.0%	.0%
Phase Three Logic	.7	.0	.7	0	.0%	.0%	.1%	.0%
Vamp	.7	.0	.7	0	.0%	.0%	.1%	.0%
CAD-Capture	.7	.0	.1	0	.0%	.0%	.0%	.0%
Engineering Systems Corp.	.7	.0	.5	0	.0%	.0%	.1%	.0%
Uniras	.7	.0	.7	0	.0%	.0%	.1%	.0%
IGC Technology	.7	.0	.7	0	.0%	.0%	.1%	.0%
debis Systemhaus	.7	.2	.4	12	.0%	.0%	.0%	.0%
Hahn & Kolb	.7	.4	.2	14	.0%	.0%	.0%	.0%
Mc2 Engineering Software	.7	.0	.7	0	.0%	.0%	.1%	.0%
ECOM Associates	.7	.0	.6	4	.0%	.0%	.1%	.0%
CADMATIC	.7	.0	.4	4	.0%	.0%	.0%	.0%
Caroline Informatique	.6	.1	.3	9	.0%	.0%	.0%	.0%
ESDU International	.6	.0	.6	0	.0%	.0%	.1%	.0%

(Continued)

Table 4 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Machinery Sales	.6	.0	.6	0	.0%	.0%	.1%	.0%
Digital	.6	.0	.4	0	.0%	.0%	.0%	.0%
Integrated Silicon Systems	.6	.2	.4	8	.0%	.0%	.0%	.0%
Ashlar	.5	.0	.5	0	.0%	.0%	.1%	.0%
Capilano Computing	.5	.0	.5	0	.0%	.0%	.1%	.0%
Bechtel Software	.5	.0	.5	0	.0%	.0%	.1%	.0%
PLUS Logic	.4	.1	.4	11	.0%	.0%	.0%	.0%
Applications in CADD	.4	.0	.3	0	.0%	.0%	.0%	.0%
The CAD Group	.4	.0	.4	0	.0%	.0%	.0%	.0%
Ithaca Software	.4	.0	.4	0	.0%	.0%	.0%	.0%
BV Engineering	.4	.0	.4	0	.0%	.0%	.0%	.0%
Geosoft	.4	.0	.4	0	.0%	.0%	.0%	.0%
Georace Technologies	.3	.0	.3	0	.0%	.0%	.0%	.0%
GEOVISION Inc.	.3	.2	.1	37	.0%	.0%	.0%	.0%
Synthesis	.3	.0	.3	0	.0%	.0%	.0%	.0%
Masta Corporation	.3	.0	.2	0	.0%	.0%	.0%	.0%
SIMUCAD	.3	.0	.3	0	.0%	.0%	.0%	.0%
Simulation Science	.2	.0	.2	0	.0%	.0%	.0%	.0%
The Great Softwestern Co.	.2	.0	.2	0	.0%	.0%	.0%	.0%
Bobcat Systems	.2	.0	.2	0	.0%	.0%	.0%	.0%
Genrad	.2	.0	.2	10	.0%	.0%	.0%	.0%
Instrumatic Espanola	.2	.0	.2	0	.0%	.0%	.0%	.0%
Norsk Data	.2	.1	.0	6	.0%	.0%	.0%	.0%
Geomath	.2	.0	.2	0	.0%	.0%	.0%	.0%

(Continued)

Table 4 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: All Applications
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Pacific Numerics	.2	.0	.2	0	.0%	.0%	.0%	.0%
Technische Computer Systeme	.2	.0	.2	5	.0%	.0%	.0%	.0%
Simutest	.2	.0	.2	0	.0%	.0%	.0%	.0%
TOOL Software	.1	.0	.1	3	.0%	.0%	.0%	.0%
National Semiconductor	.1	.0	.1	0	.0%	.0%	.0%	.0%
Radan Computational	.1	.0	.1	5	.0%	.0%	.0%	.0%
A/E Microsystems	.0	.0	.0	7	.0%	.0%	.0%	.0%
Dolphin Integration	.0	.0	.0	0	.0%	.0%	.0%	.0%
NCR Microelectronics	.0	.0	.0	0	.0%	.0%	.0%	.0%
Other Companies	496.2	489.5	6.7	130,308	16.3%	26.0%	.7%	32.4%
All Companies	3,047.1	1,880.4	999.4	401,812	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	2,295.2	1,522.8	666.6	364,818	75.3%	81.0%	66.7%	90.8%
All Asian-Based Companies	440.8	247.4	161.0	27,677	14.5%	13.2%	16.1%	6.9%
All European-Based Companies	311.2	110.2	171.7	9,316	10.2%	5.9%	17.2%	2.3%
All Hardware Companies	1,618.1	1,548.3	.0	369,290	53.1%	82.3%	.0%	91.9%
All Turnkey & SW Companies	1,429.0	332.1	999.4	32,522	46.9%	17.7%	100.0%	8.1%

Source: Dataquest (September 1992)

Table 5
1991 CAD/CAM/CAE/GIS Final Market Share

Application: Mechanical
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Compaq	141.2	141.2	.0	27,529	11.2%	17.6%	.0%	16.8%
IBM	96.1	91.3	.0	22,829	7.6%	11.4%	.0%	13.9%
Apple Computer	94.9	83.5	.0	19,887	7.5%	10.4%	.0%	12.1%
Autodesk	93.5	.0	93.5	0	7.4%	.0%	24.1%	.0%
Hewlett-Packard	67.0	53.5	.0	13,013	5.3%	6.7%	.0%	7.9%
CADAM	64.5	22.5	35.7	4,500	5.1%	2.8%	9.2%	2.7%
Hitachi	45.9	22.0	19.3	2,269	3.6%	2.7%	5.0%	1.4%
NEC	45.7	38.4	3.7	6,441	3.6%	4.8%	.9%	3.9%
Hakuto	43.8	26.3	17.5	1,499	3.5%	3.3%	4.5%	.9%
Mutoh Industries—NO OEM	29.1	16.3	11.4	1,034	2.3%	2.0%	2.9%	.6%
Fujitsu	29.1	18.3	7.8	965	2.3%	2.3%	2.0%	.6%
Investronica SA	28.1	22.5	2.8	1,125	2.2%	2.8%	.7%	.7%
Wiechers Datentechnik	20.0	11.4	6.0	577	1.6%	1.4%	1.5%	.4%
Toshiba—NO OEM	18.1	9.1	7.2	1,747	1.4%	1.1%	1.9%	1.1%
Vero International Software	15.5	.0	14.1	0	1.2%	.0%	3.6%	.0%
Tebis	14.5	2.2	10.1	80	1.1%	.3%	2.6%	.0%
Dell Computer	12.4	12.4	.0	3,162	1.0%	1.5%	.0%	1.9%
Computervision	11.2	.0	10.7	130	.9%	.0%	2.7%	.1%
CADKEY	11.0	.0	11.0	0	.9%	.0%	2.8%	.0%
Design Automation	10.2	.0	10.2	0	.8%	.0%	2.6%	.0%
Cadttron	9.8	4.9	3.9	151	.8%	.6%	1.0%	.1%
CNC Software	9.2	.0	9.2	0	.7%	.0%	2.4%	.0%
Andor	8.5	2.1	6.1	77	.7%	.3%	1.6%	.0%
Wacom	8.4	1.6	5.8	141	.7%	.2%	1.5%	.1%

(Continued)

Table 5 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: Mechanical
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Cinatron	8.0	3.6	3.6	417	.6%	.4%	.9%	.3%
Point Control	7.4	.0	7.4	0	.6%	.0%	1.9%	.0%
Research Machines	7.2	7.2	.0	1,162	.6%	.9%	.0%	.7%
DAT Standard info systems	6.5	.0	6.1	0	.5%	.0%	1.6%	.0%
Ziegler Informatics	5.6	.0	5.6	0	.4%	.0%	1.4%	.0%
Swanson Analysis	5.3	.0	5.3	0	.4%	.0%	1.4%	.0%
Intergraph	5.0	.0	4.8	0	.4%	.0%	1.2%	.0%
Anilam Electronics	4.7	1.4	2.8	58	.4%	.2%	.7%	.0%
Algor Interactive Systems	4.6	.0	4.0	0	.4%	.0%	1.0%	.0%
Mitsubishi Electric	4.5	3.0	1.5	435	.4%	.4%	.4%	.3%
Serbi	4.4	.0	4.4	0	.3%	.0%	1.1%	.0%
Moda CAD	4.2	1.0	2.9	35	.3%	.1%	.8%	.0%
Pathtrace	4.0	.9	2.6	60	.3%	.1%	.7%	.0%
Everex Systems	4.0	4.0	.0	1,754	.3%	.5%	.0%	1.1%
MCS	3.9	.0	3.5	0	.3%	.0%	.9%	.0%
ADRA Systems	3.7	.0	3.0	0	.3%	.0%	.8%	.0%
Engineering Mechanics	3.2	.2	2.7	392	.3%	.0%	.7%	.2%
Claris	3.1	.0	3.1	0	.2%	.0%	.8%	.0%
Superdraft	3.1	1.4	1.5	168	.2%	.2%	.4%	.1%
Micrografx	3.0	.0	3.0	0	.2%	.0%	.8%	.0%
Whessoe Computing Systems	2.9	.0	2.9	0	.2%	.0%	.7%	.0%
Olivetti	2.5	2.2	.0	429	.2%	.2%	.0%	.3%
Sharp System Products—NO OEM	2.5	1.3	1.2	31	.2%	.3%	.3%	.0%
Aries Technology	2.4	.0	2.2	0	.2%	.0%	.6%	.0%

(Continued)

Table 5 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	Mechanical
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
American Small Business Comp.	2.4	.0	2.4	0	.2%	.0%	.6%	.0%
Micro Engineering Solutions	2.3	.7	1.5	35	.2%	.1%	.4%	.0%
Mitsui Engineering	2.0	1.4	.4	33	.2%	.2%	.1%	.0%
ISICAD	1.9	.0	1.9	0	.1%	.0%	.5%	.0%
PAFEC	1.9	.0	1.9	0	.1%	.0%	.5%	.0%
Robocom	1.7	.0	1.7	0	.1%	.0%	.4%	.0%
FEA	1.4	.3	.4	13	.1%	.0%	.1%	.0%
Schlumberger	1.3	.3	.6	39	.1%	.0%	.2%	.0%
Rasna Corporation	1.3	.0	1.3	0	.1%	.0%	.3%	.0%
Evolution Computing	1.2	.0	1.2	0	.1%	.0%	.3%	.0%
MacNeal-Schwendler	1.1	.0	1.1	0	.1%	.0%	.3%	.0%
Softdesk	1.1	.0	1.1	0	.1%	.0%	.3%	.0%
S.T.I.D. s.r.l.	1.0	.0	1.0	0	.1%	.0%	.2%	.0%
Vision 3D	.9	.5	.2	6	.1%	.1%	.1%	.0%
CAMTEK	.9	.0	.7	0	.1%	.0%	.2%	.0%
Foresight Resources	.8	.0	.7	0	.1%	.0%	.2%	.0%
Innovative Data Design	.8	.0	.8	0	.1%	.0%	.2%	.0%
CAD Lab	.8	.0	.6	0	.1%	.0%	.2%	.0%
Aura CAD/CAM Systems	.7	.0	.6	0	.1%	.0%	.2%	.0%
Hahn & Kolb	.7	.4	.2	14	.1%	.1%	.1%	.0%
A.I. Systems	.7	.0	.7	0	.1%	.0%	.2%	.0%
Caroline Informatique	.6	.1	.3	9	.1%	.0%	.1%	.0%
GRAPHSOFT	.6	.0	.6	0	.1%	.0%	.2%	.0%
ESDU International	.6	.0	.6	0	.0%	.0%	.2%	.0%

(Continued)

Table 5 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: Mechanical
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Machinery Sales	.6	.0	.6	0	.0%	.0%	.2%	.0%
CADWorks	.5	.0	.4	0	.0%	.0%	.1%	.0%
Uniras	.4	.0	.4	0	.0%	.0%	.1%	.0%
Cascade Graphics	.4	.0	.4	0	.0%	.0%	.1%	.0%
Ithaca Software	.4	.0	.4	0	.0%	.0%	.1%	.0%
Ashlar	.3	.0	.3	0	.0%	.0%	.1%	.0%
debis Systemhaus	.3	.1	.2	6	.0%	.0%	.1%	.0%
Mc2 Engineering Software	.3	.0	.3	0	.0%	.0%	.1%	.0%
Synthesis	.3	.0	.3	0	.0%	.0%	.1%	.0%
Engineering Systems Corp.	.3	.0	.2	0	.0%	.0%	.1%	.0%
Mega CADD	.2	.0	.2	0	.0%	.0%	.1%	.0%
Norsk Data	.2	.1	.0	6	.0%	.0%	.0%	.0%
CAD-Capture	.2	.0	.0	0	.0%	.0%	.0%	.0%
Engineered Software	.1	.0	.1	0	.0%	.0%	.0%	.0%
IGC Technology	.1	.0	.1	0	.0%	.0%	.0%	.0%
Accugraph	.1	.0	.1	0	.0%	.0%	.0%	.0%
Lamp Software	.1	.0	.1	4	.0%	.0%	.0%	.0%
Radan Computational	.1	.0	.1	5	.0%	.0%	.0%	.0%
Masta Corporation	.1	.0	.0	0	.0%	.0%	.0%	.0%
A/E Microsystems	.0	.0	.0	2	.0%	.0%	.0%	.0%
Number One Systems	.0	.0	.0	1	.0%	.0%	.0%	.0%

(Continued)

Table 5 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	Mechanical
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

| Company | Total Factory Revenue | Hardware Revenue | Software Revenue | Hardware Units Shipped | Market Share | | | |
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Other Companies	195.6	194.5	1.1	51,935	15.5%	24.2%	.3%	31.6%
All Companies	1,262.1	803.9	387.6	164,204	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	866.0	605.0	220.7	145,242	68.6%	75.3%	56.9%	88.5%
All Asian-Based Companies	247.7	139.8	92.1	14,672	19.6%	17.4%	23.7%	8.9%
All European-Based Companies	148.5	59.1	74.9	4,291	11.8%	7.4%	19.3%	2.6%
All Hardware Companies	649.3	619.3	.0	147,351	51.4%	77.0%	.0%	89.7%
All Turnkey & SW Companies	612.8	184.6	387.6	16,853	48.6%	23.0%	100.0%	10.3%

Source: Dataquest (September 1992)

CAD/CAM/CAE—Personal CAD and Distribution Channels

Table 6
1991 CAD/CAM/CAE/GIS Final Market Share

Application: AEC
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Autodesk	111.9	.0	111.9	0	12.5%	.0%	39.2%	.0%
Apple Computer	92.6	81.5	.0	19,402	10.4%	14.4%	.0%	15.2%
Compaq	87.2	87.2	.0	16,994	9.8%	15.4%	.0%	13.3%
IBM	54.2	51.5	.0	12,878	6.1%	9.1%	.0%	10.1%
NEC	42.5	35.7	3.4	5,997	4.8%	6.3%	1.2%	4.7%
Hewlett-Packard	31.3	25.0	.0	6,091	3.5%	4.4%	.0%	4.8%
Fujitsu	22.0	13.8	5.9	730	2.5%	2.4%	2.1%	.6%
Nemetschek	14.9	5.8	8.6	288	1.7%	1.0%	3.0%	.2%
CADAM	12.9	4.5	7.1	900	1.4%	.8%	2.5%	.7%
Dell Computer	12.0	12.0	.0	3,083	1.3%	2.1%	.0%	2.4%
Soft-Tech Software Technologie	11.5	2.9	7.5	765	1.3%	.5%	2.6%	.6%
Intergraph	11.1	.0	10.4	0	1.2%	.0%	3.7%	.0%
ISICAD	10.9	.0	10.9	0	1.2%	.0%	3.8%	.0%
CPU	9.4	.0	8.6	0	1.1%	.0%	3.0%	.0%
BATISOFT	7.9	1.2	4.0	325	.9%	.2%	1.4%	.3%
Hochtief	6.5	1.0	4.6	81	.7%	.2%	1.6%	.1%
Everex Systems	6.2	6.2	.0	2,746	.7%	1.1%	.0%	2.1%
Hitachi	6.1	2.9	2.6	302	.7%	.5%	.9%	.2%
Sweet's Electronic Publishing	5.9	.0	4.8	0	.7%	.0%	1.7%	.0%
Mutoh Industries—NO OEM	5.8	3.2	2.3	204	.6%	.6%	.8%	.2%
Aspen Technology	5.6	.0	5.0	0	.6%	.0%	1.8%	.0%
mb Programme	4.9	2.4	1.7	117	.5%	.4%	.6%	.1%
Softdesk	4.8	.0	4.8	0	.5%	.0%	1.7%	.0%
Technovision	4.8	.0	4.8	0	.5%	.0%	1.7%	.0%

(Continued)

Table 6 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: AEC
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Caditron	4.6	2.3	1.8	70	.5%	.4%	.6%	.1%
Microway	4.6	2.8	1.4	58	.5%	.5%	.5%	.0%
International Software Systems	4.5	.0	4.5	0	.5%	.0%	1.6%	.0%
RIB/RZB	4.5	.4	3.6	30	.5%	.1%	1.3%	.0%
Computer Services Consultants	4.0	.0	4.0	0	.4%	.0%	1.4%	.0%
Micrografx	4.0	.0	4.0	0	.4%	.0%	1.4%	.0%
Research Machines	3.9	3.9	.0	629	.4%	.7%	.0%	.5%
Datagraphic	3.4	1.7	1.4	55	.4%	.3%	.5%	.0%
Anitor	3.4	.8	2.4	31	.4%	.1%	.8%	.0%
ASG—Archsoft	2.9	.0	2.9	0	.3%	.0%	1.0%	.0%
Computervision	2.8	.0	2.7	33	.3%	.0%	.9%	.0%
Ground Modelling Systems	2.7	1.4	1.1	22	.3%	.3%	.4%	.0%
CADKEY	2.6	.0	2.6	0	.3%	.0%	.9%	.0%
Toshiba—NO OEM	2.5	1.3	1.0	243	.3%	.2%	.4%	.2%
Innovative Data Design	2.4	.0	2.4	0	.3%	.0%	.9%	.0%
Sigma Design	2.4	.0	2.3	0	.3%	.0%	.8%	.0%
Claris	2.3	.0	2.3	0	.3%	.0%	.8%	.0%
Carrier Corporation	2.3	.0	2.3	0	.3%	.0%	.8%	.0%
Elstree Computing	2.2	1.0	1.2	60	.2%	.2%	.4%	.0%
Integrated Computer Graphics	2.0	1.0	.8	114	.2%	.2%	.3%	.1%
Ziegler Informatics	2.0	.0	2.0	0	.2%	.0%	.7%	.0%
Accugraph	1.9	.1	1.6	9	.2%	.0%	.6%	.0%
Moda CAD	1.8	.5	1.3	15	.2%	.1%	.4%	.0%
CADWorks	1.6	.0	1.4	0	.2%	.0%	.5%	.0%

(Continued)

Table 6 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: AEC
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Robocom	1.6	.0	1.6	0	.2%	.0%	.6%	.0%
Mitsubishi Electric	1.6	1.0	.5	152	.2%	.2%	.2%	.1%
Engineered Software	1.5	.0	1.5	0	.2%	.0%	.5%	.0%
Lamp Software	1.5	.3	1.2	65	.2%	.1%	.4%	.1%
Olivetti	1.5	1.3	.0	254	.2%	.2%	.0%	.2%
Research Engineers—Civilsoft	1.5	.0	1.5	0	.2%	.0%	.5%	.0%
Integer	1.2	.0	1.0	0	.1%	.0%	.3%	.0%
Mucke Software	1.1	.6	.4	26	.1%	.1%	.1%	.0%
American Small Business Comp.	1.1	.0	1.1	0	.1%	.0%	.4%	.0%
Serbi	1.1	.0	1.1	0	.1%	.0%	.4%	.0%
Caddlink	1.0	.0	1.0	0	.1%	.0%	.4%	.0%
ARKTEC	.9	.2	.6	30	.1%	.0%	.2%	.0%
Evolution Computing	.8	.0	.8	0	.1%	.0%	.3%	.0%
Foresight Resources	.8	.0	.7	0	.1%	.0%	.3%	.0%
Mega CADD	.8	.0	.8	0	.1%	.0%	.3%	.0%
Dynaware	.8	.0	.8	0	.1%	.0%	.3%	.0%
GRAPHSOFT	.7	.0	.7	0	.1%	.0%	.3%	.0%
ECOM Associates	.7	.0	.6	4	.1%	.0%	.2%	.0%
CADMATIC	.7	.0	.4	4	.1%	.0%	.1%	.0%
IGC Technology	.6	.0	.6	0	.1%	.0%	.2%	.0%
Bechtel Software	.5	.0	.5	0	.1%	.0%	.2%	.0%
Cascade Graphics	.4	.0	.4	0	.0%	.0%	.1%	.0%
INS Engineering	.4	.3	.1	9	.0%	.1%	.0%	.0%
DAT Standard Info systemes	.4	.0	.4	0	.0%	.0%	.1%	.0%

(Continued)

Table 6 (Continued)

1991 CAD/CAM/CAE/GIS Final Market Share

Application: AEC
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

					Market Share			
Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Mc2 Engineering Software	.4	.0	.4	0	.0%	.0%	.1%	.0%
Aura CAD/CAM Systems	.3	.0	.3	0	.0%	.0%	.1%	.0%
CAD-Capture	.3	.0	.1	0	.0%	.0%	.0%	.0%
Simulation Science	.2	.0	.2	0	.0%	.0%	.1%	.0%
Applications in CADD	.2	.0	.1	6	.0%	.0%	.0%	.0%
Engineering Systems Corp.	.2	.0	.2	0	.0%	.0%	.1%	.0%
Ashlar	.2	.0	.2	0	.0%	.0%	.1%	.0%
Mitsui Engineering	.2	.1	.0	3	.0%	.0%	.0%	.0%
Uniras	.1	.0	.1	0	.0%	.0%	.0%	.0%
TOOL Software	.1	.0	.1	3	.0%	.0%	.0%	.0%
Masta Corporation	.1	.0	.1	0	.0%	.0%	.0%	.0%
A.I. Systems	.1	.0	.1	0	.0%	.0%	.0%	.0%
A/E Microsystems	.0	.0	.0	5	.0%	.0%	.0%	.0%
Radan Computational	.0	.0	.0	1	.0%	.0%	.0%	.0%
Other Companies	213.3	207.7	5.6	55,112	23.9%	36.7%	2.0%	43.1%
All Companies	892.8	565.7	285.1	127,946	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	700.6	477.2	198.4	117,386	78.5%	84.4%	69.6%	91.7%
All Asian-Based Companies	98.6	59.3	31.5	7,671	11.0%	10.5%	11.1%	6.0%
All European-Based Companies	93.6	29.2	55.2	2,890	10.5%	5.2%	19.4%	2.3%
All Hardware Companies	505.1	484.8	.0	118,718	56.6%	85.7%	.0%	92.8%
All Turnkey & SW Companies	387.7	81.0	285.1	9,228	43.4%	14.3%	100.0%	7.2%

Source: Dataquest (September 1992)

Table 7
1991 CAD/CAM/CAE/GIS Final Market Share

Application: GIS/Mapping
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Compaq	57.0	57.0	.0	11,112	17.0%	27.8%	.0%	24.6%
IBM	41.2	39.1	.0	9,781	12.3%	19.1%	.0%	21.6%
Apple Computer	25.5	22.4	.0	5,335	7.6%	10.9%	.0%	11.8%
Autodesk	25.4	.0	25.4	0	7.6%	.0%	22.0%	.0%
Intergraph	14.3	.0	13.4	0	4.3%	.0%	11.6%	.0%
ESRI	11.0	.0	11.0	0	3.3%	.0%	9.5%	.0%
Strategic Mapping	9.0	.0	9.0	0	2.7%	.0%	7.8%	.0%
Infocel	8.0	1.6	6.0	174	2.4%	.8%	5.2%	.4%
Fujitsu	7.8	4.9	2.1	259	2.3%	2.4%	1.8%	.6%
ETAK	7.4	.4	7.0	18	2.2%	.2%	6.1%	.0%
MapInfo	7.2	.0	5.8	0	2.2%	.0%	5.0%	.0%
Hitachi	6.1	2.9	2.6	302	1.8%	1.4%	2.2%	.7%
Ground Modelling Systems	4.4	2.4	1.8	36	1.3%	1.2%	1.6%	.1%
Mitsubishi Electric	4.0	2.6	1.4	387	1.2%	1.3%	1.2%	.9%
GeoGraphix	3.3	.0	2.4	0	1.0%	.0%	2.1%	.0%
PacSoft	3.1	.0	3.1	0	.9%	.0%	2.7%	.0%
Hewlett-Packard	2.9	2.3	.0	554	.9%	1.1%	.0%	1.2%
ERDAS	2.6	.6	1.8	18	.8%	.3%	1.6%	.0%
Mutoh Industries—NO OEM	2.6	1.4	1.0	91	.8%	.7%	.9%	.2%
Generation 5 Technology	2.5	.0	2.5	0	.8%	.0%	2.2%	.0%
Facility Mapping Systems	2.3	.0	2.1	0	.7%	.0%	1.8%	.0%
Dell Computer	2.2	2.2	.0	553	.6%	1.1%	.0%	1.2%
Terra Sciences	1.8	.0	1.8	0	.5%	.0%	1.6%	.0%
Ziegler Informatics	1.7	.0	1.7	0	.5%	.0%	1.4%	.0%

Table 7 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	GIS/Mapping
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total				Market Share			
	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Genasys II	1.6	.6	1.0	13	.5%	.3%	.8%	.0%
Intera Tydac	1.5	.0	1.5	0	.5%	.0%	1.3%	.0%
LandCadd	1.5	.0	1.4	0	.5%	.0%	1.2%	.0%
Radian Corporation	1.5	.0	.9	0	.4%	.0%	.8%	.0%
Softdesk	1.5	.0	1.5	0	.4%	.0%	1.3%	.0%
Mitsui Engineering	1.3	.9	.3	22	.4%	.4%	.2%	.0%
Kork Systems	1.3	.1	.9	19	.4%	.1%	.8%	.0%
RIB/RZB	1.3	.1	1.0	9	.4%	.1%	.9%	.0%
Research Machines	1.1	1.1	.0	169	.3%	.5%	.0%	.4%
Geometria GIS Systems House	1.0	.2	.2	14	.3%	.1%	.2%	.0%
Maptech	.9	.0	.9	0	.3%	.0%	.8%	.0%
Terr-Mar Resource Info Svs	.9	.4	.5	22	.3%	.2%	.4%	.0%
Contract Data Research	.9	.0	.6	0	.3%	.0%	.5%	.0%
Everex Systems	.9	.9	.0	381	.3%	.4%	.0%	.8%
Andor	.6	.2	.4	5	.2%	.1%	.4%	.0%
Olivetti	.6	.5	.0	93	.2%	.2%	.0%	.2%
NEC	.6	.5	.0	77	.2%	.2%	.0%	.2%
Geosoft	.4	.0	.4	0	.1%	.0%	.3%	.0%
Geotrace Technologies	.3	.3	.3	0	.1%	.0%	.3%	.0%
INS Engineering	.3	.1	.1	7	.1%	.1%	.1%	.0%
Caditron	.3	.2	.1	5	.1%	.1%	.1%	.0%
GEOVISION Inc.	.3	.0	.1	37	.1%	.1%	.1%	.1%
Robocom	.3	.0	.3	0	.1%	.0%	.3%	.0%
CAD-Capture	.3	.0	.1	0	.1%	.0%	.0%	.0%

(Continued)

Table 7 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: GIS/Mapping
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Engineering Systems Corp.	.2	.0	.2	0	.1%	.0%	.1%	.0%
Applications in CADD	.2	.0	.1	6	.1%	.0%	.1%	.0%
Geomath	.2	.0	.2	0	.1%	.0%	.2%	.0%
Uniras	.1	.0	.1	0	.0%	.0%	.1%	.0%
Sigma Design	.1	.0	.1	0	.0%	.0%	.1%	.0%
American Small Business Comp.	.1	.0	.1	0	.0%	.0%	.1%	.0%
Innovative Data Design	.1	.0	.1	0	.0%	.0%	.1%	.0%
Lamp Software	.1	.0	.1	4	.0%	.0%	.1%	.0%
Accugraph	.1	.0	.1	0	.0%	.0%	.1%	.0%
Foresight Resources	.1	.0	.1	0	.0%	.0%	.1%	.0%
A.I. Systems	.1	.0	.1	0	.0%	.0%	.1%	.0%
Other Companies	59.4	59.4	.0	15,757	17.8%	29.0%	.0%	34.8%
All Companies	334.6	205.1	115.5	45,260	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	299.6	187.0	101.7	43,774	89.5%	91.2%	88.1%	96.7%
All Asian-Based Companies	23.2	13.7	7.8	1,151	6.9%	6.7%	6.8%	2.5%
All European-Based Companies	11.9	4.4	6.0	335	3.5%	2.1%	5.2%	.7%
All Hardware Companies	191.6	185.8	.0	43,906	57.3%	90.6%	.0%	97.0%
All Turnkey & SW Companies	143.0	19.4	115.5	1,355	42.7%	9.4%	100.0%	3.0%

Source: Dataquest (September 1992)

Table 8
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	Electronic Design Automation
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Compaq	109.0	109.0	.0	21,262	19.6%	35.7%	.0%	33.0%
IBM	55.0	52.2	.0	13,048	9.9%	17.1%	.0%	20.3%
Hewlett-Packard	42.4	33.8	.0	8,231	7.6%	11.1%	.0%	12.8%
Wacom	34.2	6.7	23.7	578	6.1%	2.2%	11.2%	.9%
Viewlogic Systems	22.1	.0	17.3	0	4.0%	.0%	8.2%	.0%
NEC	21.6	18.2	1.7	3,052	3.9%	5.9%	.8%	4.7%
Autodesk	20.0	.0	20.0	0	3.6%	.0%	9.5%	.0%
Apple Computer	18.5	16.3	.0	3,880	3.3%	5.3%	.0%	6.0%
Xilinx	16.2	.0	14.6	0	2.9%	.0%	6.9%	.0%
LPKF	15.0	9.8	3.8	650	2.7%	3.2%	1.8%	1.0%
Altera	13.7	.0	11.6	0	2.5%	.0%	5.5%	.0%
CADAM	13.0	3.0	8.5	600	2.3%	1.0%	4.0%	.9%
Fujitsu	12.1	8.2	2.7	400	2.2%	2.7%	1.3%	.6%
Orcad	10.5	.0	10.5	0	1.9%	.0%	5.0%	.0%
ACTEL	10.0	.0	9.0	0	1.8%	.0%	4.3%	.0%
PADS Software	8.7	.0	7.4	0	1.6%	.0%	3.5%	.0%
Aucotec	7.9	1.3	5.1	328	1.4%	.4%	2.4%	.5%
EEsof	7.8	.0	7.0	0	1.4%	.0%	3.3%	.0%
Microsim	7.6	.0	7.1	0	1.4%	.0%	3.4%	.0%
Data I/O	7.0	.0	7.0	0	1.2%	.0%	3.3%	.0%
Everex Systems	6.2	6.2	.0	2,746	1.1%	2.0%	.0%	4.3%
Kloeckner-Moeller	5.4	1.1	3.8	44	1.0%	.4%	1.8%	.1%
Ziegler Informatica	4.7	.0	4.7	0	.9%	.0%	2.2%	.0%
BETRONEX	4.6	.5	4.1	86	.8%	.2%	2.0%	.1%

(Continued)

Table 8 (Continued)

1991 CAD/CAM/CAE/GIS Final Market Share

Application:	Electronic Design Automation
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Dell Computer	4.3	4.3	.0	1,107	.8%	1.4%	.0%	1.7%
Racal-Redac	3.9	.0	3.9	0	.7%	.0%	1.9%	.0%
Hitachi	3.1	1.5	1.3	151	.5%	.5%	.6%	.2%
Research Machines	2.9	2.9	.0	460	.5%	.9%	.0%	.7%
Accel Technologies	2.8	.0	2.5	0	.5%	.0%	1.2%	.0%
ALDEC	2.5	.0	2.5	0	.5%	.0%	1.2%	.0%
Visionics	2.4	.0	1.8	10	.4%	.0%	.9%	.0%
ALS Design	2.4	.0	2.4	0	.4%	.0%	1.1%	.0%
Teradyne	2.2	.0	1.7	0	.4%	.0%	.8%	.0%
CAD-UL	2.1	.0	2.1	0	.4%	.0%	1.0%	.0%
Infinite Graphics	2.0	.0	2.0	0	.4%	.0%	.9%	.0%
Harris EDA	1.9	.1	1.2	2	.3%	.0%	.6%	.0%
Massteck	1.8	.0	1.8	0	.3%	.0%	.8%	.0%
Caditron	1.6	.8	.6	25	.3%	.3%	.3%	.0%
Tanner Research	1.4	.0	1.2	0	.3%	.0%	.6%	.0%
ISDATA	1.4	.0	1.2	0	.2%	.0%	.6%	.0%
Compact Software	1.3	.0	1.3	0	.2%	.0%	.6%	.0%
Aucos elektronische Gerate	1.2	.4	.8	116	.2%	.1%	.4%	.2%
Spectrum Software	1.1	.0	1.1	0	.2%	.0%	.5%	.0%
Serbi	1.1	.0	1.1	0	.2%	.0%	.5%	.0%
Intrinsix	1.0	1.0	.0	10	.2%	.3%	.0%	.0%
Omation	.9	.0	.9	0	.2%	.0%	.4%	.0%
Cadisys	.9	.0	.9	0	.2%	.0%	.4%	.0%
Number One Systems	.8	.2	.6	61	.1%	.0%	.3%	.1%

Table 8 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	Electronic Design Automation
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

					Market Share			
Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
DAT Standard info ssystemes	.8	.0	.7	0	.1%	.0%	.3%	.0%
Douglas Electronics	.8	.0	.8	0	.1%	.0%	.4%	.0%
Phase Three Logic	.7	.0	.7	0	.1%	.0%	.3%	.0%
Vamp	.7	.0	.7	0	.1%	.0%	.3%	.0%
Digital	.6	.0	.4	0	.1%	.0%	.2%	.0%
Integrated Silicon Systems	.6	.2	.4	8	.1%	.1%	.2%	.0%
Capilano Computing	.5	.0	.5	0	.1%	.0%	.2%	.0%
American Small Business Comp.	.4	.0	.4	0	.1%	.0%	.2%	.0%
PLUS Logic	.4	.0	.4	0	.1%	.0%	.2%	.0%
The CAD Group	.4	.0	.4	0	.1%	.0%	.2%	.0%
Andor	.4	.1	.2	3	.1%	.0%	.1%	.0%
BV Engineering	.4	.0	.4	0	.1%	.0%	.2%	.0%
debis Systemhaus	.3	.1	.2	6	.1%	.0%	.1%	.0%
Foresight Resources	.3	.0	.3	0	.1%	.0%	.1%	.0%
SIMUCAD	.3	.0	.3	0	.0%	.0%	.1%	.0%
The Great Softwestern Co.	.2	.0	.2	0	.0%	.0%	.1%	.0%
Bobcat Systems	.2	.0	.2	0	.0%	.0%	.1%	.0%
Genrad	.2	.0	.2	10	.0%	.0%	.1%	.0%
Instrumatic Espanola	.2	.0	.2	0	.0%	.0%	.1%	.0%
Innovative Data Design	.2	.0	.2	0	.0%	.0%	.1%	.0%
Cascade Graphics	.2	.0	.2	0	.0%	.0%	.1%	.0%
Pacific Numerics	.2	.0	.2	0	.0%	.0%	.1%	.0%
Technische Computer Systeme	.2	.0	.2	5	.0%	.0%	.1%	.0%
Simutest	.2	.0	.2	0	.0%	.0%	.1%	.0%

(Continued)

Table 8 (Continued)

1991 CAD/CAM/CAE/GIS Final Market Share

Application:	Electronic Design Automation
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
National Semiconductor	.1	.0	.1	0	.0%	.0%	.1%	.0%
Masta Corporation	.1	.0	.1	0	.0%	.0%	.0%	.0%
Olivetti	.1	.1	.0	17	.0%	.0%	.0%	.0%
Robocom	.0	.0	.0	0	.0%	.0%	.0%	.0%
Dolphin Integration	.0	.0	.0	0	.0%	.0%	.0%	.0%
NCR Microelectronics	.0	.0	.0	0	.0%	.0%	.0%	.0%
Other Companies	27.9	27.9	.0	7,505	5.0%	9.1%	.0%	11.7%
All Companies	557.5	305.7	211.1	64,402	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	429.1	253.6	145.9	58,417	77.0%	83.0%	69.1%	90.7%
All Asian-Based Companies	71.3	34.6	29.6	4,184	12.8%	11.3%	14.0%	6.5%
All European-Based Companies	57.2	17.5	35.6	1,801	10.3%	5.7%	16.9%	2.8%
All Hardware Companies	272.1	258.5	.0	59,316	48.8%	84.6%	.0%	92.1%
All Turnkey & SW Companies	285.4	47.2	211.1	5,086	51.2%	15.4%	100.0%	7.9%

Source: Dataquest (September 1992)

Table 9
1991 CAD/CAM/CAE/GIS Final Market Share

Application: Electronic CAE
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Compaq	76.9	76.9	.0	14,995	19.1%	36.1%	.0%	32.1%
IBM	46.8	44.5	.0	11,122	11.6%	20.9%	.0%	23.8%
Wacom	34.2	6.7	23.7	578	8.5%	3.2%	14.7%	1.2%
Hewlett-Packard	27.8	22.2	.0	5,393	6.9%	10.4%	.0%	11.6%
Viewlogic Systems	22.1	.0	17.3	0	5.5%	.0%	10.7%	.0%
Autodesk	17.4	.0	17.4	0	4.3%	.0%	10.8%	.0%
Xilinx	16.2	.0	14.6	0	4.0%	.0%	9.1%	.0%
Altera	13.7	.0	11.6	0	3.4%	.0%	7.2%	.0%
NEC	12.0	10.1	1.0	1,690	3.0%	4.7%	.6%	3.6%
ACTEL	10.0	.0	9.0	0	2.5%	.0%	5.6%	.0%
Apple Computer	9.3	8.2	.0	1,940	2.3%	3.8%	.0%	4.2%
Autotec	7.9	1.3	5.1	328	2.0%	.6%	3.2%	.7%
Elsof	7.8	.0	7.0	0	1.9%	.0%	4.3%	.0%
Microsim	7.6	.0	7.1	0	1.9%	.0%	4.4%	.0%
Orcad	7.4	.0	7.4	0	1.8%	.0%	4.6%	.0%
Data I/O	7.0	.0	7.0	0	1.7%	.0%	4.3%	.0%
Kloeckner-Moeller	5.4	1.1	3.8	44	1.3%	.5%	2.4%	.1%
Fujitsu	5.0	3.1	1.3	165	1.2%	1.5%	.8%	.4%
Everex Systems	3.8	3.8	.0	1,678	.9%	1.8%	.0%	3.6%
Ziegler Informatics	2.8	.0	2.8	0	.7%	.0%	1.7%	.0%
ALDEC	2.5	.0	2.5	0	.6%	.0%	1.6%	.0%
Teradyne	2.2	.0	1.7	0	.6%	.0%	1.0%	.0%
Dell Computer	2.2	2.2	.0	553	.5%	1.0%	.0%	1.2%
Racal-Redac	2.1	.0	2.1	0	.5%	.0%	1.3%	.0%

(Continued)

Table 9 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: Electronic CAE
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Harris EDA	1.9	.1	1.2	2	.5%	.0%	.7%	.0%
ALS Design	1.8	.0	1.8	0	.4%	.0%	1.1%	.0%
Research Machines	1.7	1.7	.0	266	.4%	.8%	.0%	.6%
Caditron	1.6	.8	.6	25	.4%	.4%	.4%	.1%
ISDATA	1.4	.0	1.2	0	.3%	.0%	.8%	.0%
Aucos elektronische Gerate	1.2	.4	.8	116	.3%	.2%	.5%	.2%
Spectrum Software	1.1	.0	1.1	0	.3%	.0%	.7%	.0%
Serbi	1.1	.0	1.1	0	.3%	.0%	.7%	.0%
Compact Software	1.0	.0	1.0	0	.2%	.0%	.6%	.0%
Intrinsix	1.0	1.0	.0	10	.2%	.5%	.0%	.0%
PADS Software	.9	.0	.7	0	.2%	.0%	.5%	.0%
DAT Standard info systems	.8	.0	.7	0	.2%	.0%	.4%	.0%
Douglas Electronics	.8	.0	.8	0	.2%	.0%	.5%	.0%
Phase Three Logic	.7	.0	.7	0	.2%	.0%	.4%	.0%
Infinite Graphics	.7	.0	.7	0	.2%	.0%	.4%	.0%
Visionics	.7	.0	.5	3	.2%	.0%	.3%	.0%
Ornation	.7	.0	.7	0	.2%	.0%	.4%	.0%
Accel Technologies	.5	.0	.5	0	.1%	.0%	.3%	.0%
Capilano Computing	.5	.0	.5	0	.1%	.0%	.3%	.0%
PLUS Logic	.4	.0	.4	0	.1%	.0%	.3%	.0%
Tanner Research	.4	.0	.4	0	.1%	.0%	.2%	.0%
The CAD Group	.4	.0	.4	0	.1%	.0%	.2%	.0%
Number One Systems	.4	.1	.3	27	.1%	.0%	.2%	.1%
BV Engineering	.4	.0	.4	0	.1%	.0%	.2%	.0%

(Continued)

Table 9 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	Electronic CAE
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
debis Systemhaus	.3	.1	.2	6	.1%	.0%	.1%	.0%
Digital	.3	.0	.2	0	.1%	.0%	.1%	.0%
American Small Business Comp.	.3	.0	.3	0	.1%	.0%	.2%	.0%
SIMUCAD	.3	.0	.3	0	.1%	.0%	.2%	.0%
Foresight Resources	.2	.0	.2	0	.1%	.0%	.1%	.0%
Bobcat Systems	.2	.0	.2	0	.1%	.0%	.1%	.0%
Genrad	.2	.0	.2	10	.1%	.0%	.1%	.0%
Cascade Graphics	.2	.0	.2	0	.0%	.0%	.1%	.0%
Technische Computer Systeme	.2	.0	.2	5	.0%	.0%	.1%	.0%
Vamp	.2	.0	.2	0	.0%	.0%	.1%	.0%
Simutest	.2	.0	.2	0	.0%	.0%	.1%	.0%
Innovative Data Design	.1	.0	.1	0	.0%	.0%	.1%	.0%
National Semiconductor	.1	.0	.1	0	.0%	.0%	.0%	.0%
Masta Corporation	.0	.0	.0	0	.0%	.0%	.0%	.0%
Dolphin Integration	.0	.0	.0	0	.0%	.0%	.0%	.0%
NCR Microelectronics	.0	.0	.0	0	.0%	.0%	.0%	.0%
Other Companies	29.1	29.1	.0	7,699	7.2%	13.6%	.0%	16.5%
All Companies	403.5	213.2	161.0	46,655	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	323.3	187.4	114.4	43,402	80.1%	87.9%	71.0%	93.0%
All Asian-Based Companies	51.1	19.9	26.0	2,433	12.7%	9.3%	16.1%	5.2%
All European-Based Companies	29.0	5.9	20.6	820	7.2%	2.8%	12.8%	1.8%
All Hardware Companies	199.1	190.1	.0	43,913	49.3%	89.1%	.0%	94.1%
All Turnkey & SW Companies	204.4	23.2	161.0	2,743	50.7%	10.9%	100.0%	5.9%

Source: Dataquest (September 1992)

Table 10

1991 CAD/CAM/CAE/GIS Final Market Share

Application:	IC Layout
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Fujitsu	2.1	1.9	.0	71	44.7%	60.8%	.0%	13.2%
Everex Systems	1.0	1.0	.0	458	21.6%	32.8%	.0%	85.3%
Tanner Research	1.0	.0	.9	0	20.6%	.0%	67.2%	.0%
Integrated Silicon Systems	.6	.2	.4	8	12.2%	6.4%	29.7%	1.5%
National Semiconductor	.0	.0	.0	0	.8%	.0%	3.1%	.0%
Other Companies	.0	.0	.0	0	.0%	.0%	.0%	.0%
All Companies	4.8	3.1	1.3	536	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	2.6	1.2	1.3	466	55.3%	39.2%	100.0%	86.8%
All Asian-Based Companies	2.1	1.9	.0	71	44.7%	60.8%	.0%	13.2%
All European-Based Companies	.0	.0	.0	0	.0%	.0%	.0%	.0%
All Hardware Companies	1.0	1.0	.0	458	21.6%	32.8%	.0%	85.3%
All Turnkey & SW Companies	3.7	2.1	1.3	79	78.4%	67.2%	100.0%	14.7%

Source: Dataquest (September 1992)

Table II
1991 CAD/CAM/CAE/GIS Final Market Share

Application: PCB/Hybrid/MCM
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Compaq	32.1	32.1	.0	6,267	21.5%	36.0%	.0%	36.4%
LPKF	15.0	9.8	3.8	650	10.0%	10.9%	7.7%	3.8%
Hewlett-Packard	14.6	11.6	.0	2,838	9.8%	13.0%	.0%	16.5%
CADAM	13.0	3.0	8.5	600	8.7%	3.4%	17.4%	3.5%
NEC	9.7	8.1	.8	1,362	6.5%	9.1%	1.6%	7.9%
Apple Computer	9.3	8.2	.0	1,940	6.2%	9.1%	.0%	11.3%
IBM	8.1	7.7	.0	1,926	5.4%	8.6%	.0%	11.2%
PADS Software	7.8	.0	6.6	0	5.2%	.0%	13.5%	.0%
Fujitsu	5.0	3.1	1.3	165	3.3%	3.5%	2.7%	1.0%
BETRONEX	4.6	.5	4.1	86	3.1%	.5%	8.4%	.5%
Orcad	3.1	.0	3.1	0	2.1%	.0%	6.3%	.0%
Hitachi	3.1	1.5	1.3	151	2.0%	1.6%	2.6%	.9%
Autodesk	2.6	.0	2.6	0	1.7%	.0%	5.2%	.0%
Accel Technologies	2.3	.0	2.1	0	1.5%	.0%	4.2%	.0%
Dell Computer	2.2	2.2	.0	553	1.4%	2.4%	.0%	3.2%
CAD-UL	2.1	.0	2.1	0	1.4%	.0%	4.2%	.0%
Ziegler Informatics	2.0	.0	2.0	0	1.3%	.0%	4.0%	.0%
Racal-Redac	1.9	.0	1.9	0	1.3%	.0%	3.9%	.0%
Massteck	1.8	.0	1.8	0	1.2%	.0%	3.6%	.0%
Visionics	1.8	.0	1.3	7	1.2%	.0%	2.7%	.0%
Everex Systems	1.4	1.4	.0	610	.9%	1.5%	.0%	3.5%
Infinite Graphics	1.3	.0	1.3	0	.9%	.0%	2.7%	.0%
Research Machines	1.2	1.2	.0	194	.8%	1.3%	.0%	1.1%
Cadisys	.9	.0	.9	0	.6%	.0%	1.8%	.0%

(Continued)

Table 11 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: PCB/Hybrid/MCM
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
ALS Design	.6	.0	.6	0	.4%	.0%	1.2%	.0%
Vamp	.5	.0	.5	0	.3%	.0%	1.1%	.0%
Number One Systems	.5	.1	.4	34	.3%	.1%	.8%	.2%
Andor	.4	.1	.2	3	.2%	.1%	.5%	.0%
Digital	.3	.0	.2	0	.2%	.0%	.4%	.0%
Omation	.3	.0	.3	0	.2%	.0%	.6%	.0%
Compact Software	.3	.0	.3	0	.2%	.0%	.5%	.0%
The Great Softwestern, Co.	.2	.0	.2	0	.2%	.0%	.5%	.0%
Instrumatic Espanola	.2	.0	.2	0	.1%	.0%	.4%	.0%
Pacific Numerics	.2	.0	.2	0	.1%	.0%	.4%	.0%
American Small Business Comp.	.2	.0	.2	0	.1%	.0%	.3%	.0%
Innovative Data Design	.1	.0	.1	0	.1%	.0%	.2%	.0%
Olivetti	.1	.1	.0	17	.1%	.1%	.0%	.1%
Foresight Resources	.1	.0	.1	0	.1%	.0%	.2%	.0%
Masta Corporation	.1	.0	.0	0	.0%	.0%	.1%	.0%
Robocom	.0	.0	.0	0	.0%	.0%	.1%	.0%
Other Companies	.0	.0	.0	0	.0%	.0%	.0%	.0%
All Companies	149.3	89.4	48.9	17,210	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	103.1	65.0	30.2	14,549	69.1%	72.7%	61.8%	84.5%
All Asian-Based Companies	18.0	12.8	3.6	1,681	12.1%	14.3%	7.4%	9.8%
All European-Based Companies	28.2	11.6	15.0	981	18.9%	12.9%	30.7%	5.7%
All Hardware Companies	72.0	67.4	.0	14,946	48.2%	75.5%	.0%	86.8%
All Turnkey & SW Companies	77.3	21.9	48.9	2,265	51.8%	24.5%	100.0%	13.2%

Source: Dataquest (September 1992)

Table 12
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	North America
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Compaq	181.4	181.4	.0	35,373	15.6%	25.1%	.0%	20.1%
Apple Computer	143.5	126.3	.0	30,072	12.4%	17.5%	.0%	17.1%
Autodesk	130.9	.0	130.9	0	11.3%	.0%	33.8%	.0%
IBM	64.1	60.9	.0	15,219	5.5%	8.4%	.0%	8.7%
Hewlett-Packard	43.0	34.4	.0	10,735	3.7%	4.8%	.0%	6.1%
CADAM	26.5	9.0	14.9	1,800	2.3%	1.2%	3.8%	1.0%
Dell Computer	22.7	22.7	.0	5,818	2.0%	3.1%	.0%	3.3%
Intergraph	16.4	.0	15.4	0	1.4%	.0%	4.0%	.0%
Everex Systems	15.0	15.0	.0	6,636	1.3%	2.1%	.0%	3.8%
Viewlogic Systems	14.8	.0	11.6	0	1.3%	.0%	3.0%	.0%
Xilinx	10.5	.0	9.5	0	.9%	.0%	2.4%	.0%
CADKEY	10.2	.0	10.2	0	.9%	.0%	2.6%	.0%
Altera	7.9	.0	6.7	0	.7%	.0%	1.7%	.0%
ESRI	7.9	.0	7.9	0	.7%	.0%	2.0%	.0%
Infocel	7.2	1.4	5.4	156	.6%	.2%	1.4%	.1%
Computervision	6.9	.0	6.5	86	.6%	.0%	1.7%	.0%
Softdesk	6.2	.0	6.2	0	.5%	.0%	1.6%	.0%
Strategic Mapping	6.2	.0	6.2	0	.5%	.0%	1.6%	.0%
ACTEL	6.2	.0	5.6	0	.5%	.0%	1.4%	.0%
MapInfo	6.0	.0	4.8	0	.5%	.0%	1.2%	.0%
ETAK	5.5	.3	5.2	13	.5%	.0%	1.4%	.0%
CNC Software	5.5	.0	5.5	0	.5%	.0%	1.4%	.0%
Microsim	5.1	.0	4.8	0	.4%	.0%	1.2%	.0%
Sweet's Electronic Publishing	5.1	.0	4.0	0	.4%	.0%	1.0%	.0%

(Continued)

Table 12 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: All Applications
Platform: Personal Computer
Region: North America
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Aspen Technology	4.5	.0	4.0	0	.4%	.0%	1.0%	.0%
PADS Software	4.2	.0	3.6	0	.4%	.0%	.9%	.0%
Micrografx	3.9	.0	3.9	0	.3%	.0%	1.0%	.0%
Moda CAD	3.8	1.0	2.7	32	.3%	.1%	.7%	.0%
Algor Interactive Systems	3.8	.0	3.4	0	.3%	.0%	.9%	.0%
Orcad	3.7	.0	3.7	0	.3%	.0%	1.0%	.0%
American Small Business Comp.	3.5	.0	3.5	0	.3%	.0%	.9%	.0%
Innovative Data Design	3.4	.0	3.4	0	.3%	.0%	.9%	.0%
International Software Systems	3.4	.0	3.4	0	.3%	.0%	.9%	.0%
Point Control	3.3	.0	3.3	0	.3%	.0%	.8%	.0%
ISICAD	3.2	.0	3.2	0	.3%	.0%	.8%	.0%
EEsof	3.2	.0	2.9	0	.3%	.0%	.7%	.0%
PacSoft	3.1	.0	3.1	0	.3%	.0%	.8%	.0%
GeoGraphix	3.1	.0	2.3	0	.3%	.0%	.6%	.0%
MCS	3.0	.0	2.7	0	.3%	.0%	.7%	.0%
Data I/O	3.0	.0	3.0	0	.3%	.0%	.8%	.0%
Swanson Analysis	2.8	.0	2.8	0	.2%	.0%	.7%	.0%
ASG—Archsoft	2.7	.0	2.7	0	.2%	.0%	.7%	.0%
Claris	2.7	.0	2.7	0	.2%	.0%	.7%	.0%
Visionics	2.4	.0	1.8	10	.2%	.0%	.5%	.0%
Accel Technologies	2.1	.0	1.9	0	.2%	.0%	.5%	.0%
Generation 5 Technology	2.1	.0	2.1	0	.2%	.0%	.5%	.0%
Facility Mapping Systems	2.0	.0	1.8	0	.2%	.0%	.5%	.0%
Infinite Graphics	2.0	.0	2.0	0	.2%	.0%	.5%	.0%

(Continued)

Table 12 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	North America
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Integrated Computer Graphics	2.0	1.0	.8	114	.2%	.1%	.2%	.1%
ERDAS	2.0	.4	1.4	14	.2%	.1%	.4%	.0%
Accugraph	2.0	.1	1.7	9	.2%	.0%	.4%	.0%
Micro Engineering Solutions	1.9	.5	1.2	28	.2%	.1%	.3%	.0%
ALDEC	1.9	.0	1.9	0	.2%	.0%	.5%	.0%
ADRA Systems	1.7	.0	1.3	0	.1%	.0%	.3%	.0%
Aries Technology	1.7	.0	1.5	0	.1%	.0%	.4%	.0%
Cimatron	1.6	.7	.7	81	.1%	.1%	.2%	.0%
Intera Tydac	1.5	.0	1.5	0	.1%	.0%	.4%	.0%
Evolution Computing	1.5	.0	1.5	0	.1%	.0%	.4%	.0%
LPKF	1.5	1.0	.4	65	.1%	.1%	.1%	.0%
Research Engineers—Civilsoft	1.5	.0	1.5	0	.1%	.0%	.4%	.0%
Sigma Design	1.5	.0	1.4	0	.1%	.0%	.4%	.0%
LandCadd	1.4	.0	1.4	0	.1%	.0%	.3%	.0%
Terra Sciences	1.4	.0	1.4	0	.1%	.0%	.4%	.0%
Teradyne	1.4	.0	1.0	0	.1%	.0%	.3%	.0%
GRAPHSOFT	1.4	.0	1.4	0	.1%	.0%	.4%	.0%
Massteck	1.2	.0	1.2	0	.1%	.0%	.3%	.0%
Racal-Redac	1.2	.0	1.2	0	.1%	.0%	.3%	.0%
BETRONEX	1.2	.1	1.0	22	.1%	.0%	.3%	.0%
Investronica SA	1.2	.9	.1	46	.1%	.1%	.0%	.0%
Carrier Corporation	1.1	.0	1.1	0	.1%	.0%	.3%	.0%
Engineering Mechanics	1.1	.1	1.0	137	.1%	.0%	.2%	.1%
Tanner Research	1.1	.0	1.0	0	.1%	.0%	.3%	.0%

(Continued)

Table 12 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: All Applications
Platform: Personal Computer
Region: North America
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Harris EDA	1.1	.2	.6	9	.1%	.0%	.2%	.0%
Foresight Resources	1.0	.0	1.0	0	.1%	.0%	.2%	.0%
Engineered Software	1.0	.0	1.0	0	.1%	.0%	.3%	.0%
Intrinsix	1.0	1.0	.0	10	.1%	.1%	.0%	.0%
Spectrum Software	1.0	.0	1.0	0	.1%	.0%	.3%	.0%
Kork Systems	1.0	.1	.7	14	.1%	.0%	.2%	.0%
Pathtrace	.9	.2	.6	14	.1%	.0%	.2%	.0%
Caddlink	.9	.0	.9	0	.1%	.0%	.2%	.0%
Cadisys	.9	.0	.9	0	.1%	.0%	.2%	.0%
Maptech	.9	.0	.9	0	.1%	.0%	.2%	.0%
Aura CAD/CAM Systems	.9	.0	.8	0	.1%	.0%	.2%	.0%
Cascade Graphics	.8	.0	.8	0	.1%	.0%	.2%	.0%
Dynaware	.8	.0	.8	0	.1%	.0%	.2%	.0%
Douglas Electronics	.8	.0	.8	0	.1%	.0%	.2%	.0%
Radian Corporation	.8	.0	.5	0	.1%	.0%	.1%	.0%
Phase Three Logic	.7	.0	.7	0	.1%	.0%	.2%	.0%
Mega CADD	.7	.0	.7	0	.1%	.0%	.2%	.0%
Uniras	.7	.0	.7	0	.1%	.0%	.2%	.0%
IGC Technology	.7	.0	.7	0	.1%	.0%	.2%	.0%
A.I. Systems	.7	.0	.7	0	.1%	.0%	.2%	.0%
ECOM Associates	.7	.0	.6	4	.1%	.0%	.2%	.0%
Ground Modelling Systems	.7	.4	.3	4	.1%	.1%	.1%	.0%
CADWorks	.6	.0	.5	0	.1%	.0%	.1%	.0%
Machinery Sales	.6	.0	.6	0	.1%	.0%	.2%	.0%

(Continued)

Table 12 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: All Applications
Platform: Personal Computer
Region: North America
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Engineering Systems Corp.	.6	.0	.4	0	.1%	.0%	.1%	.0%
Omation	.6	.0	.6	0	.1%	.0%	.1%	.0%
Vamp	.6	.0	.6	0	.0%	.0%	.1%	.0%
Mc2 Engineering Software	.5	.0	.5	0	.0%	.0%	.1%	.0%
Terr-Mar Resource Info Svs	.5	.2	.3	13	.0%	.0%	.1%	.0%
Ashlar	.5	.0	.5	0	.0%	.0%	.1%	.0%
Compact Software	.5	.0	.5	0	.0%	.0%	.1%	.0%
MacNeal-Schwendler	.5	.0	.5	0	.0%	.0%	.1%	.0%
Schlumberger	.5	.1	.2	15	.0%	.0%	.1%	.0%
Capilano Computing	.5	.0	.5	0	.0%	.0%	.1%	.0%
Digital	.5	.0	.3	0	.0%	.0%	.1%	.0%
Bechtel Software	.5	.0	.5	0	.0%	.0%	.1%	.0%
PLUS Logic	.4	.0	.4	0	.0%	.0%	.1%	.0%
Rasna Corporation	.4	.0	.4	0	.0%	.0%	.1%	.0%
The CAD Group	.4	.0	.4	0	.0%	.0%	.1%	.0%
BV Engineering	.4	.0	.4	0	.0%	.0%	.1%	.0%
Geosoft	.4	.0	.4	0	.0%	.0%	.1%	.0%
Integrated Silicon Systems	.4	.1	.2	5	.0%	.0%	.1%	.0%
GEOVISION Inc.	.3	.2	.1	35	.0%	.0%	.0%	.0%
Geotrace Technologies	.3	.0	.3	0	.0%	.0%	.1%	.0%
Genasys II	.2	.1	.1	2	.0%	.0%	.0%	.0%
The Great Softwestern Co.	.2	.0	.2	0	.0%	.0%	.1%	.0%
Bobcat Systems	.2	.0	.2	0	.0%	.0%	.1%	.0%
SIMUCAD	.2	.0	.2	0	.0%	.0%	.1%	.0%

(Continued)

Table 12 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: All Applications
Platform: Personal Computer
Region: North America
Units:.   Millions of U.S. Dollars/Actual Units

					Market Share			
Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Geomath	.2	.0	.2	0	.0%	.0%	.1%	.0%
Pacific Numerics	.2	.0	.2	0	.0%	.0%	.0%	.0%
Simutest	.2	.0	.2	0	.0%	.0%	.0%	.0%
Ithaca Software	.2	.0	.2	0	.0%	.0%	.0%	.0%
BATISOFT	.2	.0	.1	7	.0%	.0%	.0%	.0%
Synthesis	.1	.0	.1	0	.0%	.0%	.0%	.0%
Vision 3D	.1	.0	.0	0	.0%	.0%	.0%	.0%
Genrad	.1	.0	.1	4	.0%	.0%	.0%	.0%
National Semiconductor	.1	.0	.1	0	.0%	.0%	.0%	.0%
Simulation Science	.1	.0	.1	0	.0%	.0%	.0%	.0%
Number One Systems	.0	.0	.0	3	.0%	.0%	.0%	.0%
A/E Microsystems	.0	.0	.0	7	.0%	.0%	.0%	.0%
CADMATIC	.0	.0	.0	0	.0%	.0%	.0%	.0%
NCR Microelectronics	.0	.0	.0	0	.0%	.0%	.0%	.0%
Other Companies	263.3	262.1	1.2	69,019	22.7%	36.3%	.3%	39.3%
All Companies	1,159.7	722.1	387.3	175,632	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	1,150.3	718.7	381.9	175,391	99.2%	99.5%	98.6%	99.9%
All Asian-Based Companies	.0	.0	.0	0	.0%	.0%	.0%	.0%
All European-Based Companies	9.4	3.4	5.4	241	.8%	.5%	1.4%	.1%
All Hardware Companies	740.8	711.8	.0	174,666	63.9%	98.6%	.0%	99.4%
All Turnkey & SW Companies	418.9	10.3	387.3	966	36.1%	1.4%	100.0%	.6%

Source: Dataquest (September 1992)

Table 13
1991 CAD/CAM/CAE/GIS Final Market Share

Application: All Applications
Platform: Personal Computer
Region: Europe
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Compaq	181.4	181.4	.0	35,373	17.0%	27.1%	.0%	25.0%
IBM	110.9	105.4	.0	26,341	10.4%	15.7%	.0%	18.6%
Autodesk	89.8	.0	89.8	0	8.4%	.0%	26.5%	.0%
Hewlett-Packard	71.8	57.4	.0	12,325	6.7%	8.6%	.0%	8.7%
Apple Computer	60.2	53.0	.0	12,611	5.6%	7.9%	.0%	8.9%
Investronica SA	26.5	21.2	2.7	1,060	2.5%	3.2%	.8%	.8%
Wiechers Datentechnik	20.0	11.4	6.0	577	1.9%	1.7%	1.8%	.4%
CADAM	17.5	6.0	9.8	1,200	1.6%	.9%	2.9%	.8%
Caditron	16.3	8.1	6.5	251	1.5%	1.2%	1.9%	.2%
Research Machines	15.0	15.0	.0	2,420	1.4%	2.2%	.0%	1.7%
Nemetschek	14.9	5.8	8.6	288	1.4%	.9%	2.6%	.2%
Vero International Software	14.6	.0	13.3	0	1.4%	.0%	3.9%	.0%
Tebis	14.5	2.2	10.1	80	1.4%	.3%	3.0%	.1%
Ziegler Informatics	13.8	.0	13.8	0	1.3%	.0%	4.1%	.0%
LPKF	12.0	7.8	3.0	520	1.1%	1.2%	.9%	.4%
Soft-Tech Software Technologie	11.5	2.9	7.5	765	1.1%	.4%	2.2%	.5%
Intergraph	10.4	.0	9.7	0	1.0%	.0%	2.9%	.0%
ISICAD	9.1	.0	9.1	0	.8%	.0%	2.7%	.0%
Dell Computer	8.2	8.2	.0	2,087	.8%	1.2%	.0%	1.5%
Aucotec	7.9	1.3	5.1	328	.7%	.2%	1.5%	.2%
BATISOFT	7.6	1.1	3.8	312	.7%	.2%	1.1%	.2%
DAT Standard info systems	7.6	.0	7.2	0	.7%	.0%	2.1%	.0%
Serbi	6.5	.0	6.5	0	.6%	.0%	1.9%	.0%
Computervision	6.5	.0	6.1	77	.6%	.0%	1.8%	.1%

(Continued)

Table 13 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: All Applications
Platform: Personal Computer
Region: Europe
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Ground Modelling Systems	6.4	3.4	2.6	54	.6%	.5%	.8%	.0%
Hochtief	6.3	.9	4.4	79	.6%	.1%	1.3%	.1%
RIB/RZB	5.7	.5	4.7	39	.5%	.1%	1.4%	.0%
Kloeckner-Moeller	5.4	1.1	3.8	44	.5%	.2%	1.1%	.0%
Orcad	4.9	.0	4.9	0	.5%	.0%	1.5%	.0%
mb Programme	4.9	2.4	1.7	117	.5%	.4%	.5%	.1%
Olivent	4.7	4.0	.0	793	.4%	.6%	.0%	.6%
Microvay	4.6	2.8	1.4	58	.4%	.4%	.4%	.0%
Cimatron	4.5	2.0	2.0	236	.4%	.3%	.6%	.2%
Computer Services Consultants	4.0	.0	4.0	0	.4%	.0%	1.2%	.0%
Altera	3.7	.0	3.1	0	.3%	.0%	.9%	.0%
Robocom	3.6	.0	3.6	0	.3%	.0%	1.1%	.0%
Datagraphic	3.4	1.7	1.4	55	.3%	.3%	.4%	.0%
Anllam Electronics	3.2	1.0	1.9	40	.3%	.1%	.6%	.0%
Micrografx	3.2	.0	3.2	0	.3%	.0%	.9%	.0%
CADKEY	2.9	.0	2.9	0	.3%	.0%	.9%	.0%
Xilinx	2.9	.0	2.6	0	.3%	.0%	.8%	.0%
Viewlogic Systems	2.9	.0	2.3	0	.3%	.0%	.7%	.0%
Racal-Redac	2.7	.0	2.7	0	.3%	.0%	.8%	.0%
Elsof	2.7	.0	2.5	0	.3%	.0%	.7%	.0%
Superdraft	2.6	1.2	1.3	142	.2%	.2%	.4%	.1%
Pathtrace	2.4	.5	1.6	36	.2%	.1%	.5%	.0%
AIS Design	2.4	.0	2.4	0	.2%	.1%	.7%	.0%
Elstree Computing	2.2	1.0	1.2	60	.2%	.1%	.3%	.0%

(Continued)

Table 13 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: All Applications
Platform: Personal Computer
Region: Europe
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Total Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Whessoe Computing Systems	2.2	.0	2.2	0	.2%	.0%	.6%	.0%
BETRONIX	2.1	.2	1.8	39	.2%	.0%	.5%	.0%
Point Control	2.1	.0	2.1	0	.2%	.0%	.6%	.0%
CAD-UL	2.1	.0	2.1	0	.2%	.0%	.6%	.0%
PADS Software	2.1	.0	1.7	0	.2%	.0%	.5%	.0%
ACTEL	2.0	.0	1.8	0	.2%	.0%	.5%	.0%
ESRI	1.9	.0	1.9	0	.2%	.0%	.6%	.0%
CNC Software	1.8	.0	1.8	0	.2%	.0%	.5%	.0%
PAFEC	1.8	.0	1.8	0	.2%	.0%	.5%	.0%
Everex Systems	1.7	1.7	.0	763	.2%	.3%	.0%	.5%
Lamp Software	1.7	.3	1.3	73	.2%	.0%	.4%	.1%
Data I/O	1.6	.0	1.6	0	.1%	.0%	.5%	.0%
Microsim	1.5	.0	1.4	0	.1%	.0%	.4%	.0%
Moda CAD	1.5	.4	1.0	13	.1%	.1%	.3%	.0%
Swanson Analysis	1.5	.0	1.5	0	.1%	.0%	.4%	.0%
FEA	1.4	.3	.4	12	.1%	.1%	.1%	.0%
ISDATA	1.4	.0	1.2	0	.1%	.0%	.4%	.0%
Aucos elektronische Gerate	1.2	.4	.8	116	.1%	.1%	.2%	.1%
ETAK	1.1	.1	1.1	3	.1%	.0%	.3%	.0%
Mucke Software	1.1	.6	.4	26	.1%	.1%	.1%	.0%
Integer	1.1	.0	.9	0	.1%	.0%	.3%	.0%
Geometria GIS Systems House	1.0	.2	.2	14	.1%	.0%	.1%	.0%
S.T.L.D. s.r.l.	1.0	.0	1.0	0	.1%	.0%	.3%	.0%
ADRA Systems	.9	.0	.8	0	.1%	.0%	.2%	.0%

(Continued)

Table 13 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: All Applications
Platform: Personal Computer
Region: Europe
Units: Millions of U.S. Dollars/Actual Units

					Market Share			
Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
ARKTEC	.9	.2	.6	30	.1%	.0%	.2%	.0%
Foresight Resources	.9	.0	.8	0	.1%	.0%	.2%	.0%
Sweet's Electronic Publishing	.9	.0	.7	0	.1%	.0%	.2%	.0%
CAMTEK	.9	.0	.7	0	.1%	.0%	.2%	.0%
Contract Data Research	.9	.0	.6	0	.1%	.0%	.2%	.0%
Aspen Technology	.8	.0	.8	0	.1%	.0%	.2%	.0%
Harris EDA	.8	.0	.6	0	.1%	.0%	.2%	.0%
CADWorks	.8	.0	.7	0	.1%	.0%	.2%	.0%
CAD Lab	.8	.0	.6	0	.1%	.0%	.2%	.0%
Schlumberger	.8	.2	.4	22	.1%	.0%	.1%	.0%
Vision 3D	.8	.4	.2	6	.1%	.1%	.1%	.0%
Number One Systems	.7	.1	.6	55	.1%	.0%	.2%	.0%
Strategic Mapping	.7	.0	.7	0	.1%	.0%	.2%	.0%
CAD-Capture	.7	.0	.1	0	.1%	.0%	.0%	.0%
Carrier Corporation	.7	.0	.7	0	.1%	.0%	.2%	.0%
debis Systemhaus	.7	.2	.4	12	.1%	.0%	.1%	.0%
Hahn & Kolb	.7	.4	.2	14	.1%	.1%	.1%	.0%
Caroline Informatique	.6	.1	.3	9	.1%	.0%	.1%	.0%
Algor Interactive Systems	.6	.0	.6	0	.1%	.0%	.2%	.0%
Engineered Software	.6	.0	.6	0	.1%	.0%	.2%	.0%
MCS	.6	.0	.6	0	.1%	.0%	.2%	.0%
Sigma Design	.6	.0	.6	0	.1%	.0%	.2%	.0%
Teradyne	.6	.0	.5	0	.1%	.0%	.1%	.0%
ESDU International	.6	.0	.6	0	.1%	.0%	.2%	.0%

(Continued)

Table 13 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Europe
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
CADMATIC	.6	.0	.4	4	.1%	.0%	.1%	.0%
ALDEC	.5	.0	.5	0	.0%	.0%	.1%	.0%
Evolution Computing	.5	.0	.5	0	.0%	.0%	.1%	.0%
Massteck	.4	.0	.4	0	.0%	.0%	.1%	.0%
Rasna Corporation	.4	.0	.4	0	.0%	.0%	.1%	.0%
Applications in CADD	.4	.1	.3	11	.0%	.0%	.1%	.0%
Terra Sciences	.4	.0	.4	0	.0%	.0%	.1%	.0%
Accel Technologies	.4	.0	.4	0	.0%	.0%	.1%	.0%
ERDAS	.4	.1	.3	3	.0%	.0%	.1%	.0%
Genasys II	.4	.1	.2	3	.0%	.0%	.1%	.0%
MacNeal-Schwendler	.3	.0	.3	0	.0%	.0%	.1%	.0%
Omation	.3	.0	.3	0	.0%	.0%	.1%	.0%
Compact Software	.3	.0	.3	0	.0%	.0%	.1%	.0%
American Small Business Comp.	.3	.0	.3	0	.0%	.0%	.1%	.0%
Aries Technology	.3	.0	.3	0	.0%	.0%	.1%	.0%
Softdesk	.3	.0	.3	0	.0%	.0%	.1%	.0%
Generation 5 Technology	.3	.0	.3	0	.0%	.0%	.1%	.0%
Masta Corporation	.3	.0	.2	0	.0%	.0%	.1%	.0%
Kork Systems	.3	.0	.2	4	.0%	.0%	.1%	.0%
Instrumatic Espanola	.2	.0	.2	0	.0%	.0%	.1%	.0%
Norsk Data	.2	.1	.0	6	.0%	.0%	.0%	.0%
Facility Mapping Systems	.2	.0	.2	0	.0%	.0%	.1%	.0%
Mega CADD	.2	.0	.2	0	.0%	.0%	.1%	.0%
Micro Engineering Solutions	.2	.1	.1	3	.0%	.0%	.0%	.0%

(Continued)

Table 13 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Europe
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Tanner Research	.2	.0	.2	0	.0%	.0%	.1%	.0%
Cascade Graphics	.2	.0	.2	0	.0%	.0%	.1%	.0%
Technische Computer Systeme	.2	.0	.1	5	.0%	.0%	.0%	.0%
Synthesis	.2	.0	.2	0	.0%	.0%	.0%	.0%
ASG—Archsoft	.1	.0	.1	0	.0%	.0%	.0%	.0%
TOOL Software	.1	.0	.1	3	.0%	.0%	.0%	.0%
A.I. Systems	.1	.0	.1	0	.0%	.0%	.0%	.0%
Terr-Mar Resource Info Svs	.1	.1	.1	3	.0%	.0%	.0%	.0%
Vamp	.1	.0	.1	0	.0%	.0%	.0%	.0%
Genrad	.1	.0	.1	4	.0%	.0%	.0%	.0%
Radan Computational	.1	.0	.1	5	.0%	.0%	.0%	.0%
Accugraph	.1	.0	.1	0	.0%	.0%	.0%	.0%
LandCadd	.1	.0	.1	0	.0%	.0%	.0%	.0%
Simulation Science	.1	.0	.1	0	.0%	.0%	.0%	.0%
GeoGraphix	.1	.0	.1	0	.0%	.0%	.0%	.0%
Ithaca Software	.1	.0	.1	0	.0%	.0%	.0%	.0%
Caddlink	.1	.0	.1	0	.0%	.0%	.0%	.0%
Geotrace Technologies	.1	.0	.1	0	.0%	.0%	.0%	.0%
National Semiconductor	.1	.0	.1	0	.0%	.0%	.0%	.0%
Bechtel Software	.0	.0	.0	0	.0%	.0%	.0%	.0%
Integrated Silicon Systems	.0	.0	.0	0	.0%	.0%	.0%	.0%
Dolphin Integration	.0	.0	.0	0	.0%	.0%	.0%	.0%
GEOVISION Inc.	.0	.0	.0	2	.0%	.0%	.0%	.0%
Pacific Numerics	.0	.0	.0	0	.0%	.0%	.0%	.0%

(Continued)

Table 13 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Europe
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Other Companies	158.0	152.8	5.2	41,646	14.8%	22.8%	1.5%	29.5%
All Companies	1,069.8	669.7	338.2	141,270	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	778.5	566.1	178.2	132,473	72.8%	84.5%	52.7%	93.8%
All Asian-Based Companies	.0	.0	.0	0	.0%	.0%	.0%	.0%
All European-Based Companies	291.3	103.6	160.0	8,797	27.2%	15.5%	47.3%	6.2%
All Hardware Companies	627.6	599.7	.0	137,977	58.7%	89.5%	.0%	97.7%
All Turnkey & SW Companies	442.2	70.0	338.2	3,293	41.3%	10.5%	100.0%	2.3%

Source: Dataquest (September 1992)

1991 CAD/CAM/CAE/GIS Final Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Asia
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
NEC	110.4	92.7	8.8	15,568	14.9%	21.2%	3.5%	21.4%
Fujitsu	70.9	45.2	18.6	2,354	9.6%	10.4%	7.4%	3.2%
Hitachi	61.2	29.4	25.7	3,025	8.3%	6.7%	10.3%	4.2%
IBM	59.2	56.2	.0	14,049	8.0%	12.9%	.0%	19.3%
CADAM	46.4	15.0	26.7	3,000	6.3%	3.4%	10.7%	4.1%
Hakuto	43.8	26.3	17.5	1,499	5.9%	6.0%	7.0%	2.1%
Wacom	42.5	8.4	29.5	719	5.8%	1.9%	11.8%	1.0%
Mutoh Industries—NO OEM	37.4	21.0	14.6	1,329	5.1%	4.8%	5.9%	1.8%
Autodesk	27.6	.0	27.6	0	3.7%	.0%	11.1%	.0%
Hewlett-Packard	27.3	21.8	.0	4,471	3.7%	5.0%	.0%	6.1%
Apple Computer	25.5	22.4	.0	5,335	3.4%	5.1%	.0%	7.3%
Toshiba—NO OEM	20.6	10.3	8.3	1,990	2.8%	2.4%	3.3%	2.7%
Andor	12.8	3.2	9.1	116	1.7%	.7%	3.7%	.2%
Compaq	11.8	11.8	.0	2,307	1.6%	2.7%	.0%	3.2%
Design Automation	10.2	.0	10.2	0	1.4%	.0%	4.1%	.0%
Mitsubishi Electric	10.1	6.6	3.4	974	1.4%	1.5%	1.4%	1.3%
CPU	9.4	.0	8.6	0	1.3%	.0%	3.4%	.0%
Technovision	4.8	.0	4.8	0	.6%	.0%	1.9%	.0%
Viewlogic Systems	4.4	.0	3.5	0	.6%	.0%	1.4%	.0%
Mitsui Engineering	3.4	2.4	.7	58	.5%	.6%	.3%	.1%
Sharp System Products—NO OEM	2.5	1.3	1.2	31	.3%	.3%	.5%	.0%
Xilinx	2.4	.0	2.2	0	.3%	.0%	.9%	.0%
PADS Software	2.2	.0	1.9	0	.3%	.0%	.7%	.0%
Data I/O	2.1	.0	2.1	0	.3%	.0%	.8%	.0%

(Continued)

Table 14 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Asia
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Point Control	2.1	.0	2.1	0	.3%	.0%	.8%	.0%
Strategic Mapping	2.1	.0	2.1	0	.3%	.0%	.8%	.0%
Intergraph	1.9	.0	1.8	0	.3%	.0%	.7%	.0%
Elsof	1.7	.0	1.5	0	.2%	.0%	.6%	.0%
ACTEL	1.6	.0	1.4	0	.2%	.0%	.6%	.0%
Anilam Electronics	1.4	.4	.8	18	.2%	.1%	.3%	.0%
Altera	1.4	.0	1.2	0	.2%	.0%	.5%	.0%
LPKF	1.4	.9	.3	59	.2%	.2%	.1%	.1%
Cimatron	1.1	.5	.5	54	.1%	.1%	.2%	.1%
ADRA Systems	.9	.0	.8	0	.1%	.0%	.3%	.0%
BETRONEX	.9	.1	.8	17	.1%	.0%	.3%	.0%
Swanson Analysis	.9	.0	.9	0	.1%	.0%	.4%	.0%
Microsim	.9	.0	.9	0	.1%	.0%	.3%	.0%
CNC Software	.7	.0	.7	0	.1%	.0%	.3%	.0%
INS Engineering	.7	.5	.1	16	.1%	.1%	.1%	.0%
CADWorks	.6	.0	.5	0	.1%	.0%	.2%	.0%
Moda CAD	.6	.2	.4	5	.1%	.0%	.2%	.0%
ESRI	.6	.0	.6	0	.1%	.0%	.2%	.0%
CADKEY	.5	.0	.5	0	.1%	.0%	.2%	.0%
Everex Systems	.5	.5	.0	229	.1%	.1%	.0%	.3%
Whessoe Computing Systems	.5	.0	.5	0	.1%	.0%	.2%	.0%
Carrier Corporation	.5	.0	.5	0	.1%	.0%	.2%	.0%
Softdesk	.5	.0	.5	0	.1%	.0%	.2%	.0%
Rasna Corporation	.4	.0	.4	0	.1%	.0%	.2%	.0%

(Continued)

Table 14 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Asia
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Sigma Design	.4	.0	.4	0	.1%	.0%	.1%	.0%
ETAK	.4	.0	.4	1	.1%	.0%	.1%	.0%
ISICAD	.4	.0	.4	0	.1%	.0%	.1%	.0%
Aries Technology	.4	.0	.3	0	.0%	.0%	.1%	.0%
Compact Software	.3	.0	.3	0	.0%	.0%	.1%	.0%
Investronica SA	.3	.2	.0	11	.0%	.1%	.0%	.0%
Aspen Technology	.3	.0	.3	0	.0%	.0%	.1%	.0%
Computervision	.3	.0	.3	0	.0%	.0%	.1%	.0%
MCS	.3	.0	.2	0	.0%	.0%	.1%	.0%
Accel Technologies	.3	.0	.2	0	.0%	.0%	.1%	.0%
MacNeal-Schwendler	.3	.0	.2	0	.0%	.0%	.1%	.0%
Superdraft	.2	.1	.1	13	.0%	.0%	.0%	.0%
Micro Engineering Solutions	.2	.1	.1	3	.0%	.0%	.1%	.0%
Terr-Mar Resource Info Svs	.2	.1	.1	5	.0%	.0%	.0%	.0%
Integrated Silicon Systems	.2	.1	.1	3	.0%	.0%	.1%	.0%
Teradyne	.2	.0	.2	0	.0%	.0%	.1%	.0%
BATISOFT	.2	.0	.1	7	.0%	.0%	.0%	.0%
GeoGraphix	.1	.0	.1	0	.0%	.0%	.0%	.0%
ALDEC	.1	.0	.1	0	.0%	.0%	.1%	.0%
ERDAS	.1	.0	.1	1	.0%	.0%	.0%	.0%
Digital	.1	.0	.1	0	.0%	.0%	.0%	.0%
Integer	.1	.0	.1	0	.0%	.0%	.0%	.0%
Pathtrace	.1	.0	.1	2	.0%	.0%	.0%	.0%
Mega CADD	.1	.0	.1	0	.0%	.0%	.0%	.0%

(Continued)

Table 14 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Asia
Units:	Millions of U.S. Dollars/Actual Units

					Market Share			
Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Tanner Research	.1	.0	.1	0	.0%	.0%	.0%	.0%
Algor Interactive Systems	.1	.0	.1	0	.0%	.0%	.0%	.0%
American Small Business Comp.	.1	.0	.1	0	.0%	.0%	.0%	.0%
Simulation Science	.1	.0	.1	0	.0%	.0%	.0%	.0%
Genasys II	.1	.0	.0	1	.0%	.0%	.0%	.0%
Ithaca Software	.1	.0	.1	0	.0%	.0%	.0%	.0%
Massteck	.1	.0	.1	0	.0%	.0%	.0%	.0%
Schlumberger	.1	.0	.0	2	.0%	.0%	.0%	.0%
Accugraph	.0	.0	.0	0	.0%	.0%	.0%	.0%
Facility Mapping Systems	.0	.0	.0	0	.0%	.0%	.0%	.0%
SIMUCAD	.0	.0	.0	0	.0%	.0%	.0%	.0%
The CAD Group	.0	.0	.0	0	.0%	.0%	.0%	.0%
Vamp	.0	.0	.0	0	.0%	.0%	.0%	.0%
Foresight Resources	.0	.0	.0	0	.0%	.0%	.0%	.0%
Geotrace Technologies	.0	.0	.0	0	.0%	.0%	.0%	.0%
Omation	.0	.0	.0	0	.0%	.0%	.0%	.0%
PAFEC	.0	.0	.0	0	.0%	.0%	.0%	.0%
Bechtel Software	.0	.0	.0	0	.0%	.0%	.0%	.0%
Kork Systems	.0	.0	.0	0	.0%	.0%	.0%	.0%
Technische Computer Systeme	.0	.0	.0	0	.0%	.0%	.0%	.0%

(Continued)

Table 14 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Asia
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Other Companies	59.1	59.0	.1	15,529	8.0%	13.5%	.0%	21.3%
All Companies	738.6	436.7	249.7	72,800	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	291.7	187.1	85.3	44,941	39.5%	42.8%	34.2%	61.7%
All Asian-Based Companies	440.8	247.4	161.0	27,677	59.7%	56.6%	64.5%	38.0%
All European-Based Companies	6.2	2.2	3.4	181	.8%	.5%	1.4%	.2%
All Hardware Companies	198.2	186.6	.0	44,919	26.8%	42.7%	.0%	61.7%
All Turnkey & SW Companies	540.4	250.1	249.7	27,881	73.2%	57.3%	100.0%	38.3%

Source: Dataquest (September 1992)

Table 15
1991 CAD/CAM/CAE/GIS Final Market Share

Application: All Applications
Platform: Personal Computer
Region: Rest of World
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Compaq	19.7	19.7	.0	3,845	25.0%	38.0%	.0%	31.7%
IBM	12.3	11.7	.0	2,927	15.6%	22.6%	.0%	24.2%
Claris	2.7	.0	2.7	0	3.4%	.0%	11.2%	.0%
Autodesk	2.5	.0	2.5	0	3.2%	.0%	10.4%	.0%
Apple Computer	2.3	2.0	.0	485	2.9%	3.9%	.0%	4.0%
Engineering Mechanics	2.1	.1	1.8	255	2.6%	.2%	7.3%	2.1%
Orcad	1.8	.0	1.8	0	2.3%	.0%	7.6%	.0%
Intergraph	1.8	.0	1.7	0	2.3%	.0%	7.1%	.0%
Hewlett-Packard	1.4	1.2	.0	358	1.8%	2.2%	.0%	3.0%
MapInfo	1.2	.0	1.0	0	1.5%	.0%	4.0%	.0%
International Software Systems	1.1	.0	1.1	0	1.4%	.0%	4.7%	.0%
GNC Software	1.1	.0	1.1	0	1.4%	.0%	4.6%	.0%
Genasys II	1.0	.3	.6	8	1.2%	.7%	2.4%	.1%
Vero International Software	.9	.0	.9	0	1.2%	.0%	3.5%	.0%
Cimatron	.9	.4	.4	45	1.1%	.8%	1.7%	.4%
Infocel	.8	.2	.6	17	1.0%	.3%	2.5%	.1%
Radian Corporation	.8	.0	.5	0	.9%	.0%	1.9%	.0%
Altera	.7	.0	.6	0	.9%	.0%	2.4%	.0%
ESRI	.7	.0	.7	0	.8%	.0%	2.8%	.0%
Pathtrace	.6	.1	.4	8	.7%	.2%	1.5%	.1%
BETRONEX	.5	.1	.4	9	.6%	.1%	1.7%	.1%
Computervision	.4	.0	.4	0	.5%	.0%	1.7%	.0%
ETAK	.4	.0	.4	1	.5%	.0%	1.4%	.0%
Softdesk	.4	.0	.4	0	.5%	.0%	1.5%	.0%

(Continued)

Table 15 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application: All Applications
Platform: Personal Computer
Region: Rest of World
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Xilinx	.3	.0	.3	0	.4%	.0%	1.2%	.0%
Data I/O	.3	.0	.3	0	.4%	.0%	1.2%	.0%
Hochtief	.3	.0	.2	2	.3%	.1%	.8%	.0%
ACTEL	.3	.0	.2	0	.3%	.0%	1.0%	.0%
PADS Software	.3	.0	.2	0	.3%	.0%	.9%	.0%
Superdraft	.2	.1	.1	13	.3%	.2%	.5%	.1%
Whessoe Computing Systems	.2	.0	.2	0	.3%	.0%	1.0%	.0%
Investronica SA	.2	.2	.0	8	.3%	.3%	.1%	.1%
ADRA Systems	.2	.0	.2	0	.2%	.0%	.6%	.0%
Generation 5 Technology	.2	.0	.2	0	.2%	.0%	.7%	.0%
EEsof	.2	.0	.1	0	.2%	.0%	.6%	.0%
Aura CAD/CAM Systems	.2	.0	.1	0	.2%	.0%	.5%	.0%
LPKF	.2	.1	.0	7	.2%	.2%	.2%	.1%
Mc2 Engineering Software	.1	.0	.1	0	.2%	.0%	.6%	.0%
Compact Software	.1	.0	.1	0	.2%	.0%	.5%	.0%
ERDAS	.1	.0	.1	1	.2%	.1%	.4%	.0%
Innovative Data Design	.1	.0	.1	0	.2%	.0%	.5%	.0%
Engineering Systems Corp.	.1	.0	.1	0	.2%	.0%	.4%	.0%
American Small Business Compt.	.1	.0	.1	0	.1%	.0%	.5%	.0%
CADWorks	.1	.0	.1	0	.1%	.0%	.4%	.0%
Sigma Design	.1	.0	.1	0	.1%	.0%	.4%	.0%
Spectrum Software	.1	.0	.1	0	.1%	.0%	.4%	.0%
ISICAD	.1	.0	.1	0	.1%	.0%	.4%	.0%
Ziegler Informatics	.1	.0	.1	0	.1%	.0%	.4%	.0%

(Continued)

Table 15 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Rest of World
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
CADMATIC	.1	.0	.0	1	.1%	.0%	.2%	.0%
Ithaca Software	.1	.0	.1	0	.1%	.0%	.3%	.0%
Aries Technology	.1	.0	.1	0	.1%	.0%	.2%	.0%
Swanson Analysis	.1	.0	.1	0	.1%	.0%	.3%	.0%
Accel Technologies	.1	.0	.1	0	.1%	.0%	.2%	.0%
Facility Mapping Systems	.1	.0	.1	0	.1%	.0%	.2%	.0%
Moda CAD	.1	.0	.0	1	.1%	.0%	.2%	.0%
Number One Systems	.1	.0	.1	4	.1%	.0%	.2%	.0%
Caddlink	.1	.0	.1	0	.1%	.0%	.2%	.0%
Capilano Computing	.1	.0	.1	0	.1%	.0%	.2%	.0%
Kork Systems	.1	.0	.0	1	.1%	.0%	.2%	.0%
Massteck	.1	.0	.1	0	.1%	.0%	.2%	.0%
Accugraph	.0	.0	.0	0	.1%	.0%	.1%	.0%
Algor Interactive Systems	.0	.0	.0	0	.1%	.0%	.2%	.0%
Engineered Software	.0	.0	.0	0	.1%	.0%	.2%	.0%
Terr-Mar Resource Info Svs	.0	.0	.0	1	.1%	.0%	.1%	.0%
Teradyne	.0	.0	.0	0	.0%	.0%	.1%	.0%
Foresight Resources	.0	.0	.0	0	.0%	.0%	.1%	.0%
Genrad	.0	.0	.0	1	.0%	.0%	.1%	.0%
MacNeal-Schwendler	.0	.0	.0	0	.0%	.0%	.1%	.0%
Simulation Science	.0	.0	.0	0	.0%	.0%	.1%	.0%
Vision 3D	.0	.0	.0	0	.0%	.0%	.0%	.0%
ESDU International	.0	.0	.0	0	.0%	.0%	.0%	.0%
FEA	.0	.0	.0	0	.0%	.0%	.0%	.0%

(Continued)

Table 15 (Continued)
1991 CAD/CAM/CAE/GIS Final Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Rest of World
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Other Companies	15.7	15.6	.1	4,114	19.9%	30.1%	.5%	34.0%
All Companies	79.0	51.9	24.2	12,111	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	74.7	50.9	21.2	12,014	94.5%	98.1%	87.8%	99.2%
All Asian-Based Companies	.0	.0	.0	0	.0%	.0%	.0%	.0%
All European-Based Companies	4.3	1.0	2.9	97	5.5%	1.9%	12.2%	.8%
All Hardware Companies	51.4	50.2	.0	11,729	65.1%	96.8%	.0%	96.8%
All Turnkey & SW Companies	27.6	1.7	24.2	382	34.9%	3.2%	100.0%	3.2%

Source: Dataquest (September 1992)

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Personal CAD
Preliminary Forecast
May 18, 1992

Source:
Dataquest

Market Statistics

Dataquest

CAD/CAM/CAE
Personal CAD and Distribution Channels
CCAM-PER-MS-9201

Personal CAD
Preliminary Forecast
May 18, 1992

Source:
Dataquest

Market Statistics

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Personal CAD Preliminary Forecast

May 18, 1992

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Note: All tables show estimated data.

Personal CAD Preliminary Forecast

Introduction

The slowing of world economies was a major factor affecting CAD/CAM/CAE growth in 1991 and will continue to affect growth over the next few years. Many of the major world economies faltered in 1991 to 1992. On a list of the 33 largest countries compiled earlier this year by the Economic Analysis Department of The Dun & Bradstreet Corporation, 18 were in or near recession. Although the gross domestic product/gross national product (GDP/GNP) forecast for 1992 to 1993 has been adjusted upward for the United States, the GDP/GNP forecast for 1992 to 1993 for 7 of the 14 European economies tracked has been adjusted downward. The Japanese economy, which has traditionally exhibited steady growth when other major economies slowed, began to falter in the latter half of 1991. Forecasts call for R&D spending in Japan to slow to less than 10 percent (for the first time in 10 years) and for Japanese domestic spending to decline in the second half of 1992.

In spite of these poor economic conditions, the CAD/CAM/CAE market posted solid growth of 9.5 percent to $15.8 billion in 1991, somewhat slower than the growth rates of previous years. The market is forecast to grow at a compound annual growth rate (CAGR) of 9 percent through 1996 (see Figure 1). (This forecast is based on the CAD/CAM/CAE group's preliminary market information and will be updated in October).

This document contains Dataquest's detailed forecast information on the CAD/CAM/CAE industry. Included in this document are the following:

- Five-year historical data
- Five-year forecast data

More detailed data on this marked may be requested through our client inquiry service.

Forecast Accuracy and Comparison

Overall, last year's CAD/CAM/CAE market forecast appears to have been slightly optimistic in many cases, with some variance among regions (see Table 1).

European growth in 1991 was slightly less than expected because of slower growth in all countries except Benelux. Overall, the European economy slowed considerably during 1991. The North American results for 1991 were somewhat better than expected. Asia was right on target. By application, AEC results were slightly better than expected for 1991; while actual results were somewhat lower than expected in the other application areas. Figure 2 shows the CAD/CAM/CAE forecast by application.

Forecast Assumptions

Below are the main forces by region, driving the CAD/CAM/CAE forecast.

Worldwide Forecast Drivers

The following are the main forces driving the CAD/CAM/CAE worldwide forecast:

- CAD/CAM/CAE systems will continue to give buyers a competitive edge. As time-to-market requirements shrink, demand for design automation tools will continue to increase.
- Limited system budget growth in the near term will constrain growth. Budgets for hardware, software, and services are forecast to grow by 5 to 10 percent in North America in 1992, 10 to 15 percent in Europe, and approximately 15 percent in Asia. Dataquest's research indicates that users do not plan to buy one core software

Figure 1
History and Forecast for the CAD/CAM/CAE Market: Hardware, Software, and Service

Billions of Dollars

Legend: Hardware; Total Software Revenue; Service; Unbundled Software Revenue; Bundled Software Revenue
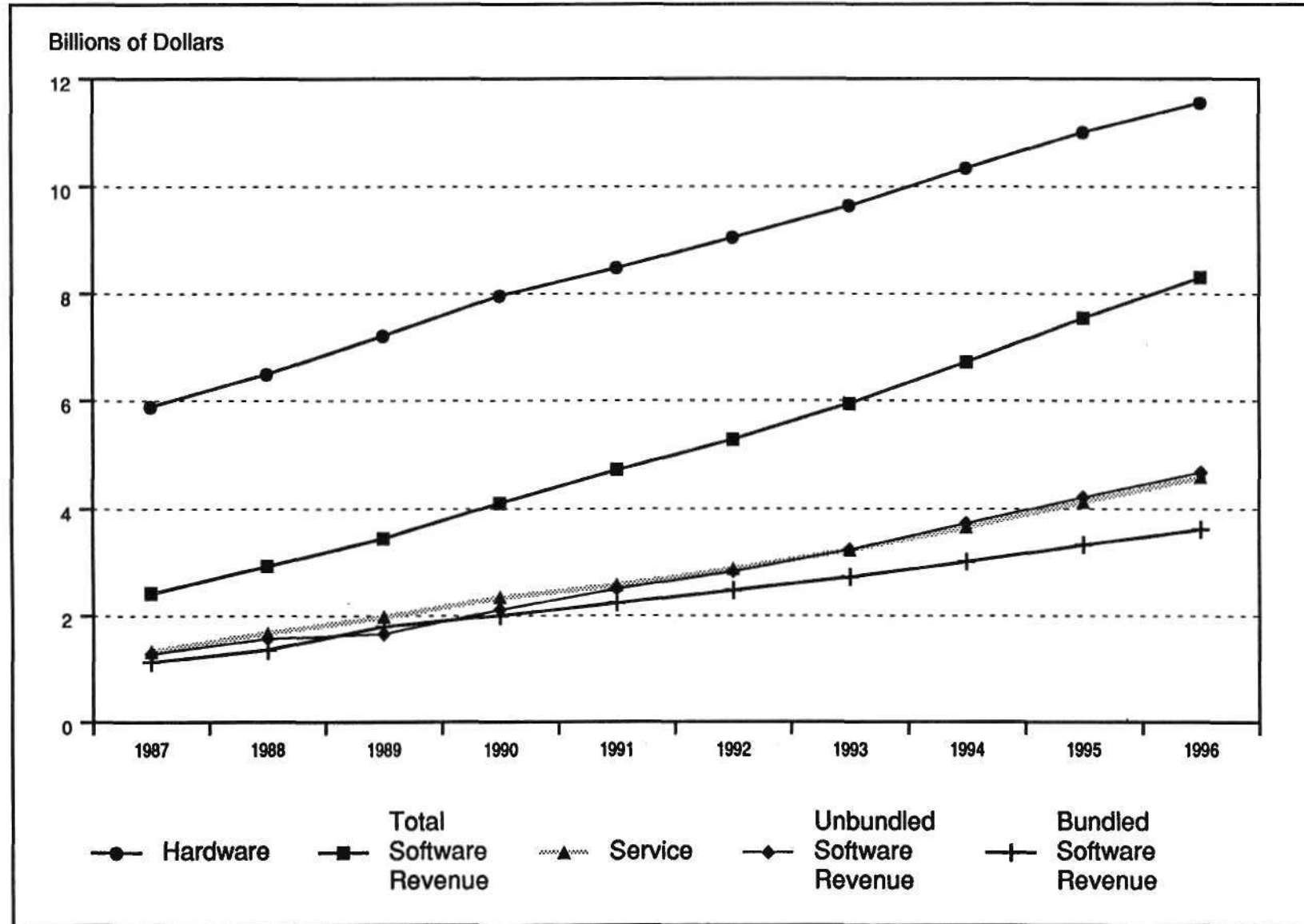
Source: Dataquest (May 1992)

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Table 1
CAD/CAM/CAE Forecast Comparison (Billions of Dollars)

	1991	1992	CAGR (%) 1991-1996
Worldwide			
Last Year's Forecast	16.0	17.9	12
Actual Results and Current Forecast	15.8	17.2	9
Difference (%)	-1.5	-4.2	
North America			
Last Year's Forecast	5.2	5.7	9
Actual Results and Current Forecast	5.3	5.7	7
Difference (%)	2.4	0.5	
Europe			
Last Year's Forecast	6.0	6.8	13
Actual Results and Current Forecast	5.7	6.2	10
Difference (%)	-4.9	-7.9	
Asia			
Last Year's Forecast	4.5	5.1	12
Actual Results and Current Forecast	4.4	4.9	9
Difference (%)	-0.8	-3.6	
Rest of World			
Last Year's Forecast	0.4	0.5	21
Actual Results and Current Forecast	0.3	0.4	16
Difference (%)	-9.6	-14.3	

Source: Dataquest (May 1992)

Figure 2
History and Forecast for the CAD/CAM/CAE Market by Application

Billions of Dollars

Legend: Mechanical, AEC, GIS/Mapping, ECAE, IC Layout, PCB/Hybrid/MCM
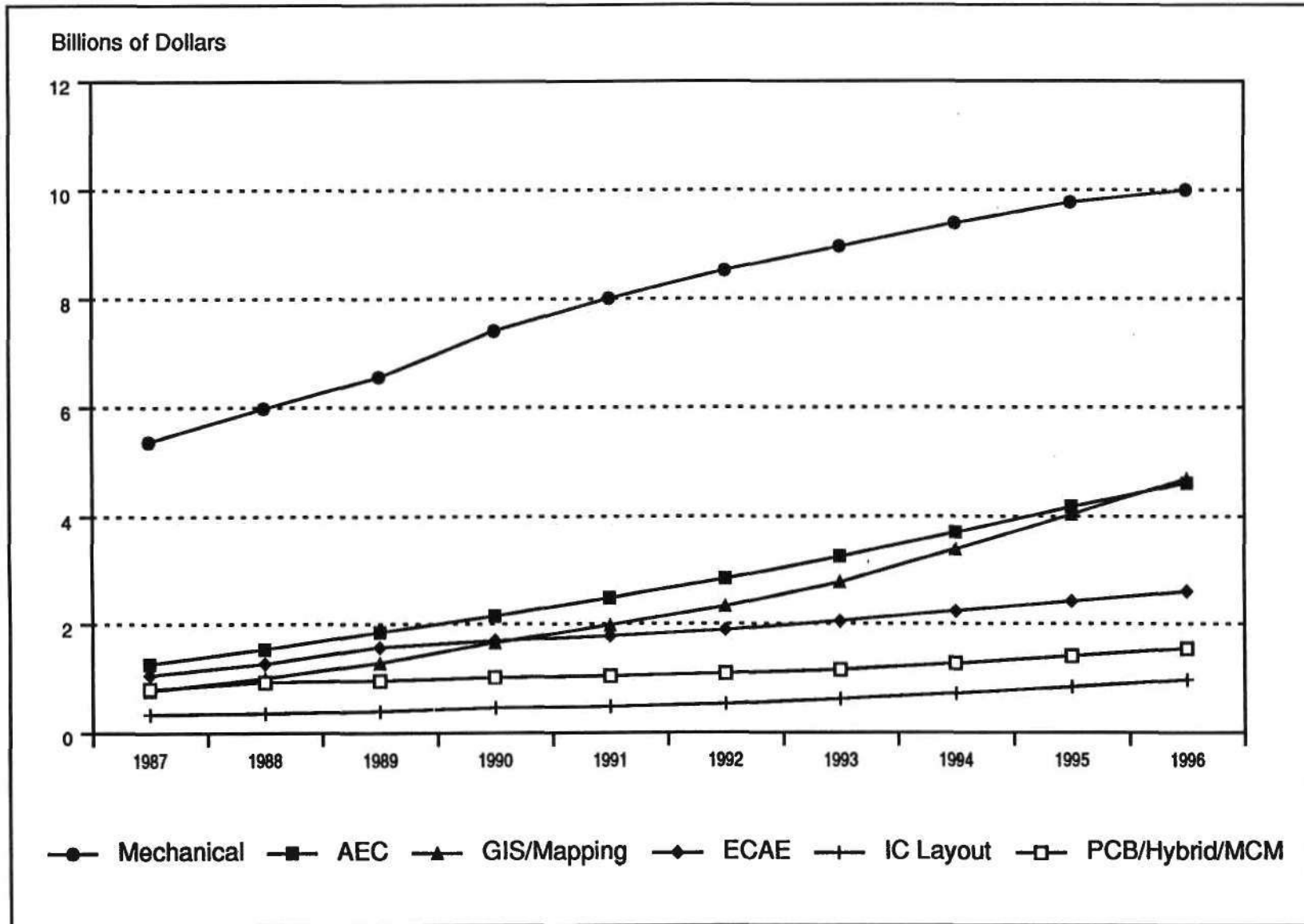
Source: Dataquest (May 1992)

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package for each person; the sharing of seats will continue. Networked users will continue to buy systems for a limited number of concurrent users, waiting until the system overloads before buying more.

- Market demand will be limited by the vendors' inability to fully meet demand for highly integrated software systems. Dataquest believes that the industry business model is evolving to a structure where large software vendors will function increasingly as application software integrators. Much of the innovation in new niche products can be expected to come from the small software vendors, which will be dependent on their OEM relationships with "major" software vendors. These alliances will ultimately reduce the total cost of software development, thus strengthening industry profitability. However, design problems will become increasingly complex, and meaningful success in integrating software will lag behind market demand.

- We anticipate incremental progress in delivering open systems and standards to market, which will constrain market demand. When and how open systems successfully arrive on the market will affect the value of CAD tools.

- The "late majority" buyers for CAD/CAM/CAE will be coming to market over the next five years, driving additional growth. However, conservative buyers will favor market leaders. These conservative buyers are the "late majority" buyers who do not buy until the weight of the majority seems to legitimize the product. Therefore, for vendors, the value of having high market share as well as financial clout will increase.

- Market growth will be limited until the second half of 1992 for the EDA market. The major EDA vendors have just introduced their new products. Currently, many EDA buyers are evaluating product options and refraining from purchasing until a thorough evaluation is completed.

North American Forecast Drivers

The North American market grew 6 percent in 1991 to $5.3 billion and is forecast to grow at an 8 percent CAGR through 1996 (see Figure 3 for the forecast by region).

Some of the main factors driving the North American forecast are the following:

- Market growth will increase in the second half of 1992. In an across-the-board resurgence of optimism, U.S. business executives have said they expect higher sales and profits in the second quarter, according to The Dun & Bradstreet Corporation's latest nationwide quarterly survey of business executives. "Rebounding sharply from nearly a nine-year low last quarter, the mood of business executives around the nation has grown much more optimistic," said Joseph W. Duncan, vice president and chief economist for The Dun & Bradstreet Corporation. "The turnaround was unequivocal, with virtually all industries and nearly every region of the country expecting stronger sales and profits next quarter."

- Market growth will be reduced because of decreasing average selling prices (ASPs). The United States is a large market with more developed distribution channels and larger order sizes than other markets. Streamlined distribution channels leave fewer places for profit to hide; and, therefore, ASPs have declined more sharply. In contrast, the European market is the sum of many markets of smaller countries, each with its own customs and requirements. Because of these special requirements, ASPs have not been as pressured to decline in European markets as they have been in the U.S. market. Therefore, North American unit shipments will continue to grow significantly, while revenue will grow at a slower rate because of strong price competition.

- Market growth will be limited because of lower defense spending. Spending cuts in the defense budget of 25 to 30 percent over the next five years are currently being proposed by the U.S. administration. In the United States, both republicans and democrats are seeking to balance defense spending cuts against the large loss of jobs that is expected to occur when such reductions are made. Most likely, the defense department will encourage continued growth in R&D spending, while severely limiting the number of programs that would lead to actual production. CAD companies that are heavily dependent on direct or indirect government defense spending contracts will have increasingly limited growth opportunities.

Figure 3
History and Forecast for the CAD/CAM/CAE Market by Region

Billions of Dollars

North America   Europe   Asia
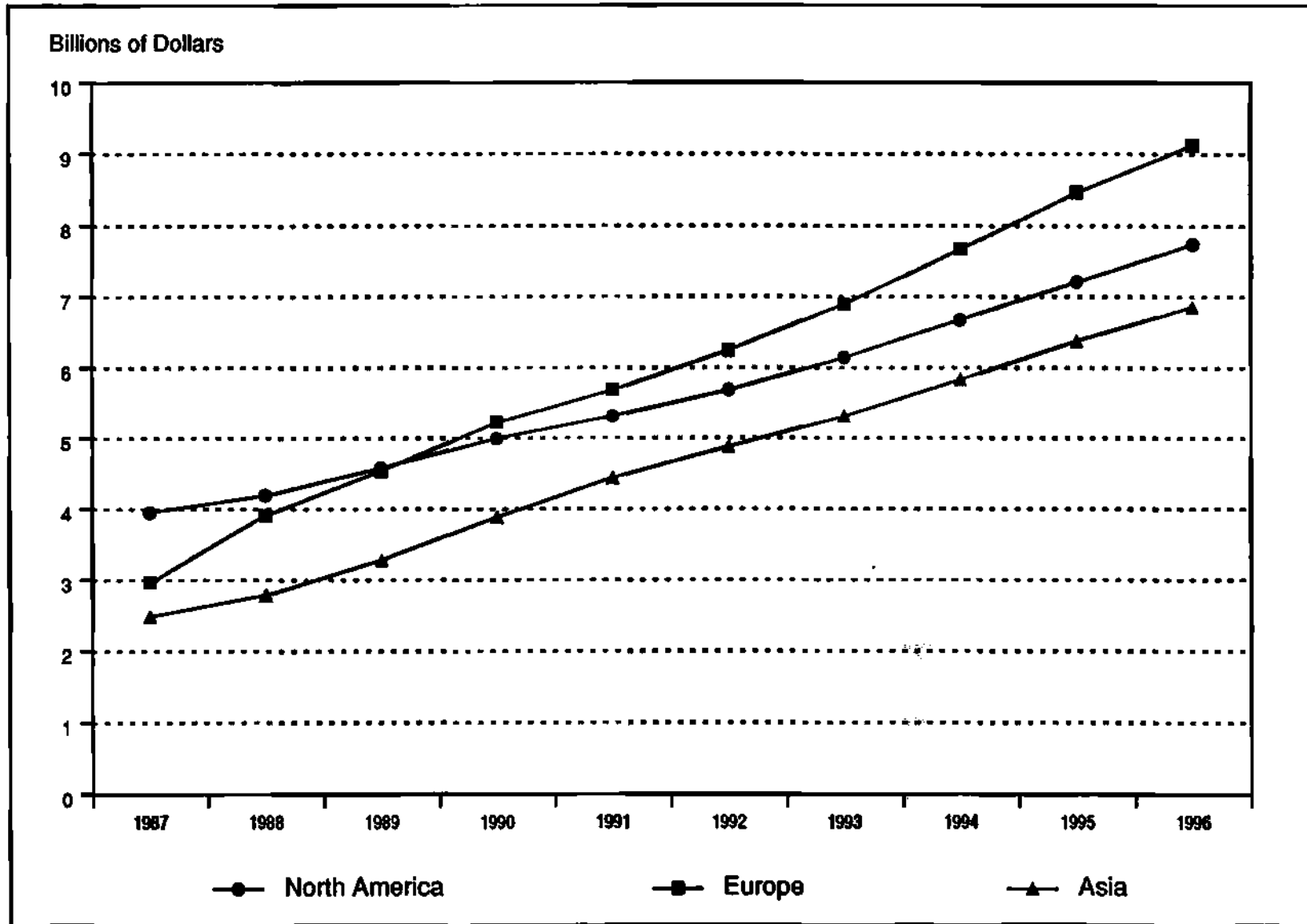
Source: Dataquest (May 1992)

European Forecast Drivers

The European market will reach $9.1 billion by 1996 and grew 9 percent in 1991 to $5.7 billion. This market is forecast to have a revenue CAGR of 10 percent through 1996. Some of the main issues driving the European forecast include the following:

- Growth will steadily increase in Eastern Europe. The collapse of the Soviet Union as an export market has complicated the difficult situation already facing other central and eastern European countries as they make the transition to market economies and establish new international trading arrangements. Poland, Hungary, and, more recently, Czechoslovakia have made impressive progress in shifting exports to other markets. In all these countries, prices have been set free and inflation seems to be coming under control. The initial groundwork has been laid. GDP/GNP growth is forecast to turn positive during 1992 to 1993 and reach strength toward 1994. As these countries' economies become market economies, CAD/CAM/CAE opportunities will increase.

- Growth will be relatively unaffected by the advent of the European Community (EC). The effects of 1992 will be evolutionary, not revolutionary. Currently, the new EC regulations on environment (such as request for environmental impact studies for town planning) are driving considerable growth in the GIS application area.

- Growth is expected for European vendors as they expand into other European markets. To date, many European vendors have competed only in their country of origin. Over the next forecast period, European vendors will increasingly expand their overseas operations to become more competitive across the European community. German companies and German subsidiaries of international companies are increasingly expanding into Eastern European countries.

Asian Forecast Drivers

The Asian market grew 14 percent in 1991 to $4.4 billion, and its forecast CAGR for revenue is 9 percent through 1996. Some of

the main issues driving the Asian forecast are as follows:

- Shifting labor costs will affect growth among countries. Labor costs in Japan, Korea, Taiwan, and Hong Kong will continue to increase, which will result in a growing demand for productivity tools including CAD/CAM/CAE. Industries with blue-collar workers will transfer operations to Indonesia, Malaysia, the Philippines, Thailand, and the Republic of China; Japan, Korea, Taiwan, and Hong Kong will grow based on the industry of the white-collar workers. Remote design and manufacturing sites also will encourage the growth of electronic data sharing and thus CAD/CAM across Asia.

- Growth will be strong as companies continue transitioning from the mainframe to network-based desktop environments. CAD/CAM/CAE in Japan is still predominantly a mainframe environment. As companies increase their interest in desktop systems, healthy unit growth will occur, and ASPs should decline sharply.

- Growth will be strong in EDA. Demands for merchant EDA tools supporting the design of ASICs, MCMs, and application-specific standard products (ASSPs) will expand; the development of in-house electronic products will continue to decline. The EDA industry will continue moving toward an oligopoly of vendors providing a full line of tools encapsulated within an open framework, with niche vendors providing point-solution tools.

- Growth is less likely in some Asian countries because of the lack of stringent intellectual property rights. Most Asian countries, with the exception of Japan, have few laws governing intellectual property rights. Many companies will be hesitant to invest or set up operations in a region where they will receive no design protection.

- Mechanical CAD/CAM/CAE growth will continue to be strong in Asia because of growing requirements to support concurrent engineering. Point-solution tools associated with parametric and variational design, manufacturability, and testability will be required. Major vendors will add these tools through OEMs, merger and acquisitions, or

in-house development in order to defend their installed base.

Notes on Forecast

For the 1991 publishing cycle, Dataquest's CAD/CAM/CAE group added server as a platform. The platform categories now include technical workstation, host-dependent, server, and personal computer. Revenue formerly classified in technical workstations, host-dependent, or personal computer may now be more accurately classified, where appropriate, in the server category. However, because of this reclassification, data and growth rates for the other platform areas were affected. Figure 4 depicts the revised platform distribution.

Forecast Methodology

Fundamental to the way Dataquest conducts its research is an underlying philosophy that says the best data and analyses come from a well-balanced program. This program includes balance between primary and secondary collection techniques; balance between supply-side and demand-side analysis; balance between focused, industry-specific research and coordinated, "big-picture" analysis aided by integration of data from the more than 25 separate high-technology industries Dataquest covers; and balance between the perspectives of experienced industry professionals and rigorous, disciplined techniques of seasoned market researchers.

Dataquest also analyzes trends in the macroenvironment, which can have major influences on both supply-side and demand-side forecasting. In addition to demographics, analysts look at GNP growth, interest rate fluctuation, currency fluctuation, business expectations, and capital spending plans. In the geopolitical arena, the group looks at trade issues, political stability or lack thereof, tariffs, nontariff barriers, and such factors as the effect on Europe of the events of 1992.

Figure 5 is a pictorial summary of the information compendium offered by the Dataquest CAD/CAM/CAE group.

The CAD/CAM/CAE industry market estimates and forecasts are derived using the following research techniques:

- "Bottom-up" aggregation—This method involves adding all relevant vendor contributions to arrive at total market estimates for all historical data.

- Segment forecasting—For each application segment tracked by the CAD/CAM/CAE group, individual forecasts are derived following the basic information model defined previously. Specifically, each design phase covered within each application is segmented by channel, product, region, and platform. In this way, each application segment incorporates its own set of unique assumptions.

- Demand-based analysis—Market growth is tracked and forecast in terms of the present and anticipated demand of current and future users. This requires the development of a total available market (TAM) model and a satisfied available market figure to accurately assess the levels of penetration. Installed base is also evaluated. Rates of product retirement are primarily based on input from end users in our ongoing survey programs. Figure 6 shows the CAD/CAM/CAE installed base by platform. In addition, Dataquest analysts factor in the acceptance or ability for users to consume new technology.

- Capacity-based analysis—This method involves identifying future shipment volume constraints. These constraints, or "ceilings," can be the result of component availability, manufacturing capacity, or distribution capacity. In any case, capacity limitations are capable of keeping shipments below the demand level.

Segmentation

For complete information on Dataquest's high-technology market segmentation scheme, please refer to the Dataquest High-Technology Guide: Segmentation and Glossary.

Dataquest defines CAD/CAM/CAE as systems used in the mechanical; architecture, engineering, and construction (AEC); GIS/mapping; and electronic design automation (EDA) application

Figure 4
CAD/CAM/CAE Revised Platform Distribution

Billions of Dollars

Personal CAD Preliminary Forecast

Legend:

- New Technical Workstation
- New Host-Dependent
- New PC
- Server
- Old Technical Workstation
- Old Host-Dependent
- Old PC

Source: Dataquest (May 1992)

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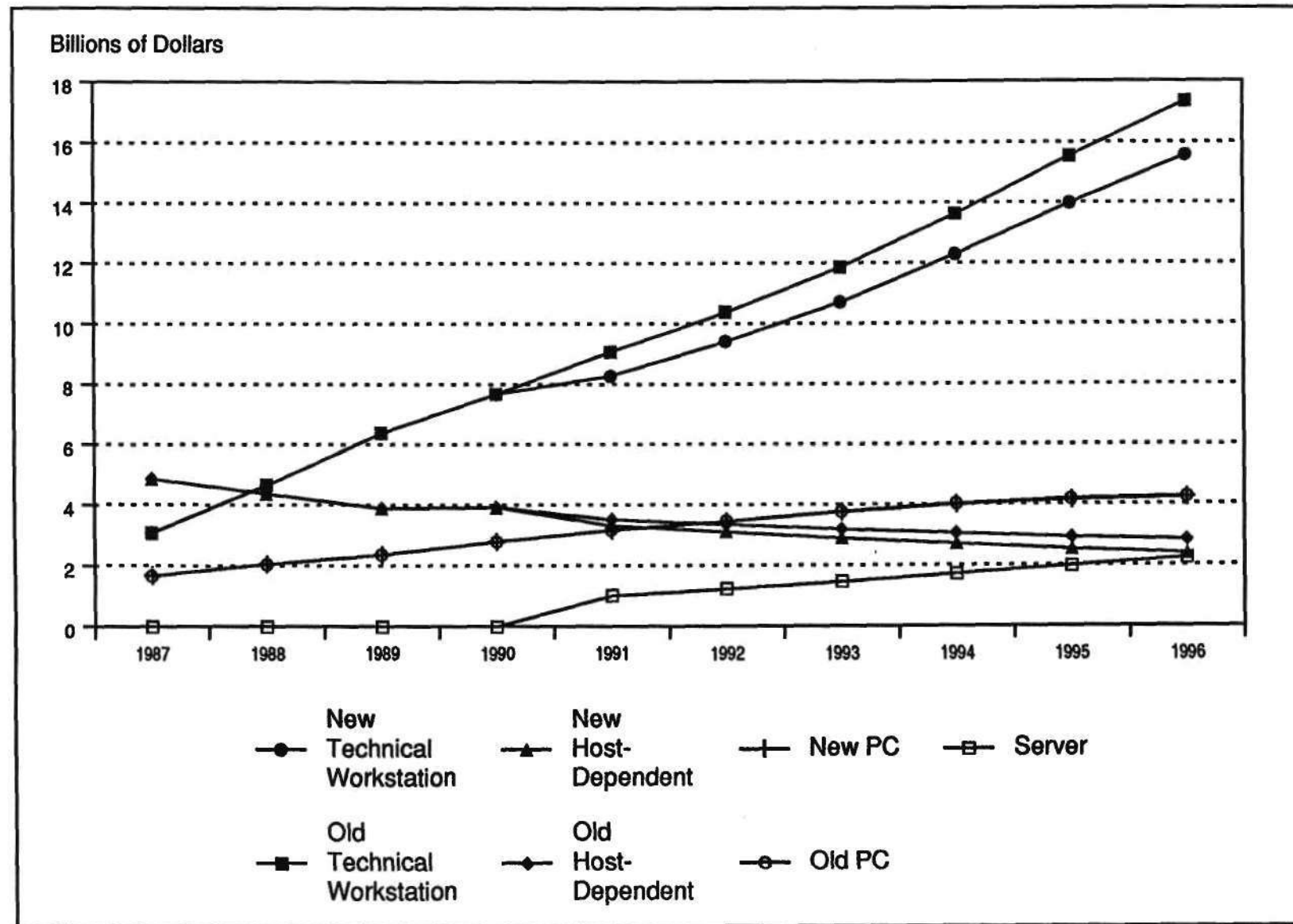
Figure 5
Information Compendium
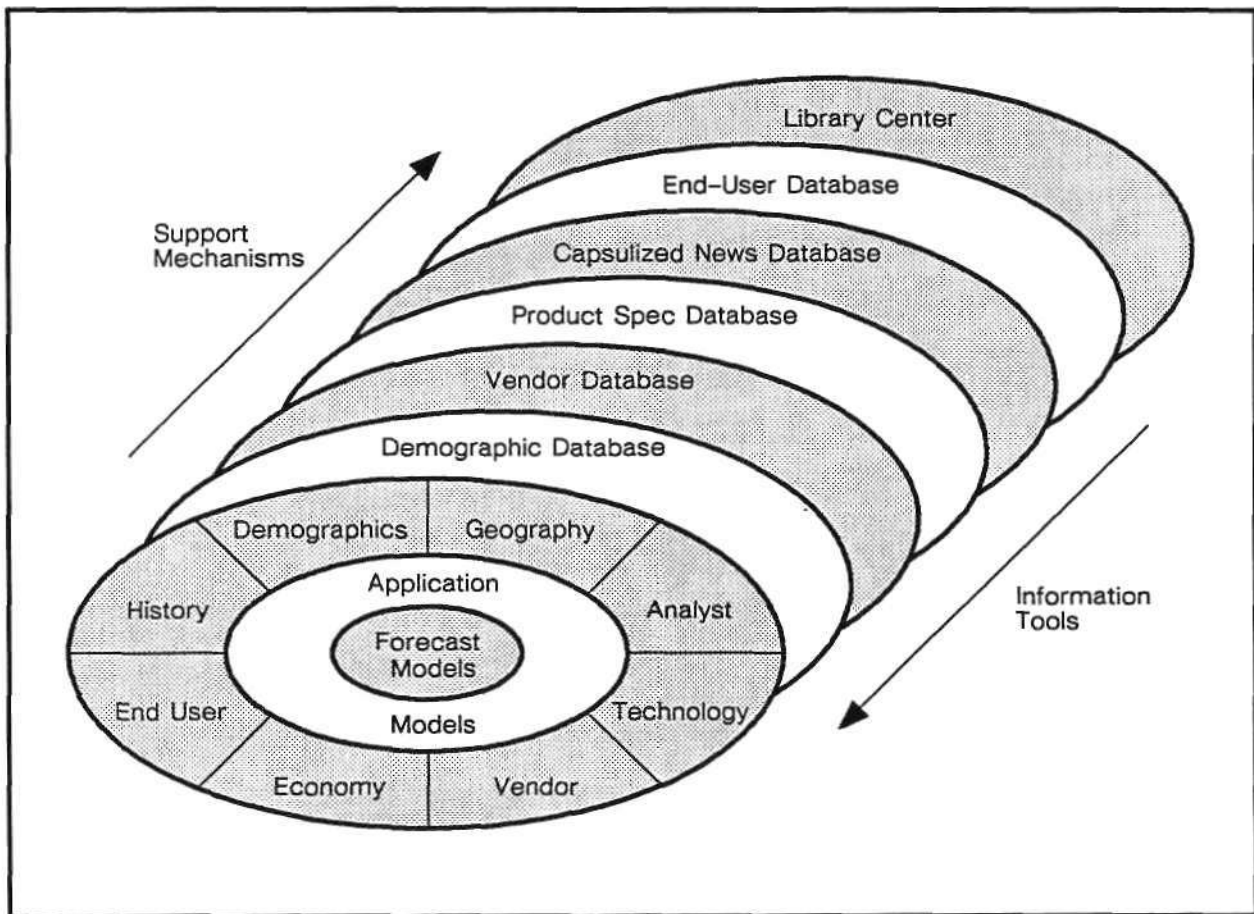
Source: Dataquest (May 1992)   G2000167

areas. The CAD/CAM/CAE market is defined according to the following segmentation scheme:

- CAD/CAM/CAE
  - Mechanical
  - AEC (Architecture, Engineering, and Construction)
  - GIS/Mapping (Geographic Information Systems)
  - EDA (Electronic Design Automation)
    - Electronic CAE
    - IC Layout
    - PCB/Hybrid/MCM

In addition, more detailed information by subapplication is available and usually published in *Dataquest Perspectives*.

For a listing of possible subapplication categories, see the *Dataquest High-Technology Guide: Segmentation and Glossary*.

Definitions

This section lists the definitions that are specific to this document. Complete definitions for all terms can be found in the *Dataquest High-Technology Guide: Segmentation and Glossary*.

Figure 6
CAD/CAM/CAE Installed Base

Thousands of Units/Seats

Legend: PC — Technical Workstation — Host-Dependent — Server

Personal CAD Preliminary Forecast

Source: Dataquest (May 1992)

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Application definitions are as follows:

- Mechanical—Mechanical CAD/CAM refers to computer-aided tools used to design, analyze, document, and manufacture discrete parts, components, and assemblies.

- Architecture, Engineering, and Construction (AEC)—This segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.

- Geographic Information Systems (GIS)/Mapping—This is a computer-based technology, composed of hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.

- Electronic Design Automation (EDA)—This segment covers computer-based tools that are used to automate the process of designing an electronic product including printed circuit boards, ICs, and systems. EDA includes ECAE, IC Layout, and PCB/Hybrid/MCM, as follows:

  - Electronic Computer-Aided Engineering (CAE)—These are computer-aided tools used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the product). Examples of Electronic CAE applications are schematic capture and simulation.

  - IC Layout—This is a software application tool that is used to create and validate the physical implementation of an integrated circuit (IC). The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), design verification tools (DRC/ERC/logic-to-layout), compilers, and module development tools.

  - Printed Circuit Board (PCB)/Hybrid/Multichip Module (MCM)—This segment covers products that are used to create the placement and routing of the traces and components laid out on a printed circuit board. Also, included in this category are thermal analysis tools.

Regional definitions are as follows:

- North America—Includes United States and Canada

- Europe—Includes the United Kingdom, Scandinavia, Benelux, France, Germany, Italy, Spain, and Rest of Europe

- Asia—Includes Japan, Singapore, Taiwan, Korea, China, and Hong Kong

- Rest of World—All other countries including Australia, New Zealand, Oceania, Africa, Central America, South America, and the Middle East

Platform definitions are as follows:

- Technical Workstation—This is a single-user computer that is distinguished from a personal computer by its features and by the user's potential range of expansion on the platform. Features include a virtual, multitasking operating system (UNIX, VMS, DOMAIN); the computer is designed by manufacturer to run high-performance graphic applications in a multiuser/multitasking environment.

- Host-Dependent—This is a shared logic system in which the external workstations' functions are dependent on a host computer.

- Server—A server is a computer that transparently provides its resources for use by other computer systems. It is a system on a network that provides specific functionality to other computer systems: the clients. Functions include file storage, database access, compute capability, and others. Dataquest tracks the following major categories of servers used for CAD/CAM/CAE and GIS applications:

  - Compute Servers—These systems provide capabilities for solving numerical problems (for example, simulations, statistical calculations, and simultaneous partial differential equations). System features usually include high-speed computational capabilities (for example, vector and parallel processing) and large memories.

  - Print Servers—These systems provide access to printers, specialized printing applications software, and print-spooling resources to a network.

- File Servers—These systems provide mass storage capability to clients on a network. Services can range from temporary storage of working files to long-term backup and archive systems.

- Database Servers—These systems manage databases as a shared resource to a network. These servers handle such functions as physical data storage, data security, and high-level queries and can access stored information at the record level.

- Personal Computer—This is defined as a single-user computer that is distinguished from a technical workstation by its features and by the user's potential range of expansion on the platform. Features found in technical workstations (such as a virtual operating system, networking, high-performance graphics, multiuser/multitasking capability) are optional rather than integrated by the manufacturer.

Line item definitions are as follows:

- Average selling price (ASP) is defined as the average price of a product, inclusive of any discounts.

- CPU installed base is defined as the total number of CPUs in active, day-to-day use.

- CPU revenue is the portion of revenue derived from a system sale that is related to the value of the CPU. (In the case of technical workstations and personal computers, CPU revenue contains the terminal revenue.)

- CPU shipment is defined as the number of CPUs delivered.

- Hardware revenue is defined as the sum of the revenue from the hardware system components: CPU revenue, terminal revenue, and peripherals revenue.

- Installed seats are defined as the total number of seats in active, day-to-day use.

- Peripherals revenue is defined as the value of all the peripherals of a turnkey sale. (Peripherals in this category typically are input and output devices.)

- Service revenue is defined as revenue derived from the service and support of CAD/CAM/CAE or GIS systems. Service revenue can be calculated in the tables by subtracting hardware and software revenue from total revenue.

- Software revenue is revenue derived from the sale of bundled (part of a turnkey system) and unbundled software.

- Terminal revenue is defined as revenue derived from the sale of terminals that are used to graphically create, analyze, or manipulate designs. The term is applicable only to the host-dependent platform, as terminal revenue is contained within CPU revenue for technical workstations and PCs.

- Total factory revenue is defined as the amount of money received by a manufacturer for its goods measured in U.S. dollars. Total factory revenue does not include revenue that a company may receive from products that are sold to another company for resale (OEM revenue).

- Unit shipment is defined as the number of products delivered (that is, seats).

Table 2
Preliminary History and Forecast

Application:	All Applications
Region:	Worldwide
Platform:	Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	208,448	248,386	265,706	333,038	380,890	419,050	460,570	496,630	511,570	520,850	16	6
Unit Shipments or Seats	208,448	248,386	265,706	333,038	380,890	419,080	460,600	496,660	511,610	520,890	16	6
CPU Installed Base	417,928	645,727	861,404	1,098,108	1,329,805	1,547,440	1,761,690	1,969,410	2,149,170	2,294,440	34	12
Installed Seats	417,928	645,727	861,404	1,098,108	1,329,805	1,547,440	1,761,690	1,969,410	2,149,170	2,294,440	34	12
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	16.0	20.9	18.7	18.4	17.1	17.1	16.9	16.7	16.5	16.1	2	-1
Hardware-Only ASP	4.3	4.7	4.8	4.6	4.4	4.4	4.3	4.2	4.2	4.0	1	-2
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	1,043	1,340	1,504	1,780	1,970	2,115	2,259	2,367	2,374	2,330	17	3
CPU Revenue	953	1,201	1,393	1,654	1,833	1,971	2,111	2,219	2,231	2,196	18	4
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	90	139	111	126	138	144	148	148	143	134	11	-1
Software Revenue	547	617	738	876	1,033	1,138	1,257	1,371	1,481	1,572	17	9
Bundled	142	115	140	140	180	189	186	181	171	159	6	-2
Unbundled	405	502	598	736	853	948	1,071	1,190	1,310	1,413	20	11
Service Revenue	74	89	123	143	166	199	237	275	309	339	22	15
Total Factory Revenue	1,665	2,046	2,364	2,799	3,169	3,453	3,754	4,013	4,164	4,241	17	6
Increase over Prior Year (%)	22	23	16	18	13	9	9	7	4	2		

NOTE: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (May 1992)

Table 3

Preliminary History and Forecast

Application: All Applications
Region: North America
Platform: Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	109,628	141,920	126,522	140,768	160,321	174,020	183,780	192,180	194,330	196,090	10	4
Unit Shipments or Seats	109,628	141,920	126,522	140,768	160,321	174,020	183,780	192,180	194,330	196,090	10	4
CPU Installed Base	235,563	364,430	461,232	546,838	624,607	691,720	753,040	811,250	861,370	900,940	28	8
Installed Seats	235,563	364,430	461,232	546,838	624,607	691,720	753,040	811,250	861,370	900,940	28	8
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	17.0	25.7	17.1	15.7	12.0	11.2	11.1	11.1	10.8	10.7	-8	-2
Hardware-Only ASP	3.9	3.9	4.8	4.6	4.4	4.3	4.2	4.2	4.1	4.0	3	-2
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	452	570	611	652	710	757	784	805	798	782	12	2
CPU Revenue	436	567	595	634	691	739	766	787	781	766	12	2
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	16	3	16	18	18	18	18	18	17	16	4	-3
Software Revenue	224	261	295	345	389	416	461	505	550	586	15	9
Bundled	20	7	6	5	4	4	3	3	3	2	-35	-7
Unbundled	204	254	289	341	385	412	458	502	548	583	17	9
Service Revenue	23	34	41	46	50	60	72	85	97	108	21	17
Total Factory Revenue	698	865	947	1,043	1,148	1,234	1,318	1,395	1,445	1,476	13	5
Increase over Prior Year (%)	7	24	10	10	10	7	7	6	4	2		

NOTE: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (May 1992)

Table 4
Preliminary History and Forecast

Application: All Applications
Region: Europe
Platform: Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	59,618	66,023	85,834	111,449	137,640	154,990	176,810	196,420	203,350	205,560	23	8
Unit Shipments or Seats	59,618	66,023	85,834	111,449	137,640	154,990	176,810	196,430	203,350	205,560	23	8
CPU Installed Base	110,021	171,628	245,253	331,753	428,723	526,140	627,730	729,950	818,070	887,140	40	16
Installed Seats	110,021	171,628	245,253	331,753	428,723	526,140	627,730	729,950	818,070	887,140	40	16
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	10.2	13.8	20.4	19.3	17.6	19.1	19.2	19.2	19.2	18.9	15	1
Hardware-Only ASP	4.5	5.4	5.0	4.8	4.5	4.5	4.4	4.3	4.2	4.1	0	-2
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	304	397	498	611	696	779	867	938	948	926	23	6
CPU Revenue	273	369	448	557	641	716	800	869	879	860	24	6
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	31	28	49	55	54	63	67	70	69	66	15	4
Software Revenue	182	206	249	303	362	432	499	565	624	671	19	13
Bundled	34	33	33	29	42	58	59	60	59	56	5	6
Unbundled	147	173	216	274	320	374	440	506	566	615	21	14
Service Revenue	28	33	41	50	57	74	93	112	128	141	19	20
Total Factory Revenue	514	636	788	964	1,115	1,285	1,459	1,616	1,700	1,738	21	9
Increase over Prior Year (%)	44	24	24	22	16	15	13	11	5	2		

NOTE: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (May 1992)

Table 5

Preliminary History and Forecast

Application: All Applications
Region: Asia
Platform: Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	34,573	36,492	48,143	73,386	71,911	75,910	82,040	85,420	86,120	86,120	20	4
Unit Shipments or Seats	34,573	36,492	48,143	73,386	71,911	75,930	82,070	85,450	86,150	86,150	20	4
CPU Installed Base	64,747	98,466	139,338	198,139	246,715	289,380	327,720	358,980	381,630	397,040	40	10
Installed Seats	64,747	98,466	139,338	198,139	246,715	289,380	327,720	358,980	381,630	397,040	40	10
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	24.4	28.7	18.2	18.2	17.3	16.7	16.3	15.9	15.6	15.1	-8	-3
Hardware-Only ASP	5.5	7.0	4.6	4.3	4.3	4.3	4.2	4.1	4.1	4.0	-6	-1
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	266	350	368	481	514	515	527	523	506	480	18	-1
CPU Revenue	224	243	323	429	450	452	465	464	451	429	19	-1
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	43	107	45	52	64	62	62	59	56	51	11	-5
Software Revenue	135	144	180	209	256	256	255	251	248	243	17	-1
Bundled	86	75	100	105	133	126	123	117	109	100	12	-6
Unbundled	49	69	80	104	123	130	132	134	138	143	26	3
Service Revenue	22	21	38	46	56	61	66	70	73	75	26	6
Total Factory Revenue	424	515	586	736	826	832	848	844	827	797	18	-1
Increase over Prior Year (%)	24	21	14	26	12	1	2	-0	-2	-4		

NOTE: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (May 1992)

Table 6
Preliminary History and Forecast

Application: All Applications
Region: Rest of World
Platform: Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	4,629	3,950	5,206	7,435	11,018	14,130	17,950	22,600	27,780	33,090	24	25
Unit Shipments or Seats	4,629	3,950	5,206	7,435	11,018	14,130	17,950	22,600	27,780	33,090	24	25
CPU Installed Base	7,597	11,203	15,581	21,379	29,761	40,200	53,190	69,230	88,100	109,320	41	30
Installed Seats	7,597	11,203	15,581	21,379	29,761	40,200	53,190	69,230	88,100	109,320	41	30
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	9.8	11.5	16.2	9.4	7.4	7.4	7.7	8.1	6.8	6.9	-7	-1
Hardware-Only ASP	4.4	5.5	5.1	4.7	4.6	4.6	4.5	4.4	4.4	4.3	1	-1
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	21	22	27	35	51	64	81	100	122	142	25	23
CPU Revenue	20	22	26	35	50	64	80	99	121	141	25	23
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	1	1	1	1	1	1	1	1	1	1	-3	13
Software Revenue	6	7	13	19	26	33	42	50	59	73	42	23
Bundled	2	1	1	0	1	1	1	1	1	1	-13	-7
Unbundled	5	6	12	19	25	32	41	48	58	72	51	24
Service Revenue	1	1	2	2	3	4	6	9	12	15	34	40
Total Factory Revenue	28	30	43	56	80	102	129	159	192	230	30	24
Increase over Prior Year (%)	73	7	41	32	41	28	27	23	21	20		

NOTE: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (May 1992)

CAD/CAM/CAE—Personal CAD and Distribution Channels

Table 7
Preliminary History and Forecast

Application: Mechanical
Region: Worldwide
Platform: Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	108,864	124,958	117,603	147,683	158,063	168,550	178,100	185,410	187,600	187,530	10	3
Unit Shipments or Seats	108,864	124,958	117,603	147,683	158,063	168,570	178,120	185,430	187,620	187,550	10	3
CPU Installed Base	214,748	329,931	422,550	521,048	603,369	672,400	734,290	790,210	836,270	869,800	29	8
Installed Seats	214,748	329,931	422,550	521,048	603,369	672,400	734,290	790,210	836,270	869,800	29	8
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	17.2	23.1	20.0	19.1	18.1	18.3	18.1	17.9	17.8	17.5	1	-1
Hardware-Only ASP	4.2	4.4	4.8	4.6	4.5	4.4	4.3	4.3	4.2	4.1	2	-2
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	568	670	667	811	859	894	919	928	915	881	11	1
CPU Revenue	504	576	605	740	778	812	836	847	837	808	11	1
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	64	94	62	72	80	82	82	80	78	72	6	-2
Software Revenue	231	261	304	329	392	414	425	425	423	412	14	1
Bundled	99	78	88	81	103	105	104	99	93	84	1	-4
Unbundled	132	183	216	248	289	309	321	327	331	328	22	3
Service Revenue	40	34	51	62	72	84	95	105	113	119	16	11
Total Factory Revenue	839	965	1,023	1,202	1,322	1,391	1,439	1,458	1,451	1,411	12	1
Increase over Prior Year (%)	35	15	6	18	10	5	3	1	-0	-3		

NOTE: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (May 1992)

Table 8
Preliminary History and Forecast

Application:	AEC
Region:	Worldwide
Platform:	Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	52,307	62,087	77,952	98,188	123,605	143,920	168,170	191,520	212,290	229,050	24	13
Unit Shipments or Seats	52,307	62,087	77,952	98,188	123,605	143,920	168,170	191,530	212,300	229,060	24	13
CPU Installed Base	107,832	163,890	228,370	301,678	387,039	478,000	578,000	684,460	792,250	895,680	38	18
Installed Seats	107,832	163,890	228,370	301,678	387,039	478,000	578,000	684,460	792,250	895,680	38	18
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	16.7	17.7	16.8	16.9	15.8	15.4	15.2	15.0	14.8	14.5	-1	-2
Hardware-Only ASP	4.1	4.8	4.7	4.5	4.2	4.2	4.1	4.1	4.0	3.9	1	-1
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	236	324	433	497	603	690	789	878	950	990	26	10
CPU Revenue	224	305	407	470	570	653	746	832	902	943	26	11
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	12	19	26	27	33	38	42	46	48	48	29	8
Software Revenue	115	147	194	253	297	344	408	464	524	579	27	14
Bundled	18	18	27	28	36	43	49	54	56	56	18	9
Unbundled	96	129	168	225	261	300	358	410	468	523	28	15
Service Revenue	10	25	33	38	45	59	77	95	114	132	47	24
Total Factory Revenue	361	496	660	788	944	1,093	1,273	1,436	1,588	1,702	27	12
Increase over Prior Year (%)	13	38	33	19	20	16	16	13	11	7		

NOTE: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (May 1992)

CAD/CAM/CAE—Personal CAD and Distribution Channels

Table 9
Preliminary History and Forecast

Application: GIS/Mapping
Region: Worldwide
Platform: Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	9,549	14,425	26,717	36,334	42,922	50,800	59,870	70,110	75,120	78,790	46	13
Unit Shipments or Seats	9,549	14,425	26,717	36,334	42,922	50,800	59,870	70,110	75,130	78,790	46	13
CPU Installed Base	12,175	26,459	52,294	85,816	122,200	160,700	200,720	242,750	281,410	315,630	78	21
Installed Seats	12,175	26,459	52,294	85,816	122,200	160,700	200,720	242,750	281,410	315,630	78	21
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	16.8	25.4	22.6	17.7	16.5	17.8	18.0	18.0	18.0	17.7	-0	1
Hardware-Only ASP	4.7	4.9	4.9	4.7	4.4	4.4	4.3	4.3	4.2	4.1	-2	-1
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	51	82	141	181	205	242	279	320	335	341	41	11
CPU Revenue	47	76	136	175	198	233	269	309	325	332	43	11
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	4	5	5	7	7	9	10	10	10	9	15	6
Software Revenue	36	54	69	97	120	159	207	261	312	362	35	25
Bundled	7	8	7	10	11	14	15	16	16	15	11	8
Unbundled	29	46	62	87	110	146	192	245	296	347	40	26
Service Revenue	3	5	9	12	14	20	28	37	46	56	52	32
Total Factory Revenue	90	141	219	291	340	421	513	618	694	759	39	17
Increase over Prior Year (%)	132	57	56	33	17	24	22	20	12	9		

NOTE: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (May 1992)

Table 10

Preliminary History and Forecast

Application: Electronic Design Automation
Region: Worldwide
Platform: Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	37,729	46,916	43,433	50,833	56,299	55,780	54,440	49,590	36,560	25,480	11	-15
Unit Shipments or Seats	37,729	46,916	43,433	50,833	56,299	55,790	54,440	49,600	36,560	25,480	11	-15
CPU Installed Base	83,173	125,447	158,191	189,565	217,197	236,340	248,670	251,990	239,240	213,320	27	-0
Installed Seats	83,173	125,447	158,191	189,565	217,197	236,340	248,670	251,990	239,240	213,320	27	-0
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	11.1	14.8	17.5	18.4	16.4	16.1	15.9	15.7	15.3	15.0	10	-2
Hardware-Only ASP	4.7	5.3	5.2	5.0	4.8	4.8	4.7	4.6	4.6	4.5	1	-1
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	187	264	263	290	303	290	273	242	174	117	13	-17
CPU Revenue	177	244	245	269	286	274	259	230	166	113	13	-17
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	10	20	18	21	17	16	14	12	8	4	15	-24
Software Revenue	166	156	170	197	224	221	218	221	221	219	8	-0
Bundled	18	11	19	21	31	28	18	12	7	3	14	-37
Unbundled	148	145	151	176	194	194	201	208	215	216	7	2
Service Revenue	22	24	29	31	35	37	38	38	36	33	13	-1
Total Factory Revenue	375	445	462	518	563	548	529	500	431	369	11	-8
Increase over Prior Year (%)	-3	19	4	12	9	-3	-3	-5	-14	-14		

NOTE: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (May 1992)

Table 11

Preliminary History and Forecast

Application: Electronic CAE
Region: Worldwide
Platform: Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	19,083	23,530	31,969	38,563	42,479	43,060	43,900	40,760	29,720	20,600	22	-13
Unit Shipments or Seats	19,083	23,530	31,969	38,563	42,479	43,060	43,900	40,760	29,720	20,600	22	-13
CPU Installed Base	53,394	73,191	97,370	123,239	148,379	169,420	186,550	195,330	188,460	169,580	29	3
Installed Seats	53,394	73,191	97,370	123,239	148,379	169,420	186,550	195,330	188,460	169,580	29	3
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	12.2	19.1	22.4	20.4	18.2	17.9	17.2	16.8	16.1	15.7	11	-3
Hardware-Only ASP	4.7	5.2	5.1	5.0	4.7	4.7	4.6	4.6	4.5	4.4	0	-1
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	95	133	187	210	221	216	214	194	138	93	23	-16
CPU Revenue	90	124	174	198	208	204	202	184	131	89	23	-16
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	5	9	13	12	13	12	12	10	7	4	24	-22
Software Revenue	81	94	124	152	168	167	171	178	184	187	20	2
Bundled	9	7	15	17	20	16	12	9	5	2	21	-35
Unbundled	71	88	108	135	148	152	159	169	179	184	20	4
Service Revenue	12	15	22	24	27	28	30	31	30	28	23	0
Total Factory Revenue	188	243	333	386	416	411	415	402	351	307	22	-6
Increase over Prior Year (%)	-32	29	37	16	8	-1	1	-3	-13	-13		

NOTE: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (May 1992)

Table 12
Preliminary History and Forecast

Application:	IC Layout
Region:	Worldwide
Platform:	Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	1,739	1,420	487	342	396	410	310	240	180	130	-31	-20
Unit Shipments or Seats	1,739	1,420	487	342	396	410	310	240	180	130	-31	-20
CPU Installed Base	2,396	3,778	4,075	3,920	3,482	2,890	2,280	1,860	1,580	1,340	10	-17
Installed Seats	2,396	3,778	4,075	3,920	3,482	2,890	2,280	1,860	1,580	1,340	10	-17
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	6.0	15.6	23.6	27.0	29.1	27.4	26.8	26.6	26.2	24.7	48	-3
Hardware-Only ASP	5.0	5.0	3.7	3.1	3.1	3.1	3.0	3.0	2.9	2.9	-11	-1
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	8	9	4	3	3	3	2	2	1	1	-22	-29
CPU Revenue	8	8	3	2	3	3	2	1	1	0	-23	-30
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	0	0	0	0	0	0	0	0	0	0	-5	-27
Software Revenue	16	5	3	1	1	1	1	0	0	0	-46	-41
Bundled	1	1	0	0	0	0	0	0	0	0	-67	-100
Unbundled	15	4	2	1	1	1	1	0	0	0	-46	-41
Service Revenue	1	0	0	0	0	1	0	0	0	0	-28	-11
Total Factory Revenue	25	14	6	4	5	5	3	2	2	1	-34	-30
Increase over Prior Year (%)	266	-45	-53	-36	13	-2	-32	-28	-33	-47		

NOTE: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (May 1992)

Table 13

Preliminary History and Forecast

Application: PCB/Hybrid/MCM
Region: Worldwide
Platform: Personal Computer

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	CAGR (%) 1987-1991	CAGR (%) 1991-1996
HARDWARE SHIPMENT DATA												
CPU Shipments	16,906	21,966	10,977	11,928	13,424	12,320	10,230	8,590	6,660	4,750	-6	-19
Unit Shipments or Seats	16,906	21,966	10,977	11,928	13,424	12,320	10,230	8,590	6,660	4,750	-6	-19
CPU Installed Base	27,383	48,478	56,745	62,406	65,336	64,030	59,840	54,810	49,200	42,410	24	-8
Installed Seats	27,383	48,478	56,745	62,406	65,336	64,030	59,840	54,810	49,200	42,410	24	-8
CALCULATED AVERAGE SELLING PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	11.0	10.7	12.1	15.3	13.8	14.0	13.7	13.5	13.3	12.8	6	-1
Hardware-Only ASP	4.6	5.4	5.5	5.4	5.2	5.1	5.0	5.0	4.9	4.8	3	-2
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	84	123	72	77	80	71	57	46	35	24	-1	-21
CPU Revenue	79	112	68	69	75	67	55	45	34	23	-1	-21
Terminal Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue (Turnkey)	4	11	4	8	4	3	2	2	1	1	0	-32
Software Revenue	69	57	43	44	55	53	46	42	38	32	-6	-10
Bundled	8	4	3	4	10	12	6	4	2	1	8	-45
Unbundled	62	53	41	39	44	41	41	39	36	32	-8	-6
Service Revenue	9	9	7	7	8	8	7	7	6	5	-3	-9
Total Factory Revenue	162	189	122	128	142	132	111	96	78	61	-3	-16
Increase over Prior Year (%)	56	16	-35	5	11	-8	-16	-14	-18	-22		

NOTE: In 1991, server was added as a platform. This reclassification reduced 1991 growth rates for the other platforms.

Source: Dataquest (May 1992)

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Personal CAD
Preliminary Market Share

February 1992

Source:
Dataquest

Market Statistics

Dataquest

CAD/CAM/CAE
Personal CAD and Distribution Channels

Personal CAD
Preliminary Market Share
February 1992

Source:
Dataquest

Market Statistics

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Personal CAD Preliminary Market Share

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Note: All tables show estimated data.

Personal CAD Preliminary Market Share

Introduction

CAD/CAM/CAE systems have dramatically changed the methods by which designers and production managers originate and implement products. CAD and CAE systems allow designers to create, draft, analyze, test, and manipulate products on a screen in two and three dimensions. As CAD/CAM/CAE systems continue to decrease in cost, they become more available and cost justifiable to new users.

In order to provide a comprehensive view of the CAD/CAM/CAE industry, Dataquest's CAD/CAM/CAE group maintains a large database of industry information. The type of information contained in the database is depicted in Figure 1.

Figure 1
CAD/CAM/CAE Market Database
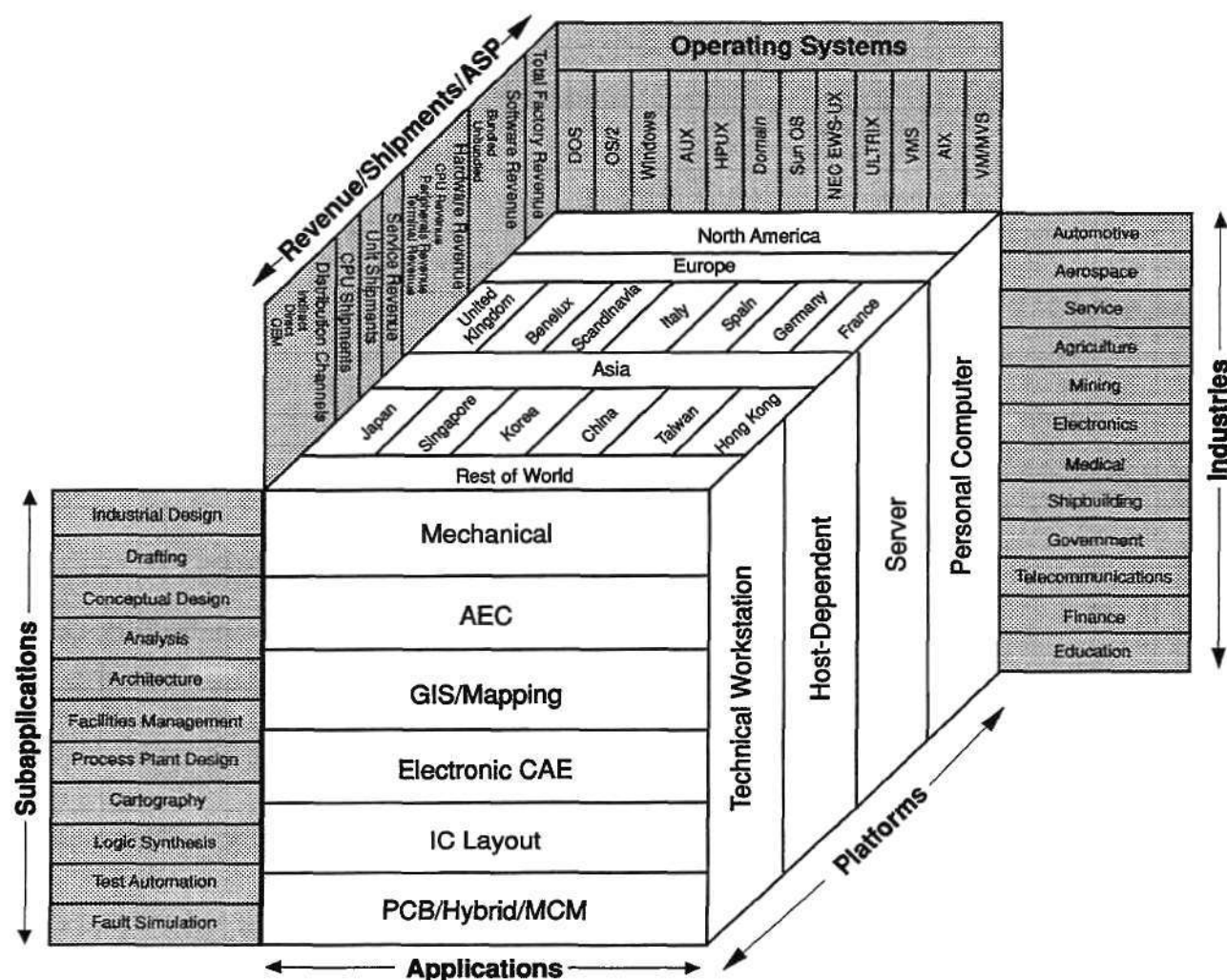
Source: Dataquest (February 1992)

This document contains Dataquest's detailed market share information on the CAD/CAM/CAE industry. Following is a description of the information reported in the *Market Share* book for each segment:

- Source—All companies in database; overview of industry

- Mechanical Applications—All companies in database with mechanical revenue

- AEC and GIS Applications—All companies in database with AEC or GIS revenue

- Electronic Design Automation Applications—All companies in database with EDA (electronic CAE, IC layout, PCB/hybrid/MCM) revenue

- Europe—All Europe-based companies and all other companies with more than $1 million in European revenue

- Asia—All Asia-based companies and all other companies with more than $1 million in Asian revenue

- Personal CAD and Distribution Channels—All companies in database with personal computer revenue

More detailed data on this market may be requested through our client inquiry service.

Segmentation

For complete information on Dataquest's high-technology market segmentation scheme, please refer to the *Dataquest High-Technology Guide—Segmentation and Glossary*.

Dataquest defines CAD/CAM/CAE as systems used in the mechanical; architecture, engineering, and construction (AEC); GIS/mapping; and electronic design automation (EDA) application areas. The CAD/CAM/CAE market is defined according to the following segmentation scheme:

- CAD/CAM/CAE

  - Mechanical

  - AEC (Architecture, Engineering, and Construction)

  - GIS/Mapping (Geographic Information Systems)

  - EDA (Electronic Design Automation)

  - Electronic CAE

  - IC Layout

  - PCB/Hybrid/MCM

In addition, more detailed information by subapplication is available and usually published in *Dataquest Perspectives*.

For a listing of possible subapplication categories, see the *Dataquest High-Technology Guide—Segmentation and Glossary*.

Definitions

This section lists the definitions that are specific to this document. Complete definitions for all terms can be found in the *Dataquest High-Technology Guide—Segmentation and Glossary*.

Application definitions are as follows:

- Mechanical—Mechanical CAD/CAM refers to computer-aided tools used to design, analyze, document, and manufacture discrete parts, components, and assemblies.

- Architecture, Engineering, and Construction (AEC)—This segment covers the use of computer-aided tools by architects, contractors, plant engineers, civil engineers, and other people associated with these disciplines to aid in designing and managing buildings, industrial plants, ships, and other types of nondiscrete entities.

- Geographic Information Systems (GIS)/Mapping—This is a computer-based technology, composed of hardware, software, and data used to capture, edit, display, and analyze spatial (tagged by location) information.

- Electronic Design Automation (EDA)—This segment covers computer-based tools that are used to automate the process of designing an electronic product including printed circuit boards, ICs, and systems. EDA includes ECAE, IC Layout, and PCB/Hybrid/MCM, as follows:

  - Electronic Computer-Aided Engineering (CAE)—These are computer-aided tools

used in the engineering or design phase of electronic products (as opposed to the physical layout phase of the product). Examples of Electronic CAE applications are schematic capture and simulation.

- IC Layout—This is a software application tool that is used to create and validate the physical implementation of an integrated circuit (IC). The IC layout category comprises polygon editors, symbolic editors, placement and routing (gate array, cell, and block), design verification tools (DRC/ERC/logic-to-layout), compilers, and module development tools.

- Printed Circuit Board (PCB)/Hybrid/ Multichip Module (MCM)—This segment covers products that are used to create the placement and routing of the traces and components laid out on a printed circuit board. Also, included in this category are thermal analysis tools.

Regional definitions are as follows:

- North America—Includes United States and Canada

- Europe—Includes the United Kingdom, Scandinavia, Benelux, France, Germany, Italy, Spain, and Rest of Europe

- Asia—Includes Japan, Singapore, Taiwan, Korea, China, and Hong Kong

- Rest of World—All other countries including Australia, New Zealand, Oceania, Africa, Central America, South America, and the Middle East

Platform definitions are as follows:

- Technical Workstation—This is a single-user computer that is distinguished from a personal computer by its features and by the user's potential range of expansion on the platform. Features include a virtual, multitasking operating system (UNIX, VMS, DOMAIN); the computer is designed by manufacturer to run high-performance graphic applications in a multiuser/multitasking environment.

- Host-Dependent—This is a shared logic system in which the external workstations' functions are dependent on a host computer.

- Server—A server is a computer that transparently provides its resources for use by other computer systems. It is a system on a network that provides specific functionality to other computer systems: the clients. Functions include file storage, database access, compute capability, and others. Dataquest tracks the following major categories of servers used for CAD/CAM/CAE and GIS applications:

  - Compute Servers—These systems provide capabilities for solving numerical problems (for example, simulations, statistical calculations, and simultaneous partial differential equations). System features usually include high-speed computational capabilities (for example, vector and parallel processing) and large memories.

  - Print Servers—These systems provide access to printers, specialized printing applications software, and print spooling resources to a network.

  - File Servers—These systems provide mass storage capability to clients on a network. Services can range from temporary storage of working files to long-term backup and archive systems.

  - Database Servers—These systems manage databases as a shared resource to a network. These servers handle such functions as physical data storage, data security, and high-level queries and can access stored information at the record level.

- Personal Computer—This is defined as a single-user computer that is distinguished from a technical workstation by its features and by the user's potential range of expansion on the platform. Features found in technical workstations (such as a virtual operating system, networking, high-performance graphics, multiuser/multitasking capability) are optional rather than integrated by the manufacturer.

Revenue/shipments/ASP definitions are as follows:

- Total factory revenue is defined as the amount of money received by a manufacturer for its goods measured in U.S. dollars. Total factory revenue does not include revenue that a company may receive from products that are sold to another company for resale (OEM revenue).

- Unit shipment is defined as the number of products delivered (that is, seats).

- Software revenue is revenue derived from the sale of bundled (part of a turnkey system) and unbundled software.

- Service revenue is defined as revenue derived from the service and support of CAD/CAM/CAE or GIS systems. Service revenue can be calculated in the tables by subtracting hardware and software revenue from total revenue.

Market Share Methodology

Dataquest uses both primary and secondary sources to produce our market share data. In the fourth quarter of each year, we survey all major participants in each industry. Each vendor is offered the opportunity to self-report the information required. Although there is a primary contact for each company, large companies are surveyed across product lines and across geographic regions. Thus, there is a corresponding increase in the number of contacts at large companies. (Dataquest maintains a large contact database on all sources of information). Examples of the job titles of people contacted for information are the following:

- President and CEO

- Vice President and General Manager

- Vice President of Marketing

- Vice President, Strategic Product Planning

- Director of Strategic Planning

- Director of Marketing

- Director of Market Development

- Manager, CAD/CAM/CAE Marketing Programs

- Market Research Analyst

We resurvey select companies during the second quarter of the following year to verify final annual results and then publish final market share information based on this updated information. Our annual delivery schedule is as follows:

- First Quarter (January 31)—Preliminary market data are available. All tables will be published and distributed to clients. Historical database is opened for changes for a six-month period.

- Second Quarter (March 31)—We provide complete preliminary forecast tables, including a new five-year forecast period.

- Third Quarter (July 1)—We send complete, final updated market share tables based on additional data collection and analysis over the previous six months, as well as company history tables. At this point, the market share database is frozen and will not be changed until the end of the year. For the next six months, supplementary market data will be based on these final market data.

- Fourth Quarter (October 1)—We provide complete final forecast tables, taking into consideration changes in the market during the previous six months.

The Audit Process

Data supplied by vendors are evaluated against information drawn from many sources, including the following:

- Revenue published by major industry participants

- Estimates made by knowledgeable and reliable industry spokespersons

- Government data or trade association data

- Published product literature and price lists

- Interviews with knowledgeable manufacturers, distributors, and users

- Relevant economic data

- Information and data from online data banks

- Articles in both the general and trade press

- Annual reports, SEC documents, credit reports

- Company publications and press releases

- Reports from financial analysts

- User studies

- Reseller and supplier reports and reports from a vendor's competitors

In addition, Dataquest sums vendor revenue across other industries covered by Dataquest to make sure that revenue is not credited twice and checks with multiple sources at one company to cross-check data on that company.

Dataquest analysts have many years of experience in how to apply the above tools to get the most accurate information possible on a particular company (such as what to use when and what industry averages are). We believe that the estimates presented here are the most accurate and meaningful generally available today. It is the CAD/CAM/CAE group's policy to continually update our market information for any year, based on any new data received, in order to arrive at the most accurate market representation possible.

Dataquest's CAD/CAM/CAE market numbers are often higher than those reported by other sources. We survey worldwide, which involves more vendors, higher total market revenue, lower market share per vendor, and a more accurate market picture—particularly useful when comparing regions or applications.

Notes on Market Share

For the 1991 market share cycle, Dataquest's CAD/CAM/CAE group added server as a platform. The platform categories now include technical workstation, host-dependent, server, and personal computer. Revenue formerly classified in technical workstations, host-dependent, or personal computer may now be more accurately classified, where appropriate, in the server category. However, because of this reclassification, data and growth rates for the other platform areas were affected.

Finally, please note that despite the care taken in gathering and analyzing the available data and in attempting to categorize those data in a meaningful way, careful attention must be paid to the definitions and assumptions used herein when interpreting the estimates presented in this document. Various companies, government agencies, and trade associations may use slightly different definitions of product categories and regional groupings, or they may include different companies in their summaries. These differences should be kept in mind when making comparisons between these data and those provided by others.

Table 1
1991 Preliminary CAD/CAM/CAE Market Share

Application: All Applications
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Compaq	433.1	433.1	.0	74,108	13.7%	22.0%	.0%	19.5%
Autodesk	249.8	.0	249.8	0	7.9%	.0%	24.2%	.0%
Apple Computer	231.5	203.7	.0	48,504	7.3%	10.3%	.0%	12.8%
IBM	190.2	180.6	.0	44,546	6.0%	9.2%	.0%	11.7%
NEC	158.4	134.6	11.1	12,653	5.0%	6.8%	1.1%	3.3%
Hewlett-Packard	144.9	115.9	.0	25,025	4.6%	5.9%	.0%	6.6%
Fujitsu	82.9	52.0	22.7	2,733	2.6%	2.6%	2.2%	.7%
CADAM	73.0	41.8	26.6	5,964	2.3%	2.1%	2.6%	1.6%
Hitachi	71.4	34.3	30.0	3,718	2.3%	1.7%	2.9%	1.0%
Hakuto	51.2	30.7	20.5	1,284	1.6%	1.6%	2.0%	.3%
Mutoh Industries—NO OEM	43.6	24.4	17.0	1,342	1.4%	1.2%	1.6%	.4%
Wacom	42.5	8.4	29.5	719	1.3%	.4%	2.9%	.2%
Nemetschek	36.0	14.4	21.6	631	1.1%	.7%	2.1%	.2%
Intergraph	30.7	.0	28.9	0	1.0%	.0%	2.8%	.0%
Investronica SA	28.1	22.5	2.8	1,125	.9%	1.1%	.3%	.3%
Dell Computer	26.8	26.8	.0	6,975	.8%	1.4%	.0%	1.8%
Toshiba—NO OEM	26.6	13.3	10.6	2,046	.8%	.7%	1.0%	.5%
Vero International Software	22.1	.0	20.1	0	.7%	.0%	1.9%	.0%
Ziegler	21.7	.0	21.7	0	.7%	.0%	2.1%	.0%
Viewlogic Systems	20.3	.0	17.1	0	.6%	.0%	1.7%	.0%
Wiechers Datentechnik	20.0	11.4	6.0	577	.6%	.6%	.6%	.2%
Computervision	18.3	.4	17.3	163	.6%	.0%	1.7%	.0%
Everex Systems	17.3	17.3	.0	5,501	.5%	.9%	.0%	1.4%
Cadtron	16.3	8.1	6.5	251	.5%	.4%	.6%	.1%

(Continued)

Table 1 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application: All Applications
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Xilinx	16.2	.0	14.6	0	.5%	.0%	1.4%	.0%
CADKEY	15.6	.9	14.7	145	.5%	.0%	1.4%	.0%
Research Machines	15.0	15.0	.0	2,420	.5%	.8%	.0%	.6%
IPKF	14.4	4.0	9.0	620	.5%	.2%	.9%	.2%
Altera	13.7	.0	11.6	0	.4%	.0%	1.1%	.0%
Mitsubishi Electric	13.0	8.6	4.6	1,141	.4%	.4%	.4%	.3%
Andor	12.8	3.2	9.1	116	.4%	.2%	.9%	.0%
ISICAD	12.8	.0	12.8	0	.4%	.0%	1.2%	.0%
Soft-Tech Software Technologie	11.5	2.9	7.5	765	.4%	.1%	.7%	.2%
BATISOFT	11.1	1.6	5.5	317	.3%	.1%	.5%	.1%
Strategic Mapping	10.9	.0	10.9	0	.3%	.0%	1.1%	.0%
Orcad	10.5	.0	10.5	0	.3%	.0%	1.0%	.0%
Design Automation	10.2	.0	10.2	0	.3%	.0%	1.0%	.0%
ACTEL	10.0	.0	9.0	0	.3%	.0%	.9%	.0%
Data I/O	9.6	.0	9.6	0	.3%	.0%	.9%	.0%
CPU	9.4	.0	8.6	0	.3%	.0%	.8%	.0%
Tebis	9.3	1.4	6.5	46	.3%	.1%	.6%	.0%
CNC Software	9.2	.0	9.2	0	.3%	.0%	.9%	.0%
DCA Softdesk	8.9	.0	8.9	0	.3%	.0%	.9%	.0%
ETAK	8.8	.4	8.3	27	.3%	.0%	.8%	.0%
PADS Software	8.7	.0	7.4	0	.3%	.0%	.7%	.0%
Microway	8.6	5.8	2.9	87	.3%	.3%	.3%	.0%
ESRI	8.4	.0	8.4	0	.3%	.0%	.8%	.0%
Racal-Redac	8.3	.0	7.9	0	.3%	.0%	.8%	.0%

(Continued)

Table 1 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application: All Applications
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Cimatron	8.0	3.6	3.6	324	.3%	.2%	.3%	.1%
Infocel	8.0	1.6	6.0	174	.3%	.1%	.6%	.0%
Aucotec	8.0	2.8	4.4	142	.3%	.1%	.4%	.0%
EEsof	7.8	.0	7.0	0	.2%	.0%	.7%	.0%
DAT Standard info systems	7.6	.0	7.2	0	.2%	.0%	.7%	.0%
Microsim	7.6	.0	7.1	0	.2%	.0%	.7%	.0%
MapInfo	7.2	.0	5.8	0	.2%	.0%	.6%	.0%
Ground Modelling Systems	7.0	3.9	2.9	58	.2%	.2%	.3%	.0%
Micrografx	7.0	.0	7.0	0	.2%	.0%	.7%	.0%
Hochtief	6.5	1.0	4.6	81	.2%	.0%	.4%	.0%
Serbi	6.5	.0	6.5	0	.2%	.0%	.6%	.0%
Moda CAD	6.0	1.5	4.2	50	.2%	.1%	.4%	.0%
CAP Electronic Sweets	5.9	.0	4.8	0	.2%	.0%	.5%	.0%
Swanson Analysis	5.8	.0	5.8	0	.2%	.0%	.6%	.0%
Aspen Technology	5.6	.0	5.0	0	.2%	.0%	.5%	.0%
BETRONEX	5.5	.5	5.1	86	.2%	.0%	.5%	.0%
Claris	5.4	.0	5.4	0	.2%	.0%	.5%	.0%
rrb Programme	4.9	2.4	1.7	117	.2%	.1%	.2%	.0%
ADRA Systems	4.8	.0	4.3	0	.2%	.0%	.4%	.0%
Technovision	4.8	.0	4.8	0	.2%	.0%	.5%	.0%
Foresight Resources	4.7	.0	4.3	0	.1%	.0%	.4%	.0%
Olivetti	4.7	4.0	.0	793	.1%	.2%	.0%	.2%
Anilam Electronics	4.7	1.4	2.8	58	.1%	.1%	.3%	.0%
RIB/RZB	4.6	.4	3.7	24	.1%	.0%	.4%	.0%

(Continued)

Table 1 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Algor Interactive Systems	4.6	.0	4.0	0	.1%	.0%	.4%	.0%
International Software Systems	4.5	.0	4.5	0	.1%	.0%	.4%	.0%
X-TRA	4.1	.9	1.9	175	.1%	.0%	.2%	.0%
Cadtronic	4.1	2.3	1.8	121	.1%	.1%	.2%	.0%
Padtrace	4.1	1.1	2.7	60	.1%	.1%	.3%	.0%
American Small Business Comp.	4.0	.0	4.0	0	.1%	.0%	.4%	.0%
Computer Services Consultants	4.0	.0	4.0	0	.1%	.0%	.4%	.0%
MCS	3.9	.0	3.5	0	.1%	.0%	.3%	.0%
Sophia Systems	3.8	.9	2.5	68	.1%	.0%	.2%	.0%
Kloeckner-Moeller	3.7	.9	2.6	130	.1%	.0%	.3%	.0%
Robocom	3.6	.0	3.6	0	.1%	.0%	.3%	.0%
Innovative Data Design	3.5	.0	3.5	0	.1%	.0%	.3%	.0%
Mitsui Engineering	3.5	2.4	.7	23	.1%	.1%	.1%	.0%
Datagraphic	3.4	1.7	1.4	55	.1%	.1%	.1%	.0%
GeoGraphix	3.3	.0	2.4	0	.1%	.0%	.2%	.0%
Engineering Mechanics	3.2	.2	2.7	392	.1%	.0%	.3%	.1%
CADWorks	3.1	.0	2.7	0	.1%	.0%	.3%	.0%
PacSoft	3.1	.0	3.1	0	.1%	.0%	.3%	.0%
Superdraft	3.1	1.4	1.5	168	.1%	.1%	.1%	.0%
Aries Technology	3.0	.0	2.7	0	.1%	.0%	.3%	.0%
Whessoe Computing Systems	2.9	.0	2.9	0	.1%	.0%	.3%	.0%
ERDAS	2.7	.5	2.1	17	.1%	.0%	.2%	.0%
Accel Technologies	2.7	.0	2.4	0	.1%	.0%	.2%	.0%
Sigma Design	2.6	.0	2.4	0	.1%	.0%	.2%	.0%

(Continued)

Table 1 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Generation 5 Technology	2.5	.0	2.5	0	.1%	.0%	.2%	.0%
ALDEC	2.5	.0	2.5	0	.1%	.0%	.2%	.0%
Carrier Corporation	2.5	.0	2.5	0	.1%	.0%	.2%	.0%
Sharp System Products—NO OEM	2.5	1.3	1.2	31	.1%	.1%	.1%	.0%
Visionics	2.4	.0	1.8	10	.1%	.0%	.2%	.0%
ALS Design	2.4	.2	2.2	50	.1%	.0%	.2%	.0%
Facility Mapping Systems	2.3	.0	2.1	0	.1%	.0%	.2%	.0%
Micro Engineering Solutions	2.3	.7	1.5	35	.1%	.0%	.1%	.0%
Teradyne	2.2	.0	1.7	0	.1%	.0%	.2%	.0%
Elstree Computing	2.2	1.0	1.2	60	.1%	.0%	.1%	.0%
Accugraph	2.1	.1	1.8	10	.1%	.0%	.2%	.0%
Evolution Computing	2.1	.0	2.1	0	.1%	.0%	.2%	.0%
CAD-UL	2.1	.0	2.1	0	.1%	.0%	.2%	.0%
PAFEC	2.0	.0	2.0	0	.1%	.0%	.2%	.0%
Infinite Graphics	2.0	.0	2.0	0	.1%	.0%	.2%	.0%
Terra Sciences	1.8	.0	1.8	0	.1%	.0%	.2%	.0%
Massteck	1.8	.0	1.8	0	.1%	.0%	.2%	.0%
Kork Systems	1.8	.2	1.2	22	.1%	.0%	.1%	.0%
Lamp Software	1.7	.3	1.1	74	.1%	.0%	.1%	.0%
Omation	1.7	.0	1.7	0	.1%	.0%	.2%	.0%
Comshoppe	1.7	.0	1.7	0	.1%	.0%	.2%	.0%
Hahn & Kolb	1.6	1.0	.5	31	.1%	.0%	.0%	.0%
Terr-Mar	1.6	.7	.9	32	.1%	.0%	.1%	.0%
Schlumberger	1.6	.4	.8	24	.0%	.0%	.1%	.0%

(Continued)

Table 1 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application: All Applications
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

| | | | | | Market Share | | | |
Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Intera Tydac	1.5	.0	1.5	0	.0%	.0%	.1%	.0%
LandCadd	1.5	.0	1.4	0	.0%	.0%	.1%	.0%
Radian Corporation	1.5	.0	.9	0	.0%	.0%	.1%	.0%
CIVILSOFT	1.5	.0	1.5	0	.0%	.0%	.1%	.0%
Genasys II	1.5	.5	.9	7	.0%	.0%	.1%	.0%
FEA	1.4	.3	.3	27	.0%	.0%	.0%	.0%
ISDATA	1.4	.0	1.2	0	.0%	.0%	.1%	.0%
Tanner Research	1.4	.0	1.2	0	.0%	.0%	.1%	.0%
GRAPHSOFT	1.4	.0	1.4	0	.0%	.0%	.1%	.0%
Compact Software	1.3	.0	.5	0	.0%	.0%	.0%	.0%
Rasna Corporation	1.3	.0	1.3	0	.0%	.0%	.1%	.0%
Phase Three Logic	1.3	.0	1.1	0	.0%	.0%	.1%	.0%
Point Control	1.3	.0	1.3	0	.0%	.0%	.1%	.0%
Marcus Computer Systeme	1.2	.7	.4	39	.0%	.0%	.0%	.0%
Integer	1.2	.0	1.0	0	.0%	.0%	.1%	.0%
Aucos elektronische Gerate	1.2	.4	.8	116	.0%	.0%	.1%	.0%
Nucke Software	1.1	.6	.4	26	.0%	.0%	.0%	.0%
Spectrum Software	1.1	.0	1.1	0	.0%	.0%	.1%	.0%
MacNeal-Schwendler	1.1	.0	1.1	0	.0%	.0%	.1%	.0%
Mega CADD	1.0	.0	1.0	0	.0%	.0%	.1%	.0%
Caddlink	1.0	.0	1.0	0	.0%	.0%	.1%	.0%
Cascade Graphics	1.0	.0	1.0	0	.0%	.0%	.1%	.0%
Aura CAD/CAM Systems	1.0	.0	.9	0	.0%	.0%	.1%	.0%
Intrinsix	1.0	1.0	.0	10	.0%	.1%	.0%	.0%

(Continued)

Table 1 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application: All Applications
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Number One Systems	1.0	.1	.9	24	.0%	.0%	.1%	.0%
Cadisys	1.0	.0	1.0	0	.0%	.0%	.1%	.0%
S.T.L.D. s.r.l.	1.0	.0	1.0	0	.0%	.0%	.1%	.0%
ARKTEC	.9	.2	.6	23	.0%	.0%	.1%	.0%
Vision 3D	.9	.5	.2	6	.0%	.0%	.0%	.0%
Maptek	.9	.0	.9	0	.0%	.0%	.1%	.0%
CAMTEK	.9	.0	.7	0	.0%	.0%	.1%	.0%
Contract Data Research	.9	.0	.6	0	.0%	.0%	.1%	.0%
A.I. Systems	.8	.0	.8	0	.0%	.0%	.1%	.0%
Dynaware	.8	.0	.8	0	.0%	.0%	.1%	.0%
Douglas Electronics	.8	.0	.8	0	.0%	.0%	.1%	.0%
GEOVISION Inc.	.7	.4	.2	281	.0%	.0%	.0%	.1%
INS Engineering	.7	.5	.1	16	.0%	.0%	.0%	.0%
CAD-Capture	.7	.0	.1	0	.0%	.0%	.0%	.0%
Engineering Systems Corp.	.7	.0	.5	0	.0%	.0%	.1%	.0%
Uniras	.7	.0	.7	0	.0%	.0%	.1%	.0%
IGC Technology	.7	.0	.7	0	.0%	.0%	.1%	.0%
Mc2 Engineering Software	.7	.0	.7	0	.0%	.0%	.1%	.0%
ECOM Associates	.7	.0	.6	4	.0%	.0%	.1%	.0%
CADMATIC	.7	.0	.4	4	.0%	.0%	.0%	.0%
Scientific Calc.	.6	.0	.6	0	.0%	.0%	.1%	.0%
Caroline Informatique	.6	.1	.4	7	.0%	.0%	.0%	.0%
Machinery Sales	.6	.0	.6	0	.0%	.0%	.1%	.0%
debis Systemhaus	.6	.2	.3	12	.0%	.0%	.0%	.0%

(Continued)

Table 1 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Digital	.6	.0	.4	0	.0%	.0%	.0%	.0%
Integrated Silicon Systems	.6	.2	.4	8	.0%	.0%	.0%	.0%
Vamp	.6	.0	.6	0	.0%	.0%	.1%	.0%
ACERI SA	.6	.1	.3	3	.0%	.0%	.0%	.0%
Ashlar	.5	.0	.5	0	.0%	.0%	.0%	.0%
Capilano Computing	.5	.0	.5	0	.0%	.0%	.0%	.0%
Bechtel Software	.5	.0	.5	0	.0%	.0%	.0%	.0%
Norsk Data	.5	.3	.1	8	.0%	.0%	.0%	.0%
CAD Lab	.5	.0	.4	0	.0%	.0%	.0%	.0%
PLUS Logic	.4	.0	.4	0	.0%	.0%	.0%	.0%
The CAD Group	.4	.0	.4	0	.0%	.0%	.0%	.0%
Ithaca Software	.4	.0	.4	0	.0%	.0%	.0%	.0%
BV Engineering	.4	.0	.4	0	.0%	.0%	.0%	.0%
Geosoft	.4	.0	.4	0	.0%	.0%	.0%	.0%
Computer-Aided Design Group	.3	.0	.3	0	.0%	.0%	.0%	.0%
Geotrace Technologies	.3	.0	.3	0	.0%	.0%	.0%	.0%
Synthesis	.3	.0	.3	0	.0%	.0%	.0%	.0%
Masta Corporation	.3	.0	.2	4	.0%	.0%	.0%	.0%
SIMUCAD	.3	.0	.3	0	.0%	.0%	.0%	.0%
Kontron Instruments	.2	.1	.1	4	.0%	.0%	.0%	.0%
Simulation Science	.2	.0	.2	0	.0%	.0%	.0%	.0%
The Great Softwestern Co.	.2	.0	.2	0	.0%	.0%	.0%	.0%
Bobcat Systems	.2	.0	.2	0	.0%	.0%	.0%	.0%
Genrad	.2	.0	.2	10	.0%	.0%	.0%	.0%

(Continued)

Table 1 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

					Market Share			
Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Instrumatic Espanola	.2	.0	.2	0	.0%	.0%	.0%	.0%
Geomath	.2	.0	.2	0	.0%	.0%	.0%	.0%
Pacific Numerics	.2	.0	.2	0	.0%	.0%	.0%	.0%
Technische Computer Systeme	.2	.0	.2	5	.0%	.0%	.0%	.0%
ESDU International	.2	.0	.2	0	.0%	.0%	.0%	.0%
Simutest	.2	.0	.2	0	.0%	.0%	.0%	.0%
National Semiconductor	.2	.0	.2	0	.0%	.0%	.0%	.0%
TOOL Software	.1	.0	.1	3	.0%	.0%	.0%	.0%
Radan Computational	.1	.0	.1	5	.0%	.0%	.0%	.0%
A/E Microsystems	.0	.0	.0	7	.0%	.0%	.0%	.0%
Dolphin Integration	.0	.0	.0	0	.0%	.0%	.0%	.0%
NCR Microelectronics	.0	.0	.0	0	.0%	.0%	.0%	.0%
Other Companies	504.4	503.9	.5	132,717	15.9%	25.6%	.0%	34.9%
All Companies	3,169.0	1,968.7	1,034.0	380,418	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	2,277.8	1,532.4	648.0	344,764	71.9%	77.8%	62.7%	90.6%
All Asian-Based Companies	537.1	314.6	183.0	25,888	16.9%	16.0%	17.7%	6.8%
All European-Based Companies	354.1	121.7	202.9	9,766	11.2%	6.2%	19.6%	2.6%
All Hardware Companies	1,594.6	1,527.6	.0	344,135	50.3%	77.6%	.0%	90.5%
All Turnkey & SW Companies	1,574.4	441.1	1,034.0	36,283	49.7%	22.4%	100.0%	9.5%

Source: Dataquest (February 1992)

Table 2
1991 Preliminary CAD/CAM/CAE Market Share

Application:	Mechanical
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Compaq	155.0	155.0	.0	26,531	11.7%	18.1%	.0%	16.8%
Apple Computer	94.9	83.5	.0	19,887	7.2%	9.7%	.0%	12.6%
Autodesk	92.8	.0	92.8	0	7.0%	.0%	23.7%	.0%
Hewlett-Packard	75.1	60.2	.0	12,982	5.7%	7.0%	.0%	8.2%
IBM	74.2	70.4	.0	17,373	5.6%	8.2%	.0%	11.0%
NEC	67.0	56.9	4.7	5,352	5.1%	6.6%	1.2%	3.4%
Hitachi	53.6	25.7	22.5	2,789	4.1%	3.0%	5.7%	1.8%
CADAM	53.3	31.3	18.7	4,473	4.0%	3.7%	4.8%	2.8%
Hakuto	51.2	30.7	20.5	1,284	3.9%	3.6%	5.2%	.8%
Fujitsu	34.5	21.4	9.7	1,138	2.6%	2.5%	2.5%	.7%
Mutoh Industries—NO OEM	33.9	19.0	13.2	1,044	2.6%	2.2%	3.4%	.7%
Investronica SA	28.1	22.5	2.8	1,125	2.1%	2.6%	.7%	.7%
Toshiba—NO OEM	23.3	11.7	9.3	1,796	1.8%	1.4%	2.4%	1.1%
Vero International Software	22.1	.0	20.1	0	1.7%	.0%	5.1%	.0%
Wiechers Datentechnik	20.0	11.4	6.0	577	1.5%	1.3%	1.5%	.4%
CADKEY	15.1	.9	14.2	145	1.1%	.1%	3.6%	.1%
Computervision	14.7	.3	13.8	130	1.1%	.0%	3.5%	.1%
Dell Computer	10.7	10.7	.0	2,790	.8%	1.3%	.0%	1.8%
Design Automation	10.2	.0	10.2	0	.8%	.0%	2.6%	.0%
Caditron	9.8	4.9	3.9	151	.7%	.6%	1.0%	.1%
Tebis	9.3	1.4	6.5	46	.7%	.2%	1.7%	.0%
CNC Software	9.2	.0	9.2	0	.7%	.0%	2.3%	.1%
Ziegler	8.7	.0	8.7	0	.7%	.0%	2.2%	.0%
Andor	8.5	2.1	6.1	77	.6%	.2%	1.5%	.0%

(Continued)

Table 2 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application: Mechanical
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Wacom	8.4	1.6	5.8	141	.6%	.2%	1.5%	.1%
Cimatron	8.0	3.6	3.6	324	.6%	.4%	.9%	.2%
Research Machines	7.2	7.2	.0	1,162	.5%	.8%	.0%	.7%
DAT Standard info ssystemes	6.5	.0	6.1	0	.5%	.0%	1.6%	.0%
Mitsubishi Electric	5.8	3.9	2.0	510	.4%	.4%	.5%	.3%
Swanson Analysis	5.8	.0	5.8	0	.4%	.0%	1.5%	.0%
Intergraph	5.1	.0	4.8	0	.4%	.0%	1.2%	.0%
ADRA Systems	4.8	.0	4.3	0	.4%	.0%	1.1%	.0%
Anilam Electronics	4.7	1.4	2.8	58	.4%	.2%	.7%	.0%
Algor Interactive Systems	4.6	.0	4.0	0	.3%	.0%	1.0%	.0%
Serbi	4.4	.0	4.4	0	.3%	.0%	1.1%	.0%
Moda CAD	4.2	1.0	2.9	35	.3%	.1%	.7%	.0%
Pathtrace	4.1	1.1	2.7	60	.3%	.1%	.7%	.0%
Everex Systems	4.0	4.0	.0	1,265	.3%	.5%	.0%	.8%
MCS	3.9	.0	3.5	0	.3%	.0%	.9%	.0%
Engineering Mechanics	3.2	.2	2.7	392	.2%	.0%	.7%	.2%
Claris	3.1	.0	3.1	0	.2%	.0%	.8%	.0%
Superdraft	3.1	1.4	1.5	168	.2%	.2%	.4%	.1%
Micrografx	3.0	.0	3.0	0	.2%	.0%	.8%	.0%
Aries Technology	3.0	.0	2.7	0	.2%	.0%	.7%	.0%
Whessoe Computing Systems	2.9	.0	2.9	0	.2%	.0%	.7%	.0%
Olivetti	2.5	2.2	.0	429	.2%	.3%	.0%	.3%
X-TRA	2.5	.5	1.1	105	.2%	.1%	.3%	.1%
Sharp System Products—NO OEM	2.5	1.3	1.2	31	.2%	.2%	.3%	.0%

(Continued)

Table 2 (Continued)

1991 Preliminary CAD/CAM/CAE Market Share

Application:	Mechanical
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
American Small Business Comp.	2.4	.0	2.4	0	.2%	.0%	.6%	.0%
Micro Engineering Solutions	2.3	.7	1.5	35	.2%	.1%	.4%	.0%
Mitsui Engineering	2.1	1.5	.4	14	.2%	.2%	.1%	.0%
PAFEC	2.0	.0	2.0	0	.2%	.0%	.5%	.0%
Foresight Resources	1.9	.0	1.7	0	.1%	.0%	.4%	.0%
ISICAD	1.9	.0	1.9	0	.1%	.0%	.5%	.0%
Robocom	1.7	.0	1.7	0	.1%	.0%	.4%	.0%
Hahn & Kolb	1.6	1.0	.5	31	.1%	.1%	.1%	.0%
Schlumberger	1.6	.4	.8	24	.1%	.0%	.2%	.0%
FEA	1.4	.3	.3	27	.1%	.0%	.1%	.0%
Rasna Corporation	1.3	.0	1.3	0	.1%	.0%	.3%	.0%
Point Control	1.3	.0	1.3	0	.1%	.0%	.3%	.0%
Marcus Computer Systeme	1.2	.7	.4	39	.1%	.1%	.1%	.0%
Evolution Computing	1.2	.0	1.2	0	.1%	.0%	.3%	.0%
MacNeal-Schwendler	1.1	.0	1.1	0	.1%	.0%	.3%	.0%
S.T.I.D. s.r.l.	1.0	.0	1.0	0	.1%	.0%	.2%	.0%
Vision 3D	.9	.5	.2	6	.1%	.1%	.1%	.0%
CAMTEK	.9	.0	.7	0	.1%	.0%	.2%	.0%
Cadtronic	.8	.5	.4	24	.1%	.1%	.1%	.0%
Innovative Data Design	.8	.0	.8	0	.1%	.0%	.2%	.0%
Aura CAD/CAM Systems	.7	.0	.6	0	.1%	.0%	.2%	.0%
A.I. Systems	.7	.0	.7	0	.0%	.0%	.2%	.0%
GRAPHSOFT	.6	.0	.6	0	.0%	.0%	.2%	.0%
Caroline Informatique	.6	.1	.4	7	.0%	.0%	.1%	.0%

(Continued)

Table 2 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	Mechanical
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

| Company | Total Factory Revenue | Hardware Revenue | Software Revenue | Hardware Units Shipped | Market Share | | | |
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Machinery Sales	.6	.0	.6	0	.0%	.0%	.2%	.0%
ACERI SA	.6	.1	.3	3	.0%	.0%	.1%	.0%
Norsk Data	.5	.3	.1	8	.0%	.0%	.0%	.0%
CAD Lab	.5	.0	.4	0	.0%	.0%	.1%	.0%
Uniras	.4	.0	.4	0	.0%	.0%	.1%	.0%
Cascade Graphics	.4	.0	.4	0	.0%	.0%	.1%	.0%
Ithaca Software	.4	.0	.4	0	.0%	.0%	.1%	.0%
Ashlar	.3	.0	.3	0	.0%	.0%	.1%	.0%
Mc2 Engineering Software	.3	.0	.3	0	.0%	.0%	.1%	.0%
debis Systemhaus	.3	.1	.2	6	.0%	.0%	.0%	.0%
Synthesis	.3	.0	.3	0	.0%	.0%	.1%	.0%
Engineering Systems Corp.	.3	.0	.2	0	.0%	.0%	.1%	.0%
Mega CADD	.2	.0	.2	0	.0%	.0%	.1%	.0%
CAD-Capture	.2	.0	.0	0	.0%	.0%	.0%	.0%
ESDU International	.2	.0	.2	0	.0%	.0%	.0%	.0%
Comshoppe	.1	.0	.1	0	.0%	.0%	.0%	.0%
IGC Technology	.1	.0	.1	0	.0%	.0%	.0%	.0%
Accugraph	.1	.0	.1	0	.0%	.0%	.0%	.0%
Lamp Software	.1	.0	.0	3	.0%	.0%	.0%	.0%
Radan Computational	.1	.0	.0	4	.0%	.0%	.0%	.0%
Masta Corporation	.1	.0	.0	1	.0%	.0%	.0%	.0%
Number One Systems	.1	.0	.0	1	.0%	.0%	.0%	.0%
A/E Microsystems	.0	.0	.0	2	.0%	.0%	.0%	.0%

(Continued)

Table 2 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	Mechanical
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Other Companies	201.6	201.6	.1	53,087	15.3%	23.5%	.0%	33.7%
All Companies	1,321.6	857.0	392.4	157,691	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	862.4	620.1	204.8	139,150	65.3%	72.4%	52.2%	88.2%
All Asian-Based Companies	301.0	175.8	105.6	14,175	22.8%	20.5%	26.9%	9.0%
All European-Based Companies	158.2	61.0	82.0	4,366	12.0%	7.1%	20.9%	2.8%
All Hardware Companies	649.4	618.9	.0	138,816	49.1%	72.2%	.0%	88.0%
All Turnkey & SW Companies	672.3	238.1	392.4	18,874	50.9%	27.8%	100.0%	12.0%

Source: Dataquest (February 1992)

Table 3
1991 Preliminary CAD/CAM/CAE Market Share

Application: AEC
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Autodesk	111.7	.0	111.7	0	11.8%	.0%	37.6%	.0%
Compaq	95.7	95.7	.0	16,378	10.1%	15.9%	.0%	13.3%
Apple Computer	92.6	81.5	.0	19,402	9.8%	13.5%	.0%	15.7%
NEC	59.5	50.6	4.2	4,754	6.3%	8.4%	1.4%	3.9%
IBM	41.8	39.7	.0	9,800	4.4%	6.6%	.0%	8.0%
Hewlett-Packard	36.1	28.9	.0	6,241	3.8%	4.8%	.0%	5.1%
Nemetschek	36.0	14.4	21.6	631	3.8%	2.4%	7.3%	.5%
Fujitsu	26.3	16.3	7.4	866	2.8%	2.7%	2.5%	.7%
Soft-Tech Software Technologie	11.5	2.9	7.5	765	1.2%	.5%	2.5%	.6%
Intergraph	11.2	.0	10.5	0	1.2%	.0%	3.5%	.0%
BAITSOFT	11.1	1.6	5.5	317	1.2%	.3%	1.9%	.3%
ISICAD	10.9	.0	10.9	0	1.2%	.0%	3.7%	.0%
CADAM	10.7	6.3	3.8	894	1.1%	1.0%	1.3%	.7%
Dell Computer	10.5	10.5	.0	2,720	1.1%	1.7%	.0%	2.2%
CPU	9.4	.0	8.6	0	1.0%	.0%	2.9%	.0%
Microway	8.6	5.8	2.9	87	.9%	1.0%	1.0%	.1%
Hitachi	7.1	3.4	3.0	372	.8%	.6%	1.0%	.3%
Mutoh Industries—NO OEM	6.7	3.7	2.6	206	.7%	.6%	.9%	.2%
Hochtief	6.5	1.0	4.6	81	.7%	.2%	1.5%	.1%
DCA Softdesk	6.3	.0	6.3	0	.7%	.0%	2.1%	.0%
Everex Systems	6.2	6.2	.0	1,980	.7%	1.0%	.0%	1.6%
CAP Electronic Sweet's	5.9	.0	4.8	0	.6%	.0%	1.6%	.0%
Aspen Technology	5.6	.0	5.0	0	.6%	.0%	1.7%	.0%
mb Programme	4.9	2.4	1.7	117	.5%	.4%	.6%	.1%

(Continued)

Table 3 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	AEC
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Technovision	4.8	.0	4.8	0	.5%	.0%	1.6%	.0%
Caditron	4.6	2.3	1.8	70	.5%	.4%	.6%	.1%
International Software Systems	4.5	.0	4.5	0	.5%	.0%	1.5%	.0%
Micrografx	4.0	.0	4.0	0	.4%	.0%	1.4%	.0%
Computer Services Consultants	4.0	.0	4.0	0	.4%	.0%	1.3%	.0%
Research Machines	3.9	3.9	.0	629	.4%	.6%	.0%	.5%
Computervision	3.7	.1	3.5	33	.4%	.0%	1.2%	.0%
RIB/RZB	3.7	.3	3.0	20	.4%	.1%	1.0%	.0%
Datagraphic	3.4	1.7	1.4	55	.4%	.3%	.5%	.0%
Andor	3.4	.8	2.4	31	.4%	.1%	.8%	.0%
Cadtronic	3.3	1.8	1.5	97	.3%	.3%	.5%	.1%
Toshiba—NO OEM	3.2	1.6	1.3	250	.3%	.3%	.4%	.2%
CADWorks	3.1	.0	2.7	0	.3%	.0%	.9%	.0%
Ziegler	3.0	.0	3.0	0	.3%	.0%	1.0%	.0%
Ground Modelling Systems	2.7	1.4	1.1	22	.3%	.2%	.4%	.0%
Carrier Corporation	2.5	.0	2.5	0	.3%	.0%	.8%	.0%
Innovative Data Design	2.4	.0	2.4	0	.3%	.0%	.8%	.0%
Sigma Design	2.4	.0	2.3	0	.3%	.0%	.8%	.0%
Mitsubishi Electric	2.3	1.5	.8	203	.2%	.3%	.3%	.2%
Claris	2.3	.0	2.3	0	.2%	.0%	.8%	.0%
Elstree Computing	2.2	1.0	1.2	60	.2%	.2%	.4%	.0%
Accugraph	1.9	.1	1.6	9	.2%	.0%	.5%	.0%
Foresight Resources	1.9	.0	1.7	0	.2%	.0%	.6%	.0%
Moda CAD	1.8	.5	1.3	15	.2%	.1%	.4%	.0%

(Continued)

Table 3 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application: AEC
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Robocom	1.6	.0	1.6	0	.2%	.0%	.5%	.0%
Lamp Software	1.6	.3	1.0	69	.2%	.0%	.3%	.1%
Comshoppe	1.5	.0	1.5	0	.2%	.0%	.5%	.0%
Olivetti	1.5	1.3	.0	254	.2%	.2%	.0%	.2%
CIVILSOFT	1.5	.0	1.5	0	.2%	.0%	.5%	.0%
Integer	1.2	.0	1.0	0	.1%	.0%	.3%	.0%
Nucke Software	1.1	.6	.4	26	.1%	.1%	.1%	.0%
American Small Business Comp.	1.1	.0	1.1	0	.1%	.0%	.4%	.0%
Serbi	1.1	.0	1.1	0	.1%	.0%	.4%	.0%
Caddlink	1.0	.0	1.0	0	.1%	.0%	.3%	.0%
ARKTEC	.9	.2	.6	23	.1%	.0%	.2%	.0%
Evolution Computing	.9	.0	.9	0	.1%	.0%	.3%	.0%
Mega CADD	.8	.0	.8	0	.1%	.0%	.3%	.0%
Dynaware	.8	.0	.8	0	.1%	.0%	.3%	.0%
GRAPHSOFT	.7	.0	.7	0	.1%	.0%	.2%	.0%
ECOM Associates	.7	.0	.6	4	.1%	.0%	.2%	.0%
CADMATIC	.7	.0	.4	4	.1%	.0%	.1%	.0%
IGC Technology	.6	.0	.6	0	.1%	.0%	.2%	.0%
CADKEY	.6	.0	.6	0	.1%	.0%	.2%	.0%
Bechtel Software	.5	.0	.5	0	.1%	.0%	.2%	.0%
Cascade Graphics	.4	.0	.4	0	.0%	.0%	.1%	.0%
INS Engineering	.4	.3	.1	9	.0%	.0%	.0%	.0%
DAT Standard info ssystemes	.4	.0	.4	0	.0%	.0%	.1%	.0%
Mc2 Engineering Software	.4	.0	.4	0	.0%	.0%	.1%	.0%

(Continued)

Table 3 (Continued)

1991 Preliminary CAD/CAM/CAE Market Share

Application:	AEC
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Computer-Aided Design Group	.3	.0	.3	0	.0%	.0%	.1%	.0%
Aura CAD/CAM Systems	.3	.0	.3	0	.0%	.0%	.1%	.0%
CAD-Capture	.3	.0	.1	0	.0%	.0%	.0%	.0%
Simulation Science	.2	.0	.2	0	.0%	.0%	.1%	.0%
Engineering Systems Corp.	.2	.0	.2	0	.0%	.0%	.1%	.0%
Ashlar	.2	.0	.2	0	.0%	.0%	.1%	.0%
Mitsui Engineering	.2	.1	.0	1	.0%	.0%	.0%	.0%
Uniras	.1	.0	.1	0	.0%	.0%	.0%	.0%
TOOL Software	.1	.0	.1	3	.0%	.0%	.0%	.0%
Masta Corporation	.1	.0	.1	2	.0%	.0%	.0%	.0%
A.I. Systems	.1	.0	.1	0	.0%	.0%	.0%	.0%
A/E Microsystems	.0	.0	.0	5	.0%	.0%	.0%	.0%
Radan Computational	.0	.0	.0	1	.0%	.0%	.0%	.0%
Other Companies	211.7	211.7	.0	55,741	22.4%	35.1%	.0%	45.2%
All Companies	943.3	602.5	296.7	123,245	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	700.3	481.1	194.4	113,223	74.2%	79.9%	65.5%	91.9%
All Asian-Based Companies	123.3	78.4	35.1	6,691	13.1%	13.0%	11.8%	5.4%
All European-Based Companies	119.7	43.0	67.2	3,331	12.7%	7.1%	22.7%	2.7%
All Hardware Companies	502.4	481.7	.0	113,410	53.3%	80.0%	.0%	92.0%
All Turnkey & SW Companies	440.9	120.8	296.7	9,835	46.7%	20.0%	100.0%	8.0%

Source: Dataquest (February 1992)

Table 4
1991 Preliminary CAD/CAM/CAE Market Share

Application:	GIS/Mapping
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Compaq	62.6	62.6	.0	10,709	18.4%	30.4%	.0%	25.0%
IBM	31.8	30.2	.0	7,444	9.4%	14.7%	.0%	17.4%
Apple Computer	25.5	22.4	.0	5,335	7.5%	10.9%	.0%	12.4%
Autodesk	25.4	.0	25.4	0	7.5%	.0%	21.1%	.0%
Intergraph	14.4	.0	13.5	0	4.2%	.0%	11.2%	.0%
Strategic Mapping	10.9	.0	10.9	0	3.2%	.0%	9.1%	.0%
Fujitsu	9.8	6.1	2.8	324	2.9%	3.0%	2.3%	.8%
ETAK	8.8	.4	8.3	27	2.6%	.2%	6.9%	.1%
ESRI	8.4	.0	8.4	0	2.5%	.0%	7.0%	.0%
Infocel	8.0	1.6	6.0	174	2.4%	.8%	5.0%	.4%
MapInfo	7.2	.0	5.8	0	2.1%	.0%	4.8%	.0%
Hitachi	7.1	3.4	3.0	372	2.1%	1.7%	2.5%	.9%
Mitsubishi Electric	4.9	3.2	1.7	428	1.4%	1.6%	1.4%	1.0%
Ground Modelling Systems	4.4	2.4	1.8	36	1.3%	1.2%	1.5%	.1%
GeoGraphix	3.3	.0	2.4	0	1.0%	.0%	2.0%	.0%
PacSoft	3.1	.0	3.1	0	.9%	.0%	2.6%	.0%
Mutoh Industries—NO OEM	3.0	1.7	1.2	92	.9%	.8%	1.0%	.2%
Hewlett-Packard	2.9	2.3	.0	499	.9%	1.1%	.0%	1.2%
ERDAS	2.7	.5	2.1	17	.8%	.2%	1.7%	.0%
Ziegler	2.7	.0	2.7	0	.8%	.0%	2.3%	.0%
DCA Softdesk	2.6	.0	2.6	0	.8%	.0%	2.1%	.0%
Generation 5 Technology	2.5	.0	2.5	0	.7%	.0%	2.1%	.0%
Facility Mapping Systems	2.3	.0	2.1	0	.7%	.0%	1.7%	.0%
Dell Computer	1.9	1.9	.0	488	.6%	.9%	.0%	1.1%

(Continued)

Table 4 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application: GIS/Mapping
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
					Market Share			
Terra Sciences	1.8	.0	1.8	0	.5%	.0%	1.5%	.0%
Kork Systems	1.8	.2	1.2	22	.5%	.1%	1.0%	.1%
Terr-Mar	1.6	.7	.9	32	.5%	.4%	.7%	.1%
Intera Tydac	1.5	.0	1.5	0	.4%	.0%	1.3%	.0%
LandCadd	1.5	.0	1.4	0	.4%	.0%	1.2%	.0%
Radian Corporation	1.5	.0	.9	0	.4%	.0%	.7%	.0%
Genasys II	1.5	.5	.9	7	.4%	.2%	.7%	.0%
Mitsui Engineering	1.2	.8	.2	8	.4%	.4%	.2%	.0%
Research Machines	1.1	1.1	.0	169	.3%	.5%	.0%	.4%
NEC	.9	.8	.1	74	.3%	.4%	.0%	.2%
RIB/RZB	.9	.1	.7	5	.3%	.0%	.6%	.0%
Maptek	.9	.0	.9	0	.3%	.0%	.7%	.0%
Contract Data Research	.9	.0	.6	0	.3%	.0%	.5%	.0%
Everex Systems	.9	.9	.0	275	.3%	.4%	.0%	.6%
GEOVISION Inc.	.7	.4	.2	281	.2%	.2%	.1%	.7%
Andor	.6	.2	.4	5	.2%	.1%	.3%	.0%
Olivetti	.6	.5	.0	93	.2%	.2%	.0%	.2%
Geosoft	.4	.0	.4	0	.1%	.0%	.3%	.0%
Geotrace Technologies	.3	.0	.3	0	.1%	.0%	.3%	.0%
INS Engineering	.3	.3	.1	7	.1%	.1%	.0%	.0%
Caditron	.3	.1	.1	5	.1%	.1%	.1%	.0%
Robocom	.3	.0	.3	0	.1%	.0%	.2%	.0%
CAD-Capture	.3	.0	.1	0	.1%	.0%	.0%	.0%
Engineering Systems Corp.	.2	.0	.2	0	.1%	.0%	.1%	.0%

Table 4 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application: GIS/Mapping
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

| | | | | | | Market Share | | |
Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Geomath	.2	.0	.2	0	.1%	.0%	.2%	.0%
Foresight Resources	.2	.0	.2	0	.1%	.0%	.1%	.0%
Unlras	.1	.0	.1	0	.0%	.0%	.1%	.0%
Sigma Design	.1	.0	.1	0	.0%	.0%	.1%	.0%
American Small Business Comp.	.1	.0	.1	0	.0%	.0%	.1%	.0%
Innovative Data Design	.1	.0	.1	0	.0%	.0%	.1%	.0%
Accugraph	.1	.0	.1	0	.0%	.0%	.1%	.0%
Lamp Software	.1	.0	.0	3	.0%	.0%	.0%	.0%
A.I. Systems	.1	.0	.1	0	.0%	.0%	.0%	.0%
Other Companies	60.5	60.5	.0	15,926	17.8%	29.4%	.0%	37.2%
All Companies	339.4	205.7	120.3	42,856	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	300.2	185.1	104.6	41,236	88.4%	90.0%	86.9%	96.2%
All Asian-Based Companies	27.8	16.4	9.4	1,310	8.2%	8.0%	7.8%	3.1%
All European-Based Companies	11.4	4.2	6.4	311	3.4%	2.0%	5.3%	.7%
All Hardware Companies	186.5	181.1	.0	40,769	55.0%	88.1%	.0%	95.1%
All Turnkey & SW Companies	152.9	24.5	120.3	2,087	45.0%	11.9%	100.0%	4.9%

Source: Dataquest (February 1992)

Table 5
1991 Preliminary CAD/CAM/CAE Market Share

Application: Electronic Design Automation
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Compaq	119.8	119.8	.0	20,491	21.2%	39.5%	.0%	36.2%
IBM	42.4	40.3	.0	9,929	7.5%	13.3%	.0%	17.5%
Wacom	34.2	6.7	23.7	578	6.0%	2.2%	10.5%	1.0%
NEC	31.0	26.3	2.2	2,473	5.5%	8.7%	1.0%	4.4%
Hewlett-Packard	30.7	24.5	.0	5,303	5.4%	8.1%	.0%	9.4%
Viewlogic Systems	20.3	.0	17.1	0	3.6%	.0%	7.6%	.0%
Autodesk	19.9	.0	19.9	0	3.5%	.0%	8.9%	.0%
Apple Computer	18.5	16.3	.0	3,880	3.3%	5.4%	.0%	6.9%
Xilinx	16.2	.0	14.6	0	2.9%	.0%	6.5%	.0%
LPKF	14.4	4.0	9.0	620	2.6%	1.3%	4.0%	1.1%
Altera	13.7	.0	11.6	0	2.4%	.0%	5.2%	.0%
Fujitsu	12.3	8.2	2.9	404	2.2%	2.7%	1.3%	.7%
Orcad	10.5	.0	10.5	0	1.9%	.0%	4.7%	.0%
ACTEL	10.0	.0	9.0	0	1.8%	.0%	4.0%	.0%
Data I/O	9.6	.0	9.6	0	1.7%	.0%	4.3%	.0%
CADAM	9.0	4.2	4.1	596	1.6%	1.4%	1.8%	1.1%
PADS Software	8.7	.0	7.4	0	1.5%	.0%	3.3%	.0%
Racal-Redac	8.3	.0	7.9	0	1.5%	.0%	3.5%	.0%
Aucotec	8.0	2.8	4.4	142	1.4%	.9%	2.0%	.3%
EEsof	7.8	.0	7.0	0	1.4%	.0%	3.1%	.0%
Microsim	7.6	.0	7.1	0	1.3%	.0%	3.2%	.0%
Ziegler	7.3	.0	7.3	0	1.3%	.0%	3.2%	.0%
Everex Systems	6.2	6.2	.0	1,980	1.1%	2.0%	.0%	3.5%
BETRONEX	5.5	.5	5.1	86	1.0%	.2%	2.2%	.2%

(Continued)

Table 5 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	Electronic Design Automation
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Sophia Systems	3.8	.9	2.5	68	.7%	.3%	1.1%	.1%
Dell Computer	3.8	3.8	.0	977	.7%	1.2%	.0%	1.7%
Kloeckner-Moeller	3.7	.9	2.6	130	.7%	.3%	1.2%	.2%
Hitachi	3.6	1.7	1.5	186	.6%	.6%	.7%	.3%
Research Machines	2.9	2.9	.0	460	.5%	.9%	.0%	.8%
Accel Technologies	2.7	.0	2.4	0	.5%	.0%	1.1%	.0%
ALDEC	2.5	.0	2.5	0	.4%	.0%	1.1%	.0%
Visionics	2.4	.0	1.8	10	.4%	.0%	.8%	.0%
ALS Design	2.4	.2	2.2	50	.4%	.1%	1.0%	.1%
Teradyne	2.2	.0	1.7	0	.4%	.0%	.7%	.0%
CAD-UL	2.1	.0	2.1	0	.4%	.0%	.9%	.0%
Infinite Graphics	2.0	.0	2.0	0	.4%	.0%	.9%	.0%
Massteck	1.8	.0	1.8	0	.3%	.0%	.8%	.0%
Omation	1.7	.0	1.7	0	.3%	.0%	.8%	.0%
Caditron	1.6	.8	.6	25	.3%	.3%	.3%	.0%
X-TRA	1.6	.3	.7	70	.3%	.1%	.3%	.1%
ISDATA	1.4	.0	1.2	0	.2%	.0%	.5%	.0%
Tanner Research	1.4	.0	1.2	0	.2%	.0%	.5%	.0%
Compact Software	1.3	.0	.5	0	.2%	.0%	.2%	.0%
Phase Three Logic	1.3	.0	1.1	0	.2%	.0%	.5%	.0%
Aucos elektronische Gerate	1.2	.4	.8	116	.2%	.1%	.4%	.2%
Spectrum Software	1.1	.0	1.1	0	.2%	.0%	.5%	.0%
Serbi	1.1	.0	1.1	0	.2%	.0%	.5%	.0%
Intrinsik	1.0	1.0	.0	10	.2%	.3%	.0%	.0%

Table 5 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	Electronic Design Automation
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

					Market Share			
Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Cadisys	1.0	.0	1.0	0	.2%	.0%	.4%	.0%
Number One Systems	.9	.1	.8	23	.2%	.0%	.4%	.0%
Foresight Resources	.8	.0	.7	0	.1%	.0%	.3%	.0%
DAT Standard info ssystemes	.8	.0	.7	0	.1%	.0%	.3%	.0%
Douglas Electronics	.8	.0	.8	0	.1%	.0%	.3%	.0%
Scientific Calc.	.6	.0	.6	0	.1%	.0%	.3%	.0%
Digital	.6	.0	.4	0	.1%	.0%	.2%	.0%
Integrated Silicon Systems	.6	.2	.4	8	.1%	.1%	.2%	.0%
Vamp	.6	.0	.6	0	.1%	.0%	.2%	.0%
Capilano Computing	.5	.0	.5	0	.1%	.0%	.2%	.0%
American Small Business Comp.	.4	.0	.4	0	.1%	.0%	.2%	.0%
PLUS Logic	.4	.0	.4	0	.1%	.0%	.2%	.0%
The CAD Group	.4	.0	.4	0	.1%	.0%	.2%	.0%
Andor	.4	.1	.2	3	.1%	.0%	.1%	.0%
BV Engineering	.4	.0	.4	0	.1%	.0%	.2%	.0%
debis Systemhaus	.3	.1	.2	6	.1%	.0%	.1%	.0%
SIMUCAD	.3	.0	.3	0	.0%	.0%	.1%	.0%
Kontron Instruments	.2	.1	.1	4	.0%	.0%	.1%	.0%
The Great Softwestern Co.	.2	.0	.2	0	.0%	.0%	.1%	.0%
Bobcat Systems	.2	.0	.2	0	.0%	.0%	.1%	.0%
Genrad	.2	.0	.2	10	.0%	.0%	.1%	.0%
Instrumatic Espanola	.2	.0	.2	0	.0%	.0%	.1%	.0%
Innovative Data Design	.2	.0	.2	0	.0%	.0%	.1%	.0%
Cascade Graphics	.2	.0	.2	0	.0%	.0%	.1%	.0%

(Continued)

Table 5 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	Electronic Design Automation
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

					Market Share			
Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Pacific Numerics	.2	.0	.2	0	.0%	.0%	.1%	.0%
Technische Computer Systeme	.2	.0	.2	5	.0%	.0%	.1%	.0%
Simutest	.2	.0	.2	0	.0%	.0%	.1%	.0%
National Semiconductor	.2	.0	.2	0	.0%	.0%	.1%	.0%
Masta Corporation	.1	.0	.1	1	.0%	.0%	.0%	.0%
Olivetti	.1	.1	.0	17	.0%	.0%	.0%	.0%
Robocom	.0	.0	.0	0	.0%	.0%	.0%	.0%
Dolphin Integration	.0	.0	.0	0	.0%	.0%	.0%	.0%
NCR Microelectronics	.0	.0	.0	0	.0%	.0%	.0%	.0%
Other Companies	30.7	30.3	.4	7,963	5.4%	10.0%	.2%	14.1%
All Companies	564.8	303.5	224.5	56,625	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	414.9	246.1	144.3	51,156	73.5%	81.1%	64.3%	90.3%
All Asian-Based Companies	85.1	43.9	33.0	3,712	15.1%	14.5%	14.7%	6.6%
All European-Based Companies	64.8	13.5	47.3	1,758	11.5%	4.5%	21.1%	3.1%
All Hardware Companies	256.4	245.8	.0	51,139	45.4%	81.0%	.0%	90.3%
All Turnkey & SW Companies	308.4	57.7	224.5	5,487	54.6%	19.0%	100.0%	9.7%

Source: Dataquest (February 1992)

Table 6
1991 Preliminary CAD/CAM/CAE Market Share

Application:	Electronic CAE
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Compaq	84.5	84.5	.0	14,451	20.3%	38.5%	.0%	34.0%
IBM	36.1	34.3	.0	8,464	8.7%	15.7%	.0%	19.9%
Wacom	34.2	6.7	23.7	578	8.2%	3.1%	14.0%	1.4%
Hewlett-Packard	28.5	22.8	.0	4,928	6.9%	10.4%	.0%	11.6%
Viewlogic Systems	20.3	.0	17.1	0	4.9%	.0%	10.1%	.0%
Autodesk	17.4	.0	17.4	0	4.2%	.0%	10.3%	.0%
NEC	17.1	14.5	1.2	1,366	4.1%	6.6%	.7%	3.2%
Xilinx	16.2	.0	14.6	0	3.9%	.0%	8.6%	.0%
Altera	13.7	.0	11.6	0	3.3%	.0%	6.9%	.0%
ACTEL	10.0	.0	9.0	0	2.4%	.0%	5.3%	.0%
Data I/O	9.6	.0	9.6	0	2.3%	.0%	5.7%	.0%
Apple Computer	9.3	8.2	.0	1,940	2.2%	3.7%	.0%	4.6%
Aucotec	8.0	2.8	4.4	142	1.9%	1.3%	2.6%	.3%
EEsof	7.8	.0	7.0	0	1.9%	.0%	4.2%	.0%
Microsim	7.6	.0	7.1	0	1.8%	.0%	4.2%	.0%
Orcad	7.4	.0	7.4	0	1.8%	.0%	4.4%	.0%
Fujitsu	5.2	3.2	1.5	170	1.2%	1.5%	.9%	.4%
Ziegler	4.3	.0	4.3	0	1.0%	.0%	2.5%	.0%
Racal-Redac	4.2	.0	4.0	0	1.0%	.0%	2.4%	.0%
Everex Systems	3.8	3.8	.0	1,210	.9%	1.7%	.0%	2.9%
Kloeckner-Moeller	3.7	.9	2.6	130	.9%	.4%	1.6%	.3%
Sophia Systems	3.7	.9	2.4	65	.9%	.4%	1.4%	.2%
ALDEC	2.5	.0	2.5	0	.6%	.0%	1.5%	.0%
Teradyne	2.2	.0	1.7	0	.5%	.0%	1.0%	.0%

(Continued)

Table 6 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application: Electronic CAE
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Dell Computer	1.9	1.9	.0	488	.5%	.9%	.0%	1.2%
ALS Design	1.8	.2	1.6	37	.4%	.1%	.9%	.1%
Research Machines	1.7	1.7	.0	266	.4%	.8%	.0%	.6%
Caditron	1.6	.8	.6	25	.4%	.4%	.4%	.1%
X-TRA	1.6	.3	.7	70	.4%	.2%	.4%	.2%
ISDATA	1.4	.0	1.2	0	.3%	.0%	.7%	.0%
Compact Software	1.3	.0	.5	0	.3%	.0%	.3%	.0%
Phase Three Logic	1.3	.0	1.1	0	.3%	.0%	.7%	.0%
Omation	1.2	.0	1.2	0	.3%	.0%	.7%	.0%
Aucos elektronische Gerate	1.2	.4	.8	116	.3%	.2%	.5%	.3%
Spectrum Software	1.1	.0	1.1	0	.3%	.0%	.7%	.0%
Serbi	1.1	.0	1.1	0	.3%	.0%	.6%	.0%
Intrinsix	1.0	1.0	.0	10	.2%	.5%	.0%	.0%
PADS Software	.9	.0	.7	0	.2%	.0%	.4%	.0%
DAT Standard Info ssystemes	.8	.0	.7	0	.2%	.0%	.4%	.0%
Douglas Electronics	.8	.0	.8	0	.2%	.0%	.4%	.0%
Infinite Graphics	.7	.0	.7	0	.2%	.0%	.4%	.0%
Visionics	.7	.0	.5	3	.2%	.0%	.3%	.0%
Scientific Calc.	.6	.0	.6	0	.1%	.0%	.4%	.0%
Foresight Resources	.6	.0	.5	0	.1%	.0%	.3%	.0%
Capilano Computing	.5	.0	.5	0	.1%	.0%	.3%	.0%
Accel Technologies	.5	.0	.4	0	.1%	.0%	.3%	.0%
PLUS Logic	.4	.0	.4	0	.1%	.0%	.3%	.0%
Tanner Research	.4	.0	.4	0	.1%	.0%	.2%	.0%

(Continued)

Table 6 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application: Electronic CAE
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
The CAD Group	.4	.0	.4	0	.1%	.0%	.2%	.0%
BV Engineering	.4	.0	.4	0	.1%	.0%	.2%	.0%
debis Systemhaus	.3	.1	.2	6	.1%	.0%	.1%	.0%
Digital	.3	.0	.2	0	.1%	.0%	.1%	.0%
American Small Business Comp.	.3	.0	.3	0	.1%	.0%	.2%	.0%
SIMUCAD	.3	.0	.3	0	.1%	.0%	.1%	.0%
Bobcat Systems	.2	.0	.2	0	.1%	.0%	.1%	.0%
Genrad	.2	.0	.2	10	.1%	.0%	.1%	.0%
Cascade Graphics	.2	.0	.2	0	.0%	.0%	.1%	.0%
Technische Computer Systeme	.2	.0	.2	5	.0%	.0%	.1%	.0%
Simutest	.2	.0	.2	0	.0%	.0%	.1%	.0%
Vamp	.2	.0	.2	0	.0%	.0%	.1%	.0%
Number One Systems	.1	.0	.1	3	.0%	.0%	.1%	.0%
Innovative Data Design	.1	.0	.1	0	.0%	.0%	.1%	.0%
National Semiconductor	.1	.0	.1	0	.0%	.0%	.1%	.0%
Masta Corporation	.0	.0	.0	0	.0%	.0%	.0%	.0%
Dolphin Integration	.0	.0	.0	0	.0%	.0%	.0%	.0%
NCR Microelectronics	.0	.0	.0	0	.0%	.0%	.0%	.0%

(Continued)

Table 6 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	Electronic CAE
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

					Market Share			
Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Other Companies	30.6	30.3	.4	7,963	7.4%	13.8%	.2%	18.8%
All Companies	415.8	219.2	168.6	42,448	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	323.4	186.3	117.3	39,464	77.8%	85.0%	69.6%	93.0%
All Asian-Based Companies	60.1	25.4	28.7	2,179	14.4%	11.6%	17.0%	5.1%
All European-Based Companies	32.4	7.6	22.6	804	7.8%	3.5%	13.4%	1.9%
All Hardware Companies	194.8	186.2	.0	39,446	46.8%	84.9%	.0%	92.9%
All Turnkey & SW Companies	221.0	33.0	168.6	3,002	53.2%	15.1%	100.0%	7.1%

Source: Dataquest (February 1992)

CAD/CAM/CAE—Personal CAD and Distribution Channels

Table 7

1991 Preliminary CAD/CAM/CAE Market Share

Application: - IC Layout
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Fujitsu	2.0	1.8	.0	64	42.2%	58.9%	.0%	16.0%
Everex Systems	1.0	1.0	.0	330	22.3%	34.4%	.0%	82.0%
Tanner Research	1.0	.0	.9	0	21.2%	.0%	66.7%	.0%
Integrated Silicon Systems	.6	.2	.4	8	12.6%	6.7%	29.5%	2.0%
National Semiconductor	.1	.0	.1	0	1.1%	.0%	3.9%	.0%
Other Companies	.0	.0	.0	0	.6%	.0%	.0%	.0%
All Companies	4.6	3.0	1.3	402	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	2.7	1.2	1.3	338	57.8%	41.1%	100.0%	84.0%
All Asian-Based Companies .	2.0	1.8	.0	64	42.2%	58.9%	.0%	16.0%
All European-Based Companies	.0	.0	.0	0	.0%	.0%	.0%	.0%
All Hardware Companies	1.0	1.0	.0	330	22.3%	34.4%	.0%	82.0%
All Turnkey & SW Companies	3.6	2.0	1.3	72	77.7%	65.6%	100.0%	18.0%

Source: Dataquest (February 1992)

Table 8
1991 Preliminary CAD/CAM/CAE Market Share

Application: PCB/Hybrid/MCM
Platform: Personal Computer
Region: Worldwide
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Compaq	35.3	35.3	.0	6,040	24.5%	43.4%	.0%	43.8%
IPKF	14.4	4.0	9.0	620	10.0%	4.9%	16.5%	4.5%
NEC	13.9	11.8	1.0	1,107	9.6%	14.5%	1.8%	8.0%
Apple Computer	9.3	8.2	.0	1,940	6.4%	10.0%	.0%	14.1%
CADAM	9.0	4.2	4.1	596	6.2%	5.1%	7.5%	4.3%
PADS Software	7.8	.0	6.6	0	5.4%	.0%	12.1%	.0%
IBM	6.3	5.9	.0	1,466	4.4%	7.3%	.0%	10.6%
BETRONEX	5.5	.5	5.1	86	3.8%	.6%	9.2%	.6%
Fujitsu	5.2	3.2	1.5	170	3.6%	3.9%	2.7%	1.2%
Racal-Redac	4.1	.0	3.9	0	2.9%	.0%	7.2%	.0%
Hitachi	3.6	1.7	1.5	186	2.5%	2.1%	2.7%	1.3%
Orcad	3.1	.0	3.1	0	2.1%	.0%	5.7%	.0%
Ziegler	3.0	.0	3.0	0	2.1%	.0%	5.5%	.0%
Autodesk	2.5	.0	2.5	0	1.8%	.0%	4.6%	.0%
Hewlett-Packard	2.2	1.7	.0	375	1.5%	2.1%	.0%	2.7%
Accel Technologies	2.2	.0	1.9	0	1.5%	.0%	3.5%	.0%
CAD-UL	2.1	.0	2.1	0	1.4%	.0%	3.8%	.0%
Dell Computer	1.9	1.9	.0	488	1.3%	2.3%	.0%	3.5%
Massteck	1.8	.0	1.8	0	1.2%	.0%	3.3%	.0%
Visionics	1.8	.0	1.3	7	1.2%	.0%	2.4%	.1%
Everex Systems	1.4	1.4	.0	440	1.0%	1.7%	.0%	3.2%
Infinite Graphics	1.3	.0	1.3	0	.9%	.0%	2.5%	.0%

(Continued)

Table 8 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	PCB/Hybrid/MCM
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Research Machines	1.2	1.2	.0	194	.8%	1.5%	.0%	1.4%
Cadisys	1.0	.0	1.0	0	.7%	.0%	1.7%	.0%
Number One Systems	.8	.1	.7	19	.5%	.1%	1.3%	.1%
ALS Design	.6	.0	.6	13	.4%	.0%	1.0%	.1%
Omation	.5	.0	.5	0	.3%	.0%	.9%	.0%
Vamp	.4	.0	.4	0	.3%	.0%	.8%	.0%
Andor	.4	.1	.2	3	.2%	.1%	.4%	.0%
Digital	.3	.0	.2	0	.2%	.0%	.4%	.0%
Kontron Instruments	.2	.1	.1	4	.2%	.1%	.2%	.0%
Foresight Resources	.2	.0	.2	0	.2%	.0%	.4%	.0%
The Great Softwestern Co.	.2	.0	.2	0	.2%	.0%	.4%	.0%
Instrumatic Espanola	.2	.0	.2	0	.2%	.0%	.4%	.0%
Pacific Numerics	.2	.0	.2	0	.1%	.0%	.3%	.0%
American Small Business Comp.	.2	.0	.2	0	.1%	.0%	.3%	.0%
Sophia Systems	.1	.0	.1	3	.1%	.0%	.2%	.0%
Innovative Data Design	.1	.0	.1	0	.1%	.0%	.2%	.0%
Olivetti	.1	.1	.0	17	.1%	.1%	.0%	.1%
Masta Corporation	.1	.0	.0	1	.0%	.0%	.1%	.0%
Robocom	.0	.0	.0	0	.0%	.0%	.1%	.0%

(Continued)

Table 8 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	PCB/Hybrid/MCM
Platform:	Personal Computer
Region:	Worldwide
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Other Companies	.0	.0	.0	0	.0%	.0%	.0%	.0%
All Companies	144.3	81.3	54.7	13,775	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	88.8	58.6	25.7	11,353	61.6%	72.0%	47.0%	82.4%
All Asian-Based Companies	23.1	16.8	4.3	1,469	16.0%	20.7%	7.8%	10.7%
All European-Based Companies	32.4	5.9	24.7	953	22.5%	7.3%	45.2%	6.9%
All Hardware Companies	60.6	58.6	.0	11,363	42.0%	72.1%	.0%	82.5%
All Turnkey & SW Companies	83.8	22.7	54.7	2,413	58.0%	27.9%	100.0%	17.5%

Source: Dataquest (February 1992)

CAD/CAM/CAE—Personal CAD and Distribution Channels

Table 9
1991 Preliminary CAD/CAM/CAE Market Share

Application: All Applications
Platform: Personal Computer
Region: North America
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Compaq	186.2	186.2	.0	31,866	16.4%	26.7%	.0%	20.2%
Apple Computer	143.5	126.3	.0	30,072	12.6%	18.1%	.0%	19.0%
Autodesk	130.0	.0	130.0	0	11.4%	.0%	33.3%	.0%
IBM	57.0	54.2	.0	13,364	5.0%	7.8%	.0%	8.5%
Hewlett-Packard	49.2	39.4	.0	8,509	4.3%	5.7%	.0%	5.4%
Dell Computer	22.3	22.3	.0	5,808	2.0%	3.2%	.0%	3.7%
CADAM	21.9	12.5	8.0	1,789	1.9%	1.8%	2.0%	1.1%
Intergraph	17.4	.0	16.3	0	1.5%	.0%	4.2%	.0%
Everex Systems	15.6	15.6	.0	4,951	1.4%	2.2%	.0%	3.1%
Viewlogic Systems	14.8	.0	12.5	0	1.3%	.0%	3.2%	.0%
CADKEY	13.5	.0	13.5	0	1.2%	.0%	3.5%	.0%
Xilinx	10.5	.0	9.5	0	.9%	.0%	2.4%	.0%
Computervision	9.3	.0	8.9	86	.8%	.0%	2.3%	.1%
Altera	7.9	.0	6.7	0	.7%	.0%	1.7%	.0%
DCA Softdesk	7.4	.0	7.4	0	.7%	.0%	1.9%	.0%
Infocel	7.2	1.4	5.4	156	.6%	.2%	1.4%	.1%
ETAK	6.6	.3	6.2	20	.6%	.0%	1.6%	.0%
Strategic Mapping	6.2	.0	6.2	0	.5%	.0%	1.6%	.0%
ACTEL	6.2	.0	5.6	0	.5%	.0%	1.4%	.0%
MapInfo	6.0	.0	4.8	0	.5%	.0%	1.2%	.0%
ESRI	5.8	.0	5.8	0	.5%	.0%	1.5%	.0%
CNC Software	5.5	.0	5.5	0	.5%	.0%	1.4%	.0%
Microsim	5.1	.0	4.8	0	.5%	.0%	1.2%	.0%
CAP Electronic Sweet's	5.1	.0	4.0	0	.4%	.0%	1.0%	.0%

(Continued)

Table 9 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application: All Applications
Platform: Personal Computer
Region: North America
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Micrografx	4.6	.0	4.6	0	.4%	.0%	1.2%	.0%
Aspen Technology	4.5	.0	4.0	0	.4%	.0%	1.0%	.0%
PADS Software	4.2	.0	3.6	0	.4%	.0%	.9%	.0%
Data I/O	4.1	.0	4.1	0	.4%	.0%	1.1%	.0%
Moda CAD	3.8	1.0	2.7	32	.3%	.1%	.7%	.0%
Algor Interactive Systems	3.8	.0	3.4	0	.3%	.0%	.9%	.0%
Orcad	3.7	.0	3.7	0	.3%	.0%	.9%	.0%
American Small Business Comp.	3.5	.0	3.5	0	.3%	.0%	.9%	.0%
EESof	3.5	.0	3.2	0	.3%	.0%	.8%	.0%
Innovative Data Design	3.4	.0	3.4	0	.3%	.0%	.9%	.0%
International Software Systems	3.4	.0	3.4	0	.3%	.0%	.9%	.0%
ISICAD	3.2	.0	3.2	0	.3%	.0%	.8%	.0%
Swanson Analysis	3.2	.0	3.2	0	.3%	.0%	.8%	.0%
ADRA Systems	3.1	.0	2.8	0	.3%	.0%	.7%	.0%
PacSoft	3.1	.0	3.1	0	.3%	.0%	.8%	.0%
Racal-Redac	3.1	.0	2.9	0	.3%	.0%	.8%	.0%
GeoGraphix	3.1	.0	2.3	0	.3%	.0%	.6%	.0%
MCS	3.0	.0	2.7	0	.3%	.0%	.7%	.0%
Claris	2.7	.0	2.7	0	.2%	.0%	.7%	.0%
Foresight Resources	2.5	.0	2.2	0	.2%	.0%	.6%	.0%
Visionics	2.4	.0	1.8	10	.2%	.0%	.5%	.0%
Accel Technologies	2.2	.0	2.0	0	.2%	.0%	.5%	.0%
Aries Technology	2.1	.0	1.9	0	.2%	.0%	.5%	.0%
Generation 5 Technology	2.1	.0	2.1	0	.2%	.0%	.5%	.0%

(Continued)

Table 9 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application: All Applications
Platform: Personal Computer
Region: North America
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Facility Mapping Systems	2.0	.0	1.8	0	.2%	.0%	.5%	.0%
Infinite Graphics	2.0	.0	2.0	0	.2%	.0%	.5%	.0%
Accugraph	2.0	.1	1.7	9	.2%	.0%	.4%	.0%
ERDAS	2.0	.4	1.5	12	.2%	.1%	.4%	.0%
Micro Engineering Solutions	1.9	.5	1.2	28	.2%	.1%	.3%	.0%
ALDEC	1.9	.0	1.9	0	.2%	.0%	.5%	.0%
LPKF	1.8	1.2	.5	75	.2%	.2%	.1%	.0%
Evolution Computing	1.8	.0	1.8	0	.2%	.0%	.5%	.0%
Kork Systems	1.6	.2	1.1	20	.1%	.0%	.3%	.0%
Cimatron	1.6	.7	.7	63	.1%	.1%	.2%	.0%
Intera Tydac	1.5	.0	1.5	0	.1%	.0%	.4%	.0%
CIVILSOFT	1.5	.0	1.5	0	.1%	.0%	.4%	.0%
Sigma Design	1.5	.0	1.4	0	.1%	.0%	.4%	.0%
LandCadd	1.4	.0	1.4	0	.1%	.0%	.3%	.0%
Terra Sciences	1.4	.0	1.4	0	.1%	.0%	.4%	.0%
Teradyne	1.4	.0	1.0	0	.1%	.0%	.3%	.0%
GRAPHSOFT	1.4	.0	1.4	0	.1%	.0%	.4%	.0%
Phase Three Logic	1.3	.0	1.1	0	.1%	.0%	.3%	.0%
Carrier Corporation	1.3	.0	1.3	0	.1%	.0%	.3%	.0%
Massteck	1.2	.0	1.2	0	.1%	.0%	.3%	.0%
CADWorks	1.2	.0	1.0	0	.1%	.0%	.3%	.0%
BETRONEX	1.2	.1	1.0	22	.1%	.0%	.3%	.0%
Investronica SA	1.2	.9	.1	46	.1%	.1%	.0%	.0%
Engineering Mechanics	1.1	.1	1.0	137	.1%	.0%	.2%	.1%

(Continued)

Table 9 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	North America
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share			
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Tanner Research	1.1	.0	1.0	0	.1%	.0%	.3%	.0%
Omation	1.1	.0	1.1	0	.1%	.0%	.3%	.0%
Comshoppe	1.0	.0	1.0	0	.1%	.0%	.3%	.0%
Intrinsix	1.0	1.0	.0	10	.1%	.1%	.0%	.0%
Spectrum Software	1.0	.0	1.0	0	.1%	.0%	.3%	.0%
Terr-Mar	1.0	.4	.5	19	.1%	.1%	.1%	.0%
Cadisys	1.0	.0	1.0	0	.1%	.0%	.2%	.0%
Pathtrace	.9	.3	.6	14	.1%	.0%	.2%	.0%
Caddlink	.9	.0	.9	0	.1%	.0%	.2%	.0%
Maptek	.9	.0	.9	0	.1%	.0%	.2%	.0%
Aura CAD/CAM Systems	.9	.0	.8	0	.1%	.0%	.2%	.0%
Cascade Graphics	.8	.0	.8	0	.1%	.0%	.2%	.0%
Dynaware	.8	.0	.8	0	.1%	.0%	.2%	.0%
Douglas Electronics	.8	.0	.8	0	.1%	.0%	.2%	.0%
Radian Corporation	.8	.0	.5	0	.1%	.0%	.1%	.0%
GEOVISION Inc.	.7	.4	.2	281	.1%	.1%	.0%	.2%
Mega CADD	.7	.0	.7	0	.1%	.0%	.2%	.0%
Uniras	.7	.0	.7	0	.1%	.0%	.2%	.0%
IGC Technology	.7	.0	.7	0	.1%	.0%	.2%	.0%
A.I. Systems	.7	.0	.7	0	.1%	.0%	.2%	.0%
ECOM Associates	.7	.0	.6	4	.1%	.0%	.2%	.0%
Ground Modelling Systems	.7	.4	.3	4	.1%	.1%	.1%	.0%
Schlumberger	.6	.2	.3	10	.1%	.0%	.1%	.0%
Machinery Sales	.6	.0	.6	0	.1%	.0%	.2%	.0%

(Continued)

Table 9 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application: All Applications
Platform: Personal Computer
Region: North America
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Engineering Systems Corp.	.6	.0	.4	0	.1%	.0%	.1%	.0%
Vamp	.6	.0	.6	0	.0%	.0%	.1%	.0%
Mc2 Engineering Software	.5	.0	.5	0	.0%	.0%	.1%	.0%
Point Control	.5	.0	.5	0	.0%	.0%	.1%	.0%
MacNeal-Schwendler	.5	.0	.5	0	.0%	.0%	.1%	.0%
Ashlar	.5	.0	.5	0	.0%	.0%	.1%	.0%
Compact Software	.5	.0	.5	0	.0%	.0%	.1%	.0%
Capilano Computing	.5	.0	.5	0	.0%	.0%	.1%	.0%
Digital	.5	.0	.3	0	.0%	.0%	.1%	.0%
Bechtel Software	.5	.0	.5	0	.0%	.0%	.1%	.0%
PLUS Logic	.4	.0	.4	0	.0%	.0%	.1%	.0%
Rasna Corporation	.4	.0	.4	0	.0%	.0%	.1%	.0%
The CAD Group	.4	.0	.4	0	.0%	.0%	.1%	.0%
BV Engineering	.4	.0	.4	0	.0%	.0%	.1%	.0%
Geosoft	.4	.0	.4	0	.0%	.0%	.1%	.0%
Integrated Silicon Systems	.4	.1	.2	5	.0%	.0%	.1%	.0%
Computer-Aided Design Group	.3	.0	.2	0	.0%	.0%	.1%	.0%
Geotrace Technologies	.3	.0	.3	0	.0%	.0%	.1%	.0%
The Great Softwestern Co.	.2	.0	.2	0	.0%	.0%	.1%	.0%
Bobcat Systems	.2	.0	.2	0	.0%	.0%	.1%	.0%
Genasys II	.2	.1	.1	1	.0%	.0%	.0%	.0%
SIMUCAD	.2	.0	.2	0	.0%	.0%	.1%	.0%
Geomath	.2	.0	.2	0	.0%	.0%	.1%	.0%
Pacific Numerics	.2	.0	.2	0	.0%	.0%	.0%	.0%

Table 9 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	North America
Units:	Millions of U.S. Dollars/Actual Units

| Company | Total Factory Revenue | Hardware Revenue | Software Revenue | Hardware Units Shipped | Market Share | | | |
					Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Simutest	.2	.0	.2	0	.0%	.0%	.0%	.0%
Ithaca Software	.2	.0	.2	0	.0%	.0%	.0%	.0%
Synthesis	.1	.0	.1	0	.0%	.0%	.0%	.0%
Vision 3D	.1	.0	.0	0	.0%	.0%	.0%	.0%
Genrad	.1	.0	.1	4	.0%	.0%	.0%	.0%
National Semiconductor	.1	.0	.1	0	.0%	.0%	.0%	.0%
Simulation Science	.1	.0	.1	0	.0%	.0%	.0%	.0%
A/E Microsystems	.0	.0	.0	7	.0%	.0%	.0%	.0%
CADMATIC	.0	.0	.0	0	.0%	.0%	.0%	.0%
NCR Microelectronics	.0	.0	.0	0	.0%	.0%	.0%	.0%
Other Companies	230.7	230.3	.4	60,652	20.3%	33.1%	.1%	38.4%
All Companies	1,136.0	696.8	389.9	158,088	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	1,125.5	693.1	383.6	157,864	99.1%	99.5%	98.4%	99.9%
All Asian-Based Companies	.0	.0	.0	0	.0%	.0%	.0%	.0%
All European-Based Companies	10.5	3.7	6.2	224	.9%	.5%	1.6%	.1%
All Hardware Companies	716.7	686.8	.0	157,011	63.1%	98.6%	.0%	99.3%
All Turnkey & SW Companies	419.3	9.9	389.9	1,077	36.9%	1.4%	100.0%	.7%

Source: Dataquest (February 1992)

Table 10
1991 Preliminary CAD/CAM/CAE Market Share

Application: All Applications
Platform: Personal Computer
Region: Europe
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Compaq	212.2	212.2	.0	36,313	18.9%	30.1%	.0%	26.1%
Autodesk	89.8	.0	89.8	0	8.0%	.0%	24.9%	.0%
IBM	76.1	72.3	.0	17,818	6.8%	10.2%	.0%	12.8%
Hewlett-Packard	63.8	51.0	.0	11,011	5.7%	7.2%	.0%	7.9%
Apple Computer	60.2	53.0	.0	12,611	5.4%	7.5%	.0%	9.1%
Nemetschek	36.0	14.4	21.6	631	3.2%	2.0%	6.0%	.5%
Investronica SA	26.5	21.2	2.7	1,060	2.4%	3.0%	.7%	.8%
Ziegler	21.6	.0	21.6	0	1.9%	.0%	6.0%	.0%
Vero International Software	20.8	.0	18.9	0	1.8%	.0%	5.2%	.0%
Wiechers Datentechnik	20.0	11.4	6.0	577	1.8%	1.6%	1.7%	.4%
Caditron	16.3	8.1	6.5	251	1.4%	1.1%	1.8%	.2%
Research Machines	15.0	15.0	.0	2,420	1.3%	2.1%	.0%	1.7%
CADAM	14.6	8.4	5.3	1,193	1.3%	1.2%	1.5%	.9%
LPKF	12.0	2.4	8.4	520	1.1%	.3%	2.3%	.4%
Soft-Tech Software Technologie	11.5	2.9	7.5	765	1.0%	.4%	2.1%	.6%
BATISOFT	11.0	1.6	5.5	312	1.0%	.2%	1.5%	.2%
Intergraph	9.3	.0	8.8	0	.8%	.0%	2.4%	.0%
Tebis	9.3	1.4	6.5	46	.8%	.2%	1.8%	.0%
ISICAD	9.1	.0	9.1	0	.8%	.0%	2.5%	.0%
Microway	8.6	5.8	2.9	87	.8%	.8%	.8%	.1%
Computervision	8.1	.4	7.6	77	.7%	.1%	2.1%	.1%
Aucotec	8.0	2.8	4.4	142	.7%	.4%	1.2%	.1%
DAT Standard info systems	7.6	.0	7.2	0	.7%	.0%	2.0%	.0%
Serbi	6.5	.0	6.5	0	.6%	.0%	1.8%	.0%

(Continued)

Table 10 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Europe
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share — Total Factory Revenue	Market Share — Hardware Revenue	Market Share — Software Revenue	Market Share — Hardware Units Shipped
Ground Modelling Systems	6.4	3.4	2.6	54	.6%	.5%	.7%	.0%
Hochtief	6.3	.9	4.4	79	.6%	.1%	1.2%	.1%
Racal-Redac	5.2	.0	5.0	0	.5%	.0%	1.4%	.0%
Orcad	4.9	.0	4.9	0	.4%	.0%	1.4%	.0%
mb Programme	4.9	2.4	1.7	117	.4%	.3%	.5%	.1%
Olivetti	4.7	4.0	.0	793	.4%	.6%	.0%	.6%
RIB/RZB	4.6	.4	3.7	24	.4%	.1%	1.0%	.0%
Cimatron	4.5	2.0	2.0	184	.4%	.3%	.6%	.1%
Dell Computer	4.5	4.5	.0	1,167	.4%	.6%	.0%	.8%
X-TRA	4.1	.9	1.9	175	.4%	.1%	.5%	.1%
Cadtronic	4.1	2.3	1.8	121	.4%	.3%	.5%	.1%
Computer Services Consultants	4.0	.0	4.0	0	.4%	.0%	1.1%	.0%
Kloeckner-Moeller	3.7	.9	2.6	130	.3%	.1%	.7%	.1%
Altera	3.7	.0	3.1	0	.3%	.0%	.9%	.0%
Robocom	3.6	.0	3.6	0	.3%	.0%	1.0%	.0%
Datagraphic	3.4	1.7	1.4	55	.3%	.2%	.4%	.0%
Anilam Electronics	3.2	1.0	1.9	40	.3%	.1%	.5%	.0%
BETRONIX	3.0	.2	2.8	39	.3%	.0%	.8%	.0%
Xilinx	2.9	.0	2.6	0	.3%	.0%	.7%	.0%
EKsof	2.7	.0	2.4	0	.2%	.0%	.7%	.0%
Superdraft	2.6	1.2	1.3	142	.2%	.2%	.4%	.1%
Micrografx	2.5	.0	2.5	0	.2%	.0%	.7%	.0%
Pathtrace	2.5	.7	1.6	36	.2%	.1%	.4%	.0%
ALS Design	2.4	.2	2.2	50	.2%	.0%	.6%	.0%

(Continued)

Table 10 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application: All Applications
Platform: Personal Computer
Region: Europe
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Viewlogic Systems	2.2	.0	1.9	0	.2%	.0%	.5%	.0%
Data I/O	2.2	.0	2.2	0	.2%	.0%	.6%	.0%
Elsree Computing	2.2	1.0	1.2	60	.2%	.1%	.3%	.0%
Whessoe Computing Systems	2.2	.0	2.2	0	.2%	.0%	.6%	.0%
Foresight Resources	2.1	.0	1.9	0	.2%	.0%	.5%	.0%
CAD-UL	2.1	.0	2.1	0	.2%	.0%	.6%	.0%
PADS Software	2.1	.0	1.7	0	.2%	.0%	.5%	.0%
ACTEL	2.0	.0	1.8	0	.2%	.0%	.5%	.0%
PAFEC	2.0	.0	2.0	0	.2%	.0%	.6%	.0%
CNC Software	1.8	.0	1.8	0	.2%	.0%	.5%	.0%
ESRI	1.8	.0	1.8	0	.2%	.0%	.5%	.0%
Swanson Analysis	1.7	.0	1.7	0	.1%	.0%	.5%	.0%
Hahn & Kolb	1.6	1.0	.5	31	.1%	.1%	.1%	.0%
Microsim	1.5	.0	1.4	0	.1%	.0%	.4%	.0%
Moda CAD	1.5	.4	1.0	13	.1%	.1%	.3%	.0%
Lamp Software	1.5	.2	.9	63	.1%	.0%	.3%	.0%
ISDATA	1.4	.0	1.2	0	.1%	.0%	.3%	.0%
Everex Systems	1.4	1.4	.0	440	.1%	.2%	.0%	.3%
FEA	1.4	.3	.3	25	.1%	.0%	.1%	.0%
CADKEY	1.4	.9	.4	145	.1%	.1%	.1%	.1%
ETAK	1.3	.1	1.3	4	.1%	.0%	.3%	.0%
Marcus Computer Systeme	1.2	.7	.4	39	.1%	.1%	.1%	.0%
Aucos elektronische Gerate	1.2	.4	.8	116	.1%	.0%	.2%	.1%
Nucke Software	1.1	.6	.4	26	.1%	.0%	.1%	.0%

Table 10 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Europe
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Integer	1.1	.0	.9	0	.1%	.0%	.2%	.0%
CADWorks	1.1	.0	.9	0	.1%	.0%	.2%	.0%
Number One Systems	1.0	.1	.9	24	.1%	.0%	.2%	.0%
S.T.L.D. s.r.l.	1.0	.0	1.0	0	.1%	.0%	.3%	.0%
ARKTEC	.9	.2	.6	23	.1%	.0%	.2%	.0%
CAP Electronic Sweet's	.9	.0	.7	0	.1%	.0%	.2%	.0%
CAMTEK	.9	.0	.7	0	.1%	.0%	.2%	.0%
Contract Data Research	.9	.0	.6	0	.1%	.0%	.2%	.0%
Schlumberger	.9	.2	.4	13	.1%	.0%	.1%	.0%
Aspen Technology	.8	.0	.8	0	.1%	.0%	.2%	.0%
Carrier Corporation	.8	.0	.8	0	.1%	.0%	.2%	.0%
Vision 3D	.8	.4	.2	6	.1%	.1%	.0%	.0%
Strategic Mapping	.7	.0	.7	0	.1%	.0%	.2%	.0%
CAD-Capture	.7	.0	.1	0	.1%	.0%	.0%	.0%
ADRA Systems	.7	.0	.6	0	.1%	.0%	.2%	.0%
Algor Interactive Systems	.6	.0	.6	0	.1%	.0%	.2%	.0%
Comshoppe	.6	.0	.6	0	.1%	.0%	.2%	.0%
MCS	.6	.0	.6	0	.1%	.0%	.2%	.0%
Sigma Design	.6	.0	.6	0	.1%	.0%	.2%	.0%
Teradyne	.6	.0	.5	0	.1%	.0%	.1%	.0%
Scientific Calc.	.6	.0	.6	0	.1%	.0%	.2%	.0%
Caroline Informatique	.6	.1	.4	7	.1%	.0%	.1%	.0%
Omation	.6	.0	.6	0	.1%	.0%	.2%	.0%
debis Systemhaus	.6	.2	.3	12	.1%	.0%	.1%	.0%

Table 10 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Europe
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
CADMATIC	.6	.0	.4	4	.0%	.0%	.1%	.0%
ACERI SA	.6	.1	.3	3	.0%	.0%	.1%	.0%
ERDAS	.5	.1	.4	3	.0%	.0%	.1%	.0%
ALDEC	.5	.0	.5	0	.0%	.0%	.1%	.0%
Norsk Data	.5	.3	.1	8	.0%	.0%	.0%	.0%
CAD Lab	.5	.0	.4	0	.0%	.0%	.1%	.0%
Massteck	.4	.0	.4	0	.0%	.0%	.1%	.0%
Rasna Corporation	.4	.0	.4	0	.0%	.0%	.1%	.0%
Terra Sciences	.4	.0	.4	0	.0%	.0%	.1%	.0%
Aries Technology	.4	.0	.4	0	.0%	.0%	.1%	.0%
DCA Softdesk	.4	.0	.4	0	.0%	.0%	.1%	.0%
Accel Technologies	.4	.0	.3	0	.0%	.0%	.1%	.0%
Point Control	.4	.0	.4	0	.0%	.0%	.1%	.0%
Genasys II	.3	.1	.2	2	.0%	.0%	.1%	.0%
MacNeal-Schwendler	.3	.0	.3	0	.0%	.0%	.1%	.0%
Compact Software	.3	.0	.0	0	.0%	.0%	.0%	.0%
Evolution Computing	.3	.0	.3	0	.0%	.0%	.1%	.0%
American Small Business Comp.	.3	.0	.3	0	.0%	.0%	.1%	.0%
Generation 5 Technology	.3	.0	.3	0	.0%	.0%	.1%	.0%
Masta Corporation	.3	.0	.2	4	.0%	.0%	.0%	.0%
Mutoh Industries—NO OEM	.3	.2	.1	0	.0%	.0%	.0%	.0%
Kontron Instruments	.2	.1	.1	4	.0%	.0%	.0%	.0%
Instrumatic Espanola	.2	.0	.2	0	.0%	.0%	.1%	.0%
Facility Mapping Systems	.2	.0	.2	0	.0%	.0%	.1%	.0%

(Continued)

Table 10 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application: All Applications
Platform: Personal Computer
Region: Europe
Units: Millions of U.S. Dollars/Actual Units

| | | | | | Market Share | | | |
Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Mega CADD	.2	.0	.2	0	.0%	.0%	.1%	.0%
Micro Engineering Solutions	.2	.1	.1	3	.0%	.0%	.0%	.0%
Tanner Research	.2	.0	.2	0	.0%	.0%	.0%	.0%
Cascade Graphics	.2	.0	.2	0	.0%	.0%	.1%	.0%
Technische Computer Systeme	.2	.0	.1	5	.0%	.0%	.0%	.0%
Terr-Mar	.2	.1	.1	4	.0%	.0%	.0%	.0%
ESDU International	.2	.0	.2	0	.0%	.0%	.0%	.0%
Synthesis	.2	.0	.2	0	.0%	.0%	.0%	.0%
TOOL Software	.1	.0	.1	3	.0%	.0%	.0%	.0%
A.I. Systems	.1	.0	.1	0	.0%	.0%	.0%	.0%
Kork Systems	.1	.0	.1	1	.0%	.0%	.0%	.0%
Genrad	.1	.0	.1	4	.0%	.0%	.0%	.0%
Accugraph	.1	.0	.1	0	.0%	.0%	.0%	.0%
LandCadd	.1	.0	.1	0	.0%	.0%	.0%	.0%
Radan Computational	.1	.0	.1	5	.0%	.0%	.0%	.0%
Simulation Science	.1	.0	.1	0	.0%	.0%	.0%	.0%
GeoGraphix	.1	.0	.1	0	.0%	.0%	.0%	.0%
Ithaca Software	.1	.0	.1	0	.0%	.0%	.0%	.0%
National Semiconductor	.1	.0	.1	0	.0%	.0%	.0%	.0%
Caddlink	.1	.0	.1	0	.0%	.0%	.0%	.0%
Geotrace Technologies	.1	.0	.1	0	.0%	.0%	.0%	.0%
Bechtel Software	.0	.0	.0	0	.0%	.0%	.0%	.0%
Integrated Silicon Systems	.0	.0	.0	0	.0%	.0%	.0%	.0%
Dolphin Integration	.0	.0	.0	0	.0%	.0%	.0%	.0%

(Continued)

Table 10 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Europe
Units:	Millions of U.S. Dollars/Actual Units

| | | | | | Market Share | | | |
Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Pacific Numerics	.0	.0	.0	0	.0%	.0%	.0%	.0%
Other Companies	185.5	185.5	.1	48,840	16.5%	26.3%	.0%	35.1%
All Companies	1,124.1	705.3	361.2	138,980	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	790.3	589.9	170.9	129,660	70.3%	83.6%	47.3%	93.3%
All Asian-Based Companies	.3	.2	.1	0	.0%	.0%	.0%	.0%
All European-Based Companies	333.5	115.3	190.2	9,320	29.7%	16.3%	52.7%	6.7%
All Hardware Companies	617.1	592.5	.0	130,188	54.9%	84.0%	.0%	93.7%
All Turnkey & SW Companies	506.9	112.8	361.2	8,792	45.1%	16.0%	100.0%	6.3%

Source: Dataquest (February 1992)

Table 11
1991 Preliminary CAD/CAM/CAE Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Asia
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
NEC	158.4	134.6	11.1	12,653	19.1%	26.1%	4.3%	17.5%
Fujitsu	82.9	52.0	22.7	2,733	10.0%	10.1%	8.8%	3.8%
Hitachi	71.4	34.3	30.0	3,718	8.6%	6.6%	11.7%	5.1%
Hakuto	51.2	30.7	20.5	1,284	6.2%	6.0%	8.0%	1.8%
IBM	47.5	45.2	.0	11,136	5.7%	8.8%	.0%	15.4%
Mutoh Industries—NO OEM	43.3	24.2	16.9	1,342	5.2%	4.7%	6.6%	1.9%
Wacom	42.5	8.4	29.5	719	5.1%	1.6%	11.5%	1.0%
CADAM	36.5	20.9	13.3	2,982	4.4%	4.0%	5.2%	4.1%
Hewlett-Packard	30.4	24.3	.0	5,255	3.7%	4.7%	.0%	7.3%
Autodesk	27.5	.0	27.5	0	3.3%	.0%	10.7%	.0%
Toshiba—NO OEM	26.6	13.3	10.6	2,046	3.2%	2.6%	4.1%	2.8%
Apple Computer	25.5	22.4	.0	5,335	3.1%	4.3%	.0%	7.4%
Compaq	13.0	13.0	.0	2,223	1.6%	2.5%	.0%	3.1%
Mitsubishi Electric	13.0	8.6	4.6	1,141	1.6%	1.7%	1.8%	1.6%
Andor	12.8	3.2	9.1	116	1.5%	.6%	3.6%	.2%
Design Automation	10.2	.0	10.2	0	1.2%	.0%	4.0%	.0%
CPU	9.4	.0	8.6	0	1.1%	.0%	3.3%	.0%
Technovision	4.8	.0	4.8	0	.6%	.0%	1.9%	.0%
Sophia Systems	3.8	.9	2.5	68	.5%	.2%	1.0%	.1%
Mitsui Engineering	3.5	2.4	.7	23	.4%	.5%	.3%	.0%
Viewlogic Systems	3.3	.0	2.7	0	.4%	.0%	1.1%	.0%
Data I/O	2.9	.0	2.9	0	.3%	.0%	1.1%	.0%
Sharp System Products—NO OEM	2.5	1.3	1.2	31	.3%	.3%	.5%	.0%
Xilinx	2.4	.0	2.2	0	.3%	.0%	.9%	.0%

(Continued)

Table 11 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application: All Applications
Platform: Personal Computer
Region: Asia
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
PADS Software	2.2	.0	1.9	0	3%	.0%	.7%	.0%
Strategic Mapping	2.1	.0	2.1	0	2%	.0%	.8%	.0%
Intergraph	1.9	.0	1.8	0	2%	.0%	.7%	.0%
Elsof	1.6	.0	1.4	0	2%	.0%	.5%	.0%
ACTEL	1.6	.0	1.4	0	2%	.0%	.5%	.0%
Anilam Electronics	1.4	.4	.8	18	2%	1%	.3%	.0%
Altera	1.4	.0	1.2	0	2%	.0%	.5%	.0%
Cimatron	1.1	.5	.5	42	1%	1%	.2%	1%
ADRA Systems	1.0	.0	.9	0	1%	.0%	.4%	.0%
BETRONEX	.9	.1	.8	17	1%	.0%	.3%	.0%
Microsim	.9	.0	.9	0	1%	.0%	.3%	.0%
Swanson Analysis	.8	.0	.8	0	1%	.0%	.3%	.0%
DCA Softdesk	.8	.0	.8	0	1%	.0%	.3%	.0%
CADKEY	.8	.0	.8	0	1%	.0%	.3%	.0%
CNC Software	.7	.0	.7	0	1%	.0%	.3%	.0%
INS Engineering	.7	.5	.1	16	1%	1%	.1%	.0%
CADWorks	.7	.0	.6	0	1%	.0%	.2%	.0%
Moda CAD	.6	.2	.4	5	1%	.0%	.2%	.0%
Arles Technology	.5	.0	.5	0	1%	.0%	.2%	.0%
Carrier Corporation	.5	.0	.5	0	1%	.0%	.2%	.0%
ESRI	.5	.0	.5	0	1%	.1%	.2%	.0%
LPKF	.5	.3	.1	20	1%	.1%	.0%	.0%
Whessoe Computing Systems	.5	.0	.5	0	1%	.0%	.2%	.0%
ETAK	.4	.0	.4	1	1%	.0%	.2%	.0%

Table 11 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Asia
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Hardware Units Shipped
Rasna Corporation	.4	.0	.4	0	.1%	.0%	.2%	.0%
Sigma Design	.4	.0	.4	0	.0%	.0%	.1%	.0%
Terr-Mar	.4	.2	.2	7	.0%	.0%	.1%	.0%
ISICAD	.4	.0	.4	0	.0%	.0%	.1%	.0%
Point Control	.4	.0	.4	0	.0%	.0%	.1%	.0%
Computervision	.4	.0	.3	0	.0%	.0%	.1%	.0%
Everex Systems	.4	.3	.0	110	.0%	.1%	.0%	.2%
Compact Software	.3	.0	.0	0	.0%	.0%	.0%	.0%
Investronica SA	.3	.2	.0	11	.0%	.0%	.0%	.0%
Aspen Technology	.3	.0	.3	0	.0%	.0%	.1%	.0%
MCS	.3	.0	.2	0	.0%	.0%	.1%	.0%
Lamp Software	.3	.1	.2	11	.0%	.0%	.1%	.0%
Superdraft	.2	.1	.1	13	.0%	.0%	.0%	.0%
MacNeal-Schwendler	.2	.0	.2	0	.0%	.0%	.1%	.0%
Micro Engineering Solutions	.2	.1	.1	3	.0%	.0%	.1%	.0%
Integrated Silicon Systems	.2	.1	.1	3	.0%	.0%	.1%	.0%
Teradyne	.2	.0	.2	0	.0%	.0%	.1%	.0%
ERDAS	.1	.0	.1	1	.0%	.0%	.0%	.0%
GeoGraphix	.1	.0	.1	0	.0%	.0%	.0%	.0%
ALDEC	.1	.0	.1	0	.0%	.0%	.1%	.0%
Digital	.1	.0	.1	0	.0%	.0%	.0%	.0%
Integer	.1	.0	.1	0	.0%	.0%	.0%	.0%
Pathtrace	.1	.0	.1	2	.0%	.0%	.0%	.0%
Foresight Resources	.1	.0	.1	0	.0%	.0%	.0%	.0%

(Continued)

Table 11 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application: All Applications
Platform: Personal Computer
Region: Asia
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Mega CADD	.1	.0	.1	0	.0%	.0%	.0%	.0%
Tanner Research	.1	.0	.1	0	.0%	.0%	.0%	.0%
Algor Interactive Systems	.1	.0	.1	0	.0%	.0%	.0%	.0%
Schlumberger	.1	.0	.0	1	.0%	.0%	.0%	.0%
American Small Business Comp.	.1	.0	.1	0	.0%	.0%	.0%	.0%
Simulation Science	.1	.0	.1	0	.0%	.0%	.0%	.0%
Genasys II	.1	.0	.0	0	.0%	.0%	.0%	.0%
Ithaca Software	.1	.0	.1	0	.0%	.0%	.0%	.0%
Accel Technologies	.1	.0	.0	0	.0%	.0%	.0%	.0%
Massteck	.1	.0	.1	0	.0%	.0%	.0%	.0%
Accugraph	.0	.0	.0	0	.0%	.0%	.0%	.0%
Facility Mapping Systems	.0	.0	.0	0	.0%	.0%	.0%	.0%
Omation	.0	.0	.0	0	.0%	.0%	.0%	.0%
SIMUCAD	.0	.0	.0	0	.0%	.0%	.0%	.0%
The CAD Group	.0	.0	.0	0	.0%	.0%	.0%	.0%
Geotrace Technologies	.0	.0	.0	0	.0%	.0%	.0%	.0%
PAFEC	.0	.0	.0	0	.0%	.0%	.0%	.0%
Bechtel Software	.0	.0	.0	0	.0%	.0%	.0%	.0%
Kork Systems	.0	.0	.0	0	.0%	.0%	.0%	.0%
Technische Computer Systeme	.0	.0	.0	0	.0%	.0%	.0%	.0%

(Continued)

Table 11 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Asia
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Other Companies	73.1	73.1	.0	19,244	8.8%	14.2%	.0%	26.6%
All Companies	829.2	515.9	256.7	72,332	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	286.9	199.7	70.6	46,309	34.6%	38.7%	27.5%	64.0%
All Asian-Based Companies	536.9	314.5	182.9	25,888	64.7%	61.0%	71.3%	35.8%
All European-Based Companies	5.4	1.7	3.2	135	.7%	.3%	1.3%	.2%
All Hardware Companies	210.7	199.2	.0	46,286	25.4%	38.6%	.0%	64.0%
All Turnkey & SW Companies	618.5	316.7	256.7	26,046	74.6%	61.4%	100.0%	36.0%

Source: Dataquest (February 1992)

Table 12
1991 Preliminary CAD/CAM/CAE Market Share

Application: All Applications
Platform: Personal Computer
Region: Rest of World
Units: Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Compaq	21.7	21.7	.0	3,705	27.1%	42.7%	.0%	33.6%
IBM	9.5	9.0	.0	2,227	11.9%	17.8%	.0%	20.2%
Claris	2.7	.0	2.7	0	3.4%	.0%	10.4%	.0%
Autodesk	2.5	.0	2.5	0	3.1%	.0%	9.6%	.0%
Apple Computer	2.3	2.0	.0	485	2.9%	4.0%	.0%	4.4%
Intergraph	2.2	.0	2.0	0	2.7%	.0%	7.8%	.0%
Engineering Mechanics	2.1	.1	1.8	255	2.6%	.2%	6.7%	2.3%
Strategic Mapping	1.9	.0	1.9	0	2.4%	.0%	7.3%	.0%
Orcad	1.8	.0	1.8	0	2.3%	.0%	7.0%	.0%
Hewlett-Packard	1.5	1.2	.0	250	1.8%	2.3%	.0%	2.3%
Vero International Software	1.3	.0	1.2	0	1.7%	.0%	4.6%	.0%
MapInfo	1.2	.0	1.0	0	1.5%	.0%	3.7%	.0%
International Software Systems	1.1	.0	1.1	0	1.4%	.0%	4.3%	.0%
CNC Software	1.1	.0	1.1	0	1.4%	.0%	4.2%	.0%
Cimatron	.9	.4	.4	35	1.1%	.8%	1.5%	.3%
Genasys II	.9	.3	.5	4	1.1%	.6%	2.0%	.0%
Infocel	.8	.2	.6	17	1.0%	.3%	2.3%	.2%
Radian Corporation	.8	.0	.5	0	.9%	.0%	1.7%	.0%
Altera	.7	.0	.6	0	.9%	.0%	2.2%	.0%
Computervision	.6	.0	.6	0	.7%	.0%	2.1%	.0%
Pathtrace	.6	.2	.4	8	.7%	.3%	1.5%	.1%
BETRONEX	.5	.1	.4	9	.6%	.1%	1.6%	.1%
ETAK	.4	.0	.4	1	.6%	.0%	1.6%	.0%
Data I/O	.4	.0	.4	0	.5%	.0%	1.5%	.0%

(Continued)

Table 12 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Rest of World
Units:	Millions of U.S. Dollars/Actual Units

					Market Share			
Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Xilinx	.3	.0	.3	0	.4%	.0%	1.1%	.0%
DCA Softdesk	.3	.0	.3	0	.4%	.0%	1.1%	.0%
ESRI	.3	.0	.3	0	.4%	.0%	1.1%	.0%
Hochtief	.3	.0	.2	2	.3%	.1%	.7%	.0%
ACTEL	.3	.0	.2	0	.3%	.0%	.9%	.0%
PADS Software	.3	.0	.2	0	.3%	.0%	.8%	.0%
Superdraft	.2	.1	.1	13	.3%	.2%	.4%	.1%
Whessoe Computing Systems	.2	.0	.2	0	.3%	.0%	.9%	.0%
CADWorks	.2	.0	.2	0	.3%	.0%	.7%	.0%
Investronica SA	.2	.2	.0	8	.3%	.3%	.1%	.1%
Generation 5 Technology	.2	.0	.2	0	.2%	.0%	.7%	.0%
Aura CAD/CAM Systems	.2	.0	.1	0	.2%	.0%	.5%	.0%
BATISOFT	.1	.0	.1	5	.2%	.0%	.3%	.0%
Mc2 Engineering Software	.1	.0	.1	0	.2%	.0%	.5%	.0%
Compact Software	.1	.0	.0	0	.2%	.0%	.0%	.0%
Innovative Data Design	.1	.0	.1	0	.2%	.0%	.5%	.0%
Engineering Systems Corp.	.1	.0	.1	0	.2%	.0%	.3%	.0%
LPKF	.1	.1	.0	5	.2%	.1%	.1%	.0%
American Small Business Comp.	.1	.0	.1	0	.1%	.0%	.4%	.0%
ERDAS	.1	.0	.1	1	.1%	.0%	.3%	.0%
Sigma Design	.1	.0	.1	0	.1%	.0%	.3%	.0%
Spectrum Software	.1	.0	.1	0	.1%	.0%	.4%	.0%
ISICAD	.1	.0	.1	0	.1%	.0%	.3%	.0%
Ziegler	.1	.0	.1	0	.1%	.0%	.3%	.0%

(Continued)

Table 12 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Rest of World
Units:	Millions of U.S. Dollars/Actual Units

					Market Share			
Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
CADMATIC	.1	.0	.0	1	.1%	.0%	.2%	.0%
EEsof	.1	.0	.1	0	.1%	.0%	.3%	.0%
FEA	.1	.0	.0	1	.1%	.0%	.0%	.0%
Ithaca Software	.1	.0	.1	0	.1%	.0%	.3%	.0%
Terr-Mar	.1	.0	.1	2	.1%	.1%	.2%	.0%
Facility Mapping Systems	.1	.0	.1	0	.1%	.0%	.2%	.0%
Moda CAD	.1	.0	.0	1	.1%	.0%	.2%	.0%
Swanson Analysis	.1	.0	.1	0	.1%	.0%	.2%	.0%
Accel Technologies	.1	.0	.0	0	.1%	.0%	.2%	.0%
Caddlink	.1	.0	.1	0	.1%	.0%	.2%	.0%
Capilano Computing	.1	.0	.1	0	.1%	.0%	.2%	.0%
Massteck	.1	.0	.1	0	.1%	.0%	.2%	.0%
Accugraph	.0	.0	.0	0	.1%	.0%	.1%	.0%
Algor Interactive Systems	.0	.0	.0	0	.1%	.0%	.2%	.0%
Comshoppe	.0	.0	.0	0	.1%	.0%	.2%	.0%
Kork Systems	.0	.0	.0	0	.0%	.0%	.1%	.0%
Teradyne	.0	.0	.0	0	.0%	.0%	.1%	.0%
Computer-Aided Design Group	.0	.0	.0	0	.0%	.0%	.1%	.0%
Foresight Resources	.0	.0	.0	0	.0%	.0%	.1%	.0%
Genrad	.0	.0	.0	1	.0%	.0%	.1%	.0%
MacNeal-Schwendler	.0	.0	.0	0	.0%	.0%	.1%	.0%
Simulation Science	.0	.0	.0	0	.0%	.0%	.1%	.0%
Vision 3D	.0	.0	.0	0	.0%	.0%	.0%	.0%
ESDU International	.0	.0	.0	0	.0%	.0%	.0%	.0%

(Continued)

Table 12 (Continued)
1991 Preliminary CAD/CAM/CAE Market Share

Application:	All Applications
Platform:	Personal Computer
Region:	Rest of World
Units:	Millions of U.S. Dollars/Actual Units

Company	Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped	Market Share Total Factory Revenue	Hardware Revenue	Software Revenue	Hardware Units Shipped
Other Companies	15.2	15.1	.0	3,981	19.0%	29.8%	.0%	36.1%
All Companies	79.8	50.7	26.1	11,018	100.0%	100.0%	100.0%	100.0%
All N.A.-Based Companies	75.1	49.7	22.9	10,931	94.1%	98.0%	87.7%	99.2%
All Asian-Based Companies	.0	.0	.0	0	.0%	.0%	.0%	.0%
All European-Based Companies	4.7	1.0	3.2	87	5.9%	2.0%	12.3%	.8%
All Hardware Companies	50.0	49.0	.0	10,649	62.7%	96.7%	.0%	96.7%
All Turnkey & SW Companies	29.8	1.7	26.1	369	37.3%	3.3%	100.0%	3.3%

Source: Dataquest (February 1992)

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Forecasts
Personal CAD and Distribution Channels

Source:
Dataquest

CAD/CAM/CAE

Dataquest

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Forecasts—Personal CAD and Distribution Channels

Forecasting Methodology

Fundamental to the way Dataquest conducts its research is an underlying philosophy that says the best data and analyses come from a well-balanced program. This program includes balance between primary and secondary collection techniques; balance between supply-side and demand-side analysis; balance between focused, industry-specific research and coordinated, "big-picture" analysis aided by integration of data from the more than 25 separate high-technology industries Dataquest covers; and balance between the perspectives of experienced industry professionals and rigorous, disciplined techniques of seasoned market researchers.

Dataquest also analyzes trends in the macroenvironment, which can have major influences on both supply-side and demand-side forecasting. In addition to demographics, analysts look at GNP growth, interest rate fluctuation, currency fluctuation, business expectations, and capital spending plans. In the geopolitical arena, the group looks at trade issues, political stability or lack thereof, tariffs, nontariff barriers, and such factors as the effect on Europe of the events of 1992.

Figure 1 is a pictorial summary of the information compendium offered by the Dataquest CAD/CAM/CAE group.

Dataquest's revenue and shipment estimates are based on the following sources:

- Information supplied by company management or gathered from publicly available published sources
- End-user surveys
- Information supplied by other Dataquest industry services relating to components/subsystems of CAD/CAM/CAE

- Information provided by OEMs or resellers of the manufacturers' products
- Senior staff estimates based on reliable historical data and in-depth understanding of a company's products and strategies

The CAD/CAM/CAE industry market estimates and forecasts are derived using the following research techniques:

- "Bottom-up" aggregation—This method involves adding all relevant vendor contributions to arrive at total market estimates for all historical data.
- Segment forecasting—For each application segment tracked by the CAD/CAM/CAE group, individual forecasts are derived following the basic information model defined previously. Specifically, each design phase covered within each application is segmented by channel, product, region, and platform. In this way, each application segment incorporates its own set of unique assumptions.
- Demand-based analysis—Market growth is tracked and forecast in terms of the present and anticipated demand of current and future users. This requires the development of a total available market (TAM) model and a satisfied available market figure to accurately assess the levels of penetration. Installed base and rates of product retirement are also evaluated. In addition, Dataquest analysts factor in the acceptance or ability for users to consume new technology.
- Capacity-based analysis—This method involves identifying future shipment volume constraints. These constraints, or "ceilings," can be the result of component availability, manufacturing capacity, or distribution capacity. In any case, constraint is capable of keeping shipments below the demand level.

Figure 1
Information Compendium
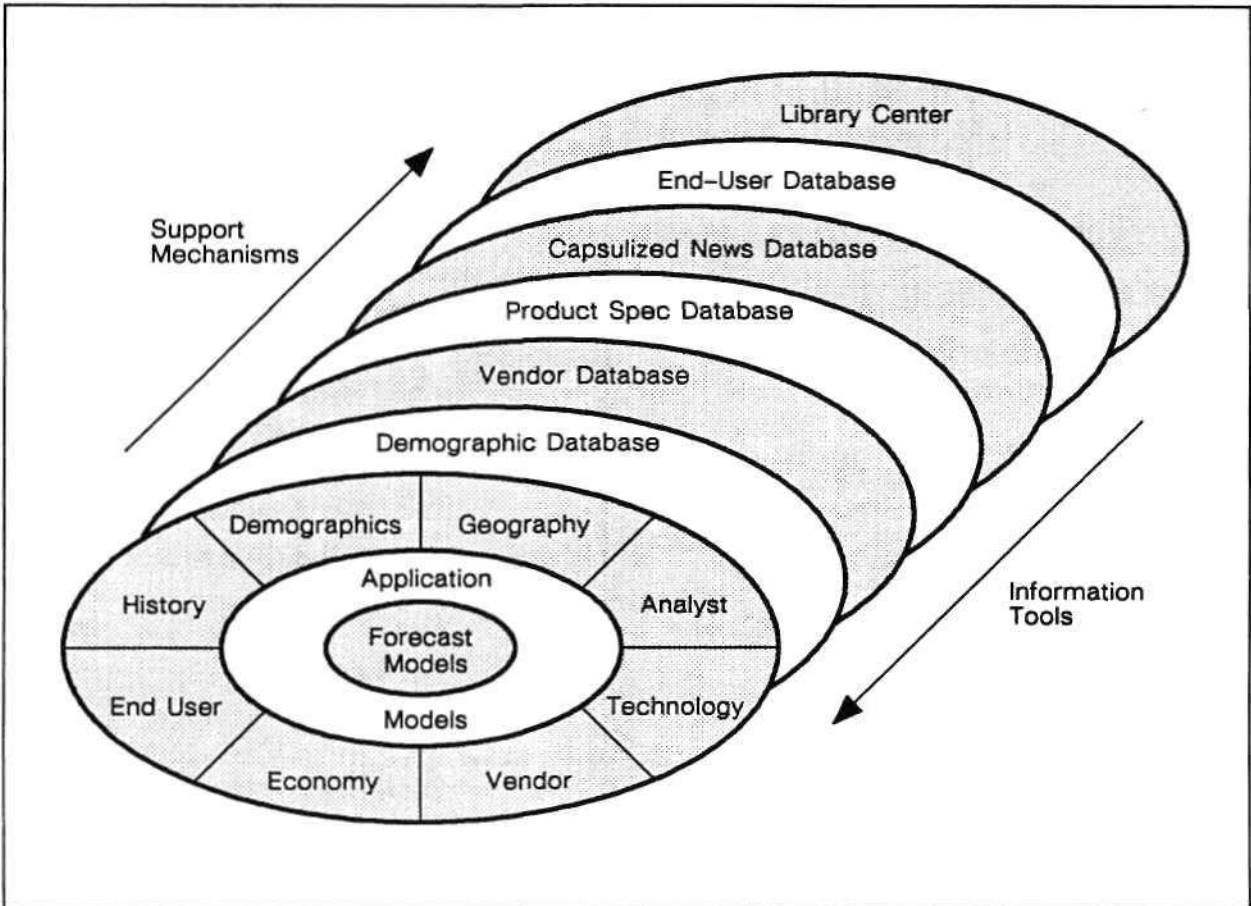
Source: Dataquest (September 1991)

TABLE NUMBER: 1
TITLE: Final History and Forecast
APPLICATION: All Applications
REGION: Worldwide
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	146,514	208,391	248,309	266,044	331,889	381,920	430,560	473,540	503,780	516,090	23%	9%
Workstation Shipments	146,514	208,391	248,309	266,044	331,889	381,920	430,560	473,540	503,780	516,090	23%	9%
CPU Installed Base	215,689	417,870	645,592	861,610	1,088,051	1,329,920	1,611,320	1,939,040	2,297,860	2,670,650	50%	20%
Workstation Installed Base	215,689	417,870	645,592	861,610	1,088,051	1,329,920	1,611,320	1,939,040	2,297,860	2,670,650	50%	20%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	24.6	16.0	20.9	18.6	19.6	20.1	20.0	19.8	19.6	19.6	-6%	0%
Hardware-Only ASP	5.0	4.3	4.7	4.8	4.6	4.6	4.5	4.5	4.4	4.4	-2%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	928	1,042	1,339	1,504	1,782	1,964	2,147	2,289	2,371	2,399	18%	6%
CPU Revenue	841	953	1,200	1,393	1,656	1,731	1,882	1,996	2,058	2,061	18%	4%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	87	89	139	111	126	233	265	294	314	338	10%	22%
Software Revenue	381	547	617	740	878	1,058	1,177	1,279	1,381	1,492	23%	11%
Bundled	148	141	115	141	143	206	206	199	190	184	-1%	5%
Unbundled	233	406	502	599	735	852	971	1,080	1,191	1,308	33%	12%
Service Revenue	60	74	88	123	143	162	178	189	198	205	24%	7%
Total Revenue	1,369	1,663	2,044	2,366	2,804	3,185	3,502	3,758	3,950	4,095	20%	8%
Increase over Prior Year	NA	21%	23%	16%	18%	14%	10%	7%	5%	4%		

Source: Dataquest
September 1991

TABLE NUMBER:	2	
TITLE:	Final History and Forecast	
APPLICATION:	All Applications	
REGION:	North America	
PLATFORM:	Personal Computer	

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	85,382	109,628	141,920	126,567	140,802	155,910	166,480	175,820	183,900	186,020	13%	6%
Workstation Shipments	85,382	109,628	141,920	126,567	140,802	155,910	166,480	175,820	183,900	186,020	13%	6%
CPU Installed Base	130,146	235,563	364,430	461,277	550,357	620,270	704,200	797,680	899,630	1,005,100	43%	13%
Workstation Installed Base	130,146	235,563	364,430	461,277	550,357	620,270	704,200	797,680	899,630	1,005,100	43%	13%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	19.5	17.0	25.7	16.5	16.3	15.2	14.6	14.6	14.6	14.9	-4%	-2%
Hardware-Only ASP	5.1	3.9	3.9	4.8	4.6	4.6	4.5	4.4	4.4	4.4	-3%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	462	452	570	611	652	715	753	784	809	815	9%	5%
CPU Revenue	446	436	567	595	634	692	722	745	762	761	9%	4%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	16	16	3	16	18	22	31	39	47	54	3%	24%
Software Revenue	168	225	262	298	348	388	426	467	508	550	20%	10%
Bundled	29	20	7	6	6	4	3	3	2	2	-33%	-20%
Unbundled	139	205	255	292	342	384	423	464	506	548	25%	10%
Service Revenue	22	23	34	42	46	50	53	56	59	62	21%	6%
Total Revenue	652	699	866	951	1,046	1,153	1,232	1,307	1,376	1,426	13%	6%
Increase over Prior Year	NA	7%	24%	10%	10%	10%	7%	6%	5%	4%		

Source: Dataquest
September 1991

TABLE NUMBER:	3
TITLE:	Final History and Forecast
APPLICATION:	All Applications
REGION:	Europe
PLATFORM:	Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	36,904	59,560	65,946	85,760	113,400	135,930	160,510	180,780	193,800	197,410	32%	12%
Workstation Shipments	36,904	59,560	65,946	85,760	113,400	135,930	160,510	180,780	193,800	197,410	32%	12%
CPU Installed Base	51,497	109,963	171,492	245,046	328,413	428,800	548,680	689,180	842,830	1,000,270	59%	25%
Workstation Installed Base	51,497	109,963	171,492	245,046	328,413	428,800	548,680	689,180	842,830	1,000,270	59%	25%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	19.4	10.1	13.7	20.2	19.2	22.1	22.4	22.6	22.7	22.9	-0%	4%
Hardware-Only ASP	5.5	4.5	5.4	5.0	4.8	4.8	4.7	4.7	4.6	4.6	-3%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	249	303	395	495	619	714	812	886	926	932	26%	9%
CPU Revenue	226	273	368	446	561	635	716	774	802	792	25%	7%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	23	30	28	49	58	79	96	112	125	140	27%	19%
Software Revenue	96	181	205	247	301	367	427	481	544	610	33%	15%
Bundled	31	33	33	32	29	38	33	27	26	28	-2%	-1%
Unbundled	65	147	172	215	272	329	394	454	518	582	43%	16%
Service Revenue	13	28	33	41	51	60	70	77	84	88	42%	11%
Total Revenue	358	511	633	783	971	1,141	1,308	1,444	1,554	1,630	28%	11%
Increase over Prior Year	NA	43%	24%	24%	24%	17%	15%	10%	8%	5%		

Source: Dataquest
September 1991

TABLE NUMBER: 4
TITLE: Final History and Forecast
APPLICATION: All Applications
REGION: Asia
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	22,399	34,573	36,492	48,510	70,252	79,680	89,300	98,660	103,170	104,460	33%	8%
Workstation Shipments	22,399	34,573	36,492	48,510	70,252	79,680	89,300	98,660	103,170	104,460	33%	8%
CPU Installed Base	30,956	64,747	98,466	139,706	187,889	251,700	317,660	395,750	478,690	562,960	57%	25%
Workstation Installed Base	30,956	64,747	98,466	139,706	187,889	251,700	317,660	395,750	478,690	562,960	57%	25%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	31.0	24.4	28.7	18.2	20.0	19.7	19.6	19.4	19.2	19.2	-10%	-1%
Hardware-Only ASP	3.6	5.5	7.0	4.7	4.3	4.2	4.2	4.1	4.1	4.1	5%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	207	266	350	370	476	487	517	536	532	524	23%	2%
CPU Revenue	159	224	243	325	427	357	381	398	397	391	28%	-2%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	48	43	107	45	49	130	136	138	135	133	1%	22%
Software Revenue	111	135	144	182	211	278	292	290	281	276	18%	5%
Bundled	87	86	75	102	108	164	170	168	161	154	6%	7%
Unbundled	24	49	69	80	103	115	122	122	120	122	44%	3%
Service Revenue	26	22	21	38	44	49	51	50	48	47	14%	1%
Total Revenue	343	424	515	590	731	814	860	876	862	847	21%	3%
Increase over Prior Year	NA	24%	21%	15%	24%	11%	6%	2%	-2%	-2%		

Source: Dataquest
September 1991

TABLE NUMBER: 5
TITLE: Final History and Forecast
APPLICATION: All Applications
REGION: Rest of World
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	1,829	4,629	3,950	5,206	7,435	10,410	14,270	18,280	22,920	28,190	42%	31%
Workstation Shipments	1,829	4,629	3,950	5,206	7,435	10,410	14,270	18,280	22,920	28,190	42%	31%
CPU Installed Base	3,091	7,597	11,203	15,581	21,393	29,150	40,780	56,430	76,720	102,310	62%	37%
Workstation Installed Base	3,091	7,597	11,203	15,581	21,393	29,150	40,780	56,430	76,720	102,310	62%	37%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	20.2	9.8	11.5	16.2	9.4	9.2	9.4	9.1	8.8	8.8	-17%	-1%
Hardware-Only ASP	5.3	4.4	5.5	5.1	4.7	4.6	4.6	4.6	4.5	4.6	-3%	-0%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	11	21	22	27	35	48	66	84	104	128	35%	29%
CPU Revenue	10	20	22	26	35	47	63	79	97	117	35%	28%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	0	1	1	1	1	2	3	4	7	11	19%	76%
Software Revenue	5	6	7	13	19	25	32	41	47	57	37%	25%
Bundled	1	2	1	1	0	1	1	0	0	1	-18%	27%
Unbundled	5	5	6	12	18	25	32	40	47	56	40%	25%
Service Revenue	0	1	1	2	2	3	4	5	7	8	55%	29%
Total Revenue	16	28	30	43	56	77	102	130	158	193	36%	28%
Increase over Prior Year	NA	73%	7%	41%	32%	36%	34%	27%	22%	22%		

Source: Dataquest
September 1991

TABLE NUMBER: 6
TITLE: Final History and Forecast
APPLICATION: Mechanical
REGION: Worldwide
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	77,570	108,864	124,951	117,793	146,636	165,000	182,030	197,710	208,510	211,120	17%	8%
Workstation Shipments	77,570	108,864	124,951	117,793	146,636	165,000	182,030	197,710	208,510	211,120	17%	8%
CPU Installed Base	108,618	214,748	329,925	422,733	520,216	609,440	715,720	839,280	974,060	1,112,670	48%	16%
Workstation Installed Base	108,618	214,748	329,925	422,733	520,216	609,440	715,720	839,280	974,060	1,112,670	48%	16%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	23.5	17.2	23.1	19.9	20.9	21.5	21.3	21.0	20.8	20.8	-3%	-0%
Hardware-Only ASP	3.6	4.2	4.4	4.8	4.6	4.6	4.5	4.5	4.4	4.4	6%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	419	568	670	668	814	888	951	999	1,022	1,021	18%	5%
CPU Revenue	356	504	576	606	742	760	810	850	868	862	20%	3%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	62	64	94	62	72	129	141	150	154	159	4%	17%
Software Revenue	168	231	261	306	332	401	421	432	434	430	19%	5%
Bundled	92	99	78	90	84	129	132	130	123	116	-2%	7%
Unbundled	76	132	183	217	249	272	289	302	310	314	35%	5%
Service Revenue	35	40	34	52	62	71	76	79	81	81	15%	5%
Total Revenue	622	839	965	1,026	1,208	1,360	1,448	1,511	1,536	1,532	18%	5%
Increase over Prior Year	NA	35%	15%	6%	18%	13%	6%	4%	2%	-0%		

Source: Dataquest
September 1991

TABLE NUMBER: 7
TITLE: Final History and Forecast
APPLICATION: Mechanical
REGION: North America
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	43,459	59,177	70,379	54,993	60,169	65,030	68,220	71,350	74,120	74,930	8%	4%
Workstation Shipments	43,459	59,177	70,379	54,993	60,169	65,030	68,220	71,350	74,120	74,930	8%	4%
CPU Installed Base	61,158	118,634	183,329	224,320	259,811	280,840	307,690	337,680	370,660	405,680	44%	9%
Workstation Installed Base	61,158	118,634	183,329	224,320	259,811	280,840	307,690	337,680	370,660	405,680	44%	9%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	19.0	15.4	13.8	10.6	20.8	20.6	20.4	20.2	20.0	20.0	2%	-1%
Hardware-Only ASP	3.4	3.8	3.7	4.7	4.6	4.6	4.5	4.5	4.4	4.4	8%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	171	242	266	261	276	298	309	320	329	332	13%	4%
CPU Revenue	161	232	265	254	267	289	297	304	310	310	14%	3%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	10	11	1	7	9	9	12	16	19	22	-4%	20%
Software Revenue	59	67	78	98	103	111	117	121	119	114	15%	2%
Bundled	16	12	2	3	3	1	1	1	1	1	-34%	-20%
Unbundled	42	55	76	94	100	110	116	120	118	113	24%	2%
Service Revenue	10	11	8	15	16	18	19	19	20	20	14%	5%
Total Revenue	239	320	352	373	395	427	445	460	468	467	13%	3%
Increase over Prior Year	NA	34%	10%	6%	6%	8%	4%	3%	2%	-0%		

Source: Dataquest
September 1991

TABLE NUMBER: 8
TITLE: Final History and Forecast
APPLICATION: Mechanical
REGION: Europe
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	19,530	27,856	32,351	37,701	49,080	56,780	65,560	73,410	78,340	79,800	26%	10%
Workstation Shipments	19,530	27,856	32,351	37,701	49,080	56,780	65,560	73,410	78,340	79,800	26%	10%
CPU Installed Base	27,396	54,711	84,750	116,144	153,536	189,530	235,180	288,820	347,390	407,420	54%	22%
Workstation Installed Base	27,396	54,711	84,750	116,144	153,536	189,530	235,180	288,820	347,390	407,420	54%	22%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	16.3	10.3	14.2	23.2	19.2	23.9	24.0	23.9	23.8	23.7	4%	4%
Hardware-Only ASP	3.8	4.4	4.6	4.9	4.8	4.7	4.7	4.6	4.6	4.6	6%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	106	143	178	229	273	306	339	368	384	390	27%	7%
CPU Revenue	92	124	160	199	239	273	301	324	336	334	27%	7%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	14	19	19	30	34	33	38	44	48	56	24%	11%
Software Revenue	34	72	88	102	114	137	149	156	164	168	35%	8%
Bundled	13	19	18	18	12	20	18	16	15	15	-3%	4%
Unbundled	21	53	70	85	102	116	130	139	149	153	48%	8%
Service Revenue	7	13	14	18	24	27	30	33	35	36	36%	9%
Total Revenue	147	229	280	349	411	469	518	556	583	593	29%	8%
Increase over Prior Year	NA	56%	22%	25%	18%	14%	10%	7%	5%	2%		

Source: Dataquest
September 1991

TABLE NUMBER: 9
TITLE: Final History and Forecast
APPLICATION: Mechanical
REGION: Asia
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	13,639	19,603	20,266	22,932	34,231	38,680	42,450	46,070	48,090	47,340	26%	7%
Workstation Shipments	13,639	19,603	20,266	22,932	34,231	38,680	42,450	46,070	48,090	47,340	26%	7%
CPU Installed Base	18,618	37,783	56,421	75,059	97,267	126,230	155,460	189,770	226,290	262,060	51%	22%
Workstation Installed Base	18,618	37,783	56,421	75,059	97,267	126,230	155,460	189,770	226,290	262,060	51%	22%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	30.3	25.7	33.2	19.7	21.8	21.1	20.8	20.6	20.4	20.4	-8%	-1%
Hardware-Only ASP	4.0	5.7	7.0	4.7	4.3	4.3	4.2	4.2	4.2	4.2	2%	-0%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	138	172	217	167	250	264	277	281	274	259	16%	1%
CPU Revenue	100	139	143	142	221	178	188	192	189	180	22%	-4%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	37	33	74	25	29	86	89	89	85	79	-6%	22%
Software Revenue	73	89	93	102	110	144	144	140	132	124	11%	2%
Bundled	62	66	58	68	69	107	113	112	107	100	2%	8%
Unbundled	11	23	35	34	41	37	31	27	25	24	39%	-11%
Service Revenue	19	16	12	18	21	25	25	25	24	22	3%	1%
Total Revenue	230	277	322	287	381	433	446	446	429	405	14%	1%
Increase over Prior Year	NA	21%	16%	-11%	33%	14%	3%	-0%	-4%	-6%		

Source: Dataquest
September 1991

TABLE NUMBER: 10
TITLE: Final History and Forecast
APPLICATION: Mechanical
REGION: Rest of World
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
	====	====	====	====	====	====	====	====	====	====	=====	=====
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	941	2,228	1,956	2,167	3,156	4,510	5,800	6,880	7,960	9,060	35%	23%
Workstation Shipments	941	2,228	1,956	2,167	3,156	4,510	5,800	6,880	7,960	9,060	35%	23%
CPU Installed Base	1,446	3,620	5,424	7,209	9,601	12,840	17,380	23,010	29,710	37,510	61%	31%
Workstation Installed Base	1,446	3,620	5,424	7,209	9,601	12,840	17,380	23,010	29,710	37,510	61%	31%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	18.9	13.5	10.0	9.6	6.2	6.1	6.1	6.0	6.0	6.0	-24%	-1%
Hardware-Only ASP	3.4	4.3	4.5	5.1	4.6	4.6	4.5	4.5	4.4	4.4	8%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	4	10	9	11	15	20	26	31	35	40	40%	22%
CPU Revenue	4	10	9	11	14	20	25	29	33	37	41%	21%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	0	1	0	0	0	1	1	2	2	3	14%	49%
Software Revenue	2	3	2	5	6	9	12	16	19	24	35%	34%
Bundled	0	1	0	1	0	0	0	0	0	0	-33%	28%
Unbundled	1	2	2	4	6	8	12	16	19	24	42%	34%
Service Revenue	0	0	0	1	1	1	2	2	2	3	54%	28%
Total Revenue	6	13	11	16	21	30	40	49	57	67	39%	26%
Increase over Prior Year	NA	136%	-15%	42%	30%	44%	31%	23%	16%	18%		

Source: Dataquest
September 1991

TABLE NUMBER:	11
TITLE:	Final History and Forecast
APPLICATION:	AEC
REGION:	Worldwide
PLATFORM:	Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
	====	====	====	====	====	====	====	====	====	====	=====	=====
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	36,580	52,238	62,005	77,926	97,913	115,530	134,070	154,110	170,240	184,670	28%	14%
Workstation Shipments	36,580	52,238	62,005	77,926	97,913	115,530	134,070	154,110	170,240	184,670	28%	14%
CPU Installed Base	57,562	107,747	163,724	228,183	293,179	378,550	474,430	591,230	724,250	871,840	50%	24%
Workstation Installed Base	57,562	107,747	163,724	228,183	293,179	378,550	474,430	591,230	724,250	871,840	50%	24%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	24.0	16.4	17.4	16.5	17.2	17.0	16.9	16.6	16.2	16.0	-8%	-1%
Hardware-Only ASP	6.5	4.1	4.8	4.7	4.5	4.4	4.4	4.3	4.3	4.3	-9%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	251	235	322	430	494	551	624	700	756	810	18%	10%
CPU Revenue	245	223	303	404	468	491	552	614	658	699	18%	8%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	6	11	19	26	26	60	72	86	98	111	44%	33%
Software Revenue	64	114	146	193	250	327	407	495	580	678	41%	22%
Bundled	12	18	17	26	28	42	42	40	41	44	24%	9%
Unbundled	52	96	128	167	222	285	365	455	539	634	44%	23%
Service Revenue	5	9	25	33	38	45	53	62	69	78	67%	16%
Total Revenue	320	357	492	656	782	922	1,083	1,257	1,405	1,565	25%	15%
Increase over Prior Year	NA	12%	38%	33%	19%	18%	18%	16%	12%	11%		

Source: Dataquest
September 1991

TABLE NUMBER: 12
TITLE: Final History and Forecast
APPLICATION: AEC
REGION: North America
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	23,320	30,019	37,626	38,630	43,499	50,000	55,990	63,250	69,570	75,130	17%	12%
Workstation Shipments	23,320	30,019	37,626	38,630	43,499	50,000	55,990	63,250	69,570	75,130	17%	12%
CPU Installed Base	37,468	66,064	99,651	129,658	157,974	184,980	218,210	258,710	305,520	358,010	43%	18%
Workstation Installed Base	37,468	66,064	99,651	129,658	157,974	184,980	218,210	258,710	305,520	358,010	43%	18%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	21.3	16.2	9.9	15.2	27.6	27.3	27.1	26.8	26.5	26.5	7%	-1%
Hardware-Only ASP	6.6	3.8	3.8	4.6	4.4	4.4	4.3	4.3	4.2	4.2	-10%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	157	116	142	179	193	218	242	270	294	318	5%	10%
CPU Revenue	156	114	142	175	189	212	232	257	277	297	5%	9%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	2	2	0	4	4	7	10	13	17	21	27%	37%
Software Revenue	34	50	70	78	98	123	151	181	207	239	30%	19%
Bundled	2	1	0	1	1	1	0	0	0	0	-8%	-28%
Unbundled	32	49	69	77	97	122	150	180	207	238	32%	20%
Service Revenue	2	2	11	12	12	14	16	19	21	23	58%	14%
Total Revenue	193	169	223	269	304	355	409	470	523	580	12%	14%
Increase over Prior Year	NA	-13%	33%	20%	13%	17%	15%	15%	11%	11%		

Source: Dataquest
September 1991

TABLE NUMBER: 13
TITLE: Final History and Forecast
APPLICATION: AEC
REGION: Europe
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	8,910	14,106	15,533	23,365	31,724	40,070	49,420	58,620	65,720	71,940	37%	18%
Workstation Shipments	8,910	14,106	15,533	23,365	31,724	40,070	49,420	58,620	65,720	71,940	37%	18%
CPU Installed Base	13,169	26,910	41,201	61,441	81,814	117,240	156,780	205,680	261,680	323,910	58%	32%
Workstation Installed Base	13,169	26,910	41,201	61,441	81,814	117,240	156,780	205,680	261,680	323,910	58%	32%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	23.6	11.7	14.2	19.2	19.6	19.8	20.0	20.0	19.9	19.9	-5%	0%
Hardware-Only ASP	7.2	4.3	6.3	4.8	4.7	4.6	4.6	4.5	4.5	4.5	-10%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	69	69	105	127	166	202	241	278	302	324	25%	14%
CPU Revenue	67	65	100	117	155	174	206	234	252	266	23%	11%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	2	4	5	10	11	28	36	44	50	58	59%	39%
Software Revenue	19	41	54	74	102	132	172	222	272	332	53%	27%
Bundled	3	6	7	8	11	13	12	9	9	11	33%	1%
Unbundled	15	35	46	65	91	119	161	212	263	321	57%	29%
Service Revenue	1	3	8	10	15	19	24	29	33	38	119%	21%
Total Revenue	88	113	167	211	282	352	437	528	608	694	34%	20%
Increase over Prior Year	NA	29%	47%	26%	34%	25%	24%	21%	15%	14%		

Source: Dataquest
September 1991

TABLE NUMBER:	14
TITLE:	Final History and Forecast
APPLICATION:	AEC
REGION:	Asia
PLATFORM:	Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	3,867	6,882	7,615	14,637	20,714	22,990	25,710	28,840	31,210	33,570	52%	10%
Workstation Shipments	3,867	6,882	7,615	14,637	20,714	22,990	25,710	28,840	31,210	33,570	52%	10%
CPU Installed Base	5,914	12,580	19,575	32,763	47,572	68,810	89,710	114,480	141,690	171,250	68%	29%
Workstation Installed Base	5,914	12,580	19,575	32,763	47,572	68,810	89,710	114,480	141,690	171,250	68%	29%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	25.7	28.8	21.7	15.9	16.1	15.8	15.6	15.5	15.3	15.3	-11%	-1%
Hardware-Only ASP	3.3	5.0	7.1	4.5	4.1	4.1	4.1	4.0	4.0	4.0	6%	-0%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	21	44	66	118	126	119	127	137	143	151	56%	4%
CPU Revenue	19	39	52	106	115	94	101	109	114	120	57%	1%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	3	5	14	12	11	25	26	28	29	31	42%	23%
Software Revenue	9	21	21	38	45	67	77	85	92	98	49%	17%
Bundled	7	10	10	17	16	29	30	31	31	32	23%	15%
Unbundled	2	11	11	22	29	38	48	55	60	66	87%	18%
Service Revenue	2	3	4	10	10	11	12	13	14	15	46%	7%
Total Revenue	33	69	91	166	182	197	217	236	249	264	53%	8%
Increase over Prior Year	NA	110%	32%	82%	9%	9%	10%	9%	6%	6%		

Source: Dataquest
September 1991

TABLE NUMBER: 15
TITLE: Final History and Forecast
APPLICATION: AEC
REGION: Rest of World
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	483	1,231	1,231	1,293	1,976	2,470	2,960	3,400	3,740	4,040	42%	15%
Workstation Shipments	483	1,231	1,231	1,293	1,976	2,470	2,960	3,400	3,740	4,040	42%	15%
CPU Installed Base	1,012	2,194	3,297	4,321	5,819	7,520	9,730	12,370	15,360	18,670	55%	26%
Workstation Installed Base	1,012	2,194	3,297	4,321	5,819	7,520	9,730	12,370	15,360	18,670	55%	26%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	20.9	3.3	15.2	20.8	16.9	16.7	16.6	16.4	16.2	16.2	-5%	-1%
Hardware-Only ASP	7.7	4.3	6.7	4.9	4.5	4.5	4.4	4.4	4.3	4.3	-13%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	4	5	8	6	9	11	13	15	16	17	24%	14%
CPU Revenue	4	5	8	6	9	11	13	14	15	16	24%	13%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	0	0	0	0	0	0	1	1	1	1	14%	66%
Software Revenue	2	1	2	3	5	6	7	8	9	9	26%	15%
Bundled	0	0	0	0	0	0	0	0	0	0	-13%	-100%
Unbundled	2	1	1	3	4	6	7	8	9	9	27%	15%
Service Revenue	0	0	1	0	0	1	1	1	1	1	66%	16%
Total Revenue	6	6	10	10	14	17	20	23	26	28	25%	15%
Increase over Prior Year	NA	12%	63%	-3%	39%	23%	19%	14%	9%	8%		

Source: Dataquest
September 1991

TABLE NUMBER: 16
TITLE: Final History and Forecast
APPLICATION: GIS/Mapping
REGION: Worldwide
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	2,545	9,561	14,436	26,721	36,236	46,010	56,980	68,480	78,510	83,700	94%	18%
Workstation Shipments	2,545	9,561	14,436	26,721	36,236	46,010	56,980	68,480	78,510	83,700	94%	18%
CPU Installed Base	2,647	12,203	26,496	52,332	84,320	125,210	175,640	237,610	309,620	386,800	138%	36%
Workstation Installed Base	2,647	12,203	26,496	52,332	84,320	125,210	175,640	237,610	309,620	386,800	138%	36%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	26.2	16.8	26.0	23.4	19.8	20.1	20.6	20.8	20.8	20.9	-7%	1%
Hardware-Only ASP	6.5	4.7	4.9	4.9	4.7	4.6	4.6	4.5	4.5	4.5	-8%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	23	52	82	142	183	229	280	332	374	396	69%	17%
CPU Revenue	21	48	77	136	176	211	256	301	337	353	71%	15%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	2	4	5	5	7	18	24	31	37	42	38%	45%
Software Revenue	16	37	55	72	100	130	167	208	257	304	58%	25%
Bundled	3	7	8	7	10	12	14	16	17	18	41%	13%
Unbundled	13	30	47	65	90	118	153	191	240	285	61%	26%
Service Revenue	2	3	6	9	12	16	20	24	29	33	68%	21%
Total Revenue	40	91	143	223	295	375	467	564	661	732	65%	20%
Increase over Prior Year	NA	127%	57%	56%	33%	27%	25%	21%	17%	11%		

Source: Dataquest
September 1991

TABLE NUMBER: 17
TITLE: Final History and Forecast
APPLICATION: GIS/Mapping
REGION: North America
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
	====	====	====	====	====	====	====	====	====	====	=====	=====
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	1,655	4,022	8,126	13,354	15,962	18,710	21,590	24,520	27,370	29,230	76%	13%
Workstation Shipments	1,655	4,022	8,126	13,354	15,962	18,710	21,590	24,520	27,370	29,230	76%	13%
CPU Installed Base	1,705	5,725	13,760	26,652	41,457	56,570	74,850	96,050	120,100	146,020	122%	29%
Workstation Installed Base	1,705	5,725	13,760	26,652	41,457	56,570	74,850	96,050	120,100	146,020	122%	29%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	21.0	32.5	37.4	69.8	9.0	8.9	8.8	8.7	8.6	8.6	-19%	-1%
Hardware-Only ASP	6.6	4.5	4.6	4.9	4.7	4.7	4.6	4.6	4.5	4.5	-8%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	13	21	39	70	75	87	100	112	124	132	54%	12%
CPU Revenue	13	20	38	68	75	84	95	106	116	123	56%	11%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	1	1	1	2	1	3	4	6	7	9	-1%	58%
Software Revenue	10	24	34	45	60	76	96	120	150	179	57%	25%
Bundled	1	3	2	1	1	1	1	1	1	1	4%	-9%
Unbundled	9	21	32	44	59	75	95	119	149	178	60%	25%
Service Revenue	1	1	3	5	6	7	9	11	13	15	55%	21%
Total Revenue	24	46	76	120	141	171	205	243	286	326	55%	18%
Increase over Prior Year	NA	88%	66%	59%	18%	21%	20%	18%	18%	14%		

Source: Dataquest
September 1991

Forecasts—Personal CAD and Distribution Channels

TABLE NUMBER: 18
TITLE: Final History and Forecast
APPLICATION: GIS/Mapping
REGION: Europe
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	639	3,644	4,301	8,898	12,674	17,050	22,070	27,490	32,890	35,140	111%	23%
Workstation Shipments	639	3,644	4,301	8,898	12,674	17,050	22,070	27,490	32,890	35,140	111%	23%
CPU Installed Base	644	4,288	8,556	17,175	28,075	43,810	63,720	89,050	119,780	152,770	157%	40%
Workstation Installed Base	644	4,288	8,556	17,175	28,075	43,810	63,720	89,050	119,780	152,770	157%	40%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	24.5	13.0	20.6	34.4	27.0	25.9	26.2	26.4	26.7	26.9	2%	-0%
Hardware-Only ASP	7.1	5.0	5.3	5.1	4.9	4.8	4.8	4.7	4.7	4.7	-9%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	6	21	26	48	65	86	109	133	156	165	79%	21%
CPU Revenue	6	19	24	46	63	78	98	119	139	146	80%	18%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	0	2	2	2	2	8	11	14	17	19	55%	55%
Software Revenue	4	10	14	16	24	31	41	51	65	78	52%	27%
Bundled	1	3	3	2	2	2	2	1	1	2	46%	-6%
Unbundled	4	7	11	14	22	29	39	49	64	76	53%	29%
Service Revenue	0	1	2	3	3	4	5	6	8	9	61%	22%
Total Revenue	11	32	42	67	92	121	155	190	229	252	69%	22%
Increase over Prior Year	NA	187%	29%	60%	37%	32%	28%	22%	21%	10%		

Source: Dataquest
September 1991

TABLE NUMBER: 19
TITLE: Final History and Forecast
APPLICATION: GIS/Mapping
REGION: Asia
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	186	1,497	1,740	3,761	6,614	8,930	11,610	14,430	15,870	16,570	144%	20%
Workstation Shipments	186	1,497	1,740	3,761	6,614	8,930	11,610	14,430	15,870	16,570	144%	20%
CPU Installed Base	231	1,726	3,451	7,098	12,494	21,390	32,120	45,710	60,740	76,460	171%	44%
Workstation Installed Base	231	1,726	3,451	7,098	12,494	21,390	32,120	45,710	60,740	76,460	171%	44%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	61.3	20.5	27.9	13.6	22.8	22.2	22.0	21.7	21.5	21.5	-22%	-1%
Hardware-Only ASP	3.1	4.9	5.8	4.5	4.1	4.1	4.1	4.0	4.0	4.0	7%	-0%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	2	8	16	20	37	50	64	77	84	86	106%	18%
CPU Revenue	2	8	13	19	34	43	55	67	72	73	116%	17%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	1	1	2	1	4	6	8	10	12	13	63%	29%
Software Revenue	1	2	6	7	12	17	22	27	30	32	79%	21%
Bundled	1	1	3	3	7	9	11	14	15	15	61%	18%
Unbundled	0	1	3	4	6	8	11	13	15	17	124%	24%
Service Revenue	0	0	1	1	3	4	5	6	6	7	206%	20%
Total Revenue	3	10	22	28	52	70	90	110	120	125	100%	19%
Increase over Prior Year	NA	213%	116%	25%	88%	34%	29%	22%	10%	4%		

Source: Dataquest
September 1991

TABLE NUMBER: 20
TITLE: Final History and Forecast
APPLICATION: GIS/Mapping
REGION: Rest of World
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	65	398	269	708	986	1,320	1,710	2,050	2,380	2,750	97%	23%
Workstation Shipments	65	398	269	708	986	1,320	1,710	2,050	2,380	2,750	97%	23%
CPU Installed Base	66	464	729	1,407	2,294	3,430	4,950	6,810	9,000	11,560	142%	38%
Workstation Installed Base	66	464	729	1,407	2,294	3,430	4,950	6,810	9,000	11,560	142%	38%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	30.7	6.0	35.1	64.1	25.0	24.8	24.5	24.3	24.0	24.0	-5%	-1%
Hardware-Only ASP	7.4	4.8	5.9	5.0	4.7	4.7	4.6	4.6	4.5	4.5	-11%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	1	2	2	4	5	6	8	10	11	12	63%	20%
CPU Revenue	1	2	2	4	5	6	8	9	10	10	66%	16%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	0	0	0	0	0	0	0	1	1	2	12%	91%
Software Revenue	0	1	1	3	4	6	8	10	12	15	74%	27%
Bundled	0	0	0	0	0	0	0	0	0	1	12%	38%
Unbundled	0	1	1	3	4	6	8	10	12	14	80%	27%
Service Revenue	0	0	0	1	1	1	1	1	2	2	93%	25%
Total Revenue	1	3	3	8	10	13	17	21	25	29	69%	24%
Increase over Prior Year	NA	120%	15%	149%	29%	32%	28%	24%	17%	18%		

Source: Dataquest
September 1991

TABLE NUMBER: 21
TITLE: Final History and Forecast
APPLICATION: Electronic Design Automation
REGION: Worldwide
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	29,819	37,729	46,916	43,604	51,105	55,380	57,490	53,240	46,520	36,600	14%	-6%
Workstation Shipments	29,819	37,729	46,916	43,604	51,105	55,380	57,490	53,240	46,520	36,600	14%	-6%
CPU Installed Base	46,862	83,173	125,447	158,362	190,336	216,720	245,530	270,920	289,940	299,330	42%	9%
Workstation Installed Base	46,862	83,173	125,447	158,362	190,336	216,720	245,530	270,920	289,940	299,330	42%	9%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	28.4	11.1	14.8	17.5	18.8	19.3	19.1	18.4	17.7	17.9	-10%	-1%
Hardware-Only ASP	6.6	4.7	5.3	5.2	5.0	5.0	4.9	4.8	4.8	4.8	-7%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	235	187	264	264	291	296	293	258	220	171	5%	-10%
CPU Revenue	219	177	244	246	271	269	264	231	195	146	5%	-12%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	16	10	20	18	21	27	29	27	25	25	6%	4%
Software Revenue	133	166	155	168	196	200	182	144	110	80	10%	-16%
Bundled	41	18	11	18	21	23	18	12	8	6	-15%	-23%
Unbundled	92	148	144	150	175	177	164	132	102	74	17%	-16%
Service Revenue	19	22	24	29	31	31	29	24	19	14	14%	-15%
Total Revenue	387	375	444	461	519	527	503	427	348	265	8%	-13%
Increase over Prior Year	NA	-3%	19%	4%	12%	2%	-5%	-15%	-18%	-24%		

Source: Dataquest
September 1991

TABLE NUMBER: 22
TITLE: Final History and Forecast
APPLICATION: Electronic Design Automation
REGION: North America
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	16,948	16,411	25,789	19,591	21,173	22,170	20,680	16,700	12,840	6,730	6%	-20%
Workstation Shipments	16,948	16,411	25,789	19,591	21,173	22,170	20,680	16,700	12,840	6,730	6%	-20%
CPU Installed Base	29,815	45,141	67,689	80,646	91,114	97,880	103,440	105,240	103,340	95,390	32%	1%
Workstation Installed Base	29,815	45,141	67,689	80,646	91,114	97,880	103,440	105,240	103,340	95,390	32%	1%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	20.0	20.4	98.7	28.3	24.7	23.9	24.6	23.7	20.2	16.7	5%	-8%
Hardware-Only ASP	7.0	4.2	4.6	5.1	5.0	5.0	4.9	4.9	4.8	4.8	-8%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	120	72	123	101	107	111	102	82	62	33	-3%	-21%
CPU Revenue	117	71	122	98	103	108	98	78	58	30	-3%	-22%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	3	2	1	3	5	3	4	4	4	2	8%	-12%
Software Revenue	65	84	80	77	86	77	62	46	32	18	7%	-27%
Bundled	10	4	3	1	0	0	0	0	0	0	-53%	-54%
Unbundled	55	79	77	76	86	77	62	46	32	18	12%	-27%
Service Revenue	9	9	12	10	12	11	10	7	5	3	6%	-25%
Total Revenue	195	165	215	188	205	200	174	135	99	53	1%	-24%
Increase over Prior Year	NA	-15%	30%	-12%	9%	-3%	-13%	-22%	-26%	-47%		

Source: Dataquest
September 1991

TABLE NUMBER: 23
TITLE: Final History and Forecast
APPLICATION: Electronic Design Automation
REGION: Europe
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	7,825	13,954	13,761	15,796	19,922	22,030	23,470	21,260	16,840	10,530	26%	-12%
Workstation Shipments	7,825	13,954	13,761	15,796	19,922	22,030	23,470	21,260	16,840	10,530	26%	-12%
CPU Installed Base	10,288	24,054	36,986	50,286	64,988	78,220	93,000	105,640	113,980	116,180	59%	12%
Workstation Installed Base	10,288	24,054	36,986	50,286	64,988	78,220	93,000	105,640	113,980	116,180	59%	12%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	26.5	7.7	10.7	12.9	17.1	19.5	18.4	17.0	16.8	16.7	-10%	-0%
Hardware-Only ASP	7.5	4.7	6.0	5.3	5.2	5.2	5.1	5.0	5.0	5.0	-9%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	67	70	86	92	115	120	122	107	84	53	14%	-14%
CPU Revenue	61	65	84	85	105	110	111	97	75	46	14%	-15%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	6	5	3	7	11	11	11	10	9	7	15%	-9%
Software Revenue	39	57	49	55	61	68	65	53	43	32	12%	-12%
Bundled	14	5	5	4	3	4	2	0	0	0	-29%	-100%
Unbundled	25	52	44	51	58	64	63	53	43	32	23%	-11%
Service Revenue	5	10	9	9	10	10	10	9	7	5	19%	-13%
Total Revenue	111	136	144	156	186	198	197	170	135	90	14%	-14%
Increase over Prior Year	NA	22%	6%	8%	20%	6%	-0%	-14%	-21%	-33%		

Source: Dataquest
September 1991

TABLE NUMBER:	24
TITLE:	Final History and Forecast
APPLICATION:	Electronic Design Automation
REGION:	Asia
PLATFORM:	Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	4,707	6,590	6,871	7,180	8,693	9,080	9,540	9,330	7,990	6,990	17%	-4%
Workstation Shipments	4,707	6,590	6,871	7,180	8,693	9,080	9,540	9,330	7,990	6,990	17%	-4%
CPU Installed Base	6,193	12,659	19,019	24,786	30,555	35,260	40,370	45,800	49,980	53,190	49%	12%
Workstation Installed Base	6,193	12,659	19,019	24,786	30,555	35,260	40,370	45,800	49,980	53,190	49%	12%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	35.4	15.1	14.8	19.5	19.3	19.2	19.1	18.5	17.8	18.0	-14%	-1%
Hardware-Only ASP	2.9	5.8	7.1	4.8	4.5	4.5	4.4	4.4	4.3	4.4	12%	-0%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	46	41	52	66	62	54	50	41	31	27	8%	-15%
CPU Revenue	39	38	35	58	57	41	37	29	22	17	10%	-22%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	7	4	16	8	5	13	13	11	10	11	-7%	16%
Software Revenue	27	23	25	35	44	50	49	38	28	22	13%	-13%
Bundled	17	9	4	14	17	19	16	12	8	6	1%	-20%
Unbundled	10	15	21	20	27	31	33	27	20	16	27%	-10%
Service Revenue	5	3	4	9	10	9	8	6	4	4	20%	-18%
Total Revenue	77	68	80	109	116	114	107	85	64	53	11%	-14%
Increase over Prior Year	NA	-12%	18%	36%	6%	-2%	-6%	-20%	-26%	-17%		

Source: Dataquest
September 1991

TABLE NUMBER: 25
TITLE: Final History and Forecast
APPLICATION: Electronic Design Automation
REGION: Rest of World
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	339	773	495	1,038	1,317	2,110	3,800	5,950	8,840	12,350	40%	56%
Workstation Shipments	339	773	495	1,038	1,317	2,110	3,800	5,950	8,840	12,350	40%	56%
CPU Installed Base	567	1,319	1,753	2,643	3,679	5,360	8,720	14,240	22,650	34,570	60%	57%
Workstation Installed Base	567	1,319	1,753	2,643	3,679	5,360	8,720	14,240	22,650	34,570	60%	57%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	15.4	9.3	21.3	25.9	16.1	15.2	14.5	12.7	10.5	22.5	1%	7%
Hardware-Only ASP	6.6	4.8	6.2	5.3	5.0	4.9	4.9	4.8	4.7	4.7	-7%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	2	4	3	6	7	10	18	29	42	58	31%	54%
CPU Revenue	2	4	3	5	7	10	18	27	39	53	30%	52%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	0	0	0	0	0	0	1	1	3	5	63%	106%
Software Revenue	1	2	2	2	4	5	6	7	7	8	31%	16%
Bundled	0	0	0	0	0	0	0	0	0	0	-24%	-100%
Unbundled	1	2	2	2	4	5	6	7	7	8	32%	16%
Service Revenue	0	0	0	0	0	1	1	1	2	2	24%	45%
Total Revenue	4	6	5	8	11	16	25	36	51	69	31%	45%
Increase over Prior Year	NA	53%	-9%	61%	29%	44%	59%	46%	40%	36%		

Source: Dataquest
September 1991

TABLE NUMBER:	26
TITLE:	Final History and Forecast
APPLICATION:	Electronic CAE
REGION:	Worldwide
PLATFORM:	Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	21,035	19,083	23,530	31,969	38,561	41,940	44,210	42,520	37,850	29,810	16%	-5%
Workstation Shipments	21,035	19,083	23,530	31,969	38,561	41,940	44,210	42,520	37,850	29,810	16%	-5%
CPU Installed Base	35,519	53,394	73,191	97,370	123,588	147,840	174,710	200,610	222,130	235,660	37%	14%
Workstation Installed Base	35,519	53,394	73,191	97,370	123,588	147,840	174,710	200,610	222,130	235,660	37%	14%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	29.5	12.2	19.1	22.4	20.4	20.7	20.2	19.9	17.2	.0	-9%	-100%
Hardware-Only ASP	6.8	4.7	5.2	5.1	4.9	4.9	4.8	4.8	4.7	4.7	-8%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	174	95	133	187	210	219	219	201	174	136	5%	-8%
CPU Revenue	161	90	124	174	198	199	198	180	155	118	5%	-10%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	12	5	9	13	12	20	21	21	19	17	-0%	7%
Software Revenue	88	81	94	123	151	150	135	103	75	52	14%	-19%
Bundled	35	9	7	15	17	15	11	8	5	4	-17%	-25%
Unbundled	53	71	87	107	134	134	123	95	70	48	26%	-19%
Service Revenue	14	12	15	22	24	24	22	18	14	10	14%	-16%
Total Revenue	276	187	242	332	384	392	376	322	263	198	9%	-12%
Increase over Prior Year	NA	-32%	29%	37%	16%	2%	-4%	-14%	-18%	-25%		

Source: Dataquest
September 1991

TABLE NUMBER:	27
TITLE:	Final History and Forecast
APPLICATION:	Electronic CAE
REGION:	North America
PLATFORM:	Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	12,230	8,373	13,316	14,350	15,719	16,100	14,880	12,120	9,580	4,690	6%	-21%
Workstation Shipments	12,230	8,373	13,316	14,350	15,719	16,100	14,880	12,120	9,580	4,690	6%	-21%
CPU Installed Base	23,588	31,013	41,615	50,825	59,019	65,430	70,730	73,490	73,860	69,340	26%	3%
Workstation Installed Base	23,588	31,013	41,615	50,825	59,019	65,430	70,730	73,490	73,860	69,340	26%	3%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	20.4	32.9	88.0	32.1	59.7	59.1	58.5	57.9	57.3	57.3	31%	-1%
Hardware-Only ASP	7.3	4.3	4.5	5.1	5.0	5.0	4.9	4.9	4.8	4.8	-9%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	91	38	65	74	79	80	73	59	46	23	-4%	-22%
CPU Revenue	88	37	64	71	75	78	70	56	43	21	-4%	-22%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	3	1	1	3	3	2	3	3	3	1	3%	-15%
Software Revenue	46	44	49	57	69	61	47	33	21	10	11%	-33%
Bundled	9	3	2	0	0	0	0	0	0	0	-56%	-100%
Unbundled	37	41	47	57	69	61	46	33	21	10	17%	-33%
Service Revenue	7	6	8	8	9	9	7	5	4	2	7%	-28%
Total Revenue	144	87	121	139	157	150	127	97	71	34	2%	-26%
Increase over Prior Year	NA	-39%	39%	15%	13%	-5%	-15%	-24%	-26%	-52%		

Source: Dataquest
September 1991

TABLE NUMBER:	28
TITLE:	Final History and Forecast
APPLICATION:	Electronic CAE
REGION:	Europe
PLATFORM:	Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	4,833	7,049	6,943	11,777	15,217	17,060	18,480	17,480	13,760	8,080	33%	-12%
Workstation Shipments	4,833	7,049	6,943	11,777	15,217	17,060	18,480	17,480	13,760	8,080	33%	-12%
CPU Installed Base	6,872	13,759	20,092	30,275	42,341	54,540	68,110	80,730	89,680	93,010	58%	17%
Workstation Installed Base	6,872	13,759	20,092	30,275	42,341	54,540	68,110	80,730	89,680	93,010	58%	17%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	29.3	9.5	14.3	20.3	19.0	22.5	22.7	.0	.0	.0	-10%	-100%
Hardware-Only ASP	7.6	4.8	6.1	5.2	5.1	5.1	5.0	5.0	4.9	4.9	-9%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	45	37	46	68	85	91	94	87	68	40	17%	-14%
CPU Revenue	39	34	44	63	79	83	85	78	61	35	19%	-15%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	6	3	2	6	6	8	8	9	7	5	1%	-5%
Software Revenue	22	24	28	35	42	45	45	36	29	21	17%	-13%
Bundled	13	3	3	3	3	2	0	0	0	0	-33%	-100%
Unbundled	9	21	24	32	39	43	45	36	29	21	45%	-12%
Service Revenue	4	5	5	7	7	8	8	7	6	4	20%	-13%
Total Revenue	70	66	79	110	134	144	147	130	102	65	17%	-14%
Increase over Prior Year	NA	-7%	20%	40%	21%	7%	2%	-11%	-22%	-37%		

Source: Dataquest
September 1991

TABLE NUMBER: 29
TITLE: Final History and Forecast
APPLICATION: Electronic CAE
REGION: Asia
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
	====	====	====	====	====	====	====	====	====	====	=====	=====
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	3,732	3,273	3,018	5,044	6,581	6,990	7,440	7,430	6,230	5,360	15%	-4%
Workstation Shipments	3,732	3,273	3,018	5,044	6,581	6,990	7,440	7,430	6,230	5,360	15%	-4%
CPU Installed Base	4,667	7,859	10,512	14,595	19,676	23,780	28,630	33,920	38,080	41,370	43%	16%
Workstation Installed Base	4,667	7,859	10,512	14,595	19,676	23,780	28,630	33,920	38,080	41,370	43%	16%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	35.7	11.4	16.4	23.1	20.6	20.0	19.8	19.6	.0	.0	-13%	-100%
Hardware-Only ASP	3.1	5.7	6.3	4.6	4.4	4.3	4.3	4.2	4.2	4.2	9%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	37	19	21	41	41	39	36	29	21	18	3%	-15%
CPU Revenue	33	17	14	36	39	30	27	21	15	12	4%	-20%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	4	1	7	5	3	9	9	8	7	6	-7%	18%
Software Revenue	19	12	17	29	37	40	38	29	20	16	17%	-15%
Bundled	13	3	2	13	14	13	11	7	5	4	2%	-22%
Unbundled	7	8	15	16	23	27	28	21	15	12	37%	-12%
Service Revenue	4	1	2	7	7	7	6	4	3	2	17%	-19%
Total Revenue	60	32	40	76	85	86	80	62	44	37	9%	-15%
Increase over Prior Year	NA	-47%	25%	91%	12%	1%	-7%	-22%	-30%	-16%		

Source: Dataquest
September 1991

Forecasts—Personal CAD and Distribution Channels

TABLE NUMBER: 30
TITLE: Final History and Forecast
APPLICATION: Electronic CAE
REGION: Rest of World
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	239	388	253	797	1,044	1,790	3,410	5,490	8,290	11,680	45%	62%
Workstation Shipments	239	388	253	797	1,044	1,790	3,410	5,490	8,290	11,680	45%	62%
CPU Installed Base	392	763	972	1,675	2,551	4,090	7,240	12,480	20,510	31,940	60%	66%
Workstation Installed Base	392	763	972	1,675	2,551	4,090	7,240	12,480	20,510	31,940	60%	66%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	11.5	36.8	29.4	32.2	8.1	8.0	7.9	7.9	7.8	7.8	-8%	-1%
Hardware-Only ASP	6.5	4.8	6.1	5.2	4.9	4.9	4.8	4.8	4.7	4.7	-7%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	2	2	2	4	5	9	16	26	39	55	34%	61%
CPU Revenue	2	2	2	4	5	8	16	25	36	50	34%	58%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	0	0	0	0	0	0	1	1	3	5	68%	129%
Software Revenue	0	1	1	2	3	4	5	5	5	5	62%	11%
Bundled	0	0	0	0	0	0	0	0	0	0	-16%	-100%
Unbundled	0	1	1	2	3	4	5	5	5	5	64%	11%
Service Revenue	0	0	0	0	0	0	1	1	2	2	50%	48%
Total Revenue	2	3	3	7	8	13	22	32	46	62	42%	49%
Increase over Prior Year	NA	42%	-9%	145%	28%	52%	68%	50%	41%	36%		

Source: Dataquest
September 1991

TABLE NUMBER:	31
TITLE:	Final History and Forecast
APPLICATION:	IC Layout
REGION:	Worldwide
PLATFORM:	Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	612	1,739	1,420	491	320	400	470	350	280	200	-15%	-9%
Workstation Shipments	612	1,739	1,420	471	320	400	470	350	280	200	-15%	-9%
CPU Installed Base	659	2,396	3,778	4,079	4,052	3,470	3,110	2,630	2,130	1,730	57%	-16%
Workstation Installed Base	659	2,396	3,778	4,079	4,052	3,470	3,110	2,630	2,130	1,730	57%	-16%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	25.7	6.0	15.6	23.5	27.0	26.3	26.1	25.7	25.5	25.6	1%	-1%
Hardware-Only ASP	2.9	5.0	5.0	3.7	3.1	3.1	3.0	3.0	3.0	3.0	2%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	2	8	9	4	3	3	4	2	2	1	8%	-14%
CPU Revenue	2	8	8	3	2	3	3	2	2	1	6%	-15%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	0	0	0	0	0	0	0	0	0	0	36%	-7%
Software Revenue	4	16	5	2	1	2	2	1	1	1	-34%	-6%
Bundled	0	1	1	0	0	1	1	1	1	0	-29%	112%
Unbundled	4	15	4	2	1	1	1	1	0	0	-35%	-28%
Service Revenue	0	1	0	0	0	1	1	1	0	0	-12%	3%
Total Revenue	7	25	14	6	4	6	6	4	3	2	-14%	-11%
Increase over Prior Year	NA	266%	-45%	-54%	-40%	51%	14%	-33%	-25%	-34%		

Source: Dataquest
September 1991

TABLE NUMBER:	32
TITLE:	Final History and Forecast
APPLICATION:	IC Layout
REGION:	North America
PLATFORM:	Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	594	581	577	273	254	290	330	260	200	160	-19%	-9%
Workstation Shipments	594	581	577	273	254	290	330	260	200	160	-19%	-9%
CPU Installed Base	602	1,183	1,729	1,882	1,871	1,760	1,700	1,570	1,380	1,140	33%	-9%
Workstation Installed Base	602	1,183	1,729	1,882	1,871	1,760	1,700	1,570	1,380	1,140	33%	-9%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	25.8	32.7	25.8	49.0	24.7	24.5	24.2	24.0	23.7	23.7	-1%	-1%
Hardware-Only ASP	2.9	5.0	5.3	3.5	3.1	3.1	3.0	3.0	3.0	3.0	2%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	2	3	3	1	1	1	1	1	1	0	-17%	-12%
CPU Revenue	2	3	3	1	1	1	1	1	1	0	-18%	-14%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	0	0	0	0	0	0	0	0	0	0	11%	0%
Software Revenue	3	10	2	1	1	1	1	1	0	0	-25%	-27%
Bundled	0	0	0	0	0	0	0	0	0	0	-24%	0%
Unbundled	3	10	2	1	1	1	1	1	0	0	-25%	-28%
Service Revenue	0	1	0	0	0	0	0	0	0	0	-33%	-8%
Total Revenue	5	14	5	2	2	2	2	2	1	1	-22%	-17%
Increase over Prior Year	NA	190%	-62%	-59%	-17%	18%	3%	-26%	-35%	-33%		

Source: Dataquest
September 1991

TABLE NUMBER:	33
TITLE:	Final History and Forecast
APPLICATION:	IC Layout
REGION:	Europe
PLATFORM:	Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	15	792	480	78	0	0	0	0	0	0	-100%	NA
Workstation Shipments	15	792	480	78	0	0	0	0	0	0	-100%	NA
CPU Installed Base	49	839	1,313	1,341	1,362	900	620	330	110	0	130%	-100%
Workstation Installed Base	49	839	1,313	1,341	1,362	900	620	330	110	0	130%	-100%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	19.6	2.8	6.5	33.0	.0	.0	.0	.0	.0	.0	-100%	NA
Hardware-Only ASP	2.9	5.0	4.7	3.7	.0	.0	.0	.0	.0	.0	-100%	NA
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	0	3	2	1	0	0	0	0	0	0	-100%	NA
CPU Revenue	0	3	2	1	0	0	0	0	0	0	-100%	NA
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Software Revenue	1	2	1	1	0	0	0	0	0	0	-100%	NA
Bundled	0	0	0	0	0	0	0	0	0	0	NA	NA
Unbundled	1	2	1	1	0	0	0	0	0	0	-100%	NA
Service Revenue	0	0	0	0	0	0	0	0	0	0	-100%	NA
Total Revenue	1	5	3	2	0	0	0	0	0	0	-100%	NA
Increase over Prior Year	NA	296%	-37%	-42%	-100%	NA	-9%	-40%	-25%	-22%		

Source: Dataquest
September 1991

TABLE NUMBER:	34
TITLE:	Final History and Forecast
APPLICATION:	IC Layout
REGION:	Asia
PLATFORM:	Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	3	311	339	135	65	110	140	90	70	50	115%	-5%
Workstation Shipments	3	311	339	135	65	110	140	90	70	50	115%	-5%
CPU Installed Base	7	318	656	774	746	750	750	700	640	590	218%	-5%
Workstation Installed Base	7	318	656	774	746	750	750	700	640	590	218%	-5%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	26.3	15.1	18.3	20.1	27.2	26.4	26.1	25.8	25.6	25.6	1%	-1%
Hardware-Only ASP	.0	5.0	5.0	4.2	.0	.0	.0	.0	.0	.0	NA	NA
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	0	2	3	2	2	2	3	2	1	1	125%	-16%
CPU Revenue	0	2	3	2	2	2	2	1	1	1	150%	-16%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	0	0	0	0	0	0	0	0	0	0	65%	-11%
Software Revenue	1	4	2	0	0	1	1	1	1	0	-100%	NA
Bundled	0	1	1	0	0	1	1	1	1	0	-100%	NA
Unbundled	1	3	1	0	0	0	0	0	0	0	-100%	NA
Service Revenue	0	0	0	0	0	0	0	0	0	0	48%	-2%
Total Revenue	1	6	5	2	2	3	4	3	2	1	27%	-7%
Increase over Prior Year	NA	651%	-12%	-57%	-10%	69%	23%	-37%	-19%	-35%		

Source: Dataquest
September 1991

TABLE NUMBER:	35
TITLE:	Final History and Forecast
APPLICATION:	IC Layout
REGION:	Rest of World
PLATFORM:	Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	0	55	25	4	0	0	0	0	0	0	NA	NA
Workstation Shipments	0	55	25	4	0	0	0	0	0	0	NA	NA
CPU Installed Base	0	55	80	82	72	50	40	20	0	0	NA	-100%
Workstation Installed Base	0	55	80	82	72	50	40	20	0	0	NA	-100%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	.0	.0	.0	25.1	.0	.0	.0	.0	.0	.0	NA	NA
Hardware-Only ASP	.0	4.9	6.0	5.5	.0	.0	.0	.0	.0	.0	NA	NA
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
CPU Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Software Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Bundled	0	0	0	0	0	0	0	0	0	0	NA	NA
Unbundled	0	0	0	0	0	0	0	0	0	0	NA	NA
Service Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Total Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Increase over Prior Year	NA	NA	-49%	-44%	-100%	NA	0%	0%	0%	0%		

Source: Dataquest
September 1991

Forecasts—Personal CAD and Distribution Channels

TABLE NUMBER: 36
TITLE: Final History and Forecast
APPLICATION: PCB/Hybrid/MCM
REGION: Worldwide
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	8,172	16,906	21,966	11,145	12,224	13,040	12,810	10,370	8,390	6,590	11%	-12%
Workstation Shipments	8,172	16,906	21,966	11,145	12,224	13,040	12,810	10,370	8,390	6,590	11%	-12%
CPU Installed Base	10,685	27,383	48,478	56,913	62,697	65,410	67,720	67,680	65,690	61,940	56%	-0%
Workstation Installed Base	10,685	27,383	48,478	56,913	62,697	65,410	67,720	67,680	65,690	61,940	56%	-0%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	24.0	11.0	10.7	12.1	16.2	16.5	16.4	16.1	15.9	15.9	-9%	-0%
Hardware-Only ASP	6.5	4.6	5.4	5.4	5.4	5.3	5.2	5.2	5.1	5.1	-5%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	60	84	123	73	79	74	70	55	44	34	7%	-15%
CPU Revenue	56	79	112	69	71	67	63	49	38	27	6%	-18%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	4	4	11	4	8	7	7	6	6	8	19%	-2%
Software Revenue	40	69	57	44	44	49	45	40	35	28	2%	-9%
Bundled	5	8	4	3	5	7	6	4	3	1	-4%	-21%
Unbundled	35	62	53	41	40	42	39	36	32	26	3%	-8%
Service Revenue	4	9	9	7	7	7	6	5	4	3	16%	-14%
Total Revenue	104	162	189	123	130	130	121	100	82	65	6%	-13%
Increase over Prior Year	NA	56%	16%	-35%	6%	-1%	-7%	-17%	-18%	-20%		

Source: Dataquest
September 1991

TABLE NUMBER: 37
TITLE: Final History and Forecast
APPLICATION: PCB/Hybrid/MCM
REGION: North America
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	4,124	7,456	11,896	4,968	5,200	5,780	5,470	4,320	3,060	1,890	6%	-18%
Workstation Shipments	4,124	7,456	11,896	4,968	5,200	5,780	5,470	4,320	3,060	1,890	6%	-18%
CPU Installed Base	5,624	12,944	24,345	27,939	30,224	30,680	31,010	30,190	28,110	24,910	52%	-4%
Workstation Installed Base	5,624	12,944	24,345	27,939	30,224	30,680	31,010	30,190	28,110	24,910	52%	-4%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	17.5	11.9	320.0	12.9	17.1	16.9	16.8	16.6	16.4	16.4	-1%	-1%
Hardware-Only ASP	6.5	4.1	4.5	5.3	5.2	5.1	5.1	5.0	5.0	5.0	-5%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	28	31	55	26	28	30	28	22	15	10	0%	-19%
CPU Revenue	27	31	55	26	27	29	27	21	14	9	-0%	-20%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	0	0	0	0	1	1	1	1	1	1	32%	-7%
Software Revenue	17	30	29	19	16	16	14	13	10	8	-1%	-13%
Bundled	1	1	1	0	0	0	0	0	0	0	-40%	-100%
Unbundled	16	29	28	19	16	15	14	12	10	8	0%	-13%
Service Revenue	2	3	4	2	2	2	2	2	1	1	6%	-15%
Total Revenue	46	64	89	47	46	48	45	36	27	18	0%	-17%
Increase over Prior Year	NA	39%	38%	-46%	-2%	3%	-7%	-19%	-25%	-32%		

Source: Dataquest
September 1991

TABLE NUMBER: 38
TITLE: Final History and Forecast
APPLICATION: PCB/Hybrid/MCM
REGION: Europe
PLATFORM: Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	2,977	6,114	6,337	3,940	4,705	4,960	4,990	3,780	3,080	2,450	12%	-12%
Workstation Shipments	2,977	6,114	6,337	3,940	4,705	4,960	4,990	3,780	3,080	2,450	12%	-12%
CPU Installed Base	3,367	9,456	15,581	18,671	21,285	22,780	24,280	24,580	24,190	23,170	59%	2%
Workstation Installed Base	3,367	9,456	15,581	18,671	21,285	22,780	24,280	24,580	24,190	23,170	59%	2%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	13.5	7.1	7.9	7.2	14.8	16.8	16.9	17.0	16.8	16.7	2%	2%
Hardware-Only ASP	7.4	4.7	5.9	5.6	5.5	5.5	5.4	5.4	5.3	5.3	-7%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	23	30	38	23	31	30	29	21	17	13	8%	-15%
CPU Revenue	22	28	37	21	26	27	26	19	15	11	4%	-15%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	0	2	1	1	5	3	3	2	2	2	77%	-16%
Software Revenue	16	31	21	18	20	22	20	17	14	11	6%	-11%
Bundled	1	2	2	1	1	2	1	0	0	0	11%	-100%
Unbundled	15	29	19	17	19	21	19	17	14	11	6%	-10%
Service Revenue	1	5	4	2	2	2	2	2	1	1	19%	-13%
Total Revenue	39	65	63	43	53	54	50	40	32	26	7%	-13%
Increase over Prior Year	NA	66%	-4%	-31%	21%	4%	-8%	-22%	-18%	-21%		

Source: Dataquest
September 1991

TABLE NUMBER:	39
TITLE:	Final History and Forecast
APPLICATION:	PCB/Hybrid/MCM
REGION:	Asia
PLATFORM:	Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	971	3,006	3,515	2,000	2,047	1,980	1,960	1,810	1,690	1,580	20%	-5%
Workstation Shipments	971	3,006	3,515	2,000	2,047	1,980	1,960	1,810	1,690	1,580	20%	-5%
CPU Installed Base	1,518	4,482	7,851	9,417	10,132	10,730	10,990	11,170	11,250	11,220	61%	2%
Workstation Installed Base	1,518	4,482	7,851	9,417	10,132	10,730	10,990	11,170	11,250	11,220	61%	2%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	34.4	18.6	12.0	15.2	16.8	16.3	16.1	15.9	15.8	15.7	-16%	-1%
Hardware-Only ASP	2.3	6.1	7.9	6.0	5.3	5.2	5.2	5.1	5.1	5.1	23%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	9	21	28	23	19	13	12	10	9	8	21%	-15%
CPU Revenue	6	19	18	20	17	9	8	7	6	4	32%	-26%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	3	2	9	2	2	3	3	3	3	4	-9%	15%
Software Revenue	7	8	6	6	8	10	10	9	8	6	2%	-6%
Bundled	4	5	1	2	4	5	4	4	3	1	-1%	-17%
Unbundled	3	3	5	4	4	5	5	5	5	4	6%	1%
Service Revenue	1	1	1	2	2	2	2	2	1	1	28%	-16%
Total Revenue	17	30	35	31	29	25	23	21	18	15	15%	-12%
Increase over Prior Year	NA	82%	16%	-12%	-6%	-15%	-7%	-10%	-14%	-16%		

Source: Dataquest
September 1991

TABLE NUMBER:	40
TITLE:	Final History and Forecast
APPLICATION:	PCB/Hybrid/MCM
REGION:	Rest of World
PLATFORM:	Personal Computer

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	CAGR 86-90	CAGR 90-95
UNIT SHIPMENT DATA (Workstation Shipments)												
CPU Shipments	99	330	217	237	273	330	390	470	560	670	29%	20%
Workstation Shipments	99	330	217	237	273	330	390	470	560	670	29%	20%
CPU Installed Base	175	501	701	887	1,056	1,220	1,440	1,740	2,130	2,640	57%	20%
Workstation Installed Base	175	501	701	887	1,056 .	1,220	1,440	1,740	2,130	2,640	57%	20%
CALCULATED AVERAGE SYSTEM PRICE DATA (Thousands of U.S. Dollars)												
Turnkey ASP	24.8	3.3	14.6	19.8	18.0	17.8	17.6	17.5	17.3	17.3	-8%	-1%
Hardware-Only ASP	6.8	4.7	6.3	5.4	5.4	5.3	5.3	5.2	5.2	5.2	-6%	-1%
REVENUE DATA (Millions of U.S. Dollars)												
Hardware Revenue	1	1	1	1	2	2	2	2	3	3	22%	18%
CPU Revenue	1	1	1	1	1	2	2	2	3	3	21%	17%
Workstation Revenue	0	0	0	0	0	0	0	0	0	0	NA	NA
Peripheral Revenue	0	0	0	0	0	0	0	0	0	0	57%	26%
Software Revenue	1	1	1	0	1	1	1	1	2	3	-1%	29%
Bundled	0	0	0	0	0	0	0	0	0	0	-29%	-100%
Unbundled	1	1	1	0	1	1	1	1	2	3	0%	29%
Service Revenue	0	0	0	0	0	0	0	0	0	0	-14%	25%
Total Revenue	2	2	2	2	2	3	3	4	5	7	10%	22%
Increase over Prior Year	NA	46%	-3%	-27%	42%	14%	18%	22%	26%	32%		

Source: Dataquest
September 1991

Dataquest

Market Share Estimates
Personal CAD and Distribution Channels

Source:
Dataquest

CAD/CAM/CAE

Dataquest

Market Share Estimates
Personal CAD and Distribution Channels

Source:
Dataquest

Dataquest   **CAD/CAM/CAE**

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Market Share Estimates—Personal CAD and Distribution Channels

Market Share Estimates

The following is a description of the information reported in the *Market Share Estimates* book for each segment:

- *Source*—All companies in database; overview of industry

- Mechanical Applications—All companies in database with mechanical revenue

- AEC and GIS Applications—All companies in database with AEC or GIS revenue

- Electronic Design Automation Applications—All companies in database with EDA revenue

- Europe—All European-based companies and all other companies with more than $1 million in European revenue

- Asia—All Asian-based companies and all other companies with more than $1 million in Asian revenue

- Personal CAD and Distribution Channels—All companies in database with PC revenue

Market Database Methodology

Dataquest's CAD/CAM/CAE industry service is committed to consistently delivering to clients the most accurate data available on the CAD/CAM/CAE industry, both in terms of market history and forecast. Our annual delivery schedule is designed to meet that commitment, as follows:

- First quarter (January 31)—We will provide complete preliminary market share tables for the year just completed. Historical database is opened for changes for a six-month period.

- Second quarter (March 31): We provide complete preliminary forecast tables, including a new five-year forecast period.

- Third quarter (July 1): We send complete final updated market share tables based on additional data collection and analysis over the previous six months as well as company history tables. At this point, the market share database is frozen and will not be changed until the end of the year. For the next six months, supplementary market data will be based on this final market data.

- Fourth quarter (October 1): We provide complete final forecast tables, taking into consideration changes in the market during the previous six months.

Since January, when the preliminary market share numbers were published, over 35 new companies have been added to the market share database. This brings the total number of companies recognized in the CAD/CAM/CAE market to 430. The market share numbers also have been rechecked and verified for all vendors worldwide. Year-end 1990 financial results released this past spring have also been checked and incorporated into the final numbers.

Additionally, a number of companies significantly improved or made changes to their reporting methods during this past update cycle. These changes have been incorporated into this update. Dataquest's policy is to continually update its market information for any year, based on any new data received, in order to arrive at the most accurate market representation possible.

TABLE NUMBER: 1
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

					---------- Market Share ---------			
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
=======	=======	=======	=======	=======	=======	=======	=======	=======
Compaq	420.5	420.5	.0	70,078	15.0%	23.6%	.0%	21.1%
Apple Computer	218.4	192.2	.0	42,000	7.8%	10.8%	.0%	12.7%
Autodesk	218.1	.0	218.1	0	7.8%	.0%	24.8%	.0%
IBM	208.7	198.3	.0	46,651	7.4%	11.1%	.0%	14.1%
Hewlett-Packard	137.0	109.6	.0	21,018	4.9%	6.1%	.0%	6.3%
NEC	117.4	99.3	8.6	8,840	4.2%	5.6%	1.0%	2.7%
Hitachi	70.8	34.0	29.7	1,470	2.5%	1.9%	3.4%	.4%
Fujitsu	63.3	39.8	17.2	2,085	2.3%	2.2%	2.0%	.6%
CADAM	59.4	35.0	20.7	5,000	2.1%	2.0%	2.4%	1.5%
Hakuto	40.5	27.9	12.5	1,202	1.4%	1.6%	1.4%	.4%
Mutoh Industries--NO OEM	36.5	20.2	14.4	1,315	1.3%	1.1%	1.6%	.4%
Wacom	35.1	6.9	24.3	594	1.3%	.4%	2.8%	.2%
Intergraph	28.8	.0	27.1	0	1.0%	.0%	3.1%	.0%
Nemetschek	27.8	11.1	16.7	467	1.0%	.6%	1.9%	.1%
Investronica SA	27.0	21.6	2.7	1,080	1.0%	1.2%	.3%	.3%
Toshiba--NO OEM	20.4	10.2	8.1	1,453	.7%	.6%	.9%	.4%
Vero International Software	19.2	.0	17.5	0	.7%	.0%	2.0%	.0%
Dell Computer	18.6	18.6	.0	4,650	.7%	1.0%	.0%	1.4%
Ziegler	18.5	.0	18.5	0	.7%	.0%	2.1%	.0%
Computervision	17.6	.8	16.5	163	.6%	.0%	1.9%	.0%
Everex Systems	17.4	17.4	.0	5,540	.6%	1.0%	.0%	1.7%
Viewlogic Systems	15.8	.0	13.3	0	.6%	.0%	1.5%	.0%
CADKEY	15.6	.9	14.7	145	.6%	.1%	1.7%	.0%
Xilinx	15.2	.0	13.7	0	.5%	.0%	1.6%	.0%
Wiechers Datentechnik	14.6	11.7	2.9	414	.5%	.7%	.3%	.1%
Research Machines	14.3	14.3	.0	2,200	.5%	.8%	.0%	.7%
EEsof	13.0	.0	11.7	0	.5%	.0%	1.3%	.0%
Caditron	13.0	6.5	5.2	200	.5%	.4%	.6%	.1%
LPKF	12.3	8.0	3.1	500	.4%	.4%	.4%	.2%
ISICAD	11.2	.0	11.2	0	.4%	.0%	1.3%	.0%
Andor	11.1	2.8	7.9	100	.4%	.2%	.9%	.0%
Design Automation	10.2	.0	10.2	0	.4%	.0%	1.2%	.0%
Altera·	10.0	.0	8.5	0	.4%	.0%	1.0%	.0%

(Continued)

TABLE NUMBER: 1
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

| | | | | | ---------- Market Share --------- | | | |
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Mitsubishi Electric	9.4	6.3	3.3	829	.3%	.4%	.4%	.2%
Orcad	9.2	.0	9.2	0	.3%	.0%	1.0%	.0%
Soft-Tech Software Technologie	9.0	.9	7.2	225	.3%	.1%	.8%	.1%
Data I/O	8.7	.0	8.7	0	.3%	.0%	1.0%	.0%
ACTEL	8.5	.0	7.7	0	.3%	.0%	.9%	.0%
Tebis	8.4	1.3	5.9	42	.3%	.1%	.7%	.0%
Racal-Redac	8.0	.0	7.6	0	.3%	.0%	.9%	.0%
CPU	7.6	.0	6.9	0	.3%	.0%	.8%	.0%
DAT Standard Information syste	7.6	.0	7.2	0	.3%	.0%	.8%	.0%
ETAK	7.6	.4	7.2	19	.3%	.0%	.8%	.0%
BATISOFT	7.2	1.1	3.6	230	.3%	.1%	.4%	.1%
Ground Modelling Systems	7.1	4.7	3.5	40	.3%	.3%	.4%	.0%
Aucotec	7.0	2.5	3.9	112	.3%	.1%	.4%	.0%
Geobased Systems	6.9	1.4	5.1	149	.2%	.1%	.6%	.0%
Kloeckner-Moeller	6.8	4.1	2.4	107	.2%	.2%	.3%	.0%
Microsim	6.5	.0	6.1	0	.2%	.0%	.7%	.0%
ESRI	6.4	.0	6.4	0	.2%	.0%	.7%	.0%
DCA Softdesk	6.1	.0	6.1	0	.2%	.0%	.7%	.0%
CNC Software	6.0	.0	6.0	0	.2%	.0%	.7%	.0%
Moda CAD	6.0	1.5	4.2	50	.2%	.1%	.5%	.0%
CAP Electronic Sweet's	5.9	.0	4.8	0	.2%	.0%	.5%	.0%
CAD Software	5.4	.0	4.6	0	.2%	.0%	.5%	.0%
Aspen Technology	5.0	.0	4.5	0	.2%	.0%	.5%	.0%
Strategic Mapping	5.0	.0	5.0	0	.2%	.0%	.6%	.0%
Serbi	4.9	.0	4.9	0	.2%	.0%	.6%	.0%
Cimatron	4.8	2.1	2.1	141	.2%	.1%	.2%	.0%
Micrografx	4.8	.0	4.8	0	.2%	.0%	.5%	.0%
Olivetti	4.7	4.0	.0	793	.2%	.2%	.0%	.2%
Claris	4.7	.0	4.7	0	.2%	.0%	.5%	.0%
Computer Services Consultants	4.5	.0	4.5	0	.2%	.0%	.5%	.0%
RIB/RZB	4.3	.4	3.5	22	.2%	.0%	.4%	.0%
Technovision	4.2	.0	4.2	0	.1%	.0%	.5%	.0%
Algor Interactive Systems	4.2	.0	3.7	0	.1%	.0%	.4%	.0%

(Continued)

TABLE NUMBER: 1
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

					---------- Market Share ----------			
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
=======	=======	=======	=======	=======	=======	=======	=======	=======
ADRA Systems	4.1	.0	3.7	0	.1%	.0%	.4%	.0%
MCS	4.1	.0	3.7	0	.1%	.0%	.4%	.0%
Pathtrace	4.1	1.1	2.7	58	.1%	.1%	.3%	.0%
BETRONEX	4.1	.0	4.1	0	.1%	.0%	.5%	.0%
MapInfo	4.0	.0	3.2	0	.1%	.0%	.4%	.0%
Hochtief	4.0	.6	2.8	35	.1%	.0%	.3%	.0%
Intercad	3.9	2.0	1.1	189	.1%	.1%	.1%	.1%
Microway	3.8	2.6	1.3	38	.1%	.1%	.1%	.0%
International Software Systems	3.8	.0	3.8	0	.1%	.0%	.4%	.0%
Foresight Resources	3.6	.0	3.2	0	.1%	.0%	.4%	.0%
LandCadd	3.5	.0	3.3	0	.1%	.0%	.4%	.0%
American Small Business Comp.	3.5	.0	3.5	0	.1%	.0%	.4%	.0%
Robocom	3.5	.0	3.5	0	.1%	.0%	.4%	.0%
Datagraphic	3.4	1.7	1.4	55	.1%	.1%	.2%	.0%
Teradyne	3.4	.0	2.8	0	.1%	.0%	.3%	.0%
Anilam Electronics	3.2	1.0	1.9	40	.1%	.1%	.2%	.0%
Mitsui Engineering	3.1	2.2	.6	20	.1%	.1%	.1%	.0%
rotring euroCAD	3.1	1.7	1.4	74	.1%	.1%	.2%	.0%
Innovative Data Design	3.0	.0	3.0	0	.1%	.0%	.3%	.0%
ERDAS	2.9	.4	2.3	17	.1%	.0%	.3%	.0%
Cadtronic	2.8	1.6	1.3	84	.1%	.1%	.1%	.0%
Sigma Design	2.8	.0	2.8	0	.1%	.0%	.3%	.0%
Whessoe Computing Systems	2.8	.0	2.8	0	.1%	.0%	.3%	.0%
Superdraft	2.7	1.3	1.3	147	.1%	.1%	.2%	.0%
Engineering Mechanics	2.6	.9	1.5	223	.1%	.1%	.2%	.1%
ALS Design	2.6	.0	2.6	0	.1%	.0%	.3%	.0%
ALDEC	2.5	.0	2.5	0	.1%	.0%	.3%	.0%
Carrier Corporation	2.5	.0	2.5	0	.1%	.0%	.3%	.0%
Visionics	2.4	.0	1.8	10	.1%	.0%	.2%	.0%
PacSoft	2.4	.0	2.4	0	.1%	.0%	.3%	.0%
PAFEC	2.4	.0	2.4	0	.1%	.0%	.3%	.0%
Swanson Analysis	2.4	.0	2.4	0	.1%	.0%	.3%	.0%
Accel Technologies	2.3	.0	2.1	0	.1%	.0%	.2%	.0%

TABLE NUMBER: 1
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

| | | | | | Market Share | | |
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Sophia Systems	2.2	.6	1.5	40	.1%	.0%	.2%	.0%
Sharp System Products--NO OEM	2.2	1.2	1.1	28	.1%	.1%	.1%	.0%
Aries Technology	2.2	.0	2.0	0	.1%	.0%	.2%	.0%
CADWorks	2.2	.0	1.9	0	.1%	.0%	.2%	.0%
Generation 5 Technology	2.1	.0	2.1	0	.1%	.0%	.2%	.0%
Facility Mapping Systems	2.1	.0	1.9	0	.1%	.0%	.2%	.0%
Micro Engineering Solutions	2.1	.6	1.4	31	.1%	.0%	.2%	.0%
Evolution Computing	2.1	.0	2.1	0	.1%	.0%	.2%	.0%
GeoGraphix	2.0	.0	1.5	0	.1%	.0%	.2%	.0%
Infinite Graphics	2.0	.0	2.0	0	.1%	.0%	.2%	.0%
Accugraph	1.9	.1	1.7	7	.1%	.0%	.2%	.0%
Elstree Computing	1.8	.8	1.0	50	.1%	.0%	.1%	.0%
Kork Systems	1.8	.2	1.2	22	.1%	.0%	.1%	.0%
CAD-UL	1.7	.0	1.7	0	.1%	.0%	.2%	.0%
Omation	1.6	.0	1.6	0	.1%	.0%	.2%	.0%
Academi Systems	1.6	.2	1.3	7	.1%	.0%	.1%	.0%
Terra Sciences	1.6	.0	1.6	0	.1%	.0%	.2%	.0%
Massteck	1.6	.0	1.6	0	.1%	.0%	.2%	.0%
Hahn & Kolb	1.5	.9	.5	30	.1%	.1%	.1%	.0%
Schlumberger	1.4	.4	.5	9	.0%	.0%	.1%	.0%
Lamp Software	1.4	.2	.9	61	.0%	.0%	.1%	.0%
Comshoppe	1.4	.0	1.4	0	.0%	.0%	.2%	.0%
FEA Limited	1.3	.3	.3	25	.0%	.0%	.0%	.0%
Genasys II	1.3	.5	.8	7	.0%	.0%	.1%	.0%
Engineering Software	1.2	.1	1.1	34	.0%	.0%	.1%	.0%
Integer	1.2	.0	1.0	0	.0%	.0%	.1%	.0%
Intera Tydac	1.2	.0	1.2	0	.0%	.0%	.1%	.0%
Terr-Mar	1.2	.6	.7	24	.0%	.0%	.1%	.0%
GRAPHSOFT	1.2	.0	1.2	0	.0%	.0%	.1%	.0%
Radian Corporation	1.2	.0	.7	0	.0%	.0%	.1%	.0%
Tanner Research	1.1	.0	1.0	0	.0%	.0%	.1%	.0%
Spectrum Software	1.1	.0	1.1	0	.0%	.0%	.1%	.0%
Phase Three Logic	1.1	.0	1.0	0	.0%	.0%	.1%	.0%

TABLE NUMBER: 1
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

| | | | | | Market Share | | |
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Mega CADD	1.0	.0	1.0	0	.0%	.0%	.1%	.0%
Marcus Computer Systeme	1.0	.5	.3	31	.0%	.0%	.0%	.0%
Aucos elektronische Gerate	1.0	.3	.7	100	.0%	.0%	.1%	.0%
Aura CAD/CAM Systems	1.0	.0	.9	0	.0%	.0%	.1%	.0%
Intrinsix	1.0	1.0	.0	10	.0%	.1%	.0%	.0%
ARKTEC	1.0	.2	.8	22	.0%	.0%	.1%	.0%
Cascade Graphics	1.0	.0	1.0	0	.0%	.0%	.1%	.0%
Cadisys	1.0	.0	1.0	0	.0%	.0%	.1%	.0%
IKOS Systems	1.0	1.0	.0	4	.0%	.1%	.0%	.0%
Aptos	.9	.0	.9	0	.0%	.0%	.1%	.0%
Point Control	.9	.0	.9	0	.0%	.0%	.1%	.0%
Vision 3D	.9	.5	.2	6	.0%	.0%	.0%	.0%
S.T.L.O. s.r.l.	.8	.0	.8	0	.0%	.0%	.1%	.0%
A.I. Systems	.8	.0	.8	0	.0%	.0%	.1%	.0%
Number One Systems	.8	.1	.7	20	.0%	.0%	.1%	.0%
CAMTEK	.8	.0	.6	0	.0%	.0%	.1%	.0%
Caddlink	.8	.0	.8	0	.0%	.0%	.1%	.0%
Rasna Corporation	.8	.0	.8	0	.0%	.0%	.1%	.0%
INS Engineering	.7	.5	.1	16	.0%	.0%	.0%	.0%
Engineering Systems Corp.	.7	.0	.5	0	.0%	.0%	.1%	.0%
Maptek	.7	.0	.7	0	.0%	.0%	.1%	.0%
Contract Data Research	.7	.0	.5	0	.0%	.0%	.1%	.0%
Dynaware	.6	.0	.6	0	.0%	.0%	.1%	.0%
debis Systemhaus	.6	.2	.4	40	.0%	.0%	.0%	.0%
Douglas Electronics	.6	.0	.6	0	.0%	.0%	.1%	.0%
IGC Technology	.6	.0	.6	0	.0%	.0%	.1%	.0%
Uniras	.6	.0	.6	0	.0%	.0%	.1%	.0%
Integrated Silicon Systems	.6	.2	.4	8	.0%	.0%	.0%	.0%
Mc2 Engineering Software	.6	.0	.6	0	.0%	.0%	.1%	.0%
Pelton Engineering	.6	.0	.6	0	.0%	.0%	.1%	.0%
GEOVISION Inc.	.6	.3	.1	219	.0%	.0%	.0%	.1%
Vamp	.6	.0	.6	0	.0%	.0%	.1%	.0%
ACERI SA	.6	.1	.3	3	.0%	.0%	.0%	.0%

(Continued)

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TABLE NUMBER:        1
TITLE:               1990 Final Market Share Estimates
APPLICATION:         All Applications
PLATFORM:            Personal Computer
REGION:              Worldwide
UNITS:               Millions of Dollars/Actual Units
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| | | | | | ---------- Market Share -------- | | | |
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Machinery Sales	.6	.0	.6	0	.0%	.0%	.1%	.0%
CAD-Capture	.5	.0	.1	0	.0%	.0%	.0%	.0%
CADMATIC	.5	.0	.3	3	.0%	.0%	.0%	.0%
Ashlar	.5	.0	.5	0	.0%	.0%	.1%	.0%
Capilano Computing	.5	.0	.5	0	.0%	.0%	.1%	.0%
Imagine That	.5	.0	.5	0	.0%	.0%	.1%	.0%
Premise	.5	.0	.5	0	.0%	.0%	.1%	.0%
Inca	.5	.0	.5	0	.0%	.0%	.1%	.0%
ECOM Associates	.5	.0	.5	3	.0%	.0%	.1%	.0%
Caroline Informatique	.5	.1	.3	5	.0%	.0%	.0%	.0%
CAD Lab	.4	.0	.4	0	.0%	.0%	.0%	.0%
PLUS Logic	.4	.0	.4	0	.0%	.0%	.1%	.0%
Bechtel Software	.4	.0	.4	0	.0%	.0%	.0%	.0%
Digital	.4	.0	.3	0	.0%	.0%	.0%	.0%
The CAD Group	.4	.0	.4	0	.0%	.0%	.0%	.0%
Norsk Data	.4	.2	.1	7	.0%	.0%	.0%	.0%
MacNeal-Schwendler	.4	.0	.4	0	.0%	.0%	.0%	.0%
BV Engineering	.4	.0	.4	0	.0%	.0%	.0%	.0%
Ithaca Software	.4	.0	.4	0	.0%	.0%	.0%	.0%
Daniel Geophysical	.3	.0	.3	0	.0%	.0%	.0%	.0%
Computer-Aided Design Group	.3	.0	.2	0	.0%	.0%	.0%	.0%
Synthesis	.3	.0	.3	0	.0%	.0%	.0%	.0%
Geosoft	.3	.0	.3	0	.0%	.0%	.0%	.0%
Masta Corporation	.3	.0	.2	4	.0%	.0%	.0%	.0%
Genrad	.2	.0	.2	12	.0%	.0%	.0%	.0%
Kontron Instruments	.2	.1	.1	4	.0%	.0%	.0%	.0%
The Great Softwestern Co.	.2	.0	.2	0	.0%	.0%	.0%	.0%
Bobcat Systems	.2	.0	.2	0	.0%	.0%	.0%	.0%
Instrumatic Espanola	.2	.0	.2	0	.0%	.0%	.0%	.0%
Microtel Pacific Research	.2	.0	.2	1	.0%	.0%	.0%	.0%
Geomath	.2	.0	.2	0	.0%	.0%	.0%	.0%

(Continued)

TABLE NUMBER: 1   (Continued)
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

					---------- Market Share ----------			
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
=======	=======	=======	=======	=======	=======	=======	=======	=======
Simulation Science	.2	.0	.2	0	.0%	.0%	.0%	.0%
Simutest	.2	.0	.2	0	.0%	.0%	.0%	.0%
ESDU International	.2	.0	.2	0	.0%	.0%	.0%	.0%
National Semiconductor	.2	.0	.2	0	.0%	.0%	.0%	.0%
Pacific Numerics	.1	.0	.1	0	.0%	.0%	.0%	.0%
TOOL Software	.1	.0	.1	3	.0%	.0%	.0%	.0%
Radan Computational	.1	.0	.0	4	.0%	.0%	.0%	.0%
SIMUCAD	.1	.0	.1	0	.0%	.0%	.0%	.0%
A/E Microsystems	.0	.0	.0	6	.0%	.0%	.0%	.0%
Meta-Software	.0	.0	.0	0	.0%	.0%	.0%	.0%
Dolphin Integration	.0	.0	.0	0	.0%	.0%	.0%	.0%
NCR Microelectronics	.0	.0	.0	0	.0%	.0%	.0%	.0%
Other Companies	418.1	418.0	.4	110,106	14.9%	23.4%	.0%	33.2%
All Companies	2,804.6	1,784.8	878.8	331,917	100.0%	100.0%	100.0%	100.0%
All U.S.-Based Companies	2,070.2	1,420.6	560.3	306,209	73.8%	79.6%	63.8%	92.3%
All Asian-Based Companies	434.7	251.8	150.8	17,992	15.5%	14.1%	17.2%	5.4%
All European-Based Companies	299.8	112.4	167.7	7,716	10.7%	6.3%	19.1%	2.3%
All Hardware Companies	1,479.2	1,414.5	.0	305,835	52.7%	79.3%	.0%	92.1%
All Turnkey & SW Companies	1,325.4	370.4	878.8	26,083	47.3%	20.7%	100.0%	7.9%

Source: Dataquest
June 1991

TABLE NUMBER: 2
TITLE: 1990 Final Market Share Estimates
APPLICATION: Mechanical
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Market Share			
					Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Compaq	150.6	150.6	.0	25,088	12.5%	18.5%	.0%	17.1%
Apple Computer	89.6	78.8	.0	17,220	7.4%	9.7%	.0%	11.7%
IBM	81.4	77.3	.0	18,194	6.7%	9.5%	.0%	12.4%
Autodesk	81.3	.0	81.3	0	6.7%	.0%	24.5%	.0%
Hewlett-Packard	71.2	57.0	.0	10,930	5.9%	7.0%	.0%	7.5%
Hitachi	53.1	25.5	22.3	1,103	4.4%	3.1%	6.7%	.8%
NEC	49.7	42.0	3.7	3,739	4.1%	5.2%	1.1%	2.5%
CADAM	43.2	26.3	14.4	3,750	3.6%	3.2%	4.3%	2.6%
Hakuto	40.5	27.9	12.5	1,202	3.3%	3.4%	3.8%	.8%
Mutoh Industries--NO OEM	27.1	15.0	10.7	978	2.2%	1.8%	3.2%	.7%
Investronica SA	27.0	21.6	2.7	1,080	2.2%	2.7%	.8%	.7%
Fujitsu	25.9	16.1	7.3	855	2.1%	2.0%	2.2%	.6%
Vero International Software	19.2	.0	17.5	0	1.6%	.0%	5.3%	.0%
Toshiba--NO OEM	18.0	9.0	7.2	1,282	1.5%	1.1%	2.2%	.9%
CADKEY	15.1	.9	14.2	145	1.2%	.1%	4.3%	.1%
Wiechers Datentechnik	14.6	11.7	2.9	414	1.2%	1.4%	.9%	.3%
Computervision	14.1	.6	13.2	130	1.2%	.1%	4.0%	.1%
Design Automation	10.2	.0	10.2	0	.8%	.0%	3.1%	.0%
Tebis	8.4	1.3	5.9	42	.7%	.2%	1.8%	.0%
Caditron	7.8	3.9	3.1	120	.6%	.5%	.9%	.1%
Andor	7.8	1.9	5.5	70	.6%	.2%	1.7%	.0%
Dell Computer	7.6	7.6	.0	1,907	.6%	.9%	.0%	1.3%
Ziegler	7.4	.0	7.4	0	.6%	.0%	2.2%	.0%
Research Machines	6.9	6.9	.0	1,056	.6%	.8%	.0%	.7%
Wacom	6.5	1.3	4.5	109	.5%	.2%	1.3%	.1%
DAT Standard Information syste	6.4	.0	6.1	0	.5%	.0%	1.8%	.0%
CNC Software	6.0	.0	6.0	0	.5%	.0%	1.8%	.0%
Intergraph	5.1	.0	4.8	0	.4%	.0%	1.4%	.0%
Cimatron	4.8	2.1	2.1	141	.4%	.3%	.6%	.1%
Everex Systems	4.3	4.3	.0	1,385	.4%	.5%	.0%	.9%
Mitsubishi Electric	4.2	2.8	1.5	372	.3%	.3%	.4%	.3%
Moda CAD	4.2	1.0	2.9	35	.3%	.1%	.9%	.0%
Algor Interactive Systems	4.2	.0	3.7	0	.3%	.0%	1.1%	.0%

(Continued)

TABLE NUMBER: 2
TITLE: 1990 Final Market Share Estimates
APPLICATION: Mechanical
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

					--------- Market Share ---------			
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
=======	=======	=======	=======	=======	=======	=======	=======	=======
ADRA Systems	4.1	.0	3.7	0	.3%	.0%	1.1%	.0%
MCS	4.1	.0	3.7	0	.3%	.0%	1.1%	.0%
Pathtrace	4.1	1.1	2.7	58	.3%	.1%	.8%	.0%
Anilam Electronics	3.2	1.0	1.9	40	.3%	.1%	.6%	.0%
Intercad	3.1	1.6	.9	151	.3%	.2%	.3%	.1%
Serbi	2.9	.0	2.9	0	.2%	.0%	.9%	.0%
Whessoe Computing Systems	2.8	.0	2.8	0	.2%	.0%	.8%	.0%
Claris	2.8	.0	2.8	0	.2%	.0%	.8%	.0%
Superdraft	2.7	1.3	1.3	147	.2%	.2%	.4%	.1%
Engineering Mechanics	2.6	.9	1.5	223	.2%	.1%	.5%	.2%
Olivetti	2.5	2.2	.0	429	.2%	.3%	.0%	.3%
PAFEC	2.4	.0	2.4	0	.2%	.0%	.7%	.0%
Swanson Analysis	2.4	.0	2.4	0	.2%	.0%	.7%	.0%
Sharp System Products--NO OEM	2.2	1.2	1.1	28	.2%	.1%	.3%	.0%
Aries Technology	2.2	.0	2.0	0	.2%	.0%	.6%	.0%
rotring euroCAD	2.1	1.2	.9	51	.2%	.1%	.3%	.0%
Micro Engineering Solutions	2.1	.6	1.4	31	.2%	.1%	.4%	.0%
American Small Business Comp.	2.1	.0	2.1	0	.2%	.0%	.6%	.0%
Micrografx	2.0	.0	2.0	0	.2%	.0%	.6%	.0%
Mitsui Engineering	1.8	1.3	.4	12	.1%	.2%	.1%	.0%
Robocom	1.6	.0	1.6	0	.1%	.0%	.5%	.0%
Hahn & Kolb	1.5	.9	.5	30	.1%	.1%	.1%	.0%
Foresight Resources	1.4	.0	1.3	0	.1%	.0%	.4%	.0%
Schlumberger	1.4	.4	.5	9	.1%	.0%	.2%	.0%
ISICAD	1.4	.0	1.4	0	.1%	.0%	.4%	.0%
FEA Limited	1.3	.3	.3	25	.1%	.0%	.1%	.0%
Evolution Computing	1.2	.0	1.2	0	.1%	.0%	.4%	.0%
Marcus Computer Systeme	1.0	.5	.3	31	.1%	.1%	.1%	.0%
Point Control	.9	.0	.9	0	.1%	.0%	.3%	.0%
Vision 3D	.9	.5	.2	6	.1%	.1%	.1%	.0%
S.T.L.D. s.r.l.	.8	.0	.8	0	.1%	.0%	.3%	.0%
CAMTEK	.8	.0	.6	0	.1%	.0%	.2%	.0%
Rasna Corporation	.8	.0	.8	0	.1%	.0%	.2%	.0%

(Continued)

TABLE NUMBER: 2
TITLE: 1990 Final Market Share Estimates
APPLICATION: Mechanical
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Market Share Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Aura CAD/CAM Systems	.7	.0	.6	0	.1%	.0%	.2%	.0%
Innovative Data Design	.7	.0	.7	0	.1%	.0%	.2%	.0%
A.I. Systems	.7	.0	.7	0	.0%	.0%	.2%	.0%
ACERI SA	.6	.1	.3	3	.0%	.0%	.1%	.0%
GRAPHSOFT	.6	.0	.6	0	.0%	.0%	.2%	.0%
Machinery Sales	.6	.0	.6	0	.0%	.0%	.2%	.0%
Premise	.5	.0	.5	0	.0%	.0%	.2%	.0%
Caroline Informatique	.5	.1	.3	5	.0%	.0%	.1%	.0%
Engineering Software	.5	.0	.4	13	.0%	.0%	.1%	.0%
CAD Lab	.4	.0	.4	0	.0%	.0%	.1%	.0%
Cadtronic	.4	.2	.2	13	.0%	.0%	.1%	.0%
Cascade Graphics	.4	.2	.1	7	.0%	.0%	.0%	.0%
Norsk Data	.4	.0	.4	0	.0%	.0%	.1%	.0%
MacNeal-Schwendler	.4	.0	.4	0	.0%	.0%	.1%	.0%
Uniras	.4	.0	.4	0	.0%	.0%	.1%	.0%
Ithaca Software	.4	.0	.4	0	.0%	.0%	.1%	.0%
Pelton Engineering	.4	.0	.4	0	.0%	.0%	.1%	.0%
Ashlar	.3	.0	.3	0	.0%	.0%	.1%	.0%
debis Systemhaus	.3	.1	.2	20	.0%	.0%	.1%	.0%
Mc2 Engineering Software	.3	.0	.3	0	.0%	.0%	.1%	.0%
Synthesis	.3	.0	.3	0	.0%	.0%	.1%	.0%
Engineering Systems Corp.	.3	.0	.2	0	.0%	.0%	.1%	.0%
Mega CADD	.2	.0	.2	0	.0%	.0%	.1%	.0%
ESDU International	.2	.0	.2	0	.0%	.0%	.1%	.0%
CAD-Capture	.2	.0	.1	0	.0%	.0%	.0%	.0%
Accugraph	.1	.0	.1	0	.0%	.0%	.0%	.0%
Comshoppe	.1	.0	.1	0	.0%	.0%	.0%	.0%
IGC Technology	.1	.0	.1	0	.0%	.0%	.0%	.0%
Imagine That	.1	.0	.1	0	.0%	.0%	.0%	.0%
Lamp Software	.1	.0	.0	3	.0%	.0%	.0%	.0%
Radan Computational	.1	.0	.0	4	.0%	.0%	.0%	.0%

TABLE NUMBER: 2   (Continued)
TITLE: 1990 Final Market Share Estimates
APPLICATION: Mechanical
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Market Share			
					Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Masta Corporation	.1	.0	.0	1	.0%	.0%	.0%	.0%
Number One Systems	.0	.0	.0	1	.0%	.0%	.0%	.0%
A/E Microsystems	.0	.0	.0	2	.0%	.0%	.0%	.0%
Other Companies	204.8	204.8	.0	53,949	17.0%	25.2%	.0%	36.8%
All Companies	1,208.3	813.9	332.2	146,636	100.0%	100.0%	100.0%	100.0%
All U.S.-Based Companies	821.9	611.2	175.5	133,010	68.0%	75.1%	52.8%	90.7%
All Asian-Based Companies	246.9	144.0	86.8	9,749	20.4%	17.7%	26.1%	6.6%
All European-Based Companies	139.5	58.7	69.9	3,877	11.5%	7.2%	21.0%	2.6%
All Hardware Companies	638.3	608.9	.0	132,851	52.8%	74.8%	.0%	90.6%
All Turnkey & SW Companies	570.0	205.0	332.2	13,785	47.2%	25.2%	100.0%	9.4%

Source: Dataquest
June 1991

TABLE NUMBER: 3
TITLE: 1990 Final Market Share Estimates
APPLICATION: AEC
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

					--------- Market Share ---------			
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
=======	=======	=======	=======	=======	=======	=======	=======	=======
Autodesk	97.3	.0	97.3	0	12.4%	.0%	38.9%	.0%
Compaq	93.0	93.0	.0	15,487	11.9%	18.8%	.0%	15.8%
Apple Computer	87.4	76.9	.0	16,800	11.2%	15.5%	.0%	17.2%
IBM	45.9	43.6	.0	10,263	5.9%	8.8%	.0%	10.5%
NEC	44.1	37.3	3.3	3,321	5.6%	7.5%	1.3%	3.4%
Hewlett-Packard	34.2	27.4	.0	5,255	4.4%	5.5%	.0%	5.4%
Nemetschek	27.8	11.1	16.7	467	3.6%	2.2%	6.7%	.5%
Fujitsu	19.6	12.2	5.5	646	2.5%	2.5%	2.2%	.7%
Intergraph	10.3	.0	9.7	0	1.3%	.0%	3.9%	.0%
ISICAD	9.8	.0	9.8	0	1.3%	.0%	3.9%	.0%
Soft-Tech Software Technologie	9.0	.9	7.2	225	1.1%	.2%	2.9%	.2%
CADAM	8.7	5.3	2.9	750	1.1%	1.1%	1.2%	.8%
CPU	7.6	.0	6.9	0	1.0%	.0%	2.8%	.0%
Dell Computer	7.4	7.4	.0	1,860	1.0%	1.5%	.0%	1.9%
BATISOFT	7.2	1.1	3.6	230	.9%	.2%	1.4%	.2%
Hitachi	7.1	3.4	3.0	147	.9%	.7%	1.2%	.2%
Mutoh Industries--NO OEM	6.9	3.8	2.7	249	.9%	.8%	1.1%	.3%
Everex Systems	6.4	6.4	.0	2,050	.8%	1.3%	.0%	2.1%
CAP Electronic Sweet's	5.9	.0	4.8	0	.8%	.0%	1.9%	.0%
Aspen Technology	5.0	.0	4.5	0	.6%	.0%	1.8%	.0%
Computer Services Consultants	4.5	.0	4.5	0	.6%	.0%	1.8%	.0%
DCA Softdesk	4.4	.0	4.4	0	.6%	.0%	1.8%	.0%
Technovision	4.2	.0	4.2	0	.5%	.0%	1.7%	.0%
Hochtief	4.0	.6	2.8	35	.5%	.1%	1.1%	.0%
Research Machines	3.9	3.9	.0	594	.5%	.8%	.0%	.6%
Microway	3.8	2.6	1.3	38	.5%	.5%	.5%	.0%
International Software Systems	3.8	.0	3.8	0	.5%	.0%	1.5%	.0%
Caditron	3.6	1.8	1.5	56	.5%	.4%	.6%	.1%
Computervision	3.5	.2	3.3	33	.5%	.0%	1.3%	.0%
RIB/RZB	3.5	.3	2.8	18	.4%	.1%	1.1%	.0%
Datagraphic	3.4	1.7	1.4	55	.4%	.3%	.5%	.1%
Sigma Design	2.8	.0	2.8	0	.4%	.0%	1.1%	.0%
Micrografx	2.7	.0	2.7	0	.3%	.0%	1.1%	.0%

(Continued)

TABLE NUMBER:	3
TITLE:	1990 Final Market Share Estimates
APPLICATION:	AEC
PLATFORM:	Personal Computer
REGION:	Worldwide
UNITS:	Millions of Dollars/Actual Units

Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Market Share Total Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Wkstns Shipped
Andor	2.6	.6	1.8	23	.3%	.1%	.7%	.0%
Carrier Corporation	2.5	.0	2.5	0	.3%	.0%	1.0%	.0%
Ziegler	2.4	.0	2.4	0	.3%	.0%	1.0%	.0%
Toshiba--NO OEM	2.4	1.2	1.0	172	.3%	.2%	.4%	.2%
CADWorks	2.2	.0	1.9	0	.3%	.0%	.7%	.0%
Innovative Data Design	2.1	.0	2.1	0	.3%	.0%	.8%	.0%
Claris	1.9	.0	1.9	0	.2%	.0%	.8%	.0%
Moda CAD	1.8	.5	1.3	15	.2%	.1%	.5%	.0%
Elstree Computing	1.8	.8	1.0	50	.2%	.2%	.4%	.1%
Accugraph	1.7	.1	1.5	6	.2%	.0%	.6%	.0%
Robocom	1.6	.0	1.6	0	.2%	.0%	.6%	.0%
Olivetti	1.5	1.3	.0	254	.2%	.3%	.0%	.3%
Foresight Resources	1.4	.0	1.3	0	.2%	.0%	.5%	.0%
Ground Modelling Systems	1.4	.9	.7	8	.2%	.2%	.3%	.0%
Mitsubishi Electric	1.4	.9	.5	119	.2%	.2%	.2%	.1%
Comshoppe	1.3	.0	1.3	0	.2%	.0%	.5%	.0%
Lamp Software	1.3	.2	.8	54	.2%	.0%	.3%	.1%
Integer	1.2	.0	1.0	0	.2%	.0%	.4%	.0%
ARKTEC	1.0	.2	.8	22	.1%	.0%	.3%	.0%
Cadtronic	1.0	.6	.5	29	.1%	.1%	.2%	.0%
Serbi	1.0	.0	1.0	0	.1%	.0%	.4%	.0%
American Small Business Comp.	1.0	.0	1.0	0	.1%	.0%	.4%	.0%
Evolution Computing	.8	.0	.8	0	.1%	.0%	.3%	.0%
Mega CADD	.8	.0	.8	0	.1%	.0%	.3%	.0%
Engineering Software	.8	.0	.7	21	.1%	.0%	.3%	.0%
Caddlink	.8	.0	.8	0	.1%	.0%	.3%	.0%
GRAPHSOFT	.6	.0	.6	0	.1%	.0%	.3%	.0%
Dynaware	.6	.0	.6	0	.1%	.0%	.3%	.0%
CADKEY	.6	.0	.6	0	.1%	.0%	.2%	.0%
CADMATIC	.5	.0	.3	3	.1%	.0%	.1%	.0%
IGC Technology	.5	.0	.5	0	.1%	.0%	.2%	.0%

(Continued)

TABLE NUMBER: ·   3   (Continued)
TITLE: 1990 Final Market Share Estimates
APPLICATION: AEC
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Market Share Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
ECOM Associates	.5	.0	.5	3	.1%	.0%	.2%	.0%
Bechtel Software	.4	.0	.4	0	.1%	.0%	.2%	.0%
INS Engineering	.4	.3	.1	9	.1%	.1%	.0%	.0%
Cascade Graphics	.4	.0	.4	0	.0%	.0%	.2%	.0%
DAT Standard Information syste	.4	.0	.4	0	.0%	.0%	.1%	.0%
Aura CAD/CAM Systems	.3	.0	.3	0	.0%	.0%	.1%	.0%
Computer-Aided Design Group	.3	.0	.2	0	.0%	.0%	.1%	.0%
Mc2 Engineering Software	.3	.0	.3	0	.0%	.0%	.1%	.0%
Pelton Engineering	.2	.0	.2	0	.0%	.0%	.1%	.0%
Engineering Systems Corp.	.2	.0	.2	0	.0%	.0%	.1%	.0%
Simulation Science	.2	.0	.2	0	.0%	.0%	.1%	.0%
CAD-Capture	.2	.0	.0	0	.0%	.0%	.0%	.0%
Ashlar	.2	.0	.2	0	.0%	.0%	.1%	.0%
Mitsui Engineering	.2	.1	.0	1	.0%	.0%	.0%	.0%
TOOL Software	.1	.0	.1	3	.0%	.0%	.0%	.0%
Uniras	.1	.0	.1	0	.0%	.0%	.0%	.0%
Masta Corporation	.1	.0	.1	2	.0%	.0%	.0%	.0%
A.I. Systems	.1	.0	.1	0	.0%	.0%	.0%	.0%
Imagine That	.0	.0	.0	0	.0%	.0%	.0%	.0%
A/E Microsystems	.0	.0	.0	4	.0%	.0%	.0%	.0%
Radan Computational	.0	.0	.0	1	.0%	.0%	.0%	.0%
Other Companies	146.3	146.3	.0	38,535	18.7%	29.6%	.0%	39.4%
All Companies	781.8	494.8	250.0	97,913	100.0%	100.0%	100.0%	100.0%
All U.S.-Based Companies	599.5	407.0	169.0	91,082	76.7%	82.2%	67.6%	93.0%
All Asian-Based Companies	96.4	59.8	28.9	4,687	12.3%	12.1%	11.6%	4.8%
All European-Based Companies	86.0	28.0	52.1	2,144	11.0%	5.7%	20.8%	2.2%
All Hardware Companies	427.4	407.6	.0	91,254	54.7%	82.4%	.0%	93.2%
All Turnkey & SW Companies	354.4	87.3	250.0	6,659	45.3%	17.6%	100.0%	6.8%

Source: Dataquest
June 1991

TABLE NUMBER: 4
TITLE: 1990 Final Market Share Estimates
APPLICATION: GIS/Mapping
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

| Company | Total Revenue | Hardware Revenue | Software Revenue | Wkstns Shipped | ---------- Market Share --------- | | | |
					Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Compaq	60.8	60.8	.0	10,126	20.6%	32.9%	.0%	27.9%
IBM	34.9	33.1	.0	7,795	11.8%	18.0%	.0%	21.5%
Apple Computer	24.0	21.1	.0	4,620	8.1%	11.5%	.0%	12.7%
Autodesk	22.1	.0	22.1	0	7.5%	.0%	22.0%	.0%
Intergraph	13.4	.0	12.6	0	4.5%	.0%	12.6%	.0%
ETAK	7.6	.4	7.2	19	2.6%	.2%	7.2%	.1%
Hitachi	7.1	3.4	3.0	147	2.4%	1.8%	3.0%	.4%
Fujitsu	7.0	4.3	2.0	229	2.4%	2.3%	1.9%	.6%
Geobased Systems	6.9	1.4	5.1	149	2.3%	.7%	5.1%	.4%
ESRI	6.4	.0	6.4	0	2.2%	.0%	6.4%	.0%
Ground Modelling Systems	5.7	3.8	2.8	32	1.9%	2.0%	2.8%	.1%
Strategic Mapping	5.0	.0	5.0	0	1.7%	.0%	4.9%	.0%
MapInfo	4.0	.0	3.2	0	1.4%	.0%	3.2%	.0%
Mitsubishi Electric	3.8	2.6	1.4	338	1.3%	1.4%	1.3%	.9%
LandCadd	3.5	.0	3.3	0	1.2%	.0%	3.3%	.0%
ERDAS	2.9	.4	2.3	17	1.0%	.2%	2.3%	.0%
Hewlett-Packard	2.7	2.2	.0	420	.9%	1.2%	.0%	1.2%
Mutoh Industries--NO OEM	2.5	1.4	1.0	88	.8%	.7%	1.0%	.2%
PacSoft	2.4	.0	2.4	0	.8%	.0%	2.4%	.0%
Generation 5 Technology	2.1	.0	2.1	0	.7%	.0%	2.1%	.0%
Facility Mapping Systems	2.1	.0	1.9	0	.7%	.0%	1.9%	.0%
GeoGraphix	2.0	.0	1.5	0	.7%	.0%	1.5%	.0%
Ziegler	2.0	.0	2.0	0	.7%	.0%	2.0%	.0%
Kork Systems	1.8	.2	1.2	22	.6%	.1%	1.2%	.1%
DCA Softdesk	1.7	.0	1.7	0	.6%	.0%	1.6%	.0%
Terra Sciences	1.6	.0	1.6	0	.5%	.0%	1.6%	.0%
Cadtronic	1.4	.8	.6	42	.5%	.4%	.6%	.1%
Genasys II	1.3	.5	.8	7	.4%	.2%	.8%	.0%
Dell Computer	1.3	1.3	.0	326	.4%	.7%	.0%	.9%
Intera Tydac	1.2	.0	1.2	0	.4%	.0%	1.2%	.0%
Terr-Mar	1.2	.6	.7	24	.4%	.3%	.7%	.1%
Mitsui Engineering	1.2	.8	.2	8	.4%	.4%	.2%	.0%
Radian Corporation	1.2	.0	.7	0	.4%	.0%	.7%	.0%

TABLE NUMBER: · 4
TITLE: 1990 Final Market Share Estimates
APPLICATION: GIS/Mapping
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Market Share			
					Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Research Machines	1.0	1.0	.0	154	.3%	.5%	.0%	.4%
Everex Systems	.9	.9	.0	277	.3%	.5%	.0%	.8%
RIB/RZB	.9	.1	.7	4	.3%	.0%	.7%	.0%
Maptek	.7	.0	.7	0	.2%	.0%	.7%	.0%
NEC	.7	.6	.1	52	.2%	.3%	.0%	.1%
Contract Data Research	.7	.0	.5	0	.2%	.0%	.5%	.0%
GEOVISION Inc.	.6	.3	.1	219	.2%	.2%	.1%	.6%
Olivetti	.6	.5	.0	93	.2%	.2%	.0%	.3%
Andor	.4	.1	.3	4	.1%	.1%	.3%	.0%
Daniel Geophysical	.3	.0	.3	0	.1%	.0%	.3%	.0%
INS Engineering	.3	.3	.1	7	.1%	.1%	.1%	.0%
Robocom	.3	.0	.3	0	.1%	.0%	.3%	.0%
Geosoft	.3	.0	.3	0	.1%	.0%	.3%	.0%
Caditron	.3	.1	.1	4	.1%	.1%	.1%	.0%
Engineering Systems Corp.	.2	.0	.2	0	.1%	.0%	.2%	.0%
Geomath	.2	.0	.2	0	.1%	.0%	.2%	.0%
CAD-Capture	.2	.0	.0	0	.1%	.0%	.0%	.0%
Foresight Resources	.2	.0	.2	0	.1%	.0%	.2%	.0%
Uniras	.1	.0	.1	0	.0%	.0%	.1%	.0%
American Small Business Comp.	.1	.0	.1	0	.0%	.0%	.1%	.0%
Innovative Data Design	.1	.0	.1	0	.0%	.0%	.1%	.0%
Lamp Software	.1	.0	.0	3	.0%	.0%	.0%	.0%
A.I. Systems	.1	.0	.1	0	.0%	.0%	.1%	.0%
Accugraph	.1	.0	.0	0	.0%	.0%	.0%	.0%

(Continued)

TABLE NUMBER: 4   (Continued)
TITLE: 1990 Final Market Share Estimates
APPLICATION: GIS/Mapping
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

					---------- Market Share --------			
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
=======	=======	=======	=======	=======	=======	=======	=======	=======
Other Companies	41.8	41.8	.0	11,010	14.1%	22.7%	.0%	30.4%
All Companies	295.5	184.5	100.4	36,236	100.0%	100.0%	100.0%	100.0%
All U.S.-Based Companies	259.5	164.9	85.4	35,030	87.8%	89.4%	85.1%	96.7%
All Asian-Based Companies	23.0	13.4	7.9	873	7.8%	7.3%	7.9%	2.4%
All European-Based Companies	13.0	6.2	7.1	333	4.4%	3.4%	7.1%	.9%
All Hardware Companies	166.9	161.7	.0	34,668	56.5%	87.6%	.0%	95.7%
All Turnkey & SW Companies	128.6	22.8	100.4	1,568	43.5%	12.4%	100.0%	4.3%

Source: Dataquest
June 1991

TABLE NUMBER: 5
TITLE: 1990 Final Market Share Estimates
APPLICATION: Electronic Design Automation
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

					--------- Market Share ---------			
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
=======	=======	=======	=======	=======	=======	=======	=======	=======
Compaq	116.3	116.3	.0	19,377	22.4%	39.9%	.0%	37.9%
IBM	46.5	44.2	.0	10,399	9.0%	15.1%	.0%	20.3%
Hewlett-Packard	28.8	23.0	.0	4,414	5.5%	7.9%	.0%	8.6%
Wacom	28.6	5.6	19.9	484	5.5%	1.9%	10.1%	.9%
NEC	22.9	19.4	1.7	1,728	4.4%	6.7%	.9%	3.4%
Apple Computer	17.5	15.4	.0	3,360	3.4%	5.3%	.0%	6.6%
Autodesk	17.4	.0	17.4	0	3.3%	.0%	8.9%	.0%
Viewlogic Systems	15.8	.0	13.3	0	3.1%	.0%	6.8%	.0%
Xilinx	15.2	.0	13.7	0	2.9%	.0%	7.0%	.0%
EEsof	13.0	.0	11.7	0	2.5%	.0%	6.0%	.0%
LPKF	12.3	8.0	3.1	500	2.4%	2.7%	1.6%	1.0%
Fujitsu	10.8	7.2	2.5	354	2.1%	2.5%	1.3%	.7%
Altera	10.0	.0	8.5	0	1.9%	.0%	4.3%	.0%
Orcad	9.2	.0	9.2	0	1.8%	.0%	4.7%	.0%
Data I/O	8.7	.0	8.7	0	1.7%	.0%	4.4%	.0%
ACTEL	8.5	.0	7.7	0	1.6%	.0%	3.9%	.0%
Racal-Redac	8.0	.0	7.6	0	1.5%	.0%	3.9%	.0%
CADAM	7.6	3.5	3.5	500	1.5%	1.2%	1.8%	1.0%
Aucotec	7.0	2.5	3.9	112	1.4%	.8%	2.0%	.2%
Kloeckner-Moeller	6.8	4.1	2.4	107	1.3%	1.4%	1.2%	.2%
Ziegler	6.7	.0	6.7	0	1.3%	.0%	3.4%	.0%
Microsim	6.5	.0	6.1	0	1.2%	.0%	3.1%	.0%
Everex Systems	5.7	5.7	.0	1,828	1.1%	2.0%	.0%	3.6%
CAD Software	5.4	.0	4.6	0	1.0%	.0%	2.4%	.0%
BETRONEX	4.1	.0	4.1	0	.8%	.0%	2.1%	.0%
Hitachi	3.5	1.7	1.5	74	.7%	.6%	.8%	.1%
Teradyne	3.4	.0	2.8	0	.7%	.0%	1.4%	.0%
ALS Design	2.6	.0	2.6	0	.5%	.0%	1.3%	.0%
Research Machines	2.6	2.6	.0	396	.5%	.9%	.0%	.8%
ALDEC	2.5	.0	2.5	0	.5%	.0%	1.3%	.0%
Visionics	2.4	.0	1.8	10	.5%	.0%	.9%	.0%
Accel Technologies	2.3	.0	2.1	0	.4%	.0%	1.1%	.0%
Dell Computer	2.2	2.2	.0	558	.4%	.8%	.0%	1.1%

TABLE NUMBER: 5
TITLE: 1990 Final Market Share Estimates
APPLICATION: Electronic Design Automation
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Market Share Total Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Wkstns Shipped
Sophia Systems	2.2	.6	1.5	40	.4%	.2%	.7%	.1%
Infinite Graphics	2.0	.0	2.0	0	.4%	.0%	1.0%	.0%
CAD-UL	1.7	.0	1.7	0	.3%	.0%	.9%	.0%
Omation	1.6	.0	1.6	0	.3%	.0%	.8%	.0%
Academi Systems	1.6	.2	1.3	7	.3%	.1%	.7%	.0%
Massteck	1.6	.0	1.6	0	.3%	.0%	.8%	.0%
Caditron	1.3	.6	.5	20	.2%	.2%	.3%	.0%
Tanner Research	1.1	.0	1.0	0	.2%	.0%	.5%	.0%
Spectrum Software	1.1	.0	1.1	0	.2%	.0%	.6%	.0%
Phase Three Logic	1.1	.0	1.0	0	.2%	.0%	.5%	.0%
Aucos elektronische Gerate	1.0	.3	.7	100	.2%	.1%	.4%	.2%
Intrinsix	1.0	1.0	.0	10	.2%	.3%	.0%	.0%
Serbi	1.0	.0	1.0	0	.2%	.0%	.5%	.0%
rotring euroCAD	1.0	.5	.4	23	.2%	.2%	.2%	.0%
Cadisys	1.0	.0	1.0	0	.2%	.0%	.5%	.0%
IKOS Systems	1.0	1.0	.0	4	.2%	.3%	.0%	.0%
Aptos	.9	.0	.9	0	.2%	.0%	.5%	.0%
Intercad	.8	.4	.2	38	.2%	.1%	.1%	.1%
DAT Standard Information syste	.8	.0	.7	0	.1%	.0%	.4%	.0%
Number One Systems	.8	.1	.7	19	.1%	.0%	.4%	.0%
Douglas Electronics	.6	.0	.6	0	.1%	.0%	.3%	.0%
Integrated Silicon Systems	.6	.2	.4	8	.1%	.1%	.2%	.0%
Vamp	.6	.0	.6	0	.1%	.0%	.3%	.0%
Foresight Resources	.5	.0	.5	0	.1%	.0%	.2%	.0%
Capilano Computing	.5	.0	.5	0	.1%	.0%	.3%	.0%
Inca	.5	.0	.5	0	.1%	.0%	.2%	.0%
PLUS Logic	.4	.0	.4	0	.1%	.0%	.2%	.0%
Digital	.4	.0	.3	0	.1%	.0%	.2%	.0%
The CAD Group	.4	.0	.4	0	.1%	.0%	.2%	.0%
Imagine That	.4	.0	.4	0	.1%	.0%	.2%	.0%
American Small Business Comp.	.4	.0	.4	0	.1%	.0%	.2%	.0%

(Continued)

TABLE NUMBER: 5   (Continued)
TITLE: 1990 Final Market Share Estimates
APPLICATION: Electronic Design Automation
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

					---------- Market Share ---------			
	Total	Hardware	Software	Wkstns	Total	Hardware	Software	Wkstns
Company	Revenue	Revenue	Revenue	Shipped	Revenue	Revenue	Revenue	Shipped
=======	=======	=======	=======	=======	=======	=======	=======	=======
BV Engineering	.4	.0	.4	0	.1%	.0%	.2%	.0%
Andor	.3	.1	.2	3	.1%	.0%	.1%	.0%
debis Systemhaus	.3	.1	.2	20	.1%	.0%	.1%	.0%
Genrad	.2	.0	.2	12	.0%	.0%	.1%	.0%
Kontron Instruments	.2	.1	.1	4	.0%	.0%	.1%	.0%
The Great Softwestern Co.	.2	.0	.2	0	.0%	.0%	.1%	.0%
Bobcat Systems	.2	.0	.2	0	.0%	.0%	.1%	.0%
Instrumatic Espanola	.2	.0	.2	0	.0%	.0%	.1%	.0%
Microtel Pacific Research	.2	.0	.2	1	.0%	.0%	.1%	.0%
Simutest	.2	.0	.2	0	.0%	.0%	.1%	.0%
Cascade Graphics	.2	.0	.2	0	.0%	.0%	.1%	.0%
Innovative Data Design	.2	.0	.2	0	.0%	.0%	.1%	.0%
National Semiconductor	.2	.0	.2	0	.0%	.0%	.1%	.0%
Pacific Numerics	.1	.0	.1	0	.0%	.0%	.1%	.0%
Masta Corporation	.1	.0	.1	1	.0%	.0%	.0%	.0%
Olivetti	.1	.1	.0	17	.0%	.0%	.0%	.0%
SIMUCAD	.1	.0	.1	0	.0%	.0%	.0%	.0%
Meta-Software	.0	.0	.0	0	.0%	.0%	.0%	.0%
Dolphin Integration	.0	.0	.0	0	.0%	.0%	.0%	.0%
Robocom	.0	.0	.0	0	.0%	.0%	.0%	.0%
NCR Microelectronics	.0	.0	.0	0	.0%	.0%	.0%	.0%
Other Companies	25.1	25.1	.3	6,606	4.8%	8.6%	.2%	12.9%
All Companies	519.0	291.7	196.1	51,133	100.0%	100.0%	100.0%	100.0%
All U.S.-Based Companies	389.2	237.6	130.4	47,087	75.0%	81.5%	66.5%	92.1%
All Asian-Based Companies	68.4	34.6	27.2	2,683	13.2%	11.9%	13.9%	5.2%
All European-Based Companies	61.4	19.5	38.6	1,363	11.8%	6.7%	19.7%	2.7%
All Hardware Companies	246.6	236.4	.0	47,062	47.5%	81.0%	.0%	92.0%
All Turnkey & SW Companies	272.4	55.3	196.1	4,071	52.5%	19.0%	100.0%	8.0%

Source: Dataquest
June 1991

TABLE NUMBER: 6
TITLE: 1990 Final Market Share Estimates
APPLICATION: Electronic CAE
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

					--------- Market Share ---------			
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
=======	=======	=======	=======	=======	=======	=======	=======	=======
Compaq	82.0	82.0	.0	13,665	21.3%	39.1%	.0%	35.4%
IBM	39.7	37.7	.0	8,864	10.3%	17.9%	.0%	23.0%
Wacom	28.6	5.6	19.9	484	7.4%	2.7%	13.2%	1.3%
Hewlett-Packard	26.7	21.4	.0	4,099	7.0%	10.2%	.0%	10.6%
Viewlogic Systems	15.8	.0	13.3	0	4.1%	.0%	8.8%	.0%
Xilinx	15.2	.0	13.7	0	3.9%	.0%	9.1%	.0%
Autodesk	15.2	.0	15.2	0	3.9%	.0%	10.0%	.0%
EEsof	13.0	.0	11.7	0	3.4%	.0%	7.8%	.0%
NEC	12.7	10.7	.9	954	3.3%	5.1%	.6%	2.5%
Altera	10.0	.0	8.5	0	2.6%	.0%	5.6%	.0%
Apple Computer	8.7	7.7	.0	1,680	2.3%	3.7%	.0%	4.4%
Data I/O	8.7	.0	8.7	0	2.3%	.0%	5.8%	.0%
ACTEL	8.5	.0	7.7	0	2.2%	.0%	5.1%	.0%
Aucotec	7.0	2.5	3.9	112	1.8%	1.2%	2.6%	.3%
Kloeckner-Moeller	6.8	4.1	2.4	107	1.8%	1.9%	1.6%	.3%
Orcad	6.5	.0	6.5	0	1.7%	.0%	4.3%	.0%
Microsim	6.5	.0	6.1	0	1.7%	.0%	4.0%	.0%
Fujitsu	4.4	2.8	1.2	146	1.2%	1.3%	.8%	.4%
Ziegler	3.7	.0	3.7	0	1.0%	.0%	2.5%	.0%
Racal-Redac	3.6	.0	3.4	0	.9%	.0%	2.3%	.0%
Teradyne	3.4	.0	2.8	0	.9%	.0%	1.9%	.0%
Everex Systems	3.3	3.3	.0	1,053	.9%	1.6%	.0%	2.7%
ALDEC	2.5	.0	2.5	0	.7%	.0%	1.7%	.0%
Sophia Systems	2.1	.5	1.4	38	.5%	.2%	.9%	.1%
ALS Design	1.9	.0	1.9	0	.5%	.0%	1.3%	.0%
Research Machines	1.6	1.6	.0	242	.4%	.7%	.0%	.6%
CAD Software	1.4	.0	1.2	0	.4%	.0%	.8%	.0%
Caditron	1.3	.6	.5	20	.3%	.3%	.3%	.1%
Omation	1.2	.0	1.2	0	.3%	.0%	.8%	.0%
Dell Computer	1.1	1.1	.0	279	.3%	.5%	.0%	.7%
Spectrum Software	1.1	.0	1.1	0	.3%	.0%	.7%	.0%
Phase Three Logic	1.1	.0	1.0	0	.3%	.0%	.6%	.0%
Aucos elektronische Gerate	1.0	.3	.7	100	.3%	.1%	.5%	.3%

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TABLE NUMBER:          6
TITLE:                 1990 Final Market Share Estimates
APPLICATION:           Electronic CAE
PLATFORM:              Personal Computer
REGION:                Worldwide
UNITS:                 Millions of Dollars/Actual Units
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					---------- Market Share ---------			
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
=======	=======	=======	=======	=======	=======	=======	=======	=======
Intrinsix	1.0	1.0	.0	10	.3%	.5%	.0%	.0%
Serbi	1.0	.0	1.0	0	.3%	.0%	.7%	.0%
rotring euroCAD	1.0	.5	.4	23	.2%	.3%	.3%	.1%
IKOS Systems	1.0	1.0	.0	4	.2%	.5%	.0%	.0%
Intercad	.8	.4	.2	38	.2%	.2%	.1%	.1%
DAT Standard Information syste	.8	.0	.7	0	.2%	.0%	.5%	.0%
Infinite Graphics	.7	.0	.7	0	.2%	.0%	.4%	.0%
Visionics	.7	.0	.5	3	.2%	.0%	.3%	.0%
Douglas Electronics	.6	.0	.6	0	.2%	.0%	.4%	.0%
Capilano Computing	.5	.0	.5	0	.1%	.0%	.3%	.0%
Inca	.5	.0	.5	0	.1%	.0%	.3%	.0%
Accel Technologies	.4	.0	.4	0	.1%	.0%	.3%	.0%
PLUS Logic	.4	.0	.4	0	.1%	.0%	.3%	.0%
The CAD Group	.4	.0	.4	0	.1%	.0%	.3%	.0%
Imagine That	.4	.0	.4	0	.1%	.0%	.3%	.0%
Foresight Resources	.4	.0	.3	0	.1%	.0%	.2%	.0%
BV Engineering	.4	.0	.4	0	.1%	.0%	.2%	.0%
Tanner Research	.3	.0	.3	0	.1%	.0%	.2%	.0%
debis Systemhaus	.3	.1	.2	20	.1%	.0%	.1%	.1%
American Small Business Comp.	.3	.0	.3	0	.1%	.0%	.2%	.0%
Genrad	.2	.0	.2	12	.1%	.0%	.1%	.0%
Bobcat Systems	.2	.0	.2	0	.1%	.0%	.1%	.0%
Digital	.2	.0	.2	0	.1%	.0%	.1%	.0%
Simutest	.2	.0	.2	0	.1%	.0%	.1%	.0%
Cascade Graphics	.2	.0	.2	0	.0%	.0%	.1%	.0%
Vamp	.2	.0	.2	0	.0%	.0%	.1%	.0%
Number One Systems	.1	.0	.1	3	.0%	.0%	.1%	.0%
National Semiconductor	.1	.0	.1	0	.0%	.0%	.1%	.0%
Innovative Data Design	.1	.0	.1	0	.0%	.0%	.1%	.0%
SIMUCAD	.1	.0	.1	0	.0%	.0%	.0%	.0%
Masta Corporation	.0	.0	.0	0	.0%	.0%	.0%	.0%

TABLE NUMBER: 6   (Continued)
TITLE: 1990 Final Market Share Estimates
APPLICATION: Electronic CAE
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

					---------- Market Share ---------			
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
=======	=======	=======	=======	=======	=======	=======	=======	=======
Meta-Software	.0	.0	.0	0	.0%	.0%	.0%	.0%
Dolphin Integration	.0	.0	.0	0	.0%	.0%	.0%	.0%
NCR Microelectronics	.0	.0	.0	0	.0%	.0%	.0%	.0%
Other Companies	25.1	25.1	.3	6,606	6.5%	12.0%	.2%	17.1%
All Companies	384.6	209.9	150.8	38,562	100.0%	100.0%	100.0%	100.0%
All U.S.-Based Companies	305.3	180.2	107.7	36,274	79.4%	85.8%	71.4%	94.1%
All Asian-Based Companies	47.8	19.6	23.4	1,622	12.4%	9.3%	15.5%	4.2%
All European-Based Companies	31.4	10.1	19.7	665	8.2%	4.8%	13.1%	1.7%
All Hardware Companies	187.6	179.2	.0	36,249	48.8%	85.3%	.0%	94.0%
All Turnkey & SW Companies	197.0	30.8	150.8	2,312	51.2%	14.7%	100.0%	6.0%

Source: Dataquest
June 1991

TABLE NUMBER: 7
TITLE: 1990 Final Market Share Estimates
APPLICATION: IC Layout
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Market Share Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Fujitsu	1.9	1.7	.0	63	45.5%	61.5%	.0%	18.0%
Everex Systems	.9	.9	.0	277	20.8%	31.3%	.0%	79.7%
Tanner Research	.8	.0	.7	0	18.7%	.0%	61.3%	.0%
Integrated Silicon Systems	.6	.2	.4	8	13.9%	7.2%	34.2%	2.3%
National Semiconductor	.1	.0	.1	0	1.2%	.0%	4.5%	.0%
Other Companies	.0	.0	.0	0	.0%	.0%	.0%	.0%
All Companies	4.2	2.8	1.1	348	100.0%	100.0%	100.0%	100.0%
All U.S.-Based Companies	2.3	1.1	1.1	285	54.5%	38.5%	100.0%	82.0%
All Asian-Based Companies	1.9	1.7	.0	63	45.5%	61.5%	.0%	18.0%
All European-Based Companies	.0	.0	.0	0	.0%	.0%	.0%	.0%
All Hardware Companies	.9	.9	.0	277	20.8%	31.3%	.0%	79.7%
All Turnkey & SW Companies	3.3	1.9	1.1	71	79.2%	68.7%	100.0%	20.3%

Source: Dataquest
June 1991

TABLE NUMBER: 8
TITLE: 1990 Final Market Share Estimates
APPLICATION: PCB/Hybrid/MCM
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

					---------- Market Share ---------			
	Total	Hardware	Software	Wkstns	Total	Hardware	Software	Wkstns
Company	Revenue	Revenue	Revenue	Shipped	Revenue	Revenue	Revenue	Shipped
=======	=======	=======	=======	=======	=======	=======	=======	=======
Compaq	34.3	34.3	.0	5,711	26.3%	43.4%	.0%	46.7%
LPKF	12.3	8.0	3.1	500	9.5%	10.1%	7.0%	4.1%
NEC	10.3	8.7	.8	774	7.9%	11.0%	1.7%	6.3%
Apple Computer	8.7	7.7	.0	1,680	6.7%	9.7%	.0%	13.7%
CADAM	7.6	3.5	3.5	500	5.8%	4.4%	7.8%	4.1%
IBM	6.9	6.5	.0	1,535	5.3%	8.3%	.0%	12.6%
Fujitsu	4.4	2.8	1.2	146	3.4%	3.5%	2.8%	1.2%
Racal-Redac	4.4	.0	4.2	0	3.4%	.0%	9.5%	.0%
CAD Software	4.1	.0	3.5	0	3.1%	.0%	7.8%	.0%
BETRONEX	4.1	.0	4.1	0	3.1%	.0%	9.1%	.0%
Hitachi	3.5	1.7	1.5	74	2.7%	2.2%	3.4%	.6%
Ziegler	3.0	.0	3.0	0	2.3%	.0%	6.7%	.0%
Orcad	2.7	.0	2.7	0	2.0%	.0%	6.0%	.0%
Autodesk	2.2	.0	2.2	0	1.7%	.0%	5.0%	.0%
Hewlett-Packard	2.0	1.6	.0	315	1.6%	2.0%	.0%	2.6%
Accel Technologies	1.9	.0	1.7	0	1.4%	.0%	3.8%	.0%
Visionics	1.8	.0	1.3	7	1.4%	.0%	3.0%	.1%
CAD-UL	1.7	.0	1.7	0	1.3%	.0%	3.8%	.0%
Academi Systems	1.6	.2	1.3	7	1.2%	.2%	2.9%	.1%
Massteck	1.6	.0	1.6	0	1.2%	.0%	3.5%	.0%
Everex Systems	1.6	1.6	.0	499	1.2%	2.0%	.0%	4.1%
Infinite Graphics	1.3	.0	1.3	0	1.0%	.0%	3.0%	.0%
Dell Computer	1.1	1.1	.0	279	.9%	1.4%	.0%	2.3%
Research Machines	1.0	1.0	.0	154	.8%	1.3%	.0%	1.3%
Cadisys	1.0	.0	1.0	0	.7%	.0%	2.1%	.0%
Aptos	.9	.0	.9	0	.7%	.0%	2.0%	.0%
ALS Design	.6	.0	.6	0	.5%	.0%	1.4%	.0%
Number One Systems	.6	.0	.6	16	.5%	.1%	1.3%	.1%
Omation	.5	.0	.5	0	.4%	.0%	1.1%	.0%
Vamp	.4	.0	.4	0	.3%	.0%	.9%	.0%
Andor	.3	.1	.2	3	.3%	.1%	.5%	.0%
Kontron Instruments	.2	.1	.1	4	.2%	.2%	.3%	.0%

(Continued)

TABLE NUMBER: 8   (Continued)
TITLE: 1990 Final Market Share Estimates
APPLICATION: PCB/Hybrid/MCM
PLATFORM: Personal Computer
REGION: Worldwide
UNITS: Millions of Dollars/Actual Units

| | | | | | ---------- Market Share --------- | | | |
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
The Great Softwestern Co.	.2	.0	.2	0	.2%	.0%	.5%	.0%
Instrumatic Espanola	.2	.0	.2	0	.2%	.0%	.5%	.0%
Microtel Pacific Research	.2	.0	.2	1	.2%	.0%	.5%	.0%
Digital	.2	.0	.2	0	.2%	.0%	.4%	.0%
Foresight Resources	.2	.0	.2	0	.1%	.0%	.4%	.0%
Pacific Numerics	.1	.0	.1	0	.1%	.0%	.3%	.0%
Sophia Systems	.1	.0	.1	3	.1%	.1%	.2%	.0%
American Small Business Comp.	.1	.0	.1	0	.1%	.0%	.3%	.0%
Olivetti	.1	.1	.0	17	.1%	.1%	.0%	.1%
Innovative Data Design	.1	.0	.1	0	.1%	.0%	.2%	.0%
Masta Corporation	.1	.0	.0	1	.0%	.0%	.1%	.0%
Robocom	.0	.0	.0	0	.0%	.0%	.0%	.0%
Other Companies	.0	.0	.0	0	.0%	.0%	.0%	.0%
All Companies	130.3	79.0	44.3	12,224	100.0%	100.0%	100.0%	100.0%
All U.S.-Based Companies	81.6	56.3	21.6	10,527	62.6%	71.3%	48.7%	86.1%
All Asian-Based Companies	18.7	13.3	3.8	999	14.4%	16.8%	8.6%	8.2%
All European-Based Companies	30.0	9.4	18.9	698	23.0%	11.9%	42.6%	5.7%
All Hardware Companies	58.2	56.4	.0	10,536	44.7%	71.4%	.0%	86.2%
All Turnkey & SW Companies	72.1	22.6	44.3	1,688	55.3%	28.6%	100.0%	13.8%

Source: Dataquest
June 1991

TABLE NUMBER: 9
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: North America
UNITS: Millions of Dollars/Actual Units

					---------- Market Share --------			
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
=======	=======	=======	=======	=======	=======	=======	=======	=======
Compaq	197.6	197.6	.0	32,937	18.9%	30.3%	.0%	23.4%
Apple Computer	133.2	117.2	.0	25,620	12.7%	18.0%	.0%	18.2%
Autodesk	115.6	.0	115.6	0	11.1%	.0%	33.3%	.0%
IBM	62.6	59.5	.0	13,995	6.0%	9.1%	.0%	9.9%
Hewlett-Packard	48.0	38.4	.0	7,356	4.6%	5.9%	.0%	5.2%
CADAM	17.8	10.5	6.2	1,500	1.7%	1.6%	1.8%	1.1%
Dell Computer	15.8	15.8	.0	3,952	1.5%	2.4%	.0%	2.8%
Everex Systems	15.6	15.6	.0	4,986	1.5%	2.4%	.0%	3.5%
Intergraph	15.3	.0	14.4	0	1.5%	.0%	4.1%	.0%
CADKEY	13.5	.0	13.5	0	1.3%	.0%	3.9%	.0%
Viewlogic Systems	11.6	.0	9.7	0	1.1%	.0%	2.8%	.0%
Xilinx	9.9	.0	8.9	0	.9%	.0%	2.6%	.0%
Computervision	8.6	.4	8.1	86	.8%	.1%	2.3%	.1%
EEsof	7.5	.0	6.8	0	.7%	.0%	2.0%	.0%
ACTEL	7.0	.0	6.3	0	.7%	.0%	1.8%	.0%
Geobased Systems	6.2	1.2	4.6	134	.6%	.2%	1.3%	.1%
Altera	5.8	.0	4.9	0	.6%	.0%	1.4%	.0%
ETAK	5.7	.3	5.4	14	.5%	.0%	1.6%	.0%
DCA Softdesk	5.2	.0	5.2	0	.5%	.0%	1.5%	.0%
CAP Electronic Sweet's	5.1	.0	4.0	0	.5%	.0%	1.2%	.0%
ESRI	4.4	.0	4.4	0	.4%	.0%	1.3%	.0%
Microsim	4.2	.0	3.9	0	.4%	.0%	1.1%	.0%
Aspen Technology	4.0	.0	3.6	0	.4%	.0%	1.0%	.0%
Moda CAD	3.8	1.0	2.7	32	.4%	.1%	.8%	.0%
Orcad	3.7	.0	3.7	0	.4%	.0%	1.1%	.0%
Strategic Mapping	3.7	.0	3.7	0	.4%	.0%	1.1%	.0%
ISICAD	3.6	.0	3.6	0	.3%	.0%	1.0%	.0%
CNC Software	3.6	.0	3.6	0	.3%	.0%	1.0%	.0%
LandCadd	3.5	.0	3.3	0	.3%	.0%	1.0%	.0%
Data I/O	3.5	.0	3.5	0	.3%	.0%	1.0%	.0%
Algor Interactive Systems	3.4	.0	3.0	0	.3%	.0%	.9%	.0%
MapInfo	3.3	.0	2.7	0	.3%	.0%	.8%	.0%
MCS	3.2	.0	2.8	0	.3%	.0%	.8%	.0%

(Continued)

TABLE NUMBER: 9
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: North America
UNITS: Millions of Dollars/Actual Units

| | | | | | Market Share | | |
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Micrografx	3.1	.0	3.1	0	.3%	.0%	.9%	.0%
American Small Business Comp.	3.1	.0	3.1	0	.3%	.0%	.9%	.0%
Claris	3.0	.0	3.0	0	.3%	.0%	.9%	.0%
Innovative Data Design	2.9	.0	2.9	0	.3%	.0%	.8%	.0%
Racal-Redac	2.9	.0	2.7	0	.3%	.0%	.8%	.0%
International Software Systems	2.8	.0	2.8	0	.3%	.0%	.8%	.0%
CAD Software	2.7	.0	2.3	0	.3%	.0%	.7%	.0%
ADRA Systems	2.7	.0	2.4	0	.3%	.0%	.7%	.0%
Visionics	2.4	.0	1.8	10	.2%	.0%	.5%	.0%
PacSoft	2.4	.0	2.4	0	.2%	.0%	.7%	.0%
Foresight Resources	2.4	.0	2.2	0	.2%	.0%	.6%	.0%
ERDAS	2.2	.3	1.7	12	.2%	.0%	.5%	.0%
Sigma Design	2.1	.0	2.1	0	.2%	.0%	.6%	.0%
Infinite Graphics	2.0	.0	2.0	0	.2%	.0%	.6%	.0%
Teradyne	1.9	.0	1.6	0	.2%	.0%	.5%	.0%
ALDEC	1.9	.0	1.9	0	.2%	.0%	.5%	.0%
Accel Technologies	1.8	.0	1.7	0	.2%	.0%	.5%	.0%
GeoGraphix	1.8	.0	1.4	0	.2%	.0%	.4%	.0%
LPKF	1.8	1.2	.5	75	.2%	.2%	.1%	.1%
Facility Mapping Systems	1.8	.0	1.6	0	.2%	.0%	.5%	.0%
Aries Technology	1.8	.0	1.6	0	.2%	.0%	.5%	.0%
Evolution Computing	1.8	.0	1.8	0	.2%	.0%	.5%	.0%
Generation 5 Technology	1.8	.0	1.8	0	.2%	.0%	.5%	.0%
Accugraph	1.7	.1	1.5	6	.2%	.0%	.4%	.0%
Micro Engineering Solutions	1.7	.5	1.1	25	.2%	.1%	.3%	.0%
Kork Systems	1.6	.2	1.1	20	.2%	.0%	.3%	.0%
Swanson Analysis	1.5	.0	1.5	0	.1%	.0%	.4%	.0%
Engineering Mechanics	1.3	.5	.8	111	.1%	.1%	.2%	.1%
Carrier Corporation	1.3	.0	1.3	0	.1%	.0%	.4%	.0%
Engineering Software	1.2	.1	1.1	34	.1%	.0%	.3%	.0%
Intera Tydac	1.2	.0	1.2	0	.1%	.0%	.3%	.0%
Terra Sciences	1.2	.0	1.2	0	.1%	.0%	.3%	.0%
GRAPHSOFT	1.2	.0	1.2	0	.1%	.0%	.3%	.0%

(Continued)

TABLE NUMBER: 9
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: North America
UNITS: Millions of Dollars/Actual Units

| Company | Total Revenue | Hardware Revenue | Software Revenue | Wkstns Shipped | Market Share | | | |
					Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
BETRONEX	1.1	.0	1.1	0	.1%	.0%	.3%	.0%
Massteck	1.1	.0	1.1	0	.1%	.0%	.3%	.0%
Investronica SA	1.1	.9	.1	43	.1%	.1%	.0%	.0%
Omation	1.1	.0	1.1	0	.1%	.0%	.3%	.0%
Phase Three Logic	1.1	.0	1.0	0	.1%	.0%	.3%	.0%
Intrinsix	1.0	1.0	.0	10	.1%	.2%	.0%	.0%
Spectrum Software	1.0	.0	1.0	0	.1%	.0%	.3%	.0%
Cadisys	1.0	.0	1.0	0	.1%	.0%	.3%	.0%
CADWorks	.9	.0	.8	0	.1%	.0%	.2%	.0%
Tanner Research	.9	.0	.8	0	.1%	.0%	.2%	.0%
Aura CAD/CAM Systems	.9	.0	.8	0	.1%	.0%	.2%	.0%
Comshoppe	.8	.0	.8	0	.1%	.0%	.2%	.0%
Cascade Graphics	.8	.0	.8	0	.1%	.0%	.2%	.0%
Pathtrace	.8	.2	.5	10	.1%	.0%	.1%	.0%
Mega CADD	.7	.0	.7	0	.1%	.0%	.2%	.0%
Terr-Mar	.7	.3	.4	14	.1%	.1%	.1%	.0%
Aptos	.7	.0	.7	0	.1%	.0%	.2%	.0%
Cimatron	.7	.3	.3	21	.1%	.0%	.1%	.0%
A.I. Systems	.7	.0	.7	0	.1%	.0%	.2%	.0%
Caddlink	.7	.0	.7	0	.1%	.0%	.2%	.0%
Maptek	.7	.0	.7	0	.1%	.0%	.2%	.0%
Ground Modelling Systems	.7	.4	.3	4	.1%	.1%	.1%	.0%
Dynaware	.6	.0	.6	0	.1%	.0%	.2%	.0%
Douglas Electronics	.6	.0	.6	0	.1%	.0%	.2%	.0%
IGC Technology	.6	.0	.6	0	.1%	.0%	.2%	.0%
Uniras	.6	.0	.6	0	.1%	.0%	.2%	.0%
Pelton Engineering	.6	.0	.6	0	.1%	.0%	.2%	.0%
Radian Corporation	.6	.0	.4	0	.1%	.0%	.1%	.0%
Engineering Systems Corp.	.6	.0	.4	0	.1%	.0%	.1%	.0%
GEOVISION Inc.	.6	.3	.1	219	.1%	.1%	.0%	.2%
IKOS Systems	.6	.6	.0	3	.1%	.1%	.0%	.0%
Schlumberger	.6	.2	.2	4	.1%	.0%	.1%	.0%
Vamp	.6	.0	.6	0	.1%	.0%	.2%	.0%

(Continued)

TABLE NUMBER:	9
TITLE:	1990 Final Market Share Estimates
APPLICATION:	All Applications
PLATFORM:	Personal Computer
REGION:	North America
UNITS:	Millions of Dollars/Actual Units

Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Market Share			
					Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Machinery Sales	.6	.0	.6	0	.1%	.0%	.2%	.0%
Point Control	.5	.0	.5	0	.1%	.0%	.2%	.0%
Ashlar	.5	.0	.5	0	.0%	.0%	.1%	.0%
ECON Associates	.5	.0	.5	3	.0%	.0%	.1%	.0%
Mc2 Engineering Software	.5	.0	.5	0	.0%	.0%	.1%	.0%
Capilano Computing	.5	.0	.5	0	.0%	.0%	.1%	.0%
PLUS Logic	.4	.0	.4	0	.0%	.0%	.1%	.0%
Digital	.4	.0	.3	0	.0%	.0%	.1%	.0%
Imagine That	.4	.0	.4	0	.0%	.0%	.1%	.0%
Premise	.4	.0	.4	0	.0%	.0%	.1%	.0%
Bechtel Software	.4	.0	.4	0	.0%	.0%	.1%	.0%
The CAD Group	.4	.0	.4	0	.0%	.0%	.1%	.0%
BV Engineering	.4	.0	.4	0	.0%	.0%	.1%	.0%
Integrated Silicon Systems	.4	.1	.2	5	.0%	.0%	.1%	.0%
Computer-Aided Design Group	.3	.0	.2	0	.0%	.0%	.1%	.0%
Geosoft	.3	.0	.3	0	.0%	.0%	.1%	.0%
Daniel Geophysical	.3	.0	.3	0	.0%	.0%	.1%	.0%
MacNeal-Schwendler	.3	.0	.3	0	.0%	.0%	.1%	.0%
Rasna Corporation	.3	.0	.3	0	.0%	.0%	.1%	.0%
Academi Systems	.2	.0	.2	1	.0%	.0%	.1%	.0%
The Great Softwestern Co.	.2	.0	.2	0	.0%	.0%	.1%	.0%
Bobcat Systems	.2	.0	.2	0	.0%	.0%	.1%	.0%
Geomath	.2	.0	.2	0	.0%	.0%	.1%	.0%
Simutest	.2	.0	.2	0	.0%	.0%	.1%	.0%
Genasys II	.2	.1	.1	1	.0%	.0%	.0%	.0%
Ithaca Software	.2	.0	.2	0	.0%	.0%	.0%	.0%
Microtel Pacific Research	.2	.0	.1	1	.0%	.0%	.0%	.0%
Pacific Numerics	.1	.0	.1	0	.0%	.0%	.0%	.0%
Synthesis	.1	.0	.1	0	.0%	.0%	.0%	.0%
Vision 3D	.1	.0	.0	0	.0%	.0%	.0%	.0%
Genrad	.1	.0	.1	6	.0%	.0%	.0%	.0%

TABLE NUMBER: 9 (Continued)
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: North America
UNITS: Millions of Dollars/Actual Units

					---------- Market Share ----------			
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
National Semiconductor	.1	.0	.1	0	.0%	.0%	.0%	.0%
Simulation Science	.1	.0	.1	0	.0%	.0%	.0%	.0%
SIMUCAD	.1	.0	.1	0	.0%	.0%	.0%	.0%
A/E Microsystems	.0	.0	.0	6	.0%	.0%	.0%	.0%
Meta-Software	.0	.0	.0	0	.0%	.0%	.0%	.0%
CADMATIC	.0	.0	.0	0	.0%	.0%	.0%	.0%
NCR Microelectronics	.0	.0	.0	0	.0%	.0%	.0%	.0%
Other Companies	188.1	188.1	.3	49,545	18.0%	28.8%	.1%	35.2%
All Companies	1,045.7	652.9	347.6	140,802	100.0%	100.0%	100.0%	100.0%
All U.S.-Based Companies	1,036.3	649.8	341.8	140,647	99.1%	99.5%	98.3%	99.9%
All Asian-Based Companies	.0	.0	.0	0	.0%	.0%	.0%	.0%
All European-Based Companies	9.4	3.1	5.8	155	.9%	.5%	1.7%	.1%
All Hardware Companies	672.1	643.4	.0	139,894	64.3%	98.5%	.0%	99.4%
All Turnkey & SW Companies	373.6	9.5	347.6	908	35.7%	1.5%	100.0%	.6%

Source: Dataquest
June 1991

TABLE NUMBER: 10
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: Europe
UNITS: Millions of Dollars/Actual Units

| | | | | | ---------- Market Share ---------- | | | |
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Compaq	197.7	197.7	.0	32,937	20.3%	31.8%	.0%	29.0%
IBM	83.5	79.3	.0	18,660	8.6%	12.8%	.0%	16.5%
Hewlett-Packard	75.3	60.3	.0	11,560	7.8%	9.7%	.0%	10.2%
Autodesk	74.2	.0	74.2	0	7.6%	.0%	24.6%	.0%
Apple Computer	59.0	51.9	.0	11,340	6.1%	8.4%	.0%	10.0%
Nemetschek	27.8	11.1	16.7	467	2.9%	1.8%	5.5%	.4%
Investronica SA	25.5	20.4	2.6	1,018	2.6%	3.3%	.8%	.9%
Ziegler	18.4	.0	18.4	0	1.9%	.0%	6.1%	.0%
Vero International Software	18.2	.0	16.6	0	1.9%	.0%	5.5%	.0%
Wiechers Datentechnik	14.6	11.7	2.9	414	1.5%	1.9%	1.0%	.4%
Research Machines	14.3	14.3	.0	2,200	1.5%	2.3%	.0%	1.9%
Caditron	13.0	6.5	5.2	200	1.3%	1.0%	1.7%	.2%
CADAM	11.9	7.0	4.2	1,000	1.2%	1.1%	1.4%	.9%
Intergraph	10.5	.0	9.9	0	1.1%	.0%	3.3%	.0%
LPKF	9.9	6.4	2.5	400	1.0%	1.0%	.8%	.4%
Soft-Tech Software Technologie	9.0	.9	7.2	225	.9%	.1%	2.4%	.2%
Tebis	8.4	1.3	5.9	42	.9%	.2%	2.0%	.0%
Computervision	8.1	.4	7.6	77	.8%	.1%	2.5%	.1%
DAT Standard Information syste	7.6	.0	7.2	0	.8%	.0%	2.4%	.0%
ISICAD	7.1	.0	7.1	0	.7%	.0%	2.3%	.0%
Aucotec	7.0	2.5	3.9	112	.7%	.4%	1.3%	.1%
BATISOFT	7.0	1.1	3.5	225	.7%	.2%	1.2%	.2%
Kloeckner-Moeller	6.8	4.1	2.4	107	.7%	.7%	.8%	.1%
Ground Modelling Systems	6.4	4.3	3.2	36	.7%	.7%	1.1%	.0%
Racal-Redac	5.2	.0	4.9	0	.5%	.0%	1.6%	.0%
Serbi	4.9	.0	4.9	0	.5%	.0%	1.6%	.0%
Olivetti	4.7	4.0	.0	793	.5%	.6%	.0%	.7%
Computer Services Consultants	4.5	.0	4.5	0	.5%	.0%	1.5%	.0%
RIB/RZB	4.3	.4	3.5	22	.4%	.1%	1.1%	.0%
EEsof	3.9	.0	3.5	0	.4%	.0%	1.2%	.0%
Intercad	3.9	2.0	1.1	189	.4%	.3%	.4%	.2%
Hochtief	3.8	.6	2.7	33	.4%	.1%	.9%	.0%
Microway	3.8	2.6	1.3	38	.4%	.4%	.4%	.0%

TABLE NUMBER: 10
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: Europe
UNITS: Millions of Dollars/Actual Units

					--------- Market Share ---------			
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
=======	=======	=======	=======	=======	=======	=======	=======	=======
Orcad	3.7	.0	3.7	0	.4%	.0%	1.2%	.0%
Robocom	3.5	.0	3.5	0	.4%	.0%	1.2%	.0%
Cimatron	3.5	1.6	1.6	103	.4%	.3%	.5%	.1%
Datagraphic	3.4	1.7	1.4	55	.4%	.3%	.5%	.0%
Pathtrace	3.3	.9	2.2	46	.3%	.1%	.7%	.0%
rotring euroCAD	3.1	1.7	1.4	74	.3%	.3%	.4%	.1%
Cadtronic	2.8	1.6	1.3	84	.3%	.3%	.4%	.1%
Dell Computer	2.8	2.8	.0	698	.3%	.5%	.0%	.6%
Xilinx	2.7	.0	2.5	0	.3%	.0%	.8%	.0%
Altera	2.6	.0	2.2	0	.3%	.0%	.7%	.0%
ALS Design	2.6	.0	2.6	0	.3%	.0%	.9%	.0%
PAFEC	2.4	.0	2.4	0	.2%	.0%	.8%	.0%
Superdraft	2.3	1.1	1.1	123	.2%	.2%	.4%	.1%
Anilam Electronics	2.2	.7	1.3	28	.2%	.1%	.4%	.0%
BETRONEX	2.2	.0	2.2	0	.2%	.0%	.7%	.0%
Whessoe Computing Systems	2.2	.0	2.2	0	.2%	.0%	.7%	.0%
Elstree Computing	1.8	.8	1.0	50	.2%	.1%	.3%	.0%
Viewlogic Systems	1.8	.0	1.5	0	.2%	.0%	.5%	.0%
CAD-UL	1.7	.0	1.7	0	.2%	.0%	.6%	.0%
Micrografx	1.7	.0	1.7	0	.2%	.0%	.6%	.0%
Hahn & Kolb	1.5	.9	.5	30	.2%	.1%	.2%	.0%
Moda CAD	1.5	.4	1.0	13	.2%	.1%	.3%	.0%
Microsim	1.4	.0	1.3	0	.1%	.0%	.4%	.0%
ESRI	1.4	.0	1.4	0	.1%	.0%	.5%	.0%
Academi Systems	1.4	.1	1.1	6	.1%	.0%	.4%	.0%
Everex Systems	1.4	1.4	.0	443	.1%	.2%	.0%	.4%
ACTEL	1.4	.0	1.2	0	.1%	.0%	.4%	.0%
CADKEY	1.4	.9	.4	145	.1%	.1%	.1%	.1%
Teradyne	1.3	.0	1.1	0	.1%	.0%	.4%	.0%
Data I/O	1.3	.0	1.3	0	.1%	.0%	.4%	.0%
FEA Limited	1.3	.3	.3	24	.1%	.0%	.1%	.0%
CAD Software	1.3	.0	1.1	0	.1%	.0%	.4%	.0%
CNC Software	1.2	.0	1.2	0	.1%	.0%	.4%	.0%

(Continued)

TABLE NUMBER: 10
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: Europe
UNITS: Millions of Dollars/Actual Units

| | | | | | ---------- Market Share --------- | | | |
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Lamp Software	1.2	.2	.7	51	.1%	.0%	.2%	.0%
ETAK	1.1	.1	1.1	3	.1%	.0%	.4%	.0%
Integer	1.1	.0	.9	0	.1%	.0%	.3%	.0%
Foresight Resources	1.1	.0	1.0	0	.1%	.0%	.3%	.0%
Marcus Computer Systeme	1.0	.5	.3	31	.1%	.1%	.1%	.0%
Aucos elektronische Gerate	1.0	.3	.7	100	.1%	.0%	.2%	.1%
ARKTEC	1.0	.2	.8	22	.1%	.0%	.3%	.0%
CAP Electronic Sweet's	.9	.0	.7	0	.1%	.0%	.2%	.0%
S.T.L.D. s.r.l.	.8	.0	.8	0	.1%	.0%	.3%	.0%
Number One Systems	.8	.1	.7	20	.1%	.0%	.2%	.0%
CAMTEK	.8	.0	.6	0	.1%	.0%	.2%	.0%
Schlumberger	.8	.2	.3	5	.1%	.0%	.1%	.0%
Aspen Technology	.8	.0	.7	0	.1%	.0%	.2%	.0%
Carrier Corporation	.8	.0	.8	0	.1%	.0%	.2%	.0%
Vision 3D	.7	.4	.2	6	.1%	.1%	.1%	.0%
CADWorks	.7	.0	.6	0	.1%	.0%	.2%	.0%
Contract Data Research	.7	.0	.5	0	.1%	.0%	.2%	.0%
MCS	.7	.0	.6	0	.1%	.0%	.2%	.0%
Strategic Mapping	.7	.0	.7	0	.1%	.0%	.2%	.0%
Algor Interactive Systems	.6	.0	.6	0	.1%	.0%	.2%	.0%
Swanson Analysis	.6	.0	.6	0	.1%	.0%	.2%	.0%
debis Systemhaus	.6	.2	.4	40	.1%	.0%	.1%	.0%
ADRA Systems	.6	.0	.5	0	.1%	.0%	.2%	.0%
ACERI SA	.6	.1	.3	3	.1%	.0%	.1%	.0%
CAD-Capture	.5	.0	.1	0	.1%	.0%	.0%	.0%
Omation	.5	.0	.5	0	.1%	.0%	.2%	.0%
Comshoppe	.5	.0	.5	0	.1%	.0%	.2%	.0%
ERDAS	.5	.1	.4	3	.1%	.0%	.1%	.0%
ALDEC	.5	.0	.5	0	.1%	.0%	.2%	.0%
Inca	.5	.0	.5	0	.1%	.0%	.2%	.0%
CADMATIC	.5	.0	.3	3	.0%	.0%	.1%	.0%
Caroline Informatique	.5	.1	.3	5	.0%	.0%	.1%	.0%
CAD Lab	.4	.0	.4	0	.0%	.0%	.1%	.0%

TABLE NUMBER: 10
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: Europe
UNITS: Millions of Dollars/Actual Units

Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Market Share Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Terra Sciences	.4	.0	.4	0	.0%	.0%	.1%	.0%
Massteck	.4	.0	.4	0	.0%	.0%	.1%	.0%
Norsk Data	.4	.2	.1	7	.0%	.0%	.0%	.0%
Accel Technologies	.4	.0	.3	0	.0%	.0%	.1%	.0%
Genasys II	.3	.1	.2	2	.0%	.0%	.1%	.0%
Evolution Computing	.3	.0	.3	0	.0%	.0%	.1%	.0%
Sigma Design	.3	.0	.3	0	.0%	.0%	.1%	.0%
Masta Corporation	.3	.0	.2	4	.0%	.0%	.1%	.0%
Mutoh Industries--NO OEM	.3	.2	.1	10	.0%	.0%	.0%	.0%
American Small Business Comp.	.3	.0	.3	0	.0%	.0%	.1%	.0%
DCA Softdesk	.3	.0	.3	0	.0%	.0%	.1%	.0%
Rasna Corporation	.3	.1	.1	0	.0%	.0%	.1%	.0%
Kontron Instruments	.2	.1	.2	4	.0%	.0%	.0%	.0%
Generation 5 Technology	.2	.0	.2	0	.0%	.0%	.1%	.0%
Instrumatic Espanola	.2	.0	.2	0	.0%	.0%	.1%	.0%
Facility Mapping Systems	.2	.0	.2	0	.0%	.0%	.1%	.0%
Mega CADD	.2	.0	.2	0	.0%	.0%	.1%	.0%
Micro Engineering Solutions	.2	.1	.1	3	.0%	.0%	.0%	.0%
Cascade Graphics	.2	.0	.2	0	.0%	.0%	.1%	.0%
IKOS Systems	.2	.2	.0	1	.0%	.0%	.0%	.0%
Aries Technology	.2	.0	.2	0	.0%	.0%	.1%	.0%
Point Control	.2	.0	.2	0	.0%	.0%	.1%	.0%
ESDU International	.2	.0	.2	0	.0%	.0%	.1%	.0%
Tanner Research	.2	.0	.1	0	.0%	.0%	.1%	.0%
Aptos	.2	.0	.2	0	.0%	.0%	.0%	.0%
Synthesis	.2	.0	.2	0	.0%	.0%	.0%	.0%
Terr-Mar	.1	.1	.1	3	.0%	.0%	.0%	.0%
TOOL Software	.1	.0	.1	3	.0%	.0%	.0%	.0%
A.I. Systems	.1	.0	.1	0	.0%	.0%	.0%	.0%
Genrad	.1	.0	.1	6	.0%	.0%	.0%	.0%
Kork Systems	.1	.0	.1	1	.0%	.0%	.0%	.0%

TABLE NUMBER: 10   (Continued)
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: Europe
UNITS: Millions of Dollars/Actual Units

Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Market Share Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Accugraph	.1	.0	.1	0	.0%	.0%	.0%	.0%
Imagine That	.1	.0	.1	0	.0%	.0%	.0%	.0%
Radan Computational	.1	.0	.0	4	.0%	.0%	.0%	.0%
GeoGraphix	.1	.0	.1	0	.0%	.0%	.0%	.0%
Ithaca Software	.1	.0	.1	0	.0%	.0%	.0%	.0%
Microtel Pacific Research	.1	.0	.1	0	.0%	.0%	.0%	.0%
National Semiconductor	.1	.0	.1	0	.0%	.0%	.0%	.0%
Simulation Science	.1	.0	.1	0	.0%	.0%	.0%	.0%
Daniel Geophysical	.1	.0	.1	0	.0%	.0%	.0%	.0%
Premise	.1	.0	.1	0	.0%	.0%	.0%	.0%
Caddlink	.0	.0	.0	0	.0%	.0%	.0%	.0%
Bechtel Software	.0	.0	.0	0	.0%	.0%	.0%	.0%
Integrated Silicon Systems	.0	.0	.0	0	.0%	.0%	.0%	.0%
Dolphin Integration	.0	.0	.0	0	.0%	.0%	.0%	.0%
Pacific Numerics	.0	.0	.0	0	.0%	.0%	.0%	.0%
Other Companies	110.4	110.4	.0	29,066	11.4%	17.8%	.0%	25.6%
All Companies	971.6	621.0	301.0	113,423	100.0%	100.0%	100.0%	100.0%
All U.S.-Based Companies	687.4	513.1	143.2	105,966	70.7%	82.6%	47.6%	93.4%
All Asian-Based Companies	.3	.2	.1	10	.0%	.0%	.0%	.0%
All European-Based Companies	283.9	107.7	157.7	7,447	29.2%	17.3%	52.4%	6.6%
All Hardware Companies	541.9	514.8	.0	106,498	55.8%	82.9%	.0%	93.9%
All Turnkey & SW Companies	429.7	106.2	301.0	6,924	44.2%	17.1%	100.0%	6.1%

Source: Dataquest
June 1991

TABLE NUMBER: 11
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: Asia
UNITS: Millions of Dollars/Actual Units

					Market Share		
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
NEC	117.4	99.3	8.6	8,840	16.1%	20.9%	4.1%	12.6%
Hitachi	70.8	34.0	29.7	1,470	9.7%	7.1%	14.1%	2.1%
Fujitsu	63.3	39.8	17.2	2,085	8.7%	8.4%	8.1%	3.0%
IBM	52.2	49.6	.0	11,663	7.1%	10.4%	.0%	16.6%
Hakuto	40.5	27.9	12.5	1,202	5.5%	5.9%	5.9%	1.7%
Mutoh Industries--NO OEM	36.2	20.1	14.3	1,306	5.0%	4.2%	6.7%	1.9%
Wacom	35.1	6.9	24.3	594	4.8%	1.5%	11.5%	.8%
CADAM	29.7	17.5	10.4	2,500	4.1%	3.7%	4.9%	3.6%
Autodesk	26.2	.0	26.2	0	3.6%	.0%	12.4%	.0%
Apple Computer	24.0	21.2	.0	4,620	3.3%	4.4%	.0%	6.6%
Toshiba--NO OEM	20.4	10.2	8.1	1,453	2.8%	2.1%	3.8%	2.1%
Compaq	12.6	12.6	.0	2,102	1.7%	2.7%	.0%	3.0%
Hewlett-Packard	12.3	9.8	.0	1,892	1.7%	2.1%	.0%	2.7%
Andor	11.1	2.8	7.9	100	1.5%	.6%	3.7%	.1%
Design Automation	10.2	.0	10.2	0	1.4%	.0%	4.8%	.0%
Mitsubishi Electric	9.4	6.3	3.3	829	1.3%	1.3%	1.6%	1.2%
CPU	7.6	.0	6.9	0	1.0%	.0%	3.3%	.0%
Technovision	4.2	.0	4.2	0	.6%	.0%	2.0%	.0%
Data I/O	3.5	.0	3.5	0	.5%	.0%	1.6%	.0%
Mitsui Engineering	3.1	2.2	.6	20	.4%	.5%	.3%	.0%
Viewlogic Systems	2.5	.0	2.1	0	.3%	.0%	1.0%	.0%
Xilinx	2.3	.0	2.1	0	.3%	.0%	1.0%	.0%
Sophia Systems	2.2	.6	1.5	40	.3%	.1%	.7%	.1%
Sharp System Products--NO OEM	2.2	1.2	1.1	28	.3%	.2%	.5%	.0%
EEsof	1.4	.0	1.3	0	.2%	.0%	.6%	.0%
CAD Software	1.4	.0	1.2	0	.2%	.0%	.5%	.0%
Intergraph	1.2	.0	1.1	0	.2%	.0%	.5%	.0%
Altera	1.1	.0	.9	0	.2%	.0%	.4%	.0%
Anilam Electronics	1.0	.3	.6	12	.1%	.1%	.3%	.0%
ADRA Systems	.9	.0	.8	0	.1%	.0%	.4%	.0%
Microsim	.8	.0	.8	0	.1%	.0%	.4%	.0%
CADKEY	.8	.0	.8	0	.1%	.0%	.4%	.0%
INS Engineering	.7	.5	.1	16	.1%	.1%	.1%	.0%

(Continued)

TABLE NUMBER: 11
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: Asia
UNITS: Millions of Dollars/Actual Units

| | | | | | ---------- Market Share ---------- | | | |
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
BETRONEX	.7	.0	.7	0	.1%	.0%	.3%	.0%
Moda CAD	.6	.2	.4	5	.1%	.0%	.2%	.0%
Cimatron	.6	.3	.3	17	.1%	.1%	.1%	.0%
Carrier Corporation	.5	.0	.5	0	.1%	.0%	.2%	.0%
LPKF	.5	.3	.1	20	.1%	.1%	.1%	.0%
CNC Software	.5	.0	.5	0	.1%	.0%	.2%	.0%
CADWorks	.4	.0	.4	0	.1%	.0%	.2%	.0%
ISICAD	.4	.0	.4	0	.1%	.0%	.2%	.0%
Whessoe Computing Systems	.4	.0	.4	0	.1%	.0%	.2%	.0%
ESRI	.4	.0	.4	0	.1%	.0%	.2%	.0%
ETAK	.4	.0	.4	1	.1%	.0%	.2%	.0%
DCA Softdesk	.4	.0	.4	0	.1%	.0%	.2%	.0%
Everex Systems	.4	.4	.0	111	.0%	.1%	.0%	.2%
Computervision	.4	.0	.3	0	.0%	.0%	.2%	.0%
MCS	.3	.0	.3	0	.0%	.0%	.1%	.0%
Sigma Design	.3	.0	.3	0	.0%	.0%	.1%	.0%
Swanson Analysis	.3	.0	.3	0	.0%	.0%	.1%	.0%
Terr-Mar	.3	.1	.2	5	.0%	.0%	.1%	.0%
Investronica SA	.3	.2	.0	11	.0%	.0%	.0%	.0%
Aries Technology	.3	.0	.2	0	.0%	.0%	.1%	.0%
Aspen Technology	.3	.0	.2	0	.0%	.0%	.1%	.0%
Rasna Corporation	.3	.0	.3	0	.0%	.0%	.1%	.0%
Lamp Software	.2	.0	.1	9	.0%	.0%	.1%	.0%
Micro Engineering Solutions	.2	.1	.1	3	.0%	.0%	.1%	.0%
Superdraft	.2	.1	.1	12	.0%	.0%	.0%	.0%
Integrated Silicon Systems	.2	.1	.1	3	.0%	.0%	.1%	.0%
IKOS Systems	.2	.2	.0	1	.0%	.0%	.0%	.0%
Point Control	.2	.0	.2	0	.0%	.0%	.1%	.0%
GeoGraphix	.1	.0	.1	0	.0%	.0%	.1%	.0%
Teradyne	.1	.0	.1	0	.0%	.0%	.1%	.0%
ALDEC	.1	.0	.1	0	.0%	.0%	.1%	.0%
Integer	.1	.0	.1	0	.0%	.0%	.0%	.0%
ERDAS	.1	.0	.1	1	.0%	.0%	.0%	.0%

TABLE NUMBER: 11
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: Asia
UNITS: Millions of Dollars/Actual Units

| | | | | | ---------- Market Share --------- | | | |
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Foresight Resources	.1	.0	.1	0	.0%	.0%	.0%	.0%
MacNeal-Schwendler	.1	.0	.1	0	.0%	.0%	.0%	.0%
Mega CADD	.1	.0	.1	0	.0%	.0%	.0%	.0%
ACTEL	.1	.0	.1	0	.0%	.0%	.0%	.0%
Algor Interactive Systems	.1	.0	.1	0	.0%	.0%	.0%	.0%
Schlumberger	.1	.0	.0	0	.0%	.0%	.0%	.0%
American Small Business Comp.	.1	.0	.1	0	.0%	.0%	.0%	.0%
Ithaca Software	.1	.0	.1	0	.0%	.0%	.0%	.0%
Simulation Science	.1	.0	.1	0	.0%	.0%	.0%	.0%
Tanner Research	.1	.0	.0	0	.0%	.0%	.0%	.0%
Accel Technologies	.1	.0	.0	0	.0%	.0%	.0%	.0%
Genasys II	.1	.0	.0	0	.0%	.0%	.0%	.0%
PAFEC	.1	.0	.1	0	.0%	.0%	.0%	.0%
Premise	.1	.0	.1	0	.0%	.0%	.0%	.0%
Aptos	.0	.0	.0	0	.0%	.0%	.0%	.0%
Facility Mapping Systems	.0	.0	.0	0	.0%	.0%	.0%	.0%
Massteck	.0	.0	.0	0	.0%	.0%	.0%	.0%
Omation	.0	.0	.0	0	.0%	.0%	.0%	.0%
Pathtrace	.0	.0	.0	1	.0%	.0%	.0%	.0%
The CAD Group	.0	.0	.0	0	.0%	.0%	.0%	.0%
Accugraph	.0	.0	.0	0	.0%	.0%	.0%	.0%
Daniel Geophysical	.0	.0	.0	0	.0%	.0%	.0%	.0%
Imagine That	.0	.0	.0	0	.0%	.0%	.0%	.0%
Bechtel Software	.0	.0	.0	0	.0%	.0%	.0%	.0%
Kork Systems	.0	.0	.0	0	.0%	.0%	.0%	.0%
Meta-Software	.0	.0	.0	0	.0%	.0%	.0%	.0%
SIMUCAD	.0	.0	.0	0	.0%	.0%	.0%	.0%

(Continued)

TABLE NUMBER: 11   (Continued)
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: Asia
UNITS: Millions of Dollars/Actual Units

Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Market Share Total Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Wkstns Shipped
Other Companies	111.2	111.2	.0	29,287	15.2%	23.4%	.0%	41.7%
All Companies	731.1	475.7	211.6	70,257	100.0%	100.0%	100.0%	100.0%
All U.S.-Based Companies	292.8	222.9	58.4	52,194	40.0%	46.8%	27.6%	74.3%
All Asian-Based Companies	434.4	251.7	150.7	17,982	59.4%	52.9%	71.2%	25.6%
All European-Based Companies	4.0	1.2	2.5	81	.5%	.3%	1.2%	.1%
All Hardware Companies	230.3	222.4	.0	52,175	31.5%	46.7%	.0%	74.3%
All Turnkey & SW Companies	500.8	253.3	211.6	18,082	68.5%	53.3%	100.0%	25.7%

Source: Dataquest
June 1991

TABLE NUMBER: 12
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: Rest of World
UNITS: Millions of Dollars/Actual Units

| | | | | | Market Share | | |
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
Compaq	12.6	12.6	.0	2,102	22.5%	35.8%	.0%	28.3%
IBM	10.4	9.9	.0	2,333	18.6%	28.1%	.0%	31.4%
Apple Computer	2.2	1.9	.0	420	3.9%	5.5%	.0%	5.6%
Autodesk	2.2	.0	2.2	0	3.9%	.0%	11.7%	.0%
Orcad	1.8	.0	1.8	0	3.3%	.0%	9.9%	.0%
Intergraph	1.8	.0	1.7	0	3.2%	.0%	9.0%	.0%
Claris	1.6	.0	1.6	0	2.9%	.0%	8.8%	.0%
Hewlett-Packard	1.4	1.1	.0	210	2.4%	3.1%	.0%	2.8%
Engineering Mechanics	1.3	.5	.8	111	2.3%	1.3%	4.0%	1.5%
Vero International Software	1.0	.0	.9	0	1.7%	.0%	4.7%	.0%
International Software Systems	.9	.0	.9	0	1.7%	.0%	5.0%	.0%
Genasys II	.8	.3	.5	4	1.4%	.8%	2.5%	.1%
CNC Software	.7	.0	.7	0	1.3%	.0%	3.9%	.0%
Geobased Systems	.7	.1	.5	15	1.2%	.4%	2.7%	.2%
MapInfo	.7	.0	.5	0	1.2%	.0%	2.9%	.0%
Strategic Mapping	.7	.0	.7	0	1.2%	.0%	3.5%	.0%
Radian Corporation	.6	.0	.4	0	1.0%	.0%	1.9%	.0%
Computervision	.5	.0	.5	0	.9%	.0%	2.7%	.0%
Altera	.5	.0	.4	0	.9%	.0%	2.3%	.0%
Data I/O	.4	.0	.4	0	.8%	.0%	2.3%	.0%
ETAK	.4	.0	.4	1	.7%	.1%	1.9%	.0%
DCA Softdesk	.3	.0	.3	0	.5%	.0%	1.6%	.0%
Xilinx	.3	.0	.3	0	.5%	.0%	1.5%	.0%
CADWorks	.2	.0	.2	0	.4%	.0%	1.0%	.0%
Whessoe Computing Systems	.2	.0	.2	0	.4%	.0%	1.2%	.0%
Superdraft	.2	.1	.1	12	.4%	.3%	.5%	.2%
Hochtief	.2	.0	.1	2	.4%	.1%	.8%	.0%
ESRI	.2	.0	.2	0	.3%	.0%	1.0%	.0%
Investronica SA	.2	.2	.0	8	.3%	.4%	.1%	.1%
Aura CAD/CAM Systems	.2	.0	.1	0	.3%	.0%	.7%	.0%
Generation 5 Technology	.2	.0	.2	0	.3%	.0%	.8%	.0%
BATISOFT	.1	.0	.1	5	.2%	.1%	.4%	.1%
Sigma Design	.1	.0	.1	0	.2%	.0%	.8%	.0%

(Continued)

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TABLE NUMBER:          12
TITLE:                 1990 Final Market Share Estimates
APPLICATION:           All Applications
PLATFORM:              Personal Computer
REGION:                Rest of World
UNITS:                 Millions of Dollars/Actual Units
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					---------- Market Share ----------			
Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped
=======	=======	=======	=======	=======	=======	=======	=======	=======
EEsof	.1	.0	.1	0	.2%	.0%	.6%	.0%
BETRONEX	.1	.0	.1	0	.2%	.0%	.6%	.0%
LPKF	.1	.1	.0	5	.2%	.2%	.2%	.1%
CAD Software	.1	.0	.1	0	.2%	.0%	.5%	.0%
Engineering Systems Corp.	.1	.0	.1	0	.2%	.0%	.4%	.0%
Innovative Data Design	.1	.0	.1	0	.2%	.0%	.6%	.0%
Mc2 Engineering Software	.1	.0	.1	0	.2%	.0%	.6%	.0%
American Small Business Comp.	.1	.0	.1	0	.2%	.0%	.5%	.0%
Spectrum Software	.1	.0	.1	0	.2%	.0%	.5%	.0%
ACTEL	.1	.0	.1	0	.2%	.0%	.4%	.0%
ERDAS	.1	.0	.1	1	.2%	.1%	.4%	.0%
Ziegler	.1	.0	.1	0	.2%	.0%	.5%	.0%
ISICAD	.1	.0	.1	0	.1%	.0%	.4%	.0%
FEA Limited	.1	.0	.0	1	.1%	.0%	.1%	.0%
CADMATIC	.1	.0	.0	0	.1%	.0%	.2%	.0%
Facility Mapping Systems	.1	.0	.1	0	.1%	.0%	.3%	.0%
Ithaca Software	.1	.0	.1	0	.1%	.0%	.3%	.0%
Moda CAD	.1	.0	.0	1	.1%	.0%	.2%	.0%
Terr-Mar	.1	.0	.0	1	.1%	.1%	.2%	.0%
Accel Technologies	.1	.0	.0	0	.1%	.0%	.2%	.0%
Accugraph	.1	.0	.0	0	.1%	.0%	.2%	.0%
Algor Interactive Systems	.0	.0	.0	0	.1%	.0%	.2%	.0%
Caddlink	.0	.0	.0	0	.1%	.0%	.2%	.0%
Capilano Computing	.0	.0	.0	0	.1%	.0%	.2%	.0%
Massteck	.0	.0	.0	0	.1%	.0%	.2%	.0%
Pathtrace	.0	.0	.0	1	.1%	.0%	.2%	.0%
Comshoppe	.0	.0	.0	0	.1%	.0%	.2%	.0%
Kork Systems	.0	.0	.0	0	.1%	.0%	.1%	.0%
Teradyne	.0	.0	.0	0	.1%	.0%	.2%	.0%
Computer-Aided Design Group	.0	.0	.0	0	.0%	.0%	.1%	.0%
Foresight Resources	.0	.0	.0	0	.0%	.0%	.1%	.0%

TABLE NUMBER: 12   (Continued)
TITLE: 1990 Final Market Share Estimates
APPLICATION: All Applications
PLATFORM: Personal Computer
REGION: Rest of World
UNITS: Millions of Dollars/Actual Units

Company	Total Revenue	Hardware Revenue	Software Revenue	Wkstns Shipped	Market Share Total Revenue	Market Share Hardware Revenue	Market Share Software Revenue	Market Share Wkstns Shipped
Genrad	.0	.0	.0	1	.0%	.0%	.1%	.0%
Simulation Science	.0	.0	.0	0	.0%	.0%	.1%	.0%
Vision 3D	.0	.0	.0	0	.0%	.0%	.0%	.0%
ESDU International	.0	.0	.0	0	.0%	.0%	.1%	.0%
MacNeal-Schwendler	.0	.0	.0	0	.0%	.0%	.1%	.0%
Other Companies	8.4	8.4	.0	2,202	14.9%	23.7%	.0%	29.6%
All Companies	56.2	35.3	18.6	7,435	100.0%	100.0%	100.0%	100.0%
All U.S.-Based Companies	53.8	34.9	16.9	7,402	95.6%	98.9%	90.7%	99.6%
All Asian-Based Companies	.0	.0	.0	0	.0%	.0%	.0%	.0%
All European-Based Companies	2.5	.4	1.7	33	4.4%	1.1%	9.3%	.4%
All Hardware Companies	35.0	34.0	.0	7,267	62.2%	96.2%	.0%	97.7%
All Turnkey & SW Companies	21.2	1.3	18.6	168	37.8%	3.8%	100.0%	2.3%

Source: Dataquest
June 1991

Dataquest