Conference focuses on document management technology

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In a brief overview of the computer micrographics technology industry, Arnold E. Keller, editor and publisher of Info Systems magazine, suggested that “perhaps we have all dwelled too heavily on the technology and too little on the practical applications of the technology.”

Keller was the keynote speaker at the 14th Annual Comtec Conference held February 20-23 in San Francisco. Technology did in fact get the most attention as the professional users’ and vendors’ group met to explore the latest developments in the management of information resources—resources that often include as much graphic as alphanumeric data.

Urged by Keller to consider the cost of not having information available when needed, the attendees listened to a succession of speakers describe established and emerging technologies and the solutions that various users have found to document storage, retrieval, and distribution problems.

Computer output microfilm (COM). Although still thought of primarily as a medium for document storage, micrographics offers considerable versatility through such refinements as computer-aided retrieval (CAR), half tone and color recording, and graphics capabilities. Engineering drawings are typically filmed and stored on 35mm aperture cards, but those created at CAD stations can bypass this hard-copy stage and be output directly on 35mm or 105mm film at high speed. This is a relatively expensive form of output, yet volume, hard copy, distribution, and frequency-of-update requirements can make it economical in certain types of applications.

Large numbers of drawings stored on microfiche or aperture cards can be accessed remotely in seconds with sophisticated retrieval systems. Images are placed in front of a scanner for rapid digitizing and transmission to a display terminal or a hard-copy plotter. An additional advantage of CAR is that it allows extensive cross-referencing; thus, an image can be located through any one of several parameters.

Electron beam recorder. Another method for recording digitized data on film is through the use of an electron beam recorder. Instead of reproducing an image displayed on a CRT, as a COM recorder does, the electron beam recorder creates the image directly on electron-sensitive film at a higher resolution than provided by a COM recorder. A projector then shoots the image up 10 diameters for printing. According to Troy Pelfrey of Image Graphics, Inc., the drawings that result match the accuracy of pen plotters and are produced much faster. In addition, a variety of line widths can appear in the final print.

With its ability to print raster or vector data, register multiple images and overlays, and make color proofs, the electron beam recorder can be particularly useful in CAD applications. Equipment costs range from $200,000 for a basic electron beam recorder to more than $450,000 for a complete system. Edward J. Westlund of 3M Company, whose topic was “Micrographics Versus Optical Disk,” commented that “the electron beam shows promise of being the ultimate system.”

Optical disk. The optical disk (a) is not a commercial product today, (b) offers the potential for instant remote access to a large file, (c) has beenscrapped by a number of R&D companies, (d) will find significant use as a read-only device on personal computers, (e) is already marketed as a storage system. All of these statements—complete with seemingly inherent contradictions—were expressed with conviction during the three-day conference, so it is safe to say that optical disk technology is still very much in a state of flux. Although working systems may be in scant evidence today, the consensus is that they are definitely coming; over 30 companies are working on the technology, according to Westlund.

Problems cited by Westlund include error rate over a 10-year life, poor gray-level quality, and the need for a disk and drive to be commercialized. Nor is optical disk technology ready to compete with micrographics in cost.

Rapid access to images on the same platter is a major feature of the optical disk, said Robert J. Kalthoff, president of Access Corporation. But he also pointed to a contention problem with large-scale optical disk operations. Because of the time delay in bringing different disks to a single read head. He feels that instead of an either-or situation, optical disks and micrographics can complement each other. The development of an erasable optical disk that would make use of a change in physical chemistry is also a possibility, Kalthoff said.

Mnemodisc. Neither an optical disk nor a film medium, the Mnemodisc is a clear plastic disk about the size of an LP record. It can hold 6000 8½ × 11-inch
pages of text and/or graphics and uses an outer ring for positioning during image retrieval. Magnetic media are preferred as input, and the images can be redigitized for transmission. A hard-copy printout capability will be available in June, according to Stan Bailey of Mnemos, and the ability to store E-size documents is also expected soon.

To manufacture the Mnemodisc, a glass master disk is created with an electron beam recorder; then an intermediary version (a stamping master) is used to produce the number of replicas needed. Data is displayed on a special workstation at a resolution of 200 lines per inch.

With its higher rate of reduction and short access time, the Mnemodisc may well compete with COM in certain applications. It is not intended for documents that are frequently updated, however; a practical revision cycle for Mnemodisc storage would be 90 days or longer.

**Total document management.** Much vital data still exists only on paper. Scanners for rapidly digitizing both text and graphics remain a major concern in large-volume applications, with color scanning, film scanning, and large engineering drawings posing perhaps the greatest challenges. The ability to vectorize, and thus compress, raster data may also be desirable for applications in which high-speed communication is required.

The paperless office may never become a reality and may not in fact be all that desirable. It appears that total document management in large companies will continue to incorporate paper, magnetic, film, and optical media, capitalizing on the strengths and economies of each to create a system that can meet the specialized needs of each organization.

**CAE journal offers discounts to society members**

*Computer-Aided Engineering* is a recently introduced, bimonthly IEE publication that promises refereed papers and articles designed to update professional engineers in the design, manufacture, testing, learning, and management aspects of CAE. For information on subscription discounts for members of IEE, IEEE, IOP, AIP, and IMECH, write to IEE, PO Box 26, Hitchin, Herts, SG5 1SA England.

**Graphics market survey and CAD primer offered**

A report on the estimated $4.4-billion European market for computer graphics equipment and a CAD evaluation aid are now available from Technology and Business Communications, Inc.

Published in cooperation with Europe's J+J Consultants, the 230-page *Marketing Computer Graphics Equipment in Europe* lists computer graphics distributors, manufacturers, exhibitions, and publications in Belgium, France, West Germany, Italy, Norway, Spain, Sweden, Switzerland, and the United Kingdom. The $675 report analyzes industrial and economic conditions and discusses business customs, attitudes, and opportunities.

Economics of CAD, Solving the Puzzle is a 35-page report intended to help readers select and evaluate a CAD system for eventual purchase. The report presents ways to test a system, calculate potential benefits, and integrate the selected system into a company's operations. It sells for $29.

Both reports can be obtained from TBCI, PO Box 89, Sudbury, MA 01776; (617) 443-4671.

**CG '84 expects 25,000 for its five-day “video gala”**

From May 13 through May 17, approximately 225 industry experts and professional educators will conduct 25 tutorials and 87 technical sessions on more than 20 topics in computer graphics at Computer Graphics 84, the fifth annual conference and exposition of the National Computer Graphics Association at the Anaheim Convention Center in Anaheim, California.

NCGA, in cooperation with the Human Factors Society, the Society for Photo-Optical Engineers, Women in Information Processing, and CADAM Users Exchange, will feature six major sessions on video technology and four tutorials and nine technical sessions on visual arts and design.

The four-day exposition will give representatives and technical staff of 200 vendors an opportunity to explain products and services for use in CAD/CAM, business and management, cartography, structural analysis, medicine, animation, marketing, and architecture.


**Computer graphics sales to reach $23 billion by 1992**

An international research report firm is predicting that sales of computer graphics equipment and software will jump from $1.7 billion in 1982 to $6 billion in 1987 and $23.3 billion by 1992, a growth rate that averages 30 percent a year.

The Frost & Sullivan market study, *Computer Graphics in the Manufacturing Industries*, reports that CAD products composed 53 percent, or $885 million, of the overall 1982 market. With CAM products responsible for an additional 9 percent, CAD/CAM products together totaled more than $1 billion. Most of the remainder of the market was divided between business graphics and monitoring and control applications.

According to the study, business graphics is the fastest growing segment of the market, increasing by 40 percent a year from 17 percent of the total in 1982 ($280 million) to 35 percent in 1992 ($8.1 billion).

The market study (report 1028), which sells for $1300, can be obtained by contacting Customer Service, Frost & Sullivan, Inc., 106 Fulton St., New York, NY 10038; (212) 233-1080. In Europe the address is 104-112 Marylebone Lane, London W1M 5FU.

**TC begins work on office systems standards**

ANSI's Technical Committee on Office Systems, the X3V1, has received permission to start work on three new standards development projects: (1) text imaging capabilities of text, data, graphics, imaging, and voice output devices (X3 Project 393-D); (2) positioning of text on hard-copy devices and definition of techniques for text interchange (X3 Project 394-D); and (3) a basic processable text interchange format, which will include physical layout elements and the form of interchange to be extensible to an interchange format for mixed-mode testing (X3 Project 395-D). The format is also intended to be compatible with the inclusion of identifier/delimiters for logical structure elements.

Work already underway is scheduled to continue at the next X3V1 meeting June 11-15 in Toronto. Interested participants should contact X3V1 chairman for more information: Millard Collins, IBM Corporation, IBM Tower at Williams Square, 5205 N. O'Connor Rd., #200, Irving, TX 75039-5030; (214) 556-7690.

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Caltech to use computer graphics in all academic areas

"Over the next five years, we expect to see a revolution in teaching, with computers used as tools in essentially every academic discipline," said Geoffrey Fox, professor of theoretical physics and dean for educational computing at the California Institute of Technology.

"Caltech has already made considerable progress toward computerizing its courses," said Fox. "Computer courseware is in use or under development in many areas of the institute, particularly in computer science, engineering (including computer-aided design), and physics. Caltech faculty are emphasizing computer graphics in their projects."

Caltech recently announced a three-year major equipment grant from IBM to support the project. IBM will supply several hundred IBM PC workstations, a host processor, and several graphics subsystems to aid in the development and use of educational software.

A cash grant of $150,000 will accompany the equipment grant so that adapter cards can be purchased to tie the IBM workstations to Caltech’s campus-wide high-speed network. An IBM technical support person has also been assigned to the project for three years.

In addition to the IBM grant, Caltech has received pledges of cash and equipment totaling more than $1 million from other computer vendors.

When fully implemented, the system will include over 800 workstations in clusters of 10 to 20 machines in classroom areas, laboratories, the computing center, and libraries. Faculty and teaching assistants will be able to prepare courseware on individual workstations, and students will have network outlets in their dormitories if they wish to use their home computers.

GKS introduced to wider audience

Two independent organizations have announced plans to bring the proposed American National Standards Institute’s Graphical Kernel System software standard for computer graphics to the attention of more professionals.

Nova Graphics International Corporation recently announced plans to conduct three two-day educational courses entitled "Introduction to GKS" for designers and developers of computer graphics software, hardware, systems, and applications. In addition to presenting an overview of GKS, its history, significance, and relationship to other standards, the course will cover specific technical features of the proposed standard. The $495 course will be held June 25-26, September 24-25, and November 5-6 in Austin, Texas. For further information, contact Nova at 1015 Bee Cave Woods, Austin, TX 78746; (512) 327-9300.

The Association for Computing Machinery’s Special Interest Group on Computer Graphics (Siggraph) has printed copies of the complete GKS document for distribution to 12,000 of its members receiving the February issue of its publication, Computer Graphics. Siggraph’s wide distribution was intended to enable as many members as possible to respond to ANSI’s July 1, 1984, deadline for evaluation of the proposed standard.

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