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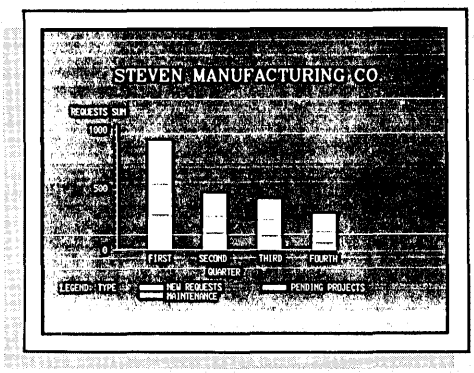

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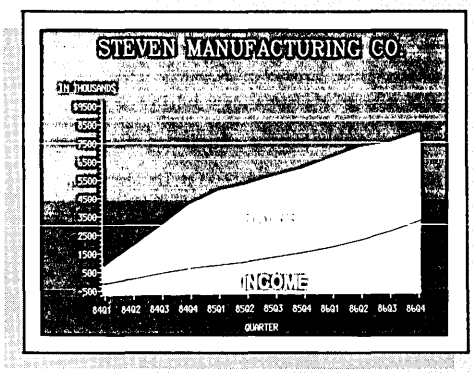

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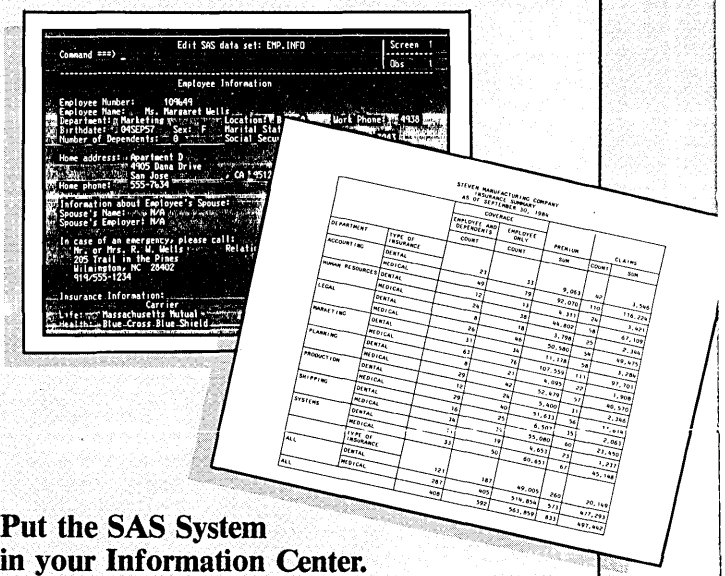

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CIRCLE 3 ON READER CARD

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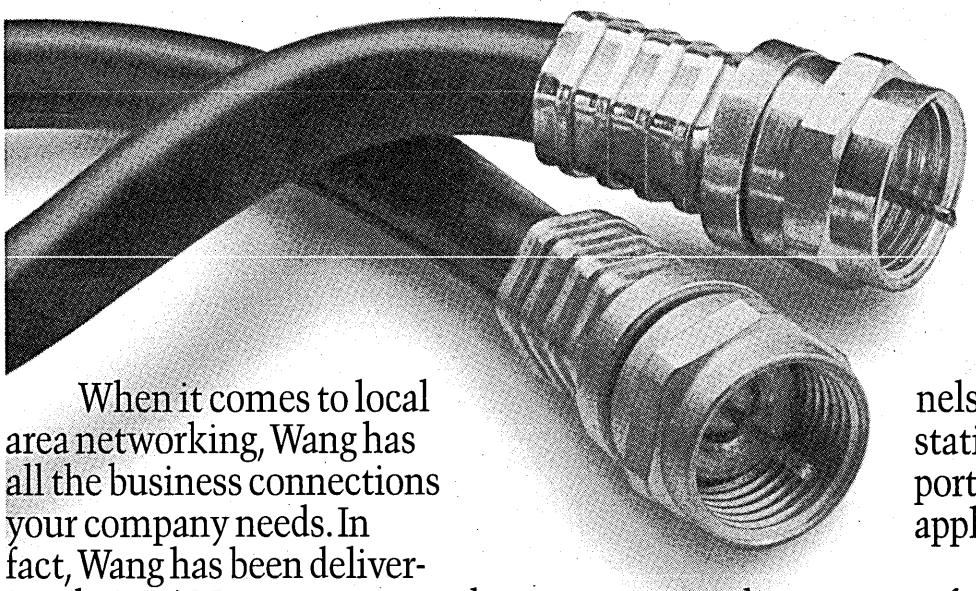

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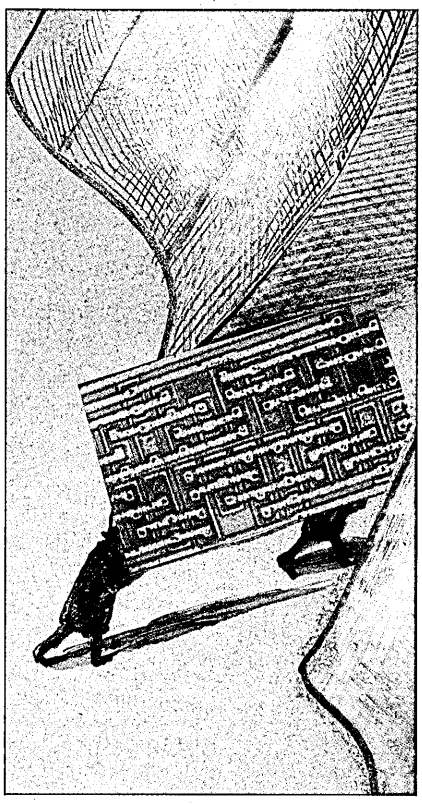

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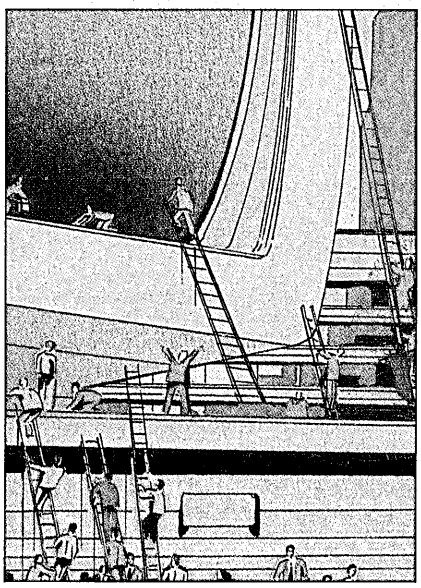

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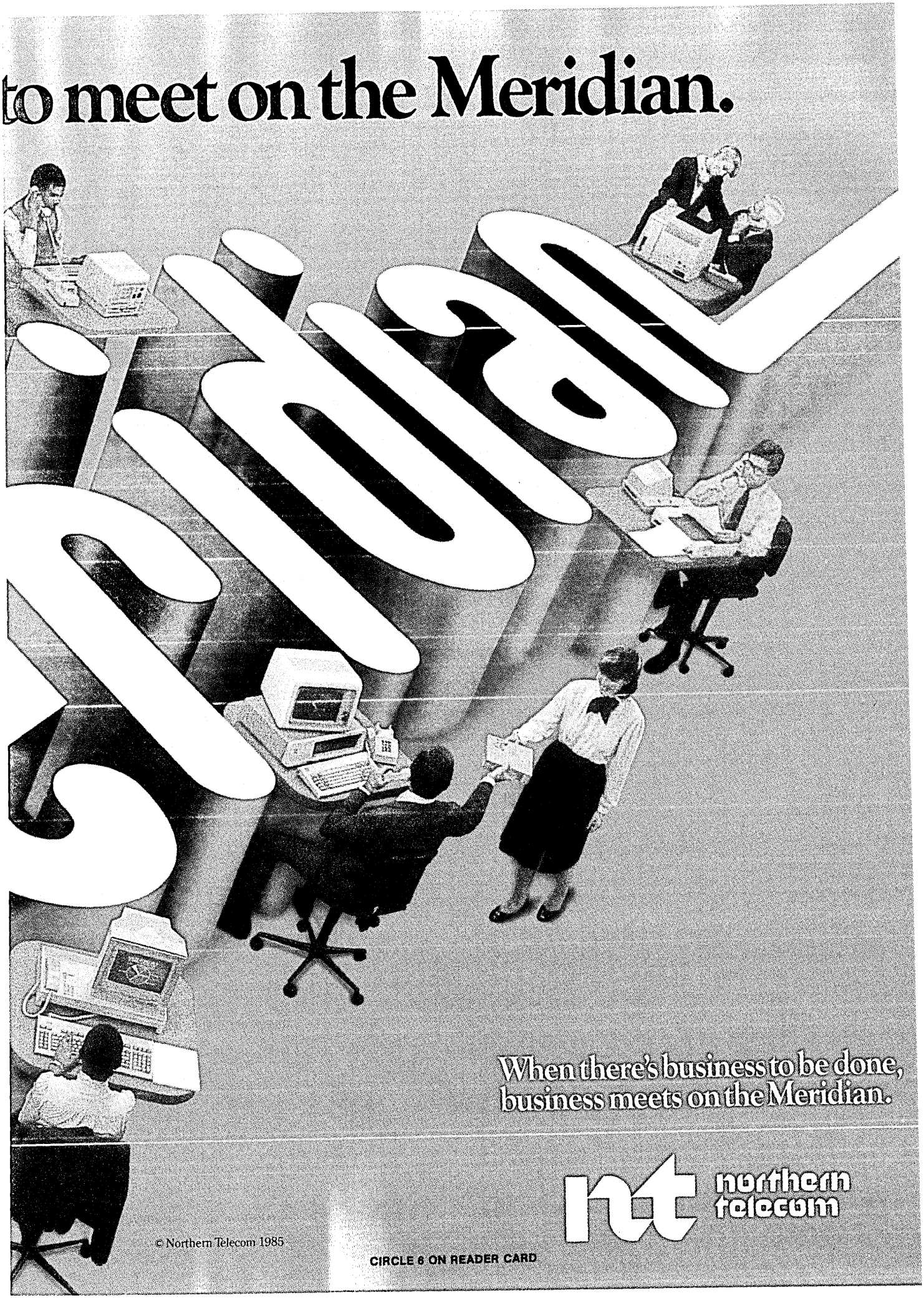

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CIRCLE 6 ON READER CARD

LOOKING BACK

PHILOSOPHIZING IN PHILLY

June 1965: Topics like "What's New in Punched Cards" and "Scheduling for Optimum Computer Utilization"—as well as exhibits by hardware vendors— drew dp managers to the DPMA International Conference and Business Expo in Philadelphia. Some 40 seminars were presented in the areas of MIS, dp management, dp education, hardware, and software.

Walter W. Finke set the keynote with his thoughts on "Computers and the Great Society," a modest project President Lyndon Johnson was launching at the time. Other sessions were perhaps closer to the dp managers' hearts. "Today Data Processing—Tomorrow Top Management," for example, addressed questions like, "Why isn't the dp manager a part of the management team?" and "Why aren't more dp managers promoted into management positions?"

Why indeed? Perhaps because dp was still a back office function, out of top management's sight and mind. But people were working to change that. Vincent Bannan of RCA mediated a discussion entitled "Putting Management On-Line" in which he said, "The computer and specifically on-line management, I believe, will swing this pendulum of diminishing authority back to management."

OBJECTIONS OVERRULED

June 1975: "Gosh, it sounds great and we'd like to do it, *but*. . ." was what a lot of dp managers answered when asked about structured programming, and Edward Yourdon was tired of hearing it. In "Making the Move to Structured Programming," he attempted to quash their protests and move them toward a brave new structured world.

According to Yourdon, a lot of the objections to structured programming were really political. Managers who discovered how bad their programming productivity was, he reasoned, were trying desperately to cover it up in the hopes of avoiding any accusations that they'd been doing an unsatisfactory job for years. Other managers, Yourdon said, figured the structured programming techniques couldn't really deliver the fivefold increase in programmer productivity that was advertised. They didn't think they could expect more than 10%. Yourdon pointed out that their programmers may have been following an informal, semi-structured, semi-top-down approach all along. Still, they felt the small increase would reflect badly on their competence as well as their programmers. Yourdon commented, "One hardly knows what to say about this head-in-the-sand objection, except the obvious point that a 10% improvement in productivity, with commensurate improvements in software reliability and maintenance, is better than no improvement at all!"

Still other managers protested that the Hawthorne effect (i.e., programmers are more productive because they know they are being observed) would alter the results of a study on structured programming. Yourdon believed that any manager who knew anything about programming would laugh at this objection. He added, however, that "many dp managers are about as familiar with programming as they are with the theory of relativity." Even if the Hawthorne effect were valid, so what? Why knock it?

Another common objection was that structured programming techniques were of little help when maintaining existing unstructured programs. A valid point, said Yourdon, but it is possible to add new sections of code in a top-down, structured manner. There were also complaints about the cost of training programmers and developing new standards to conform to the new programming techniques. Yourdon maintained that retraining costs were relatively small in comparison to the eventual benefits, while the cost of developing new standards seemed "to be an inevitable fact of life." Still other managers were bothered by obstinate programmers who objected to this new approach. Words like "awkward" and "inadequate" were often heard when senior programmers discussed structured programming. To sum up Yourdon's response: poppycock.

—Mary Ann Hariton

SCIENCE/SCOPE

A new radar can map military targets with high resolution equal to that of infrared devices, even in rain and other bad weather. The Advanced Synthetic Aperture Radar System (ASARS-2), designed to complement electro-optic sensors, is flown on a U.S. Air Force TR-1 reconnaissance aircraft and provides real-time radar imagery to a ground station. ASARS-2 operates in all weather at ranges far exceeding the capabilities of infrared and other electro-optic devices, thanks to new state-of-the-art signal processing and other advances. The Air Force gave the system an excellent rating after it underwent strict operational performance tests as part of a "fly-before-buy" program. Hughes Aircraft Company is producing the system under a development and production contract. Eventually ASARS-2 is expected to be adapted for tactical aircraft and mobile tactical stations.

NASA's Project Galileo Probe, which will explore the planet Jupiter later this decade, must arrive at a precise angle if it is to carry out its measurements of the chemical composition and physical state of the Jovian atmosphere. The Hughes-built probe will arrive at 107,000 miles per hour, fast enough to travel between Los Angeles and Las Vegas in nine seconds. If the probe hits at too shallow an angle, it will skip off into space; too steep, it will be reduced to ashes. Even at the proper angle, the probe will encounter extremes never before faced by spacecraft. In less than two minutes, much of the forward heat shield will be eroded by temperatures of thousands of degrees. With atmospheric entry forces reaching 360 times the gravitational pull of Earth, the 742-pound probe will take on a weight equal to an empty DC-10 jetliner. Project Galileo is scheduled to be launched from the space shuttle in May 1986 and to arrive at Jupiter in August 1988.

Two versions of a new color image recorder, designed to provide the means to capture on film the precise color image from television monitors, have been introduced by Hughes. The high-fidelity TV recorders, Models CIR 100 and CIR 200, interface directly with a color display. They contain their own high-resolution, flat-face cathode-ray tubes, primary color filters, and controls for exposure and color. They record on either 35-mm or instant film with the high resolution, brightness, and color range necessary for scientific, medical, or other applications where accuracy is essential.

Lasers soon will be inspecting solder joints of fighter aircraft radars, thanks to new manufacturing technology being set in place at Hughes. Solder joints will be examined by a computerized technique using lasers and fiber optics, the glass threads that carry laser light transmissions. The process will free manufacturing personnel from tedious and time-consuming inspections of more than 36 million solder joints created in a single year's production. The project is part of an Industrial Modernization Incentive Program (IMIP) awarded by the U.S. Navy and Air Force. IMIP is a share-the-savings concept that will reduce costs of the F-14, F-15, and F/A-18 radar programs by more than $10 million, while improving the quality and reliability of the systems.

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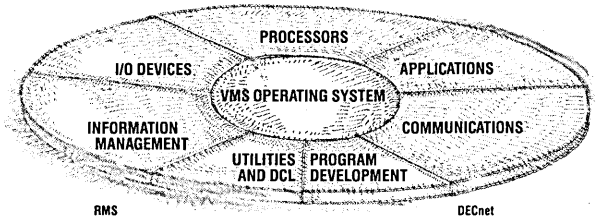

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As for complex, high-volume production applications, IDMS/R is without peer. Thanks to the unique architecture of IDMS/R, data processing can tune the database and thereby benefit from a dramatic boost in performance. Moreover, IDMS/R has the most sophisticated back-up and recovery capability of any dbms —an absolute must for on-line applications.

The Complete Software Solution

Decision Support Applications Database

And when one considers that IDMS/R is the cornerstone of the only information management system available today that fully integrates database, applications and decision support software, choosing a relational dbms becomes a very simple decision.

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We understand business better than any software company in business.

CIRCLE 7 ON READER CARD

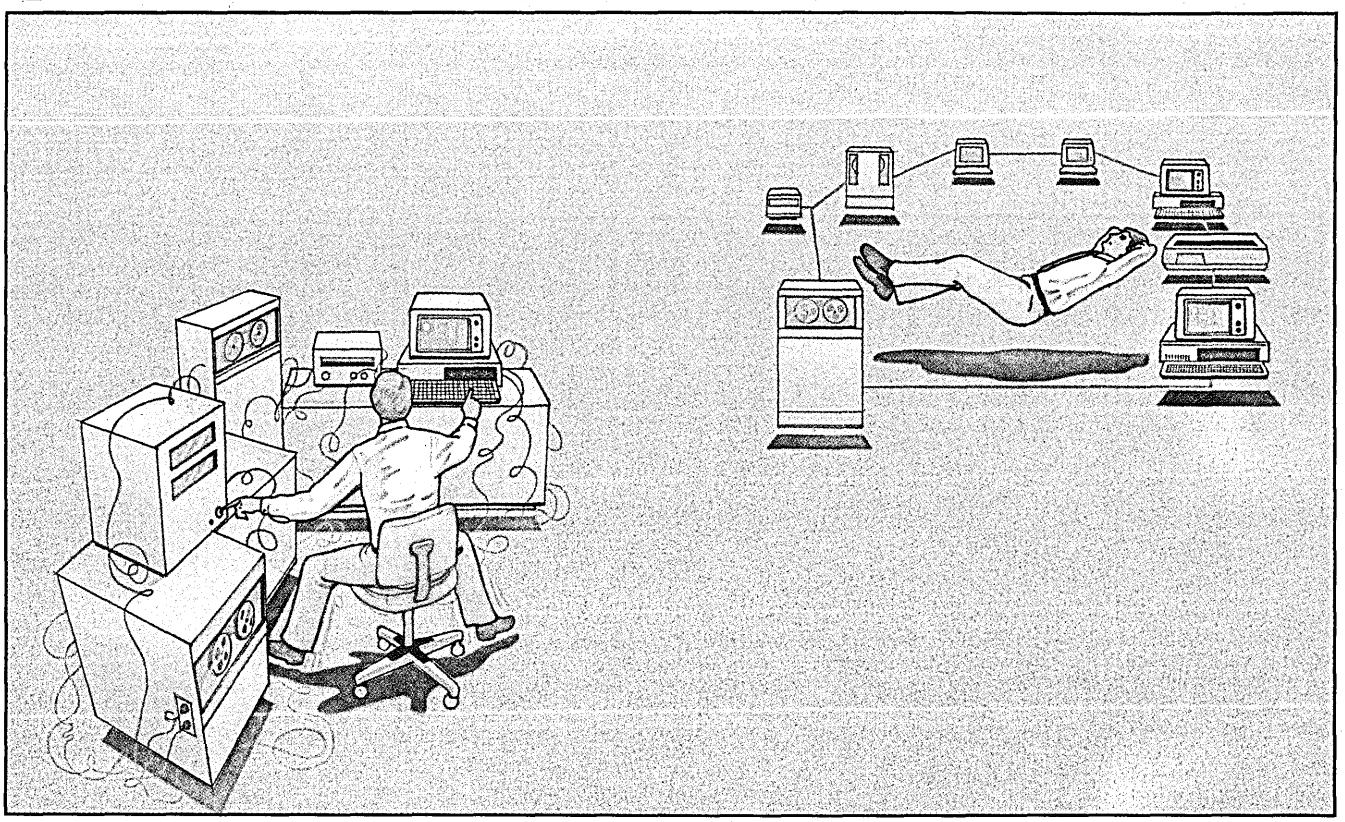
LOOK AHEAD

DG'S ANSWER TO MICROVAX II	Even as Digital Equipment has established a new technology standard at the low end with its MicroVAX II, Data General has been laboring on its response. The Marlboro, Mass., company has slated a year-end debut for its so-called MicroEagle, a desktop version of its 32-bit minicomputer. Sources say the entire MV architecture has been etched onto four chips, with a floating point processor on a fifth. The new box will support the CEO office software and IBM PCs at a bargain basement price of about $7,000.
IBM'S RING NET DUE AT YEAR-END	IBM is completing work on its token ring local area network product in Zurich, and the long-heralded product may actually appear in user shops by the end of the year. It will operate at 4MB over specially treated twisted pair wire, support both voice and data, and will be primarily driven by a Series/1 server.
NEW WARES FROM TANDEM	Tandem Computers Inc., Cupertino, Calif., is working on another new low-end, entry level system as a departmental computer to flesh out its line below the recently introduced EXT, according to Wall Street sources. Major software enhancements almost ready for release include an enhanced SNA link with DIA/DCA hooks for supporting IBM's office automation protocols and an improved database management system.
PC TO SNA LINKS FROM AT&T	AT&T is trying to leverage off IBM's installed base by offering, if not compatibility, at least PC to SNA connectivity. Ma Bell is expected to announce one or more local area network products later this month in conjunction with the unveiling of up to 30 Unix PC software programs. A source close to AT&T claims the new devices will provide both Starlan and Ethernet local area networks with SNA compatibility. One product, the source adds, may hook a cluster of Ethernet-driven 3B computers to SNA through either a direct or remote channel. A 3B could also conceivably act as a file server and gateway to SNA.
NBI SHOPPING AGAIN	Watch for NBI Inc., Boulder, Colo., to arrange some sort of joint venture with a leading minicomputer maker in order to expand its word processing line into a broader-based office automation package. Wall Street sources report that superminis from Gould, Pyramid, Convex, and other companies are under consideration.
AT&T LOOKS AT OPTICAL SYSTEM	Look for AT&T Information Systems to make a strong and sudden foray into the optical storage arena, probably by way of very cheap wallet-sized cards holding 2 or more megabytes of memory that can be slapped into its 6300 and 7300 line of microcomputers in lieu of floppy

LOOK AHEAD

	disks. AT&T has two of its employees on the brand-new ANSI X3B10 optical memory card subcommittee, which is in the process of setting standards for the devices, and one of them is from Bell Labs. While another company, Drexler Technology Corp. of Mountain View, Calif., has the lock on the technology, some say that AT&T may be brewing up its own secret release. Also sitting on X3B10, by the way, are representatives from American Express, Polaroid, and Visa International. Is the magnetic stripe card entering senescence?
AI WORKSTATION FROM JAPAN . . .	Mitsubishi Electric, Tokyo, is due to announce a workstation with artificial intelligence, based on the Sequential Inference Machine developed at Japan's Institute for New Generation Computer Technology (ICOT). The workstation's kernel is based on Prolog and incorporates a software development environment similar to Smalltalk. Expect an announcement in the next few months, though distribution will initially be limited to other Japanese affiliates of ICOT.
. . . AS IBM AND BERKELEY LOOM	Work is under way at the University of California at Berkeley on a VLSI chip that would run Prolog in native mode. Meanwhile, a 370-based Prolog product is being readied by IBM. Big Blue's Paris Scientific Center already has an experimental VM/CMS version of Prolog, which may form the basis of the new product offering. IBM also offers Lisp under VM.
PRICE PRESSURE AT PRIME?	The price/performance of Digital Equipment's new MicroVAX II may pressure Prime Computer to drop its prices. Prime's medium and low-end systems-especially its 0.9 MIPS 9650, which sells for $84,000 a MIP, and its 2550, selling at $59,000 a MIP and weighing in at 0.75 MIPS-are vulnerable since the MicroVAX II sells for a fraction of the price. The company claims that because of limited I/O, disk, and functionality of the MicroVAX II, it won't have to lower its prices.
RUMORS AND RAW RANDOM DATA	Japan's Ministry of International Trade & Industry is expected to select AT&T's System V as the Unix variation it will standardize around for its five-year, $100 million Sigma project, which is aimed at developing software productivity tools. . . .Later this month Valid Logic will introduce a computer aided engineering workstation package for VLSI chip design based on IBM's PC AT. . . .Don't bother to look for an Apple or Wang booth at the upcoming National Computer Conference-they've both dropped out for financial reasons. Also, Harris Information is sharply reducing its booth space, we hear. . . .Hogan Systems is planning a joint venture with an established player in the banking business for software installation, to improve customer satisfaction with its products.

In automating an office, one must often choose between piece and harmony.



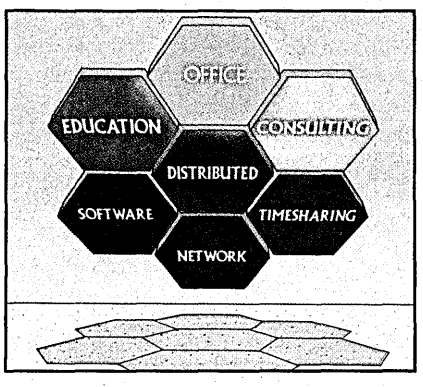
Most companies approach office automation piecemeal. So it's not surprising when their wordprocessors can't talk to their microcomputers. And mainframe text editing is frequently inaccessible to the personnel who need it most. It's also why Boeing Computer Services now introduces Boeing Office Solutions.

Boeing can integrate your current office automation hardware, regardless of brand. And we can help you choose future pieces or total systems — *without bias to a particular hardware manufacturer.*

In other words, you can come to us at any stage in the office automation process with the knowledge that we'll help you achieve harmony of hardware, software and communications.

We also offer you special software systems that can make your operations more productive . . . immediately.

For example, there's PROFS*, a system that can keep your calendar and send memos. Or DISOSS*, documentation library and distribution services. Or the Boeing Document Transfer System, a system that transforms and transmits editable text documents between your word processing machines.



PROFS, DISOSS and the Boeing Document Transfer System all run on our MAINSTREAM® teleprocessing system. Or you can license the Boeing Document Transfer System for your own computers.

Boeing Office Solutions are just one part of Boeing's complete integrated information services. Including enhanced remote computing services. Distributed processing and micro/mainframe links. Additional software solutions. Education and training. And a variety of professional support services.

For more information or the location of the sales office nearest you, call toll free **1-800-447-4700.** Or write BOEING COMPUTER SERVICES, M.S. CV-26-16A, 7980 Gallows Court, Vienna, Virginia 22180.

BOEING COMPUTER SERVICES

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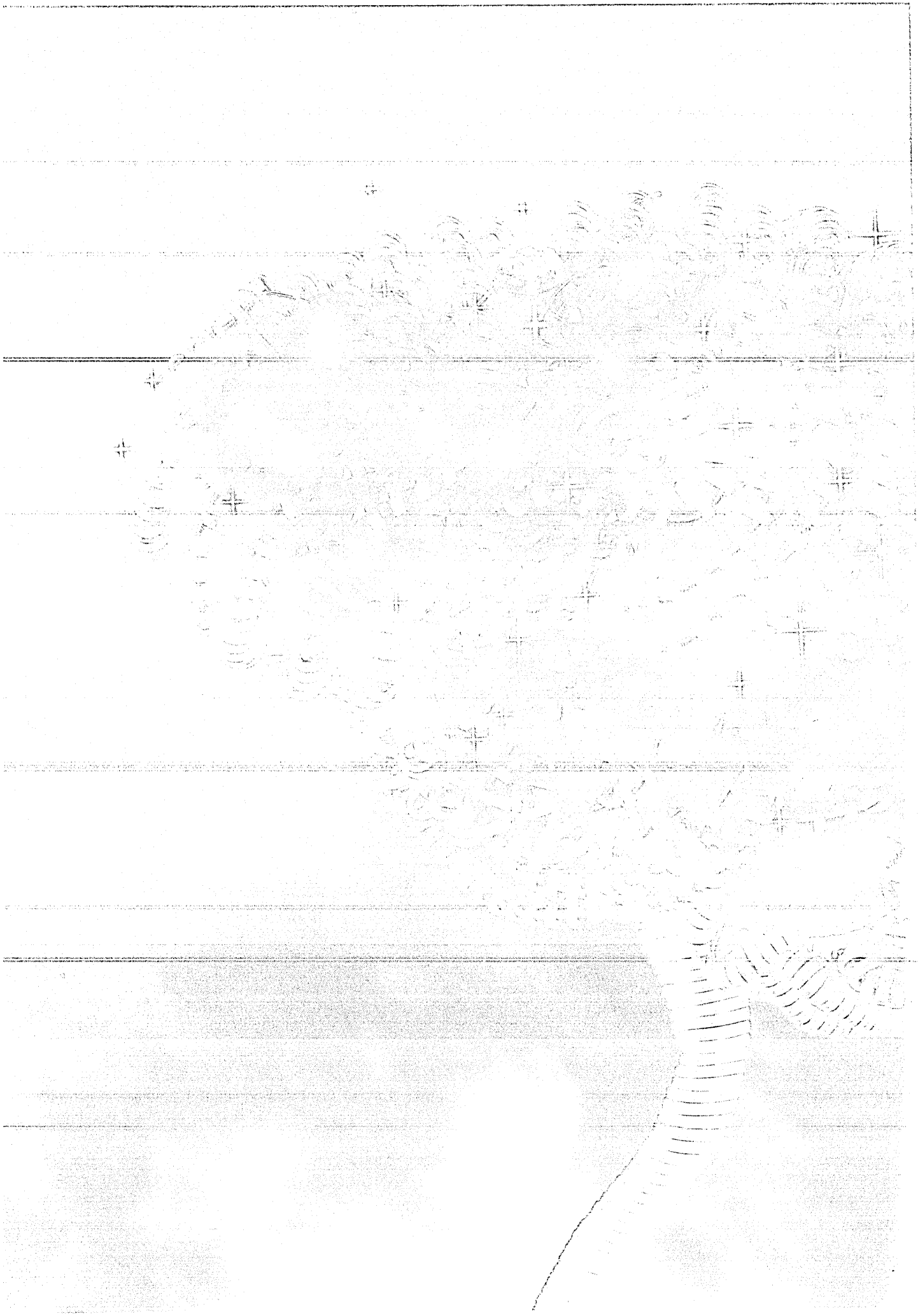
CIRCLE 4 ON READER CARD



AN INTELLIGENT COMMUNICATION SYSTEM NEEDS MORE THAN ONE BRAIN.

When communication is crucial, the only intelligent way to switch information is to distribute processing capability. At Ericsson, we've designed our MD110 Digital Switching System without a central processor, making it virtually impossible for the entire system to go down. And distributed architecture achieves this reliability using the inherent redundancy built into the system.

As a worldwide Swedish company with systems installed in over fifty countries, we've long understood the importance of reliability. We've also learned to be flexible. The Ericsson MD110 is perfectly capable of switching voice and data simultaneously over existing lines, and the modular software structure allows changes and adaptations simply, with minimal effect on the overall operation.

And when you consider that each module requires no more space and gives off no more heat than a human body, and uses only 360 watts of power, the Ericsson MD110 clearly becomes a very intelligent choice.

Ericsson. For over a hundred years, we've been making systems adaptable to your needs and compatible with your future.

For further information on the Ericsson MD110 or other Ericsson products, call us toll free at 1-800-443-0100, extension 218.

ERICSSON

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CALENDAR

JUNE

PC Expo.
June 17-19, New York. Contact Camille Caminiti, 333 Sylvan Ave., Englewood Cliffs, NJ 07632, (201) 569-8542.

EFOC/LAN 85 (The Third European Fiber Optic Communications and Local Area Network Exposition).
June 17-21, Montreux, Switzerland. Contact Michael O'Bryant, Information Gatekeepers Inc., 214 Harvard Ave., Boston, MA 02134, (617) 232-3111.

Advanced Manufacturing Systems Exposition and Conference.
June 18-20, Rosemont, Ill. Contact AMS '85, Cahners Exposition Group, 708 Third Ave., New York, NY 10017, (212) 661-8010.

Canadian Robotics Show.
June 18-20, Toronto. Contact Ron McCreary, RIA, P.O. Box 1366, Dearborn, MI 48121, (313) 271-7800.

Design Automation Conference.
June 23-26, Las Vegas. Contact P.O. Pistilli, MP Associates Inc., 7366 Old Mill Terr., Suite 101, Boulder, CO 80301, (303) 530-4562.

Telecon East.
June 24-26, New York. Contact APPLIED BUSINESS teleCOMMUNICATIONS, Box 5106, San Ramon, CA 94583, (415) 820-5563.

VIDEOTEX '85.
June 24-26, New York. Contact Online Conference Inc., 989 Avenue of the Americas, New York, NY 10018, (212) 279-8890.

JULY

World Computer Graphics '85.
July 10-12, New York. Contact Dorothy L. Bomberger, World Computer Graphics 85, 2033 M St. NW, Suite 333, Washington, DC 20036, (202) 775-9556.

Association for Women in Computing's Fourth Annual Conference.
July 13-14, Chicago. Contact Joan Wallbaum, AWCC 85, 407 Hillmore Dr., Silver Spring, MD 20901.

1985 National Computer Conference (NCC '85).
July 15-18, Chicago. Contact Registration Dept., AFIPS, 1899 Preston White Dr., Reston, VA 22091, (703) 620-8900.

SIGGRAPH '85.
July 22-26, San Francisco. Contact SIGGRAPH '85, Conference Services Office, Smith, Bucklin and Associates Inc., 111 East Wacker Dr., Chicago, IL 60601, (312) 644-6610.

1985 Summer Computer Simulation Conference.
July 22-26, Chicago. Contact Gene Graber, Applied Dynamics International, 3800 Stone School Rd., Ann Arbor, MI 48104, (313) 973-1300.

WCCE/85 (World Conference on Computers in Education).
July 29-Aug. 2, Norfolk, Va. Contact AFIPS, 1899 Preston White Dr., Reston, VA 22091, (800) 622-1985.

AUGUST

1985 International Computers in Engineering Conference and Exhibition
Aug. 4-8, Boston. Contact Gemma Tansey, ASME, 345 E. 47th St., New York, NY 10017, (212) 705-7795.

COMTRED '85 (The National Computer Training and Education Conference & Exposition).
Aug. 7-9, Philadelphia. Contact NCEE, 1411 Walnut St., Suite 200, Philadelphia, PA 19102, (215) 972-8792.

The Fifth National Conference on Artificial Intelligence.
Aug. 11-15, Philadelphia. Contact Lorraine Cooper, AAAI, 445 Burgess, Menlo Park, CA 94025, (415) 328-3123.

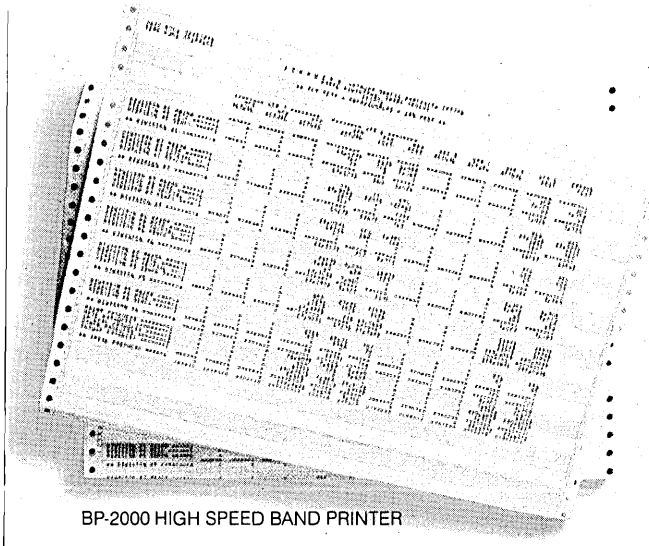
IFIP/Sec'85 (Third International Conference and Exhibition on Computer Security).
Aug. 12-15, Dublin, Ireland. Contact Conference Secretariat, IFIP/Sec'85, 44 Northumberland Rd., Dublin 4, Ireland, tel. 688244, telex 31098.

AUSGRAPH 85 (International Computer Graphics Conference & Exhibition).
Aug. 12-16, Brisbane, Australia. Contact Conference Secretariat, AUSGRAPH 85, P.O. Box 29, Parkville, Victoria, Australia 3052, tel. (03) 387 9955, telex AA 33761.

INTECH '85 (Integrated Information Technology Conference and Exposition).
Aug. 26-29, San Francisco. Contact National Trade Productions Inc., 2111 Eisenhower Ave., Suite 400, Alexandria, VA 22314, (800) 638-8510.

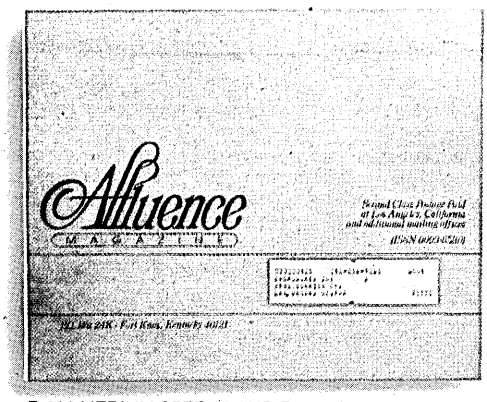
INTERCONNECT '85.
Aug. 27-29, San Mateo, Calif. Contact USTSA, 333 N. Michigan Ave., Suite 1618, Chicago, IL 60601, (312) 782-8597.

9th New Zealand Computer Conference & Exhibition.
Aug. 27-31, Auckland, New Zealand. Contact Conference Committee, C.M.S.P.O. Box 3839, Auckland, New Zealand, (09) 774-041, telex NZ2401.

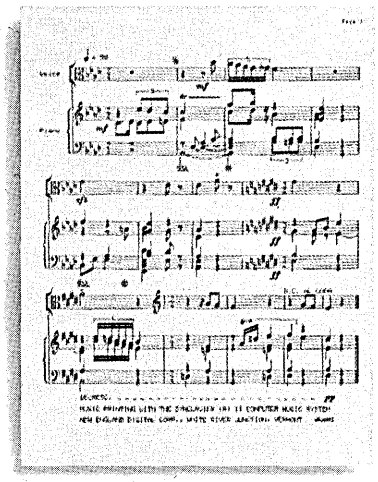


BP-2000 HIGH SPEED BAND PRINTER

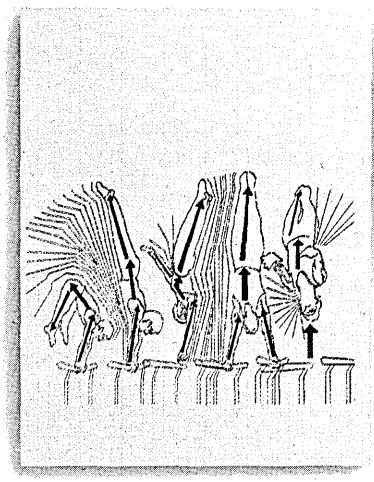
M-100L
MATRIX PRINTER



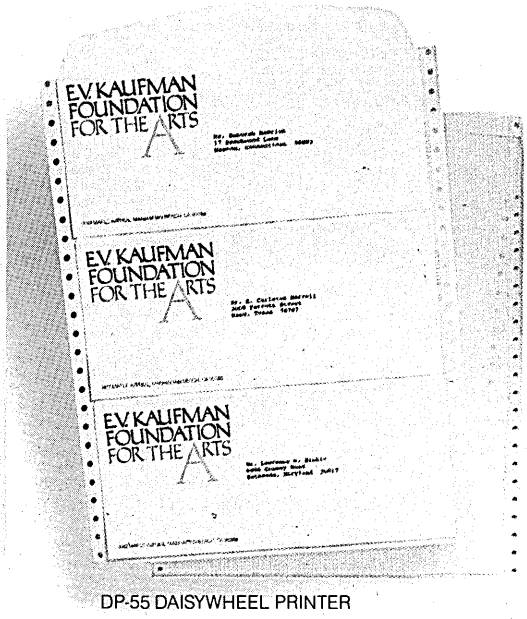
B-600 MEDIUM SPEED BAND PRINTER



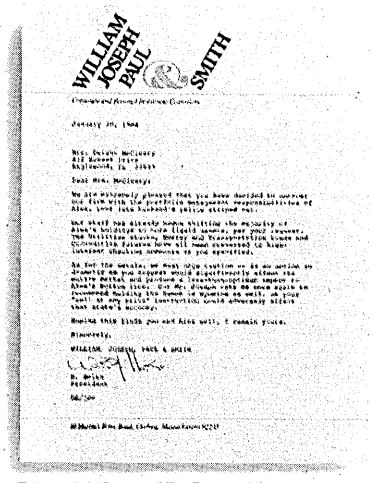
8010 MATRIX PRINTER



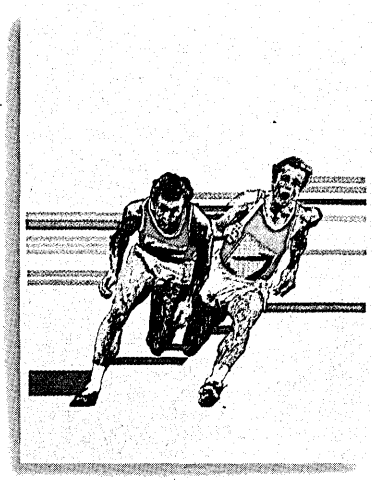
8020 MATRIX PRINTER



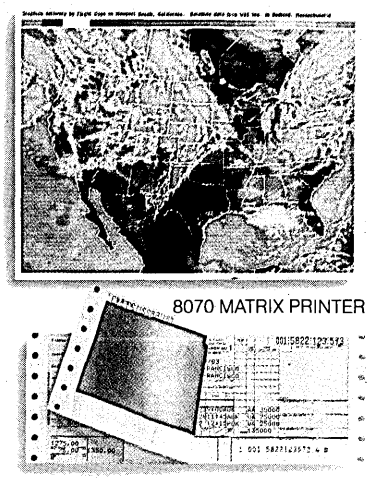
DP-55 DAISYWHEEL PRINTER



DP-35 DAISYWHEEL PRINTER



8050 MATRIX PRINTER



8070 MATRIX PRINTER

M-120 MATRIX PRINTER

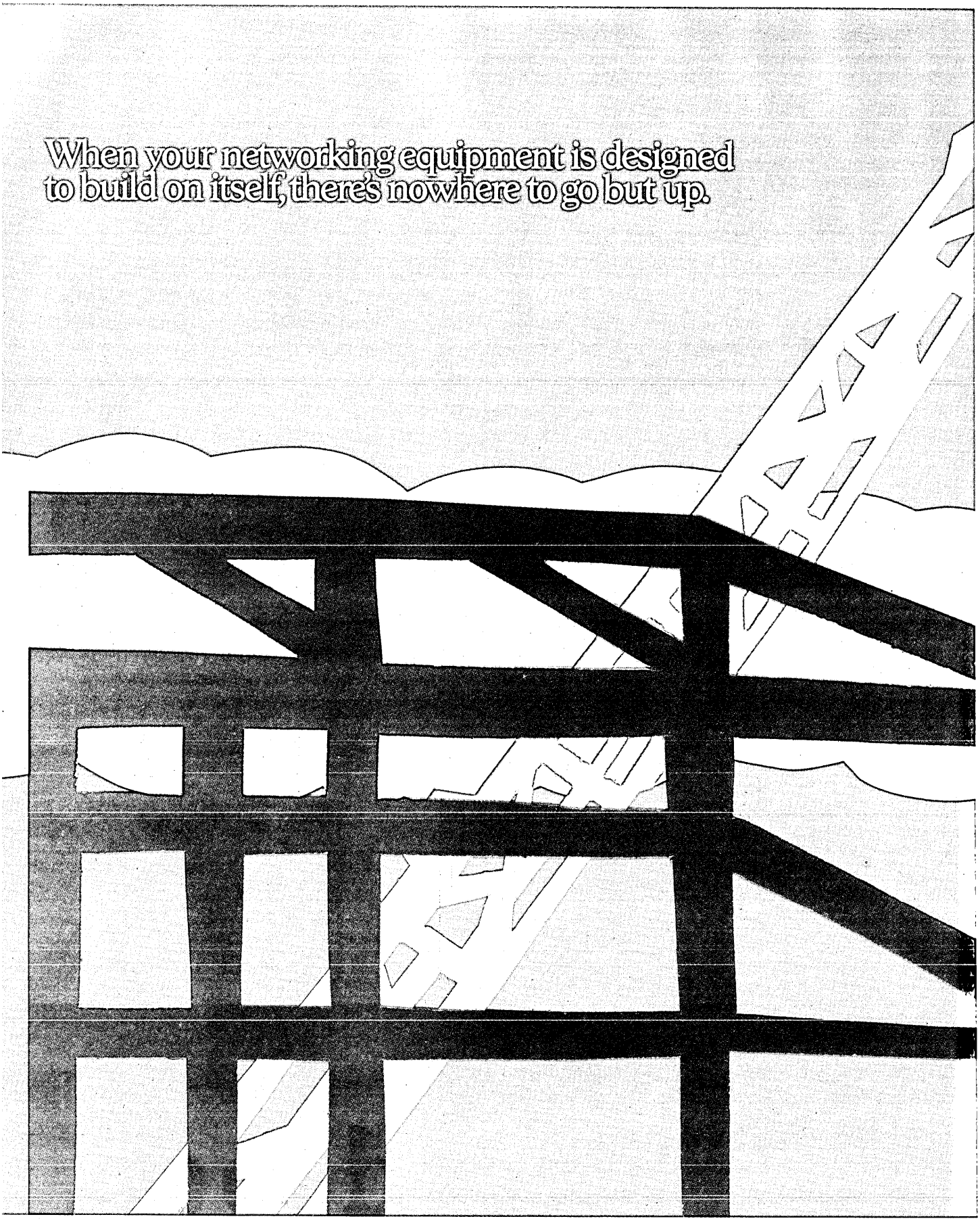
...and so on.

Dataproducts printers.
Nobody puts ideas on paper so many ways.

DATAPRODUCTS CORP., 6200 CANOGA AVE., WOODLAND HILLS, CA 91365. (818) 887-3924. IN EUROPE, 136-138 HIGH ST., EGHAM, SURREY, TW 20 9HL ENGLAND.

CIRCLE 8 ON READER CARD

When your networking equipment is designed to build on itself, there's nowhere to go but up.



Because they're so easy to upgrade, DCA's flexible network processors and statistical multiplexors can easily grow with your company. So can our modems, our network management software and our advanced 56KB-to-T1 time division multiplexors.

You see, ever since 1974 when we introduced the first commercial stat mux to the marketplace, we have built our entire product line aroun modular hardware and software. Every network we sell incorporate error-controlled transmission and virtual circuit switching. Plus ever

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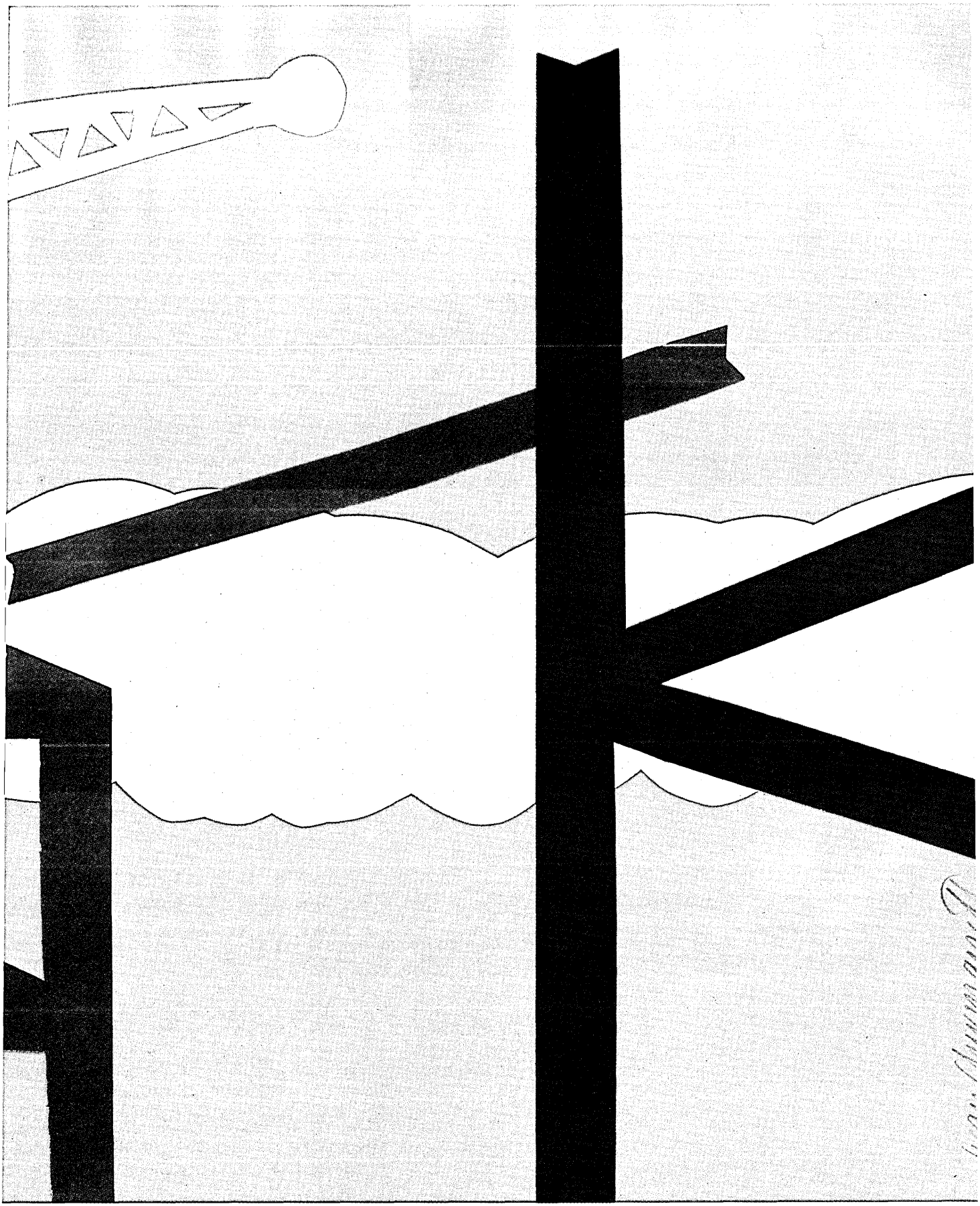

part of our network is transparent, so everything is compatible.

And what's more, DCA network systems also support synchronous protocols, X.25 interfacing, camp-on, broadcast and contention functions.

So it's no wonder DCA customers feel they've made a wise, long-term investment. They have. To find out more, call DCA at *1-800-241-5793.*

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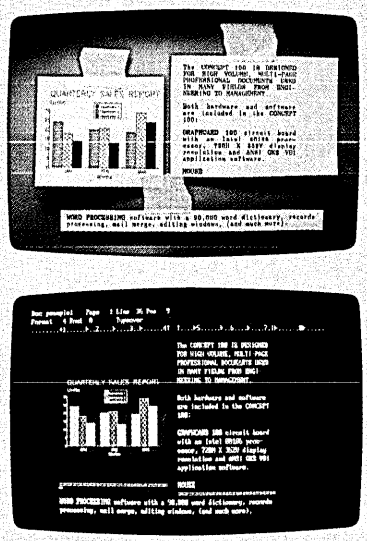
CIRCLE 9 ON READER CARD

TEXT PLUS GRAPHICS, MINUS SCISSORS AND PASTE: THE $2195 PC SOLUTION!

Now you can produce full-function text-and-graphics for reports, manuals, color overheads and slides right on your PC XT/AT. All you'll cut out is the scissors and paste! The CONCEPT 100 System lets you create text on a Wang-like word processor, complete with 90,000-word dictionary and list processing. You can easily create charts and drawings. Or import text or graphics from other systems. Then, use electronic cut-and-paste to combine them on-screen just as you'll see them in hard copy.

CONCEPT 100™ is based on the ANSI GKS* standard using the Virtual Device Interface. It offers Tektronix terminal emulation and output options like the ConceptWriter™ or Lasergrafix laser printers. In short, it's a personal publishing system at an unprecedented low price. Now available from your local distributor.

Call 1-800-631-2692 for more information.

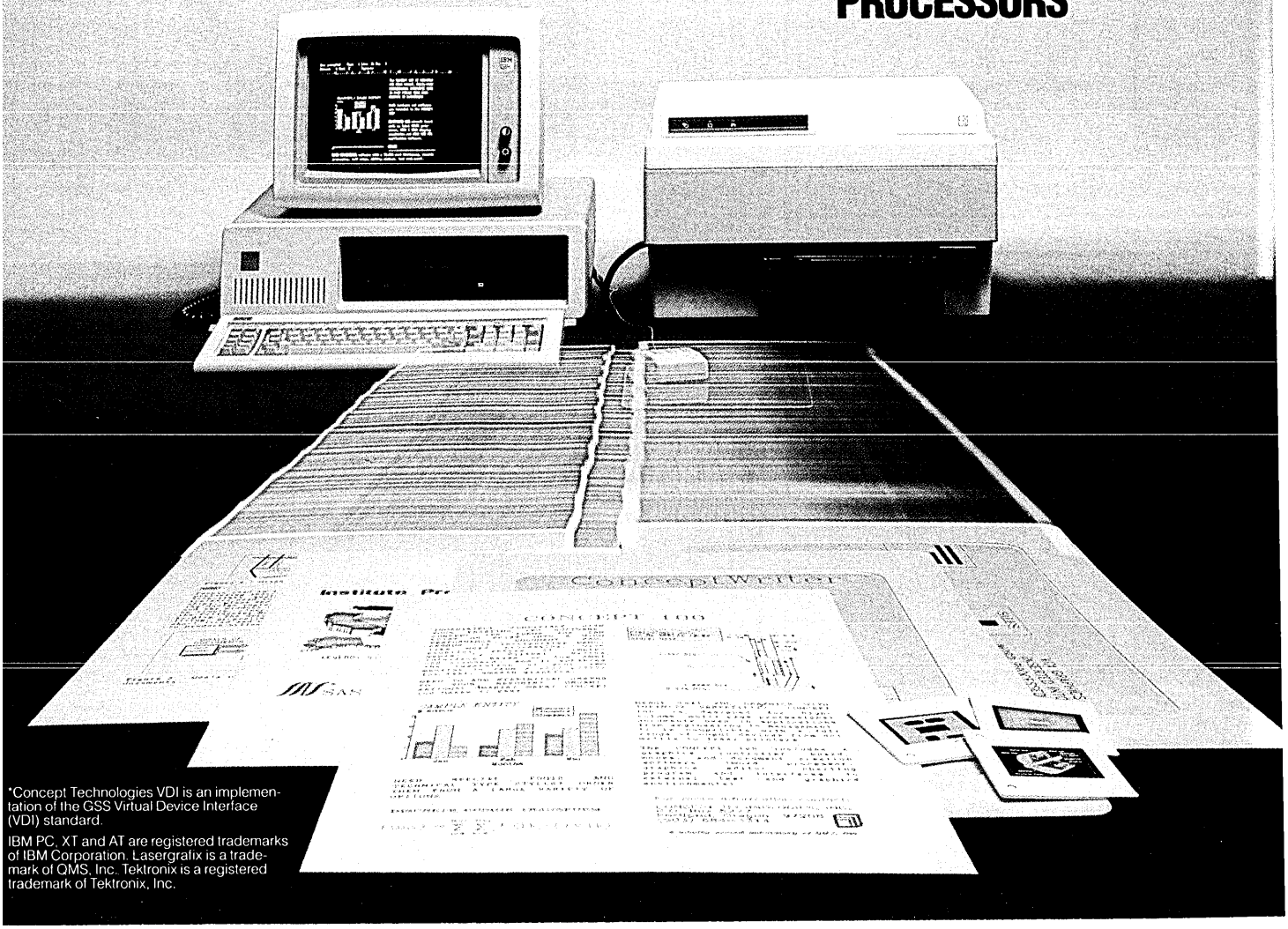


CONCEPT TECHNOLOGIES, INC.
A QMS Company

P.O. Box 5277, Portland, OR 97208

CIRCLE 10 ON READER CARD

THE DOCUMENT PROCESSORS©



*Concept Technologies VDI is an implementation of the GSS Virtual Device Interface (VDI) standard.

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LETTERS

GET THE PICTURE?

The views espoused in "Graphically Speaking with Dr. Edward R. Tufte" by John W. Verity (April 1, p. 88) could be summarized as computer graphics encourages poor graphics design.

An interesting theory, but what do we see happening over time in computer graphics? The same process of natural selection that took place when paintbrushes, ink, and drafting boards were introduced—as the tools got better, so did the end product. Inevitably. When the person in the next office produces better, more informative graphics than you do, you catch up.

If people are still gleefully producing moire patterns and bad fonts as new generations of graphics capabilities evolve, I will gladly concede to Dr. Tufte's views. In the meantime, I give the industry credit for coming quite far, quite fast.

RICHARD S. GALLAGHER
Manager, Technical Support
PDA Engineering
Santa Ana, California

"Graphically Speaking with Dr. Edward R. Tufte" is an excellent article, one that describes a major problem in computer graphics today.

It's time we stopped thinking that chief executive officers of major companies cannot read a quantitative table, but require a multicolored exploded pie-chart; they read quantitative financial projections all day long!

LAWRENCE S. DRIBIN, PHD
Vice President, Consulting Services
The Allenwood Group Inc.
Rosemont, Illinois

PUZZLED

I believe that in "New Race for Speed Kings" (News in Perspective, March 1, p. 52), R. Emmett Carlyle was terribly unfair to Gould, Harris, and especially Perkin-Elmer. When I read "at least one of the three won't make it" followed by "the hot tip for abdication is Perkin-Elmer," I was shocked and puzzled. I couldn't believe what I was reading. Perhaps what he meant was that, in his opinion, PE was abdicating the real-time simulation market. This, at least, would be debatable. What appeared in print is utter nonsense.

Based on my experience, Perkin-Elmer has the best FORTRAN 77 that I have ever used, including IBM, HP, and DEC. I was told by the person in charge of converting a 70,000-line real-time scientific database system from Prime to PE that he was really impressed with PE FORTRAN. PE flagged all the extensions to FORTRAN 77 that three other FORTRAN compilers had let slide. Moreover, the FORTRAN optimizer eliminates the need to do very much, if any, coding in assembler. He said that this was by far his smoothest conversion.

Although FORTRAN is where PE has devoted a good deal of its development effort, their OS/32 file manager is a dream to use compared with virtually (pun intended) anyone else's. While its lack of a tree-structured directory can certainly be criticized, the ease with which one can create and use files is nothing short of wonderful.

Then there is Unix. How many other computers support the three major versions of Unix (Edition VII and both the Berkeley and Bell System V kernels), and how many have had Unix running on their equipment for so long?

RAY A. GASKINS, PHD
Director of Computing and
Professor of Mathematics
Hampden-Sydney College
Hampden-Sydney, Virginia

As the old saying goes, "there are two sides to every story," and in his unsolicted letter [see above], Ray A. Gaskins deals with the side absent from your "New Race for Speed Kings" article.

For my part, let me state that Perkin-Elmer has been and will continue to be in the forefront of high-performance computing technology. We pioneered the concept of shared memory on the industry's first 32-bit minicomputers, the 7/32 and 8/32, in 1975. We introduced the first supermini multiprocessing architecture, the 3200MPS, two years ago. And we recently extended this multiprocessing capability with the 3260MPS, providing completely integrated and transparent system support while allowing for linear growth from 1.9MIPS to 7.2MIPS and up to 21 whetstone MIPS.

Indeed, our history is high-technology multiprocessing and our future lies in taking the next logical step in this technology—providing parallel processing. We plan to accomplish this not through revolution, however, but rather by evolution.

We believe that a strong uniprocessor architecture is not sufficient to carry a computer vendor into the 1990s; thus, we are building upon knowledge derived from our customers' broad base of installed 3200 multiprocessing systems to provide one that can offer true parallel processing with components that are themselves powerful uniprocessor systems. That is part of our well-known philosophy of system compatibility and protection of the customers' investments. To this end, we will use the appropriate hardware technology to achieve the desired price/performance targets whether they be ECL, CMOS, bit-sliced, etc. Because we recognize that hardware technology is insufficient to address market needs, we also offer a full repertoire of multiprocessing software, including data communications, transaction processing, and database management systems.

Two other comments attributed to unnamed sources also bear comment. The alleged "management squabbles" statement is not representative of the facts. Data Systems Group has had zero turnover in its management team from the di-

LETTERS

rector level up, over the past 18 months, with an average tenure of eight years.

We have not had difficulty retaining our design staff. Overall, we have experienced a less than 10% turnover, far less than the industry average. Incidentally, you might be interested to learn that we even added 60 to 70 engineering personnel over the past year and plan to hire additional engineers in the near future.

JAMES K. SIMS
Vice President, General Manager
Data Systems Group, Perkin-Elmer
Holmdel, New Jersey

HARD JOB

In the Feb. 15 issue of DATAMATION, you included a service announcement (Updates, p. 149) about a company that has proposed a new method for training data entry operators, one that allows operators who are productive to listen with headphones to personal radios and tape players while they work.

"Few data entry clerks would call their jobs the most interesting work they could imagine," you state, "so . . . companies are challenged to find creative ways to motivate these clerks." The president of the training company then refers to data entry operators as "knowledge foundry workers" who perform a "necessary but mundane task."

As representatives of the data entry field and the professionals who work in it, we take exception to the condescending tone of this piece and its implications. We believe that the career of the data entry professional can be both challenging and rewarding, and we applaud our members in their serious efforts to improve the quality of their work. We also feel that our members and their operators should feel pride in the contributions they make to their organizations and to our national economy.

CLEMENT L. RUSSO, PHD
Managing Editor, *DEMA Newsletter*
Data Entry Management Association
Stamford, Connecticut

Our apologies. We did not mean to condescend, but rather, to describe some of the difficulties of a tough job.—Ed.

NOT DISOSS

In "Dark Days at Wang" (New in Perspective, April 1, p. 32), you suggested that Wang will introduce "a new, compact version of DISOSS that Wang has written over the past two years." I was referring to Wang OFFICE *not* DISOSS, as the product that will have the means to integrate office functions with the host environment. While we "will make . . . available this year" and in the years to come ever more flexible versions of Wang OFFICE, we have not and will not attempt to retool the IBM product. Our strategy is to provide a best alternative to DISOSS, one using the host as an information server.

SAM GAGLIANO
Wang Laboratories
Lowell, Massachusetts

SOFTWARE AG

We request the following be accompanied by a note expressing regret for the inaccuracies in Look Ahead (see "Cullinet, ADR to Gain Market," May 1, p. 9).

The item contained erroneous information concerning Software AG. The two major errors were (1) survey statistics in the article that were said to relate to Software AG in fact refer to another company, and (2) the survey results were misinterpreted by DATAMATION, which confused market share of "in use" systems with market share of "plans to buy."

In fact, from February 1984 to February 1985, the market share of ADABAS (Software AG) of all mainframe DBMS software in use increased from 8% to 9%. The survey also measured intentions on the part of IBM mainframe system users to acquire DBMS software packages during 1985-86. Software AG's share of prospective purchases remained constant from the previous year at 6%.

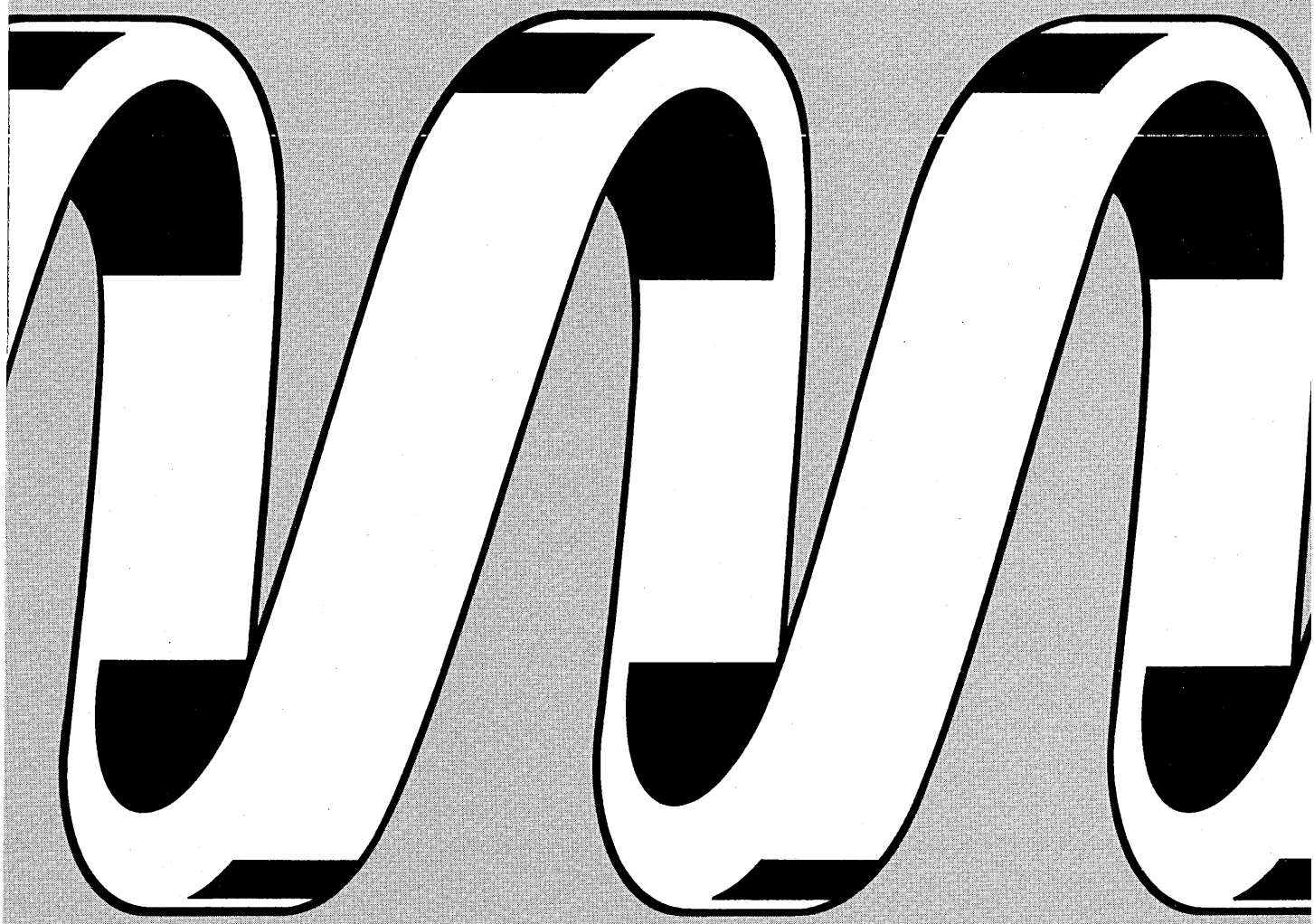
STUART MILLER
President and ceo, Software AG
Reston, Va.

CORRECTION

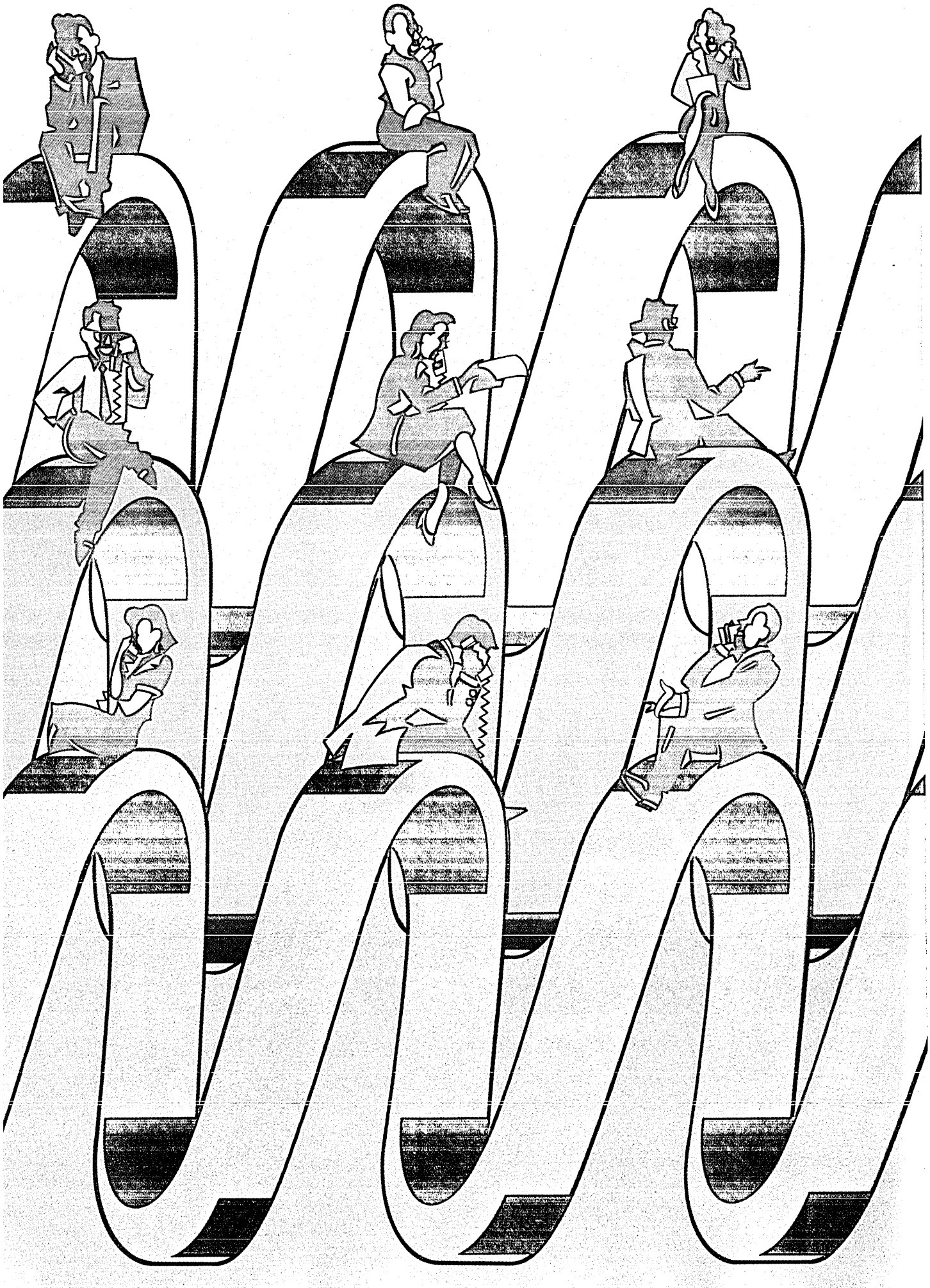
We regret the Look Ahead item mentioned in the preceding letter was inaccurate. The corrected version follows—Ed.

The future bodes well for Cullinet and ADR in the DBMS sweepstakes. Both companies are expected to increase their shares in the market for mainframe DBMSs for IBM hardware, according to a new DATAMATION/Cowen & Co. survey of 4,346 users, of which 2,947 were IBM users. Based on respondents' plans to install DBMSs during the next two years, Cullinet's share for IDMS-IDMS/R will increase to 24% of planned new installations from 17% of the DBMS systems already in use, while IBM's aggregate share for IMS, DL/1, DB2, and SQL is expected to decline to 33% from 41% on this same basis, even though strong gains are indicated for SQL and DB2. Survey results show the comparable percentages for ADR's Datacom/DB tripling to 15% from 5%, while Software AG's ADABAS is shown dropping to 6% from 9%. Among 3033/308X respondents, these percentages are shown increasing for Cullinet to 26% from 17%, decreasing for IBM to 33% from 40%, soaring for ADR to 17% from 4%, and dropping for Software AG to 4% from 11%.

AT&T SYSTEM 85 AND AT&T SYSTEM 75.



THE MOST POWERFUL, MOST FLEXIBLE COMMUNICATIONS SYSTEMS IN THE WORLD.



WHAT MAKES US THINK WE CAN SPEAK FOR EVERYBODY?

VOICE MANAGEMENT OFFERS OVER 150 CALLING FEATURES TO CUSTOM-TAILOR EACH VOICE TERMINAL. IT'S ONE OF MANY INTEGRATED FUNCTIONS OF AT&T SYSTEM 85 AND AT&T SYSTEM 75.

The telephone. We depend on it like nothing else in our lives. Since we were old enough to form a complete sentence, hardly a day has gone by without our having used it. We take it for granted. We slam it around. It has entered our language as an idiom for ease of use and reliability. "It's just a phone call away." "It's as easy as making a phone call."

AT&T's legacy of superiority in voice communications is being passed on to the next generation. You'll find it in the Voice Management function of System 85 and System 75 from AT&T Information Systems—the most powerful, most flexible communications systems in the world.

THE LAST WORD IN VOICE

Our voice terminals set the industry standard for reliability, diversity and flexibility. We offer the widest selection available, and they're modular in design, so you can add new features as your needs increase.

One such feature is our optional 40-character display module. It tells you the name and number of a caller before you answer. With this information, you can screen your own calls while you're in your office, electing either to answer them or send them to a coverage point.

We also offer over 150 calling features which you can assign as you see fit. So each phone is custom-tailored to the needs of its user. Abbreviated Dialing, Call Forwarding, and Automatic Callback are just a few of the features that can save you time and make your systems easier to use.

Making sure the phone works is one thing. But how do you make sure it gets answered? Enter our Call Coverage and Leave Word Calling features. Your phone can be answered and messages taken, even when you're not around.

For call intensive businesses, we have Uniform Call Distribution. It directs incoming calls to the first available agent. So you can handle more calls in a shorter period of time. That's good for you and your customers.

Whatever your needs, from conference calling to simultaneous voice and data transmission, System 85 and System 75 are sure to get the job done.

100 YEARS OF COMMUNICATIONS EXPERIENCE

Our experience in voice communications speaks for itself. We've been the undisputed leader for over 100 years, and we're dedicated to keeping it that way. More than 4000 scientists and engineers formerly at AT&T Bell Laboratories are now working at AT&T Information Systems Laboratories developing systems that integrate voice and data to help your business operate more efficiently.

To further protect your investment, our Information Systems Architecture ensures that any upgrades or future generations of your system will be compatible with the current one.

How can you make sure your business is operating with the best voice communications system available anywhere in the world? It's as easy as making a phone call. Call your AT&T Information Systems Account Executive or 1-800-247-1212, and ask about System 85 and System 75.

HOW TO MAKE SURE YOUR OFFICE CAN ROLL WITH THE PUNCHES.

SYSTEM MANAGEMENT LETS YOU CHANGE YOUR COMMUNICATIONS SYSTEM ACCORDING TO YOUR NEEDS. IT'S ONE OF MANY INTEGRATED FUNCTIONS OF AT&T SYSTEM 85 AND AT&T SYSTEM 75.

Things happen fast in the business world. You've got to be on your guard, quick on your feet, able to bounce back, or you're out for the count.

With System 85 and System 75 from AT&T Information Systems, you can be ready for anything. You'll have the most powerful, most flexible communications systems in the world at your command.

YOU CONTROL THE SYSTEM

The centralized System Management function puts you in complete control of the system's operation. You have a hands-on ability to respond to your changing needs quickly and easily. Here are a few of the things it can do for you:

Terminal Change Management If the game "musical offices" is popular in your business, this feature can give you an edge. It lets you add, remove, or relocate equipment easily. You can also customize terminal features so the right people have the capabilities they need. Changes can be made on-line, reducing costly downtime. And they only have to be made once on a common data base at a central location. Related data bases are updated with the same information automatically.

Cost Management Call privileges can be granted or withdrawn as you see fit. Call detail can also be recorded and allocated by department, project, or individual to help you keep a tight rein on expenditures and abuse.

Facility Management You determine how you want your calls routed so you'll be sure you're always using the least expensive lines available. This function also optimizes network performance by giving you the power to administer its many features, like Automatic Route Selection and Trunk Group Translation.

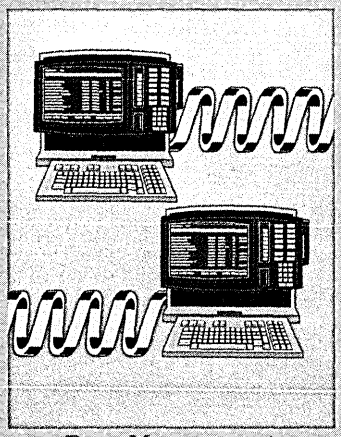
Traffic Management This is a set of tools that collect, summarize and report on system performance and usage. Data concerning the operation of your system can be stored on disk files, and called as needed.

System Management is just one of the many functions of System 85 and System 75. Others are specifically designed to facilitate office management, voice and data communications, and networking. Whatever your needs, you can custom-tailor a system that's right for you.

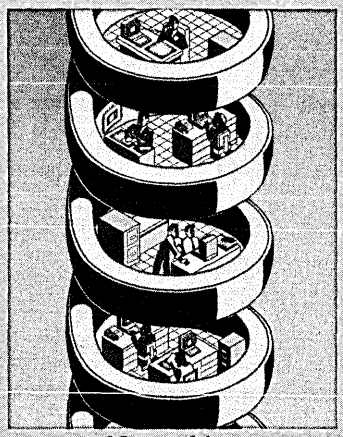
OVER 100 YEARS OF EXPERIENCE

System 85 and System 75 are designed according to the guidelines of Information Systems Architecture. That translates into investment protection, because future generations and upgrades will be designed to fit right into your existing system.

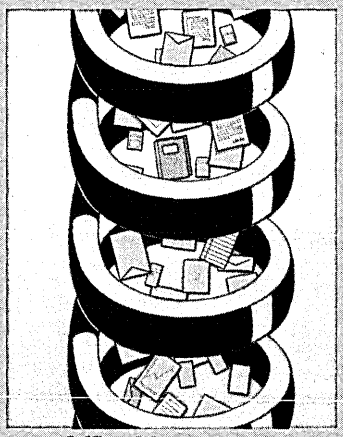
There are a lot of decisions you have to make. And there is no margin for error. Our leadership in communications goes back over 100 years. We have the largest sales and service staff in the industry. Those are just two more reasons why you should call your AT&T Information Systems Account Executive or 1-800-247-1212, and ask about System 85 and System 75.



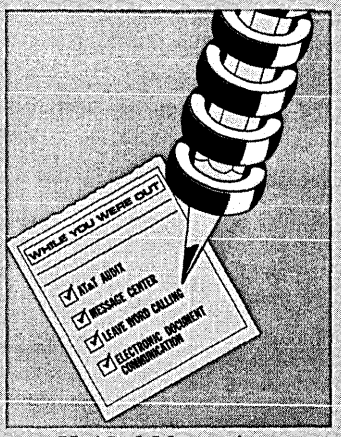
Data Management



Networking



Office Management



Unified Messaging

VOICE MANAGEMENT AND SYSTEM MANAGEMENT ARE JUST TWO OF THE WAYS AT&T SYSTEM 85 AND AT&T SYSTEM 75 CAN HELP YOUR OFFICE OPERATE MORE EFFICIENTLY. THERE ARE ALSO FOUR OTHER FULLY INTEGRATED FUNCTIONS.

Data Management integrates voice and data transmission, resulting in more productive use of your equipment.

Networking lets you link all your locations, either across the street or across the country.

Office Management streamlines your everyday office procedures into one easy-to-use system, so you can create, store and send information more easily and productively.

Unified Messaging integrates all your messaging features including AUDIX, our powerful voice mail service.

Whether your business needs as few as 40 lines or as many as 100,000, there's an AT&T system for you. One that can meet your changing needs and evolve with changing technologies. That's investment protection, from the most powerful, most flexible communications systems in the world—AT&T System 85 and AT&T System 75.

AT&T

The right choice.

Michael Tyler, Assistant News Editor

HARDCOPY

CALLING THE SHOTS IN MICRO SOFTWARE

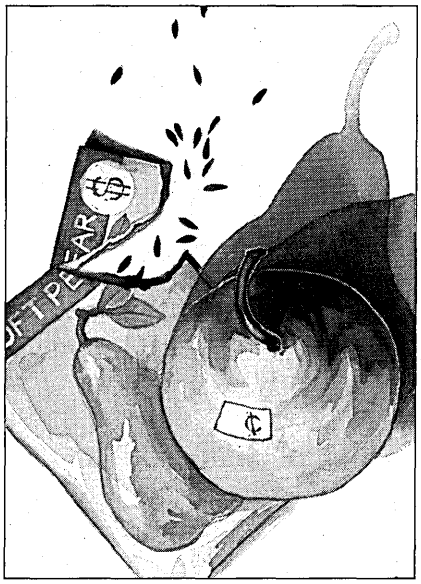


ILLUSTRATION BY DORIS ETTLINGER

This story is about two micro software companies—one big and powerful, the other small and obscure. The big company, Lotus Development Corp., Cambridge, Mass., recently bid on an Air Force contract for 7,000 spreadsheet packages—easily a multimillion dollar award. The Air Force, however, wanted to control the dissemination of software internally, rather than having users buy their copies from local retail shops.

That demand rubbed Lotus the wrong way. After experimenting with site licensing once and incurring the wrath of its dealers, the firm instituted a hard-line policy: each user of any Lotus product must have his own authorized, factory-made copy, purchased from a retail outlet. To enforce this policy, Lotus has been spearheading a drive within ADAPSO to develop and standardize a "lock and key" approach to software protection. If you try to copy the software anyway, watch out! Lotus may sue even its biggest customer for $10 million or so. Lotus's commitment to this policy—and to its allegiance to dealers over users—is apparently firm: it chose to walk away from the Air Force, which found an alternative supplier.

The small company in our story is Summa Technologies, which is 3,100 miles from Lotus in Beaverton, Ore., and even farther in corporate philosophy. It calls directly on MIS managers, bypassing all middlemen. It sells its Freestyle word processing package only via site licenses, which could cost over $100,000 apiece. But when a user organization buys the site license, it gets the right to make as many copies of the software and documentation as it likes, to distribute them to any employees it wants, and even to allow its employees to use the software at home. The $100,000 or so may seem to be a hefty price tag for micro software, but compare that single payment to hundreds of $500 individual copies of other software it replaces. Site licensing also means customers don't pay big premiums to distributors and dealers.

Is the site license approach valid? In the first seven weeks after Summa instituted the policy, it signed big contracts with U.S. Financial Corp., Ohio State University, the California State College system, a division of Shell Oil, and the Los Angeles County government. These organizations preferred site licenses because they give dp management the flexibility to use micro software free from the constraints of individual licenses, threats of lawsuits, and protection techniques that obstruct networked applications.

In this way, the user gets micro software that can be integrated intelligently into corporate information systems, as several feature articles in this issue argue is crucial to a coherent corporate strategy. The vendor wins, too. Summa probably sees as much money from a big site license as Lotus sees from selling individual copies to the same site, after the middlemen skim off their trimmings—which could total 60% of the retail cost.

The site license message is spreading. The Microcomputer Managers Association (MMA) of New York, which represents an installed micro software base of over $100 million, strongly endorses the site licensing approach, and nearly came to blows with ADAPSO over the issue. Yet despite increasing user awareness, the majority of software vendors are toeing the Lotus line.

That's too bad. What's worse is that most users are still meekly letting their vendors get away with it. But micro software is no different, really, from factory automation. If General Motors can almost singlehandedly foster a revolution by compelling suppliers to support its Manufacturing Automation Protocol, then surely the MMA, the Air Force, and other big users can stand up to the vendors and demand site licenses. Let Lotus call the bluff; there are dozens of spreadsheets available that are of comparable quality. Most are sold by companies like Summa that are sufficiently hungry to negotiate licensing arrangements that will work for both the vendor and the user. Micro software is too important a part of any integrated corporate information strategy for users to submit timidly to the vendors' tactics. ◉

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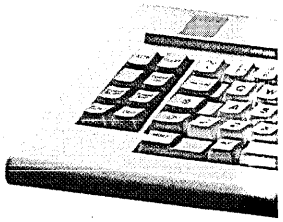
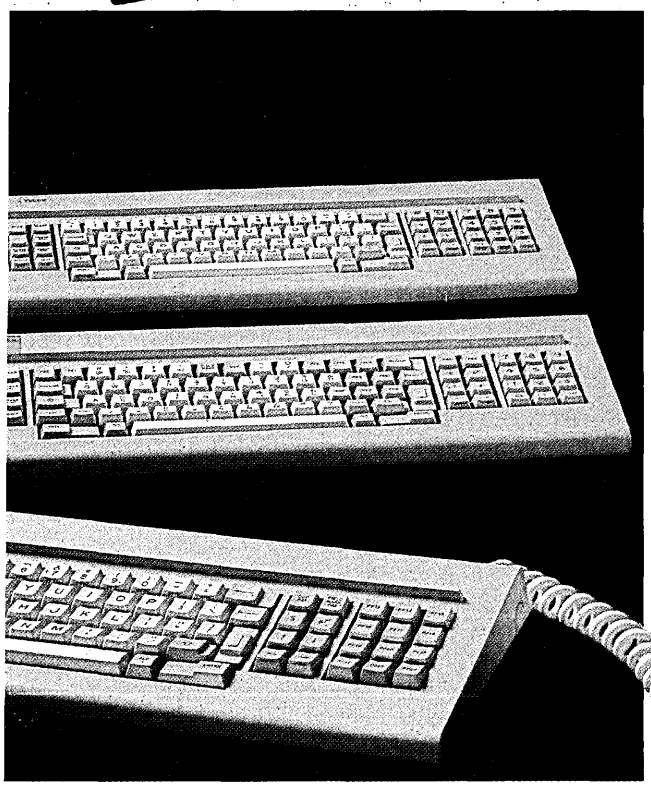
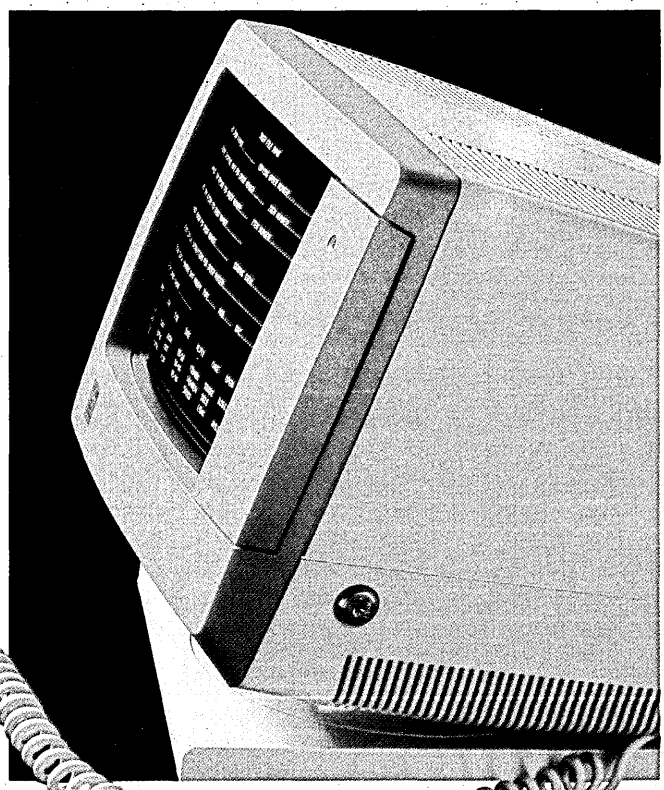


CIRCLE 12 ON READER CARD

JOMY





IN FOCUS

SOVIET STING SOURS

Government efforts to disrupt the flow of computers to the Soviet Union may have led to more smuggling, not less.

by David Hebditch and Nick Anning

"There used to be about a dozen of us in this game, but now the market's been flooded," laments one European high-technology exporter who operated as a successful techno-bandit for many years, shipping embargoed Western electronic equipment to countries behind the Iron Curtain. "A lot of cowboys have got into the act and that has pushed prices down to the extent that the Russians can pick and choose who they buy from and name their price. They don't even have to haggle. Some of the new boys will sell DEC gear at 25% discount. There's no money to be made anymore."

If correct, his assessment throws new light on the efforts of the U.S. government to stem the tide of high-technology goods flowing to the Soviet Union and its Eastern European satellites. For the past several years a coordinated offensive among the Western Allies, "Operation Exodus," has been publicly rounding up alleged smugglers and detaining their shipments of minicomputers and semiconductor production equipment.

But, typical of many government programs, the law of unintended consequences may apply. Despite its conspicuous successes in thwarting important smuggling networks and bringing several prominent smugglers before the courts, Operation Exodus, according to a theory prevalent in the gray trade, is backfiring. The theory has it that by attracting more players into the game, Exodus has unwittingly given fresh impetus to the illicit business of diverting Western-manufactured high-technology products to countries in the Soviet orbit.

"The East Bloc is still getting everything it needs," says a British trader who is soon to face a string of charges under the United Kingdom's Export of Goods Control Order for supplying a Soviet Bloc country with embargoed instrumentation and test equipment. "West Germany is still an easy country to move stuff through," he claims. "If anything, demands have increased.

" I feel no conscience in this at all," he adds, " because if they want this stuff, they're going to get it. I feel old enough and wise enough to know what they should or should not have."

Another U.K. trader in a similar position confides, "I had lunch in London only last week with one of my old East Bloc contacts. I won't be supplying him, of course, but somebody will. . . . The contacts are well known in the trade.

"There are certain guys responsible in each East Bloc state for bringing in the embargoed gear. In Poland it's Przychodzien, in East Germany it's Kupfer, in Bulgaria you deal with Bozarov, and in Czechoslovakia it's a guy called Vobril."

The fact that the insiders can freely discuss the names of their contacts is not merely hubris, but an indication of the multitude of channels and players in the gray trade. Illegal shipment of contraband technology to the Soviets and their colleagues in Bulgaria, Czechoslovakia, and East Germany is not yet as prevalent as the open sales of illicit drugs in New York City and Miami, but there are certain similarities. Business is booming.

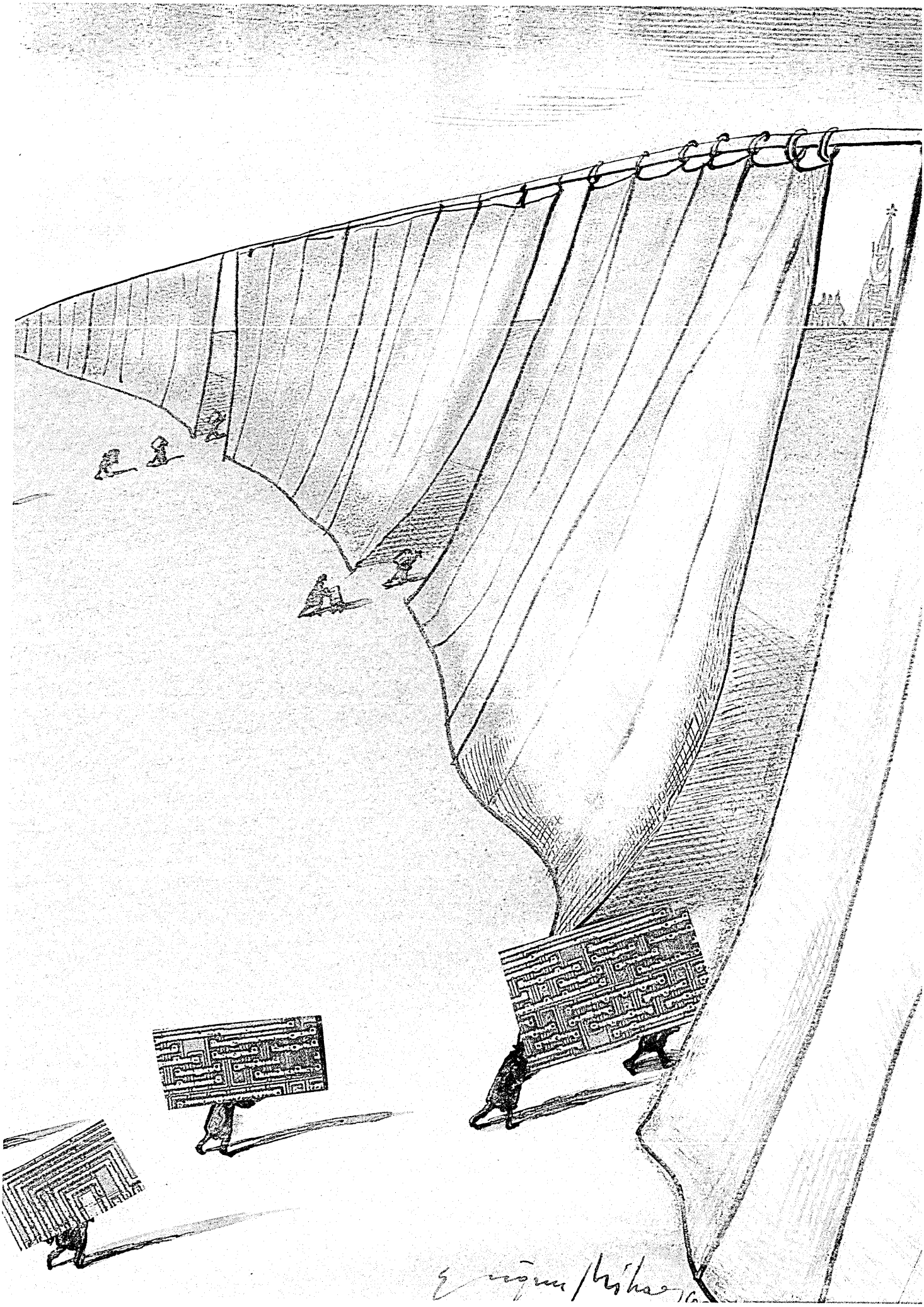
In part this is due to the recent slowdown being felt throughout the computer industry. The minicomputer makers are not exactly rolling in greenbacks these days, yet American dp vendors are enjoying strong European revenues; who is to say that is not due in part to the diversions? Selling computers is an intensely competitive business, both for the small independent company and for the sales forces of the big multinationals. The temptation to bend rules or turn a blind eye to dubious contracts may win out when it comes time to produce an income statement sheet or meet a sales quota.

This is especially true for the value-added resellers and distributors in the middle of the diversion schemes, because their profit margins depend on volume-related purchase price agreements with the major vendors. A fair number of the Digital Equipment Corp. VAXs that find their way to the East, gray traders confided to DATAMATION, originate from dealers hard-pressed to meet their minimum annual commitments. These dealers, and sometimes even the vendors, are only too pleased when times are tough to accommodate an offer to relieve them of surplus systems on a "no questions asked" basis.

Indeed, a computer dealer in the United Kingdom recounts how, quite recently, a well-known U.S. computer firm's subsidiary in West Germany had hurriedly sent a member of its sales staff to advise an oem in person. Why the sudden visit? It had been all too obvious that past orders had ended up in an embargoed country, and the salesman was there to see that the most "suitable" destinations were put on the paperwork.

"I know of a firm in Holland right

ILLUSTRATION BY EUGENE MIHAESCO



now," the same source went on, "where there are several VAX-11/750s parked in the office just waiting to be shipped east." Given these kinds of economic realities, it should come as no surprise that U.S. government agents increased their scrutiny of the worldwide business activities of large companies like DEC and Control Data last year.

For the record, government officials reject the notion that there's an expanding international trade in embargoed technology. They are convinced they have made inroads into many established diversion networks and that this has had two main effects.

First, the risks for Western businesspeople who sell illicitly to the Eastern Bloc have escalated since Exodus began and so, therefore, have their asking prices.

Illegal shipment of contraband to the Soviets is not yet as prevalent as the sale of illicit drugs in New York City and Miami, but there are similarities.

Second, they argue that older, established techno-bandits have been picked off one by one, and no equivalent operators are coming forward to fill the resulting gaps in the ranks. Sounds a little like the Drug Enforcement Administration, doesn't it?

Yet, in interviews with DATAMATION on both sides of the Atlantic Ocean, it was made clear that top customs officials realize their jobs are now tougher than ever. Top members of the Exodus team take a realistic view of the impact of their investigations. "We can never stop the trade in its tracks," acknowledges Roger Urbanski, director of the strategic investigation division. All they can do is make it more difficult for Western businesspeople and their Eastern Bloc contacts to function. It is an exercise in containment.

So how successful has Operation Exodus been since it began in late 1981? In terms of seizures, the record looks impressive: more than 4,000 shipments seized, worth more than $250 million, according to U.S. Customs (see Fig. 2).

Unfortunately for Customs, the wide publicity accompanying Exodus's success has made its job that much tougher. The better it does, the better it has to do.

"The violators have become much more wary and sophisticated," Urbanski concedes. "That makes our job more difficult. And now we've noticed a confluence between arms and high tech. If you're going to do one, you do both.

"Of course, as their sophistication increases, so does ours. We're now preventing losses from occurring before the goods leave the U.S. We've got the same number of cases, but they begin much earlier. And the Justice Department is prosecuting more successfully."

Exodus's biggest success so far has been the culmination of U.S. Customs' nine-year campaign against the global network run by West German Richard Müller (see "The British Connection," August 1983, p. 148).

Attempts to catch Müller began back in 1974. Despite indictments in a California court in 1977 and 1979 for his part in illegally exporting microchip manufacturing equipment to the Soviet Union, Müller has managed to evade the authorities for years. Even now, with West German police and Interpol warrants out for his arrest, he is one of Europe's most wanted techno-bandits, yet he still manages to stay at large and continue trading.

The recent convictions of some of his aides underscores the relatively light penalties and substantial rewards of the game. In 1983 West German and Swedish customs, acting on U.S. intelligence reports, intercepted large shipments of embargoed DEC VAX and PDP-11 computers en route on the Elgaren, a cargo ship from South Africa, to an intermediary in Stockholm. Authorities alleged that this Swedish contact intended reshipping the contraband cargo to an Eastern Bloc destination. Since the intermediary had already made it possible for one of the first dual-processor VAX-11/782s to reach Europe to find a home at the University of Moscow, their concern was well placed.

Richard Müller's man in Stockholm, Sven-Olaf Haakansson, was subsequently arrested by Swedish authorities and sentenced to four years in jail for tax and currency offences.

One important consequence of the Hamburg seizure of part of the Elgaren's container cargo was the arrest and trial of several members of the Müller network in Luebeck, West Germany, last November. Volker Nast, Manfred Schröder, Detleff Heppner, and a number of others were found guilty of complicity in a series of large-scale diversions of hardware worth more than $20 million between 1978 and 1983.

In all, seven major diversion operations were detailed in the Luebeck State Court. None of them had been intercepted by West German authorities and the prosecution relied on papers seized in raids on a number of Richard Müller's companies—Deutsche Integrated Time, Semitronic, Techimex, and Dan Control—in West Germany and Switzerland.

The paper records indicated that over a five-year period the Müller operation had shipped at least four VAX 11/782s, six VAX 11/780s, five VAX 11/750s, and no less than 30 PDP-11s. Other equipment originated from Calcomp, Nashua, Hewlett-Packard, Racal, and Tektronix in the form of plotters, interfaces, expansion boxes, power units, modems, disk packs, disk drives, tape units, digitizers, multiplexors, and a variety of lasers.

But the most significant deal by far was shipped over a four-year period to Leningrad from Deutsche Integrated Time at a value of some $10 million. In addition to the usual VAXs (configured for computer aided design applications), this consignment included TLA photo masks and contact printers, 20 GCA/David Mann 3095 photorepeaters and Series 2000 pattern generators, various mask-aligners, and an Eaton 400 inspection station. Once assembled, the shipment comprised a complete semiconductor litho shop. Much of this was ordered in Europe, some through a front company in England. No service contracts were requested—a fact that should have raised suspicions when the orders were first processed.

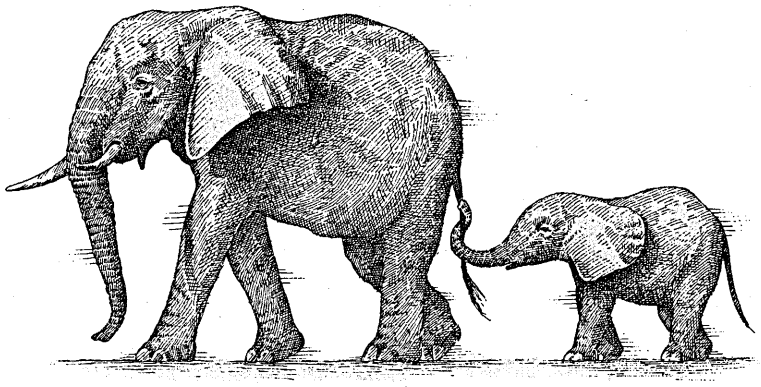
The accused were given fines of less than $15,000 and suspended prison sentences—surprisingly lenient penalities in view of the value of the equipment and the fact that the charges included "subverting the security of the Federal Republic."

And considering what their boss and his organization are worth, the fines don't amount to much. U.S. Customs agents have uncovered more than 100 Müller-related companies, and visited South Africa, Hong Kong, and Panama to pursue fresh leads. In Vienna, Austrian authorities are following up information on Müller's business activities there. The U.S. team has already uncovered one single payment of $20 million from Moscow's Voskhod Bank to a Panamanian company called Investment Control SA, in which Müller is believed to have had an interest. He is thought to have assets of up to $100 million salted away in bank accounts throughout the West to fund his operations.

"The violators have become much more wary and sophisticated."

Despite the attention of law enforcement agencies, Richard Müller is still in business. His only concession to the heat is to base his operations in East Germany. Customs officers in the Federal Republic are convinced that between June and September of last year he organized six shipments of computer equipment from Hannover to East Berlin. The deal followed meetings with a Western

WHEN IT COMES TO LINKING PC's TO MAINFRAMES, ONE COMPANY IS A MILLENNIUM AHEAD.



You don't have to look hard to see why McCormack & Dodge has linked more PC's to more mainframes than any other business software vendor.

It's a classic case of a superior product leading to superior sales. A product that lets your PC access all company business applications, no matter who designed them—not just applications designed by McCormack & Dodge. A selective system that lets you pinpoint and summon exactly the portion of data you need.

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business contact in the Hotel Metropol in East Berlin. His contact is now in prison in Hannover awaiting trial later this year. Müller is thought to have visited Britain during this same period to see his wife and daughters.

Another case coming to trial illustrates how the smuggling trade has expanded with newcomers who view the lucrative business through the dim prospects of the legitimate trade. The story of Michael Ludlam, Christopher Millington, and their Derbyshire-based systems house, Michael Ludlam Associates Ltd., typifies the route many gray traders take to involvement in the trade before some of them go on to become full-scale technobandits.

"I love exporting. I like flying the old flag and disappearing abroad and earning some money."

Just before his trial, Ludlam said to the journalists sitting at the press bar, "I'm the guinea pig, aren't I?" His question proved to be prophetic; his case set a clear precedent for the other five diversion cases that were heard in Britain during 1985.

The contacts that led to the deals, he claimed, originated from Michael La Costa, a director of Systek Ltd., a North London computer supplier. Ludlam alleges that during 1982 La Costa, a former collegue, gave him the name of a Zurich-based businessman seeking computer systems.

"La Costa asked me if I'd be interested in talking to this Swiss chap," Ludlam said in an interview. "I said yes, of course I would. You see, I love exporting. I like flying the old flag and disappearing abroad and earning some money. La Costa knew this from our days at Systime [a British company now 90% owned by CDC] in Leeds, where I launched its export drive." In return for the sales lead, La Costa was to take 50% of any profits made.

Once contact had been established, Ludlam flew to Zurich in May 1982. "The man was called Hans Wirth of ICOWATEC AG. He said he had a Spanish customer who wanted to buy computers for the hotel industry and was I interested in supplying the hardware? I was dead interested—any true Brit would be a fool not to be, wouldn't he?"

Ludlam said that he and software director Christopher Millington agreed to talk to the Spaniard. Ludlam traveled to Vienna later that month to discuss the technical details of the contract. Wirth also attended the meeting.

The next rendezvous was the Zurich airport at the end of May. While they were having lunch, Wirth told Ludlam that there had been a change of plan.

"Hans said, 'Well actually, we're going to Sofia this afternoon.' When I asked him what for, he told me that the Spaniard was really Bulgarian. We had to slip down to Sofia [the capital of Bulgaria] and come back the next day. They were really keen to talk about computers. So I made the decision—it's not hard to make a decision like that, really. I said, fine, I'd quite like to see a Communist country. So off we went, Chris, Hans, and myself.

"We got there about five o'clock, just as a crowd of East Germans were arriving. It was my first experience of Eastern Europe. I found it incredible. You come in on this jet and there's all this military stuff on one side and everything's so drab. It's a bloody awful place. So we joined the East Germans and paid $38 to get a piece of paper which allowed us into Bulgaria. We didn't need visas.

"We were met by the man we'd known as the Spanish hotelier. He escorted us through a side door and drove us in the company Lada [auto] to Sofia." The three were taken to the offices of INCO, one of Bulgaria's state-owned trading companies, where protracted discussions took place about what Ludlam might be able to supply through Wirth's company in Switzerland.

"They were smashing blokes—extremely polite—and I was happy to talk to them. The conversation took place in English, which they spoke perfectly. There was coffee and brandy. The coffee wasn't bad; the brandy wasn't bad. That night we stayed at the Hotel Vitosha, the one the Japanese built."

Initially, the Bulgarians told Ludlam they wanted eight DEC PDP-11 computers. But INCO's requirements soon escalated to include VAX-11/780s and 750s, which are as adept at CAD/CAM for military equipment as they are for keeping track of hotel reservations. Millington claims that at the Centre for Microelectronics outside Sofia he saw "the best, most complete library of DEC manuals I've seen anywhere, including at DEC headquarters. DEC badges there are a status symbol."

Ludlam, however, denies he would have sold the computers had he suspected they might be used in other than routine commercial applications. "Chris Millington oversaw the installation of the PDP-11/44s in the Fruit and Vegetable Market. The farmers grow grapes and get paid by our computer. Then the grapes are sold to West Germany, where they are made into wine for the Common Market. In any case, who in his right mind would use an RSTS-based PDP-11 for strategic military applications? The VAXs were for a hotel reservation system in Sofia."

Ludlam, a former DEC employee, had no trouble obtaining the computers. "I got them from Systime. Everything came from Systime. I bought one computer from Mike La Costa, but even that originated from them." Yorkshire-based Systime, Britain's second-largest indigenous systems house with over 1,500 employees, insists it was unaware that Ludlam intended to export the computers beyond Switzerland.

Ludlam explained how simple it was to obtain the required U.K. Department of Trade export licenses. "Hans Wirth provided me with an end-user certificate from another of his companies—Tormex Pharmaceuticals—stating the computers would be installed in Switzerland. On the basis of that I got a British export license and shipped [the equipment] to Zurich airport. Everything had a valid export license. But when I signed the form that asked for the country of ultimate destination I put 'Switzerland' when I knew it wasn't."

The computers reached the U.K. in 1982, based on Systime's distribution license from DEC. When the Department of Trade in London processed Ludlam's application at the beginning of 1983 it did not ask if he had applied for a U.S. Department of Commerce license to reexport the computers. Since neither Ludlam nor Wirth nor any of their associated companies were on the U.S. government's export blacklist, there is no reason to believe that such a license would have been refused by the Americans.

The essence of the prosecution's case was that Ludlam made fraudulent entries on the license application forms knowing fully that licenses would not be awarded for exports to Bulgaria. In support of its arguments about the seriousness of the case, Customs submitted a statement from David Hall, under-secretary at the Department of Trade and Industry for Export Control Policy and the British Government's most senior specialist in this area.

Ludlam was sentenced to a total of two years in jail. The company was fined $36,000.

"The British Government, in common with fellow Cocom member governments, believes that it is essential to prevent the acquisition by the USSR and its allies of advanced Western technology which could directly benefit the development of the military equipment programs of those countries," Hall claimed. "The loss of such technology involves the sacrifice of a strategic advantage which has been developed in the West at considerable expense. In turn, this requires con-

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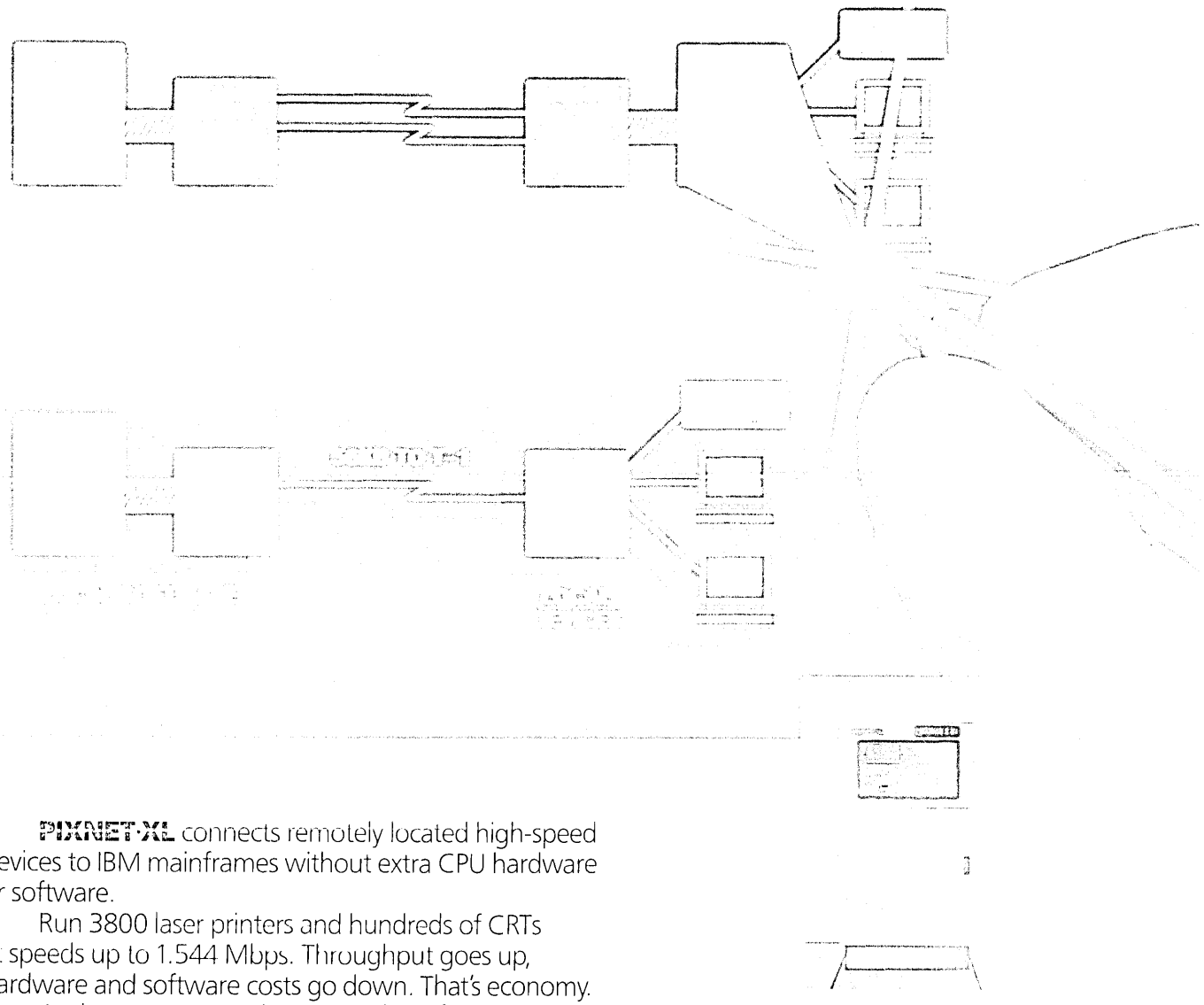

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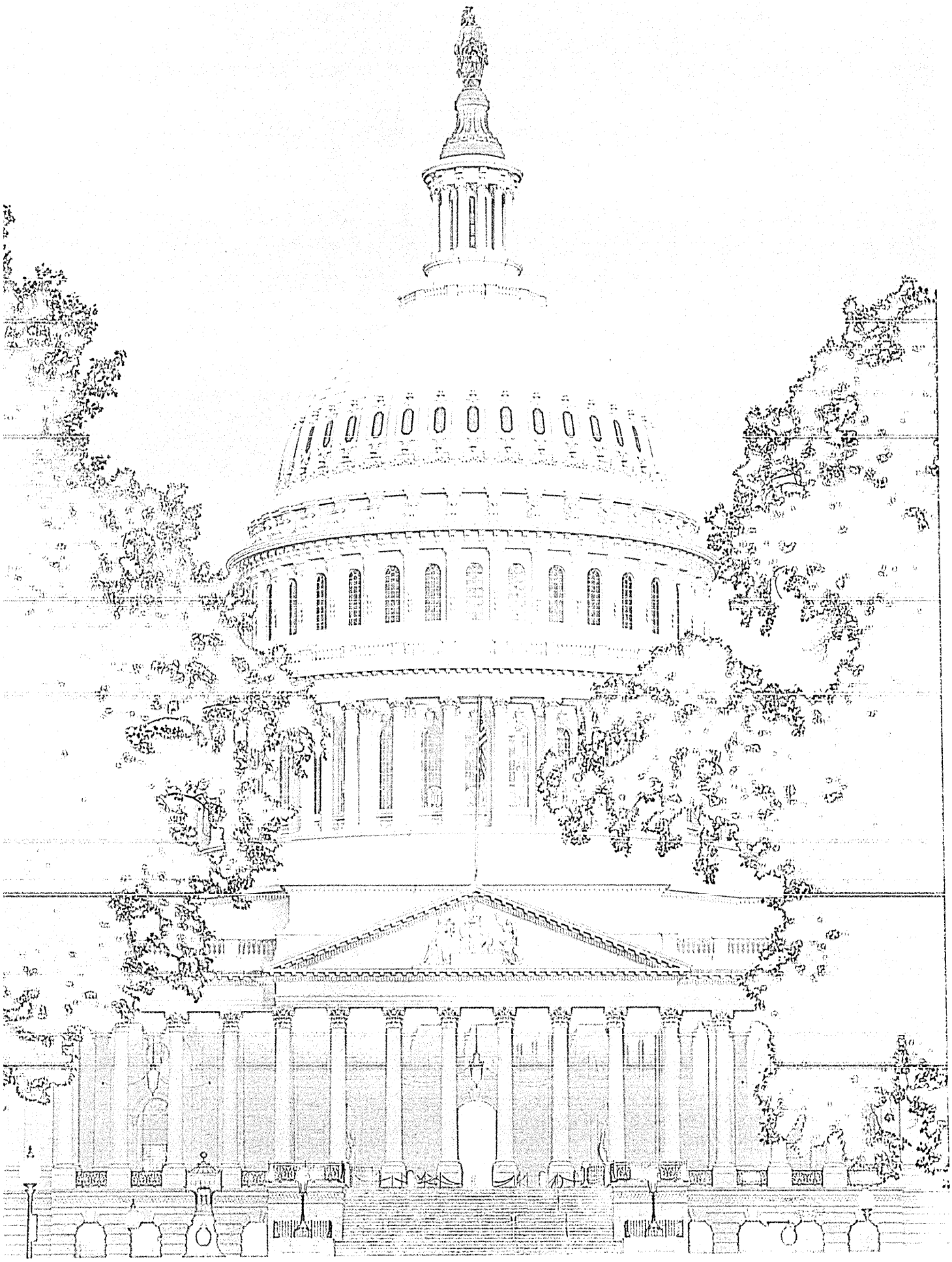

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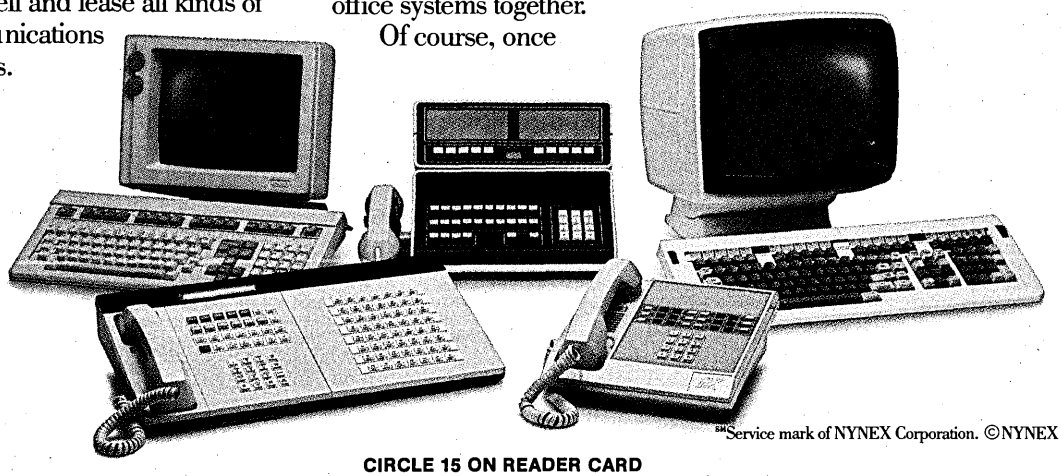

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CIRCLE 15 ON READER CARD

EXODUS UP CLOSE

Operation Exodus is the U.S. Customs Service's attempt to stop the bad guys now before they stop us later. Exodus is officially defined as "an integrated enforcement program to protect our national security by intercepting illegal high-technology exports including arms to Eastern Bloc countries."

It's unoffically defined as a royal pain by a government relations executive of one of the U.S.'s top 10 computer companies.

"We've run into it a couple of times," he says. "It hasn't pinched us to the point where it's affected business. But it delays things more than usual."

That's the idea. Delaying the export process is one of the milder outcomes of a confrontation with Exodus. The operation can be very painful, resulting in detention or seizure. In those cases, post-op recovery can take a very long time.

What doesn't make it past the border is critical technology that violates the Export Administration Act and the Arms Export Control Act. Critical technologies are like opinions—everybody has his own definition. So far, the opinion of Exodus is the last word on the subject.

"In 1982 we had no control here or in any other countries," says Roger Urbanski, director of the strategic investigation division at Customs. "Then we set the example. We put our own house in order by penalizing U.S. industry first."

This was no minor two-minute fire drill. The ensuing sound and fury signified a great deal. Customs discarded its iron fist for a leather glove. Industry was able to prove its case that it knew better than Customs which of its products should not be entitled to take that long trip to the not-so-exotic East.

"I'm convinced that the U.S. export community is paying attention to the letter of the law," contends Urbanski. He didn't say anything about the spirit of the law, but he surely was thinking that the capitalists out there in entrepreneurland were sorely tempted by the easy money. "There's a lot less going out through inadvertent means. We matured and so did industry. Now a majority of our cases involve industry through a tip, a contact, or just turning in another company."

Should a company get caught in the tangled web Customs weaves, two things can happen. Both of them are bad. The goods can be detained, which means Customs just wants to take a look and see what the story is. If the exporter can establish its right to be doing what it's doing, then it may pass Go. It may not collect $200, because it's going to be late, but that's not Customs' problem.

If there's no license or the goods are headed for a controlled country, then they are liable to seizure and subsequent forfeiture, as in the heavily publicized VAX incident in late 1983 (see Fig. 1). The government can force the vendor and customer to forfeit goods worth up to $100,000 without court review. The alleged offender has the right of appeal, but that ain't cheap.

For a three-and-a-half-year-old, Exodus doesn't seem to be doing badly. Even its former detractors concede the program has come a long way.

A few years ago, the computer industry and the U.S. Customs Service were quite antagonistic. Now, says Urbanski, the former antagonists have become friends. Maybe not fast ones, but not slow ones, either. "We're not adversaries anymore," he says. "That's definitely a change for the better. Besides, they know better than we do what products the Soviets are after."

—W.S.

FIG. 1

OPERATION EXODUS BOX SCORE—SYSTEMS

(from Oct. 1981 through March 31, 1985)

NO. OF SHIPMENTS	DETAINED	SEIZED	VALUE (IN $ MIL.)
FY82	2,581	795	54.8
FY83	3,620	1,444	86.3
FY84	2,391	1,459	85.6
FY85	NA	343	28.1
Total	8,492	4,039	$255.2

FIG. 2

OPERATION EXODUS BOX SCORE—PEOPLE

(from Oct. 1981 through Sept. 30, 1984)

Cases accepted for prosecution	351
Indictments	575
Arrests	534
Convictions	347

SOURCE: U.S. CUSTOMS SERVICE

siderable expenditure of intellectual resources and money, often at direct cost to the taxpayer, before the West can reestablish its lead."

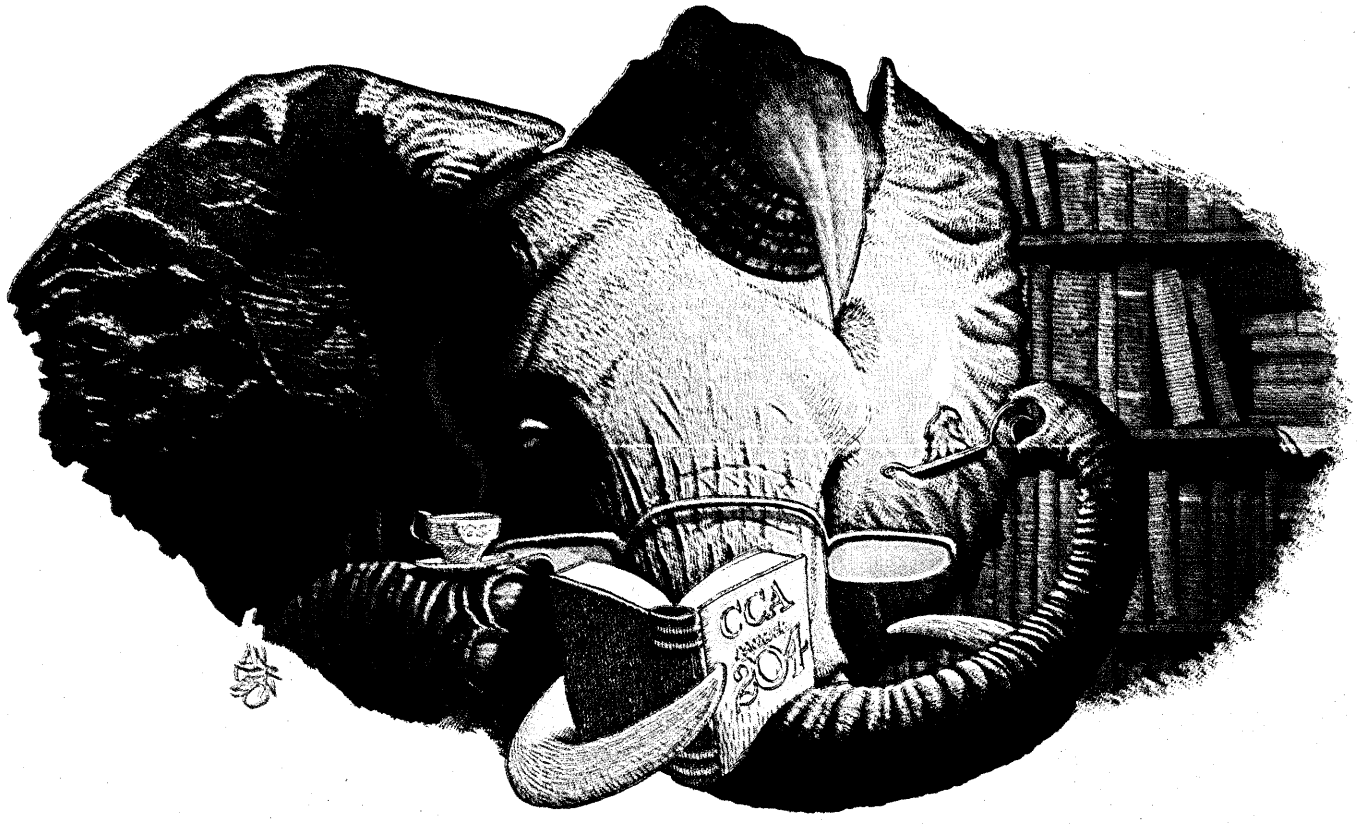
The Ludlam case is outstanding both because it shows how easy it is to get into the smuggling racket, and because of its unusual outcome. Ludlam was sentenced to a total of two years in jail. His former partner, Christopher Millington, was given a suspended sentence and fined more than $1,000. A fine of $36,000 was levied on Michael Ludlam Associates Ltd. Neither Michael La Costa in London nor Hans Wirth in Switzerland has been charged with any offense.

The sentences came as a shock to observers, who took the view that the prison sentence in particular was harsh and at variance with penalties meted out in other cases in England and in other countries. Comparisons were made with the Nast case in West Germany, where the charges were more serious and the value of the diverted goods some 17 times greater.

Furthermore, the Nast case included a complete semiconductor litho shop, which has considerably more strategic significance than an individual computer system. Volker Nast had previously been indicted in two diversion cases in the United States, but had sought refuge back in West Germany, where he was safe from extradition.

Ludlam says he has few regrets, however. He describes the Bulgarians as "really smart guys. . . . I'm very happy to have done business with them because they're the most honorable people you could wish to meet on business terms. They shake hands on a deal and they pay you within seven days. And if there's a bit of the shipment missing, they still pay you the full money on the basis that they trust you to send it next time. I've no regrets about doing business with them, none at all."

Regardless of Michael Ludlam's assurances about how they are using his computers, it would appear that the Bulgarians have become the Eastern Bloc's main broker for the advanced VAX computer. A Helsinki businessman with ex-



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CIRCLE 16 ON READER CARD

cellent connections in Moscow recently confided that even the Soviet Union is surprised at the success of Sofia in this field. Two other Britons currently charged are known to have been involved in shipping computers to Bulgaria.

Traditionally, computer smugglers sell only for dollars. Where does that hard currency come from? The answer seems to be connected with one of INCO's other roles, operating as an international trading agent for Libya.

Although in percentage terms Libyan oil imports to North America are small, there are few alternative sources of high-quality light oil. The oil is processed by refineries in the Caribbean and Gulf of Mexico before finding its way into gas tanks throughout the continent.

Following the 1981 American embargo on trade with Tripoli, the Bulgarians took over the exporting of Libyan light oil to North America. For commissions as high as 15% the oil is sold on the Rotterdam and London markets to companies dependent on that supply for many of their refineries. It may be illegal to buy Libyan oil, but the black goo doesn't have labels.

One of the leading reasons why the flow of technology to the Soviets may be increasing is a classic lesson in misguided government policies. For some years Cocom, the international governmental body that regulates high-tech export, has maintained a list of strategic technologies embargoed for sale to the Eastern Bloc. This list has been criticized for being too wide-ranging. By putting too many Western products in the "hard to obtain" category for the Soviet Union and its satellites, Cocom may have unwittingly stimulated an entire black market. The beneficiaries in the West are the gray trade middlemen who have made the handsome profits that are never reflected in official trade balances. The embargoes are only partly successful.

Cocom's latest computer list took eight years to evolve and has only just been ratified, following an agreement in principle in Paris last July—the so-called "Bastille Day Accord." The content of this new list is a tacit admission that the Warsaw Pact nations have either acquired sufficient numbers of modern Western computers or can now produce enough of their own equivalents.

The West's new objective appears to be to limit the modernization of Eastern Bloc telecommunications by refusing to permit supplies of digital computer-controlled telephone exchanges and local area networking technology. This would hold back the development of high-speed Soviet Bloc data networks and inhibit the introduction of Western-style command, control, communications, and intelligence systems for the Warsaw Pact armed forces. All but the more advanced 16-bit and 32-bit Western computers have now been deregulated and a start has been made at tackling the complex problems of software—an area of diversion where Exodus has had little apparent success.

One of the obstacles to success on the part of the embargo police has been the open hostility to the rules on the part of corporate and government officials. Numerous politicians and businessmen, particularly in Europe, believe the present export rules to be wrong—if not actually harmful.

The latest Cocom decisions have provoked serious political and business dissatisfaction in France, West Germany, and the U.K., each of which now stands to lose lucrative telecom contracts to the Eastern Bloc. That dissatisfaction is shared by neutral non-Cocom nations like Sweden, Finland, and Austria (though under U.S. pressure Austria has just amended its legal code to make it an offense for Austrian businessmen to breach the commercial regulations of another country in any trade deal).

Talk of a technology gap between East and West is no longer meaningful.

The Paris-based Organization for Economic Cooperation and Development (OECD) has sponsored a study of Cocom's embargoes by Australian information technology specialist Stuart MacDonald entitled *The Sisyphus Syndrome.* It not only attacks Cocom, its policies, and the recent attempts by U.S. hard-liners to strengthen trade embargoes aimed at the Eastern Bloc, but also suggests that fundamentalist anti-Sovietism among politicians may be used as a cover, behind which U.S. firms can seek to obtain trade advantage over their European and Japanese counterparts.

In a highly unusual move, the U.S. OECD delegates vetoed publication of the critical report. Various European publications have reprinted large blocks of its text, however.

Perhaps the most surprising body to join the ranks of the dissenters is NATO itself. Concerned that the restrictions were interfering with collaborative projects between member countries, a December 1984 meeting in Brussels called on the U.S. to prune its cumbersome Military Critical Technologies List (MCTL) down to essentials. The delegates also called for the establishment of a Technology Transfer Bureau in each NATO country. The bureau would be charged with resolving differences in export control policy—a function not apparently performed by Cocom.

The differences between Cocom policy and U.S. policy were never more apparent than earlier this year. Commerce released export regulations it thought accurately reflected Cocom's decisions at its summer meeting. After considerable pressure from the computer industry, DOC did more than an about-face. "They underestimated the amount of software affected by a factor of 10," says ADAPSO associate general counsel Dave Wormser. "This is a victory."

But where would that leave Japan? Members of Cocom but not of NATO, the Japanese have already been accused by businessmen on both sides of the Atlantic of having sporadic and convenient embargo list dyslexia. *Newsweek* recently reported that U.S. Customs has stationed its agents in Japan and throughout Southeast Asia. This was after they found evidence that high-tech smuggling was taking the same route as drugs, but in reverse.

Recently the Soviets have stepped directly into the fray. Deputy prime minister Alexy Antonov recently told the West German government that $16 billion worth of business with the country was in jeopardy over the next five years as a result of the Cocom regulations.

Meanwhile, West German intelligence services claim to have discovered a secret Soviet booklet for espionage agents, which lists the Western high technologies in which it has a particular interest.

This raging international debate on trade embargoes with the Eastern Bloc was one reason behind the visit of Under Secretary of Commerce Lionel Olmer to Moscow in January. High technology was high on the agenda. The contraband for which a number of Europeans now reside in prison may well become one of the currencies of the new period of détente, particularly as a bargaining chip in the new round of SALT talks.

The fact that the Cocom lists come up for review as soon as 1988 suggests that that group's members have little faith in the long-term impact of embargoes and will now rely more on preserving short-term strategic leads. Even these are already recognized as diminishing to the point where talk of a "technology gap" between East and West may no longer be meaningful. ◉

London-based journalists David Hebditch and Nick Anning are coauthors (with Linda Melvern) of *Techno-Bandits* (Houghton Mifflin Co., Boston, 1984), excerpted in the Sept. 15 DATAMATION, p. 116. Additional reporting for this article was done by Andreas Orth, of Hamburg, West Germany, and by DATAMATION Washington bureau manager Willie Schatz.

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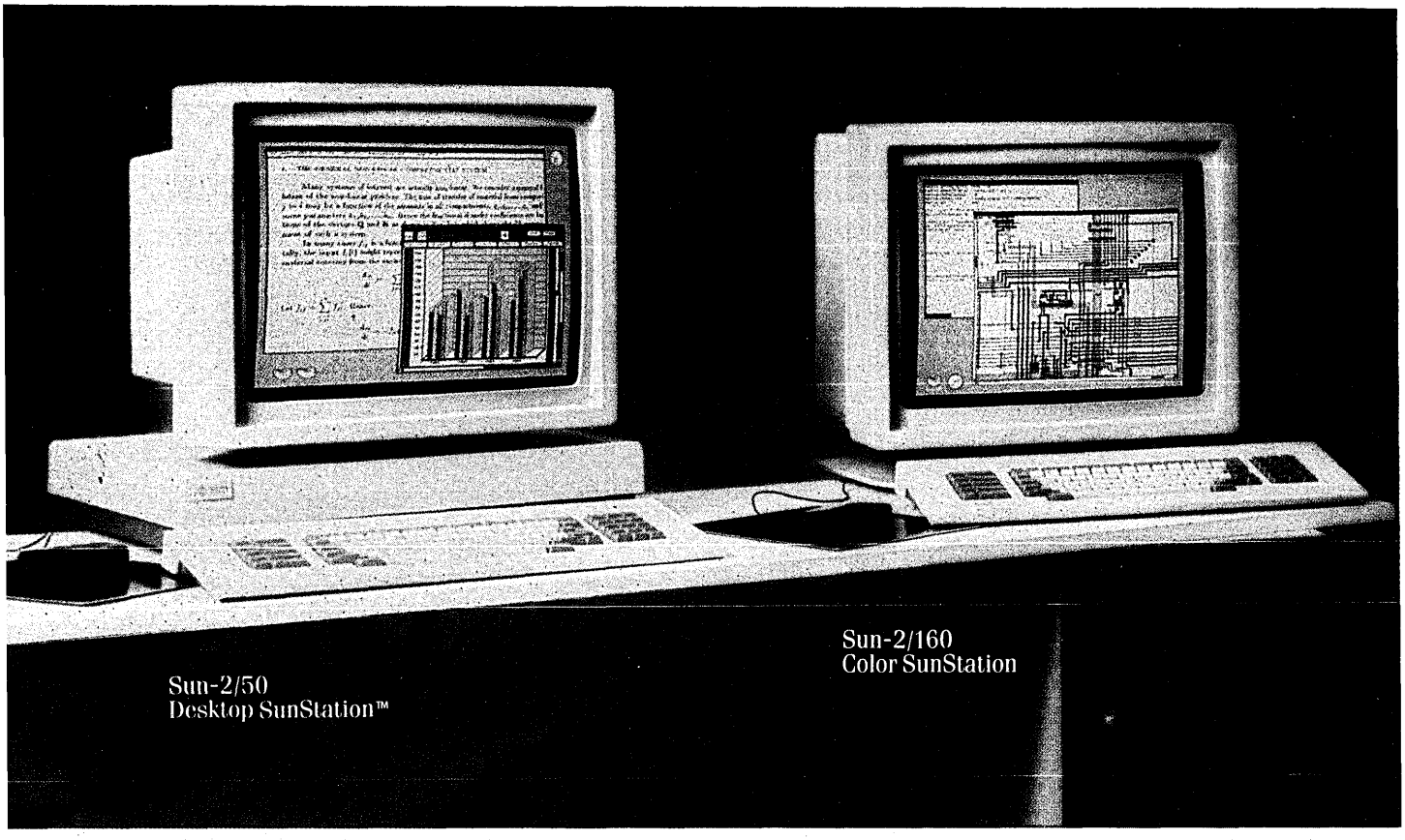

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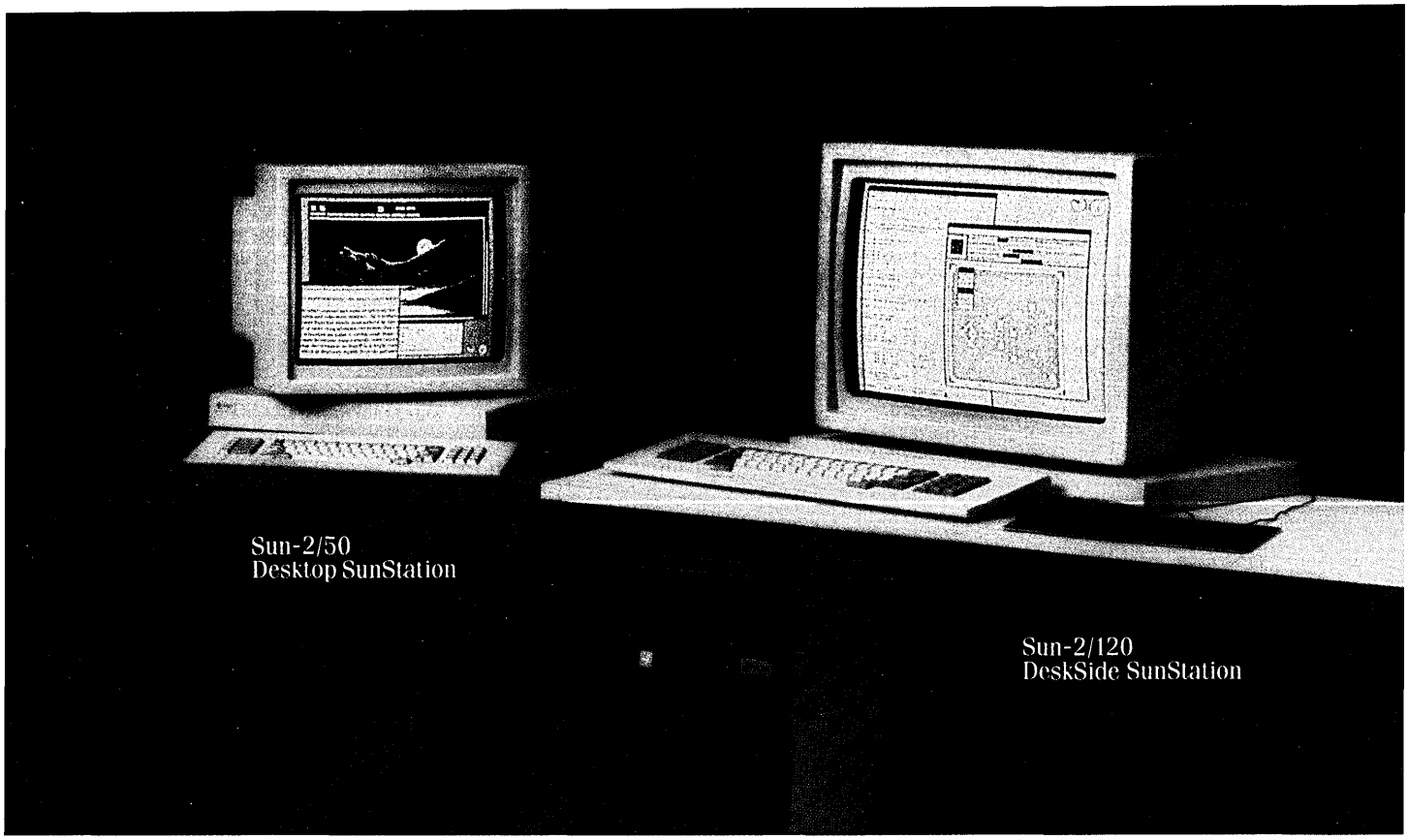

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NEWS IN PERSPECTIVE

OFFICE SYSTEMS

Connectivity of systems from a variety of vendors is the biggest headache for dp managers these days, and recent new product announcements will only add to their woes. DATAMATION first reviews the problem in "Too Many Choices," then offers two solutions. "A MAP for the Office" explains how users have banded together to try to pressure vendors to find common ground, and "Bringing It All Home" presents IBM's software solution.

TOO MANY CHOICES?

Users are struggling to choose between multi-user systems, small minis, and pc networks for departmental computing.

by Karen Gullo

The battle between the traditional minicomputer makers and the upstart vendors of multi-user microcomputers is about to be joined. Digital Equipment Corp.'s recent introduction of its MicroVAX II, and forthcoming desktop minis from IBM, Data General, and others, announce the mini makers' counterattack after years of microcomputer victories.

Users, vars, and other third-party distributors say mini vendors may have a tough fight. Low-end systems that support two to four users are fast becoming a boom business, and the fact that you can get a microprocessor-based system with as much power, speed, and disk space as a low-end mini for as much as $10,000 less is making life much more interesting for dp managers looking for a departmental system.

"Unix- or Xenix-based micros have brought the price/performance ratio of multi-user systems down," says Dan Cotter, chief executive at Computerized Business Solutions, a Tampa, Fla., systems house. "Systems such as the NCR Tower and Altos and Plexus machines have speed comparable to a mini, but the cost of terminals is what makes the difference. On the minis we deal with, a crt will cost $2,000 each, whereas a crt with a micro system will cost $700. Every time you add a user, the price spread gets bigger.

"Take a system like the Altos 496T," Cotter continues. "You get 80 megabytes of disk storage, the Altos box, a tape drive for backup, and a 1-megabyte floppy, all for about $14,950. The same configuration on a mini would cost $24,000." Cotter points out that the traditional limitations of the micro system—upgradability of the processor and number of users—are no longer valid. A mini can handle 30 or more users with additional processor speed. But the bottom line, Cotter says, is that "minis were your only answer at one time. Not so any longer. And what would once have cost you $26,000 is now $17,000."

Of course, the minicomputer makers are not taking this lying down. Several, including Digital Equipment Corp., Hewlett-Packard, Honeywell, IBM, and NCR, have introduced a variety of multi-user micro systems—in essence, scaled-down versions of their minis. The leaders are AT&T's 3B2, the Altos 986 model, Data General's Desktop Generation, and Convergent Technologies' Megaframe.

DEC's new MicroVAX puts a whole new spin on the business because it is a direct descendant of its superminicomputer line. Most significantly for the microcomputer-based multi-user crowd, one version of the MicroVAX II supports two to three users and is priced at $6,000. Lucky for them, though, the company may not position its new box directly opposite their system. "DEC recognizes the need for smaller systems, but we believe that micro products are desktop devices and are complements to total systems," says Henry Ancona, DEC group manager for office and information systems. "It's fine to take micros and marry them with the mini. The small micro systems on today's market may solve some users' problems, but you get what you pay for."

Users, of course, differ on whether multiple terminals sharing a host mini, a pc network, or a multi-user system are the best answer to departmental computing. It's their version of the lyric, "One man's ceiling is another man's floor." Some dp managers are opting for pcs that they plan to link in a local area network. Others are sticking with minicomputers because they need more power and expandability. Others are jumping at the lower-priced microsystems. All are hoping that when the dust clears their mainframes, minis, and micros or terminals will all be able to communicate.

"We have 80 terminals and pcs in a department, and we're looking at how we can automate them, tie them to our mainframe, and tie them together," says Frank Feely, technical support manager at Ford Aerospace and Communications Corp., the Palo Alto-based Ford subsidiary that makes satellite and communications equipment. "Sometimes a micro-based system can do the job, and sometimes you find out that it works well for the first six months, but you need to add more disk storage or more users."

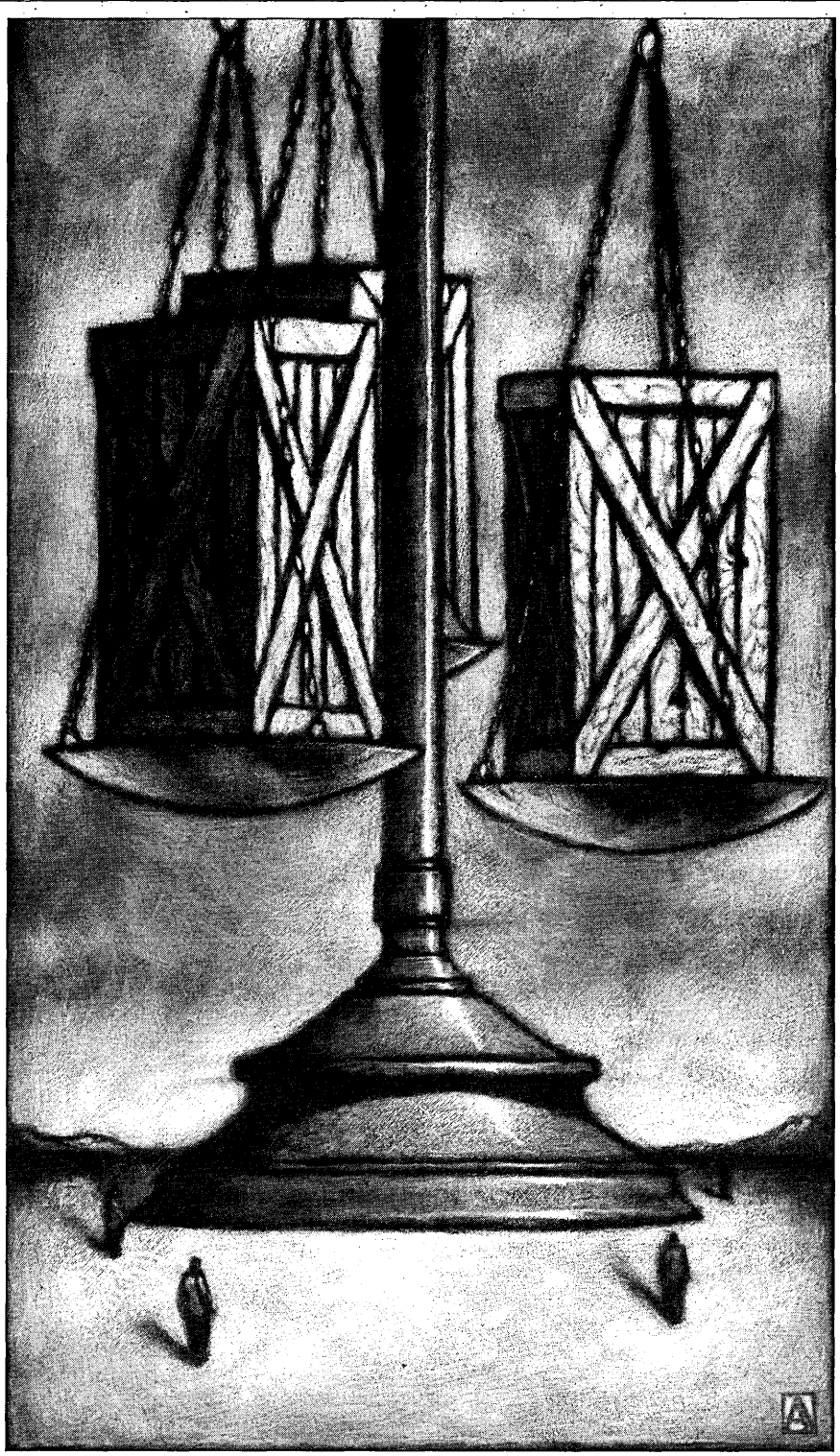

ILLUSTRATION BY DAN ADEL

Feely says he may opt for a two-pronged solution—balancing the load between a micro and a mini system. The company has two micro-based multi-user systems from Molecular Computer Co., San Jose., which support 12 to 14 terminal users. Two years ago the systems cost one third the price of a similarly configured mini, although the price of minis has come down since then. "The Molecular systems we have now are about a 25% savings over a mini today," Feely says.

"But cost wasn't the only consideration when we bought the product. The spreadsheets we're running today were nonexistent for the VAX we had two years ago. We wanted something that would run pc software and was user friendly. We especially didn't want to load people down with expensive equipment for what I'd call second-tier support applications."

The vp of MIS at a large retail company in the Midwest says his firm just replaced its Wang terminals with IBM PCs because it believes the PCs will be easier to link in the long run. "Our strategy is to hook them up into a local area network," he says. "We will be piloting a System/36 or departmental networking. We looked at the cost per terminal versus the cost of PCs, and we found PCs were cheaper in the long run. Wang says it will be able to link with IBM communications architecture, but they're not there yet, and there's no telling how long that will take."

Implementing a practical departmental computing solution has not been easy, this MIS executive says. "We need to improve our profitability, and getting a good system in our departments is costly and sometimes hard to justify. We're trying to slip the pcs in through the back door, you might say. But even if we had the money, the networking technology isn't there yet."

The choice between meeting departmental computing needs with more pcs or multi-user systems depends heavily on costs and future upgrade needs, says Alan Goldberg, an analyst with International Data Corp. in Framingham, Mass. It's arguable whether networked pcs or shared-logic minicomputers provide more utility, he says, but more users are finding out that personal computers are not the panacea they might have imagined.

"Sometimes you find that a micro-based system works well the first six months, but you need to add more disk storage or more users."

Goldberg subscribes to the multi-user system solution to departmental computing for several reasons. First, the cost comparisons are persuasive, he says. He compares the total costs of a system of four networked IBM PCs, including network cards and printer, with the cost of an Altos 586 series system with four terminals and a printer. The cost per user of the PC-based system is $3,325, while the multi-user system is $2,700 per user, a saving of $625 per user.

A study on low-end multi-user systems by Infocorp, a market research firm in Cupertino, Calif., concurs with Goldberg's point: multi-user systems have become significantly more cost-effective than pcs on a per-user basis. The study predicts that shipments of multi-user micro systems selling for under $25,000 will grow 47% through 1988, representing a market worth $25 billion.

MIS managers may be better off, however, implementing minis in their departments for reasons that include, among other things, data security and the availability of high-level communications

protocols to download information from the mainframe. But perhaps more important, minis provide a measure of control over departmental data processing. "MIS has lost control over ad hoc pc purchases," Goldberg says.

Departments have had their fling with technology, and the time for disciplined access to data and centralized hardware configurations has come, says Ronald T. Brzezinski, vice president of corporate information services at Quaker Oats in Chicago. "We used to have separate groups of people doing their own thing within departments, using pcs or word processors, but now we need to have everyone communicate with each other."

The company just installed a Wang VS 85 mini to handle correspondences in the consumer affairs department. "We needed a lot of processing power for this job because we process something like 130,000 correspondences a year. A micro-based system just wasn't big enough for the job," he says. The company also has an HP 3000 in its market research department, where 18 users have direct access terminals linked to the mainframe. "In both cases, the decision to purchase those systems was driven by the specialized software we wanted," Brzezinski says.

"We also have clustered Burroughs B25 pcs at our Fisher-Price Toys subsidiary. In addition, we have three Ethernet local area networks implemented, and the best I can say about them right now is that they are highly experimental. Our biggest challenge is to learn to manage multivendor equipment in a multi-user environment."

Will standardized and more sophisticated local area networks replace multi-user systems in the future? Probably not, the Infocorp study hints. Both will coexist in the marketplace. In the meantime, micro and mini vendors are both beefing up and scaling down their product lines in an attempt to fill the gaps in departmental computing. Altos promises to move upscale in the low end of the market over the next six months. "We're going after the traditional minicomputer market with smaller and cheaper systems," says Ed Franklin, manager of product marketing at Altos. The company has developed a proprietary LAN to connect multi-user systems and pc networks, but for now only Altos equipment can be hooked up.

In the end, the winners in the departmental computing race may be determined not on the bases of functionality, networkability, or expandability, but on the more mundane factor of low-cost distribution. "The large vendors aren't doing a good job at selling in the $10,000 to $50,000 range," says Chris Steitz, an analyst at Infocorp. That's where the small vendors of microsystems come in. "It's not a whole lot easier to sell multi-user systems now that they're $30,000 than it was when they were $100,000 because the cost of selling is the same. You're just making less profit on the sale," says Sandy Gant, also of Infocorp.

The small vendors will thus be looking heavily to resellers to market their departmental systems into vertical niches. That may leave horizontal applications open to the big vendors, who can rely on their size and longevity to win sales into user departments. ◉

A MAP FOR THE OFFICE

Can users organize a new office automation standard protocol and end the incompatibility nightmare?

by Willie Schatz

Having made it at the bottom, MAP (Manufacturing Automation Protocol) is taking it to the top.

That's TOP, as in Technology Office Protocol. Actually, that's only its nickname. Its full moniker is Open Systems Interconnection (OSI) TOP. But you can call it TOP. All its friends will. There should be thousands of those if all goes according to plan. TOP's creators hope it will do for the office what MAP is doing for the factory.

"It's pretty simple," explains Laurie Bride, manager of networking technology for Boeing Computer Services (BCS). "We wanted office products that are OSI compatible and we weren't getting any."

Neither were most of the other members of the Network Users Group. NUG is composed of about 80 leading dp shops, all of which have spent considerably more money than they wanted to, trying to get one part of their offices to talk to another without busting their budgets. Like their MAP counterparts, these companies haven't gone to proprietary networks because they wanted to—they haven't had a choice.

Now they think they will. After spending so much for so little (relatively), maybe they can get bigger bangs for fewer bucks.

"I think all of us face the same frustrations and problems," says Doug Taylor, manager of strategic planning for data and communications systems at Ford Aerospace, Newport Beach, Calif., and secretary of NUG. "We've got a lot of excellent systems that won't share resources or communicate with each other. We've got more and more of a need to share information.

"There are systems that won't remain if we can't find a way to integrate. Even our biggest vendor, IBM, has products that puzzle us. The products are excellent for what they were specifically designed for, but they won't fit well within our overall family."

Dissension is bad news. After all, the family that inputs together outputs together. Since Ford Aerospace is hardly out there by its lonesome, vendors began hearing what users were saying. The issue came to a head at a recent OSI workshop at the National Bureau of Standards. Among its other functions, NBS tests standards to make sure that they are in reality what it was said they would be in theory. According to Bride, the agency is currently making OSI into Federal Information Processing Standards.

Enter General Motors and Boeing. GM, MAP's creator and protector, wanted to make sure the factory floor could talk to the office cubicle. Boeing, a major participant at last year's NCC demonstration and the link through which IEEE standards 802.3 and 802.4 will talk at November's AutoFact show, was getting a little tired of being invisible.

"All the emphasis on GM fogs recognition that these are international standards," Bride says. "Not everything is MAP. Some of it is space fillers. GM has done me a favor by moving ahead on products. By putting so much money into mass changes I get to see products I wouldn't otherwise see. But office users aren't nearly as cognizant of vendor problems as factory floor users are. It's tough for users to convince management that they should get involved.

"We've been playing second fiddle to GM for a long time. That doesn't mean they're getting in the way. I just wish we carried the weight they do."

Well, TOP will tell where BCS tips the scales. Anxious to go from second to first, at least on an office issue for which it has been conformance testing all along, BCS will lead the TOP parade.

Okay, so it's not much of a crowd right now. The specifications aren't written yet. When they are, they will involve only layers six and seven—presentation and application—of the International Standards Organization's OSI standard. There's no users group, although one is sure to be spun off from the current similar MAP creation. And vendors aren't exactly killing themselves to sign up.

That doesn't mean they won't, though. Lurking behind the scenes is the

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omnipresent and omnipotent GM. Caveat vendor—the giant automaker and its billion-dollar dp spending is as committed to TOP as it is to MAP.

"We had been fighting both Ethernet and 802.5 [token ring] as potential standards until 802.4 [token bus] was locked as a factory floor standard," says Mike Kaminski, program manager for MAP. "But if we don't start working on the office now, it will be too late to develop something where different environments are talking to each other. We want to link MAP to a cost-effective network in the office and engineering environments.

"But we can't do everything. Boeing has been concerned that it's not getting enough PR for the 802.3 interface

GM and its billion-dollar dp spending is as committed to TOP as it is to MAP.

it's going to show at AutoFact. So we'll obviously support them. We'll pass the technology we're developing to them. Our only concern is to make sure what BCS develops is no different than MAP at the two upper levels of the standard."

That may be easier said than done. Writing the additional protocols for electonic mail or business graphics should be a breeze. Trying to get them accepted in the office may create a hurricane.

"Office automation has fizzled," Bride contends. "We're not able to get office people excited. There's a lot of inertia and complacency to overcome.

"But there will be additional pressure from GM. And vendors are already talking TOP. The office includes a whole user and vendor segment that MAP leaves out. There's too good a nucleus in the MAP users group to let that go. And it should be no problem getting vendors like DEC and Wang to support this."

For sure—if they buy the MAP theory. The assault on vendors' proprietary tendencies hasn't changed. Only the location has. For TOP to fly, users may just have to tell vendors that they don't want them darkening their doors unless they have TOP-compatible products with them. That's working for MAP because GM is talking. BCS's voice isn't quite as loud and its pocket is hardly as deep. "Hell, no," said a member of the MAP standards committee at the recent MAP users meeting when asked if BCS could do what GM did.

Still, the message seems to be getting across.

"In terms of multivendor compatibility, TOP is most certainly necesssary," says Joe St. Amand, senior network architecture consultant for Wang. "Most members of NUG have told us they can't handle any more incompatibility. So we're involved. So are DEC, Data General, and IBM. We're all doing the same thing. I think only Burroughs is taking a different tack.

"What's Wang's interest in this? We're providing a service that the users want. It's a radical departure for us. We've always been proprietary. The users have told us they won't tolerate that any more. They haven't put a drop-dead date on us yet because the protocols aren't stable. Once they are, I think they'll do just that." That business ought to be mighty good. Megabucks, at least. After all, there are more offices out there than factories. Maybe office automation isn't the buzzword it once was, but that doesn't mean the door will be slammed when a TOP vendor comes calling.

"Almost every major vendor has an office architecture it's promoting as the solution to the communications problem," Ford Aerospace's Taylor notes. "We've got DEC, Prime, Data General, IBM, Honeywell, and Wang products in our office. They're all using proprietary synchronous protocols. We can't find out what they are. Even the vendors aren't sure. They just know it works.

"We work a lot of strange methods to pass data between systems. It becomes a difficult environment to manage. It's not productive, either. TOP has the potential to change that."

But can the top player keep TOP on top?

"Sure, we have the ability to pull this off," BCS's Bride says. "We're as well qualified as anyone."

Well, almost. But just in case, there's always GM in the wings. ◉

BRINGING IT ALL HOME

IBM has tapped DISOSS and the System/36 as key elements in its grand scheme to unify its entire product line.

by R. Emmett Carlyle

It's been called "a hardware hog," "clumsy," and "indigestible." The first release four years ago was generally agreed to be so awful that it was unusable. Rather than attempt to migrate from the product, users simply abandoned it in favor of a later version. Four releases later, hundreds of (mostly experimental) installations have risen to the challenge of swallowing IBM's DISOSS (Distributed Office Support System/370), only to reach, in discomfort, for their stomachs.

Early indications from test sites are that DISOSS is an organizational nightmare, for some "a vision of hell." But it's a seductive and compelling vision, they admit, because DISOSS and its implementation of IBM's Document Interchange Architecture (DIA) for the office promise to be the "the great unifier," a solution that reaches out to IBM's fractured and fragmented product line and glues it together for the first time.

Two questions are central: how much will it cost, and which midrange machines will be used to implement this great unifier? Users simply can't answer the first question. "Until you've been there you don't know; the costs can't be computed beforehand," says Dolores Forg, president of the IBM Distributed Office Systems User Group, which counts many experimental DISOSS sites among its membership. "You have to proceed on faith, and move away from cost justification."

It's not suprising then that many users are holding back. Some sites have had DISOSS in-house for two years or more

"You don't just drop DISOSS in, because it cuts across all the usual corporate boundaries and territories."

and are still far from a production system. Most are just commencing pilots, typically with some 150 users.

"You don't just drop DISOSS in," Forg points out. "The product cuts across all the usual corporate boundaries and territories" (in the sense of management fiefdoms). Since DISOSS caters to electronic document distribution as well as to host-based library services, the system has to know where to find people and documents. It's a colossal cultural as well as organizational problem, she explains.

On any level you look at it, DIA/DISOSS is the price that IBM's customers must pay for embracing the company's vision of mainframe host-driven (and host-dependent) office automation; and pay they will, embrace it they must, as recent surveys show.

The big corporations are intent on maximizing access to corporate (i.e., IBM host) data, and will do so even if it means passing up the superior functionality and price of competitive mini-based solutions. For this reason, DEC, Wang, Data General, and other leading vendors have been forced to accept DISOSS and mainframe support as major requirements, and are busy building bridges into this world—even sculpting their own streamlined and more compact versions of DISOSS.

"If you want to maintain central control—and we all do—DISOSS is the

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only way to go, the only coherent approach we've found," says David Marks, head of subsystems operations and a senior office automation analyst at Great Western Savings & Loan, Northridge, Calif. "DIA and DISOSS are the only constants in IBM's volatile office scenario and [IBM] is committed to them," he says.

This commitment and the prospect of DISOSS bringing the proliferation of IBM's midrange systems into cohesion seem to be what large IBM users have been waiting for. "We've got one of everything, like everybody else," says John Nack, president of the user group GUIDE and director of the data center for Caterpillar Tractor in Peoria, Ill. "We've been hanging back on our DISOSS while we finalize our OA plans, but now we're moving forward with the software."

DISOSS is designed for use on multiple host mainframes (running under MVS or DOS), preferably with an intermediary distributed node. IBM built the 8100 expressly to perform this role, but DISOSS is now reaching out to other intermediaries, notably the highly visible System/36, and even directly to terminals and PCs on the desk.

The original (so-called Professional Support) interface to DISOSS was very difficult to use and is now being replaced by friendlier versions known as PS/PM (Personal Support/Personal Manager). The PC version was expected this month. Nack's 200MIPS installation, one of IBM's biggest, has been beta testing the PS/PM versions for the 3270, and he says they are acceptable for simple messaging and memo exchanges. "They're not as user friendly as they could be," he notes, "but IBM's getting there."

Because DISOSS will require a terminal on every desk, Forg predicts that both voice input and a new breed of ceo more familiar and comfortable with technology will be required before IBM's MVS customers begin to commit themselves to DISOSS in large numbers. "There's great cultural resistance. Most top executives still prefer secretaries to touching a keyboard." And as Nack points out, "There's not enough in the 3270 link for a secretary at this time."

IBM NAD president Mike Quinlan: "We must make the System/36 the departmental 'system of choice' and establish DISOSS and PROFS as our strategic host applications."

Nack confirms the widely held belief that DISOSS is a resource hog when used without an intermediary node. Since IBM's strategic purpose is to get sites to implement DISOSS as quickly as possible because of the extra cycles, storage, and other hardware it can sell, the cost of software is now very low. A base license of $1,000 and a $217 monthly fee are all that is required to run DISOSS on a host. A license for mounting a chunk on the 8100 costs $187 and only $38 a month.

Through IBM's many halting attempts to sell office automation systems to its large accounts, the company has given off confusing signals as to which of its distributed and departmental machines is the strategic choice. At various times the 8100, Displaywriter, and PC have been in.

Now, as Mike Quinlan, president of IBM's National Accounts Division, recently explained to his marketing troops, "We must make the System/36 the departmental 'system of choice' and establish DISOSS and PROFS as our strategic host applications."

The message hammered home IBM's apparent decision that the 8100 is out and the System/36 should be rapidly elevated to take its place, both as the DISOSS cluster controller and as an applications machine. "The implication is that the System/36 is the 8100 replacement,

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but IBM has not come out and said it yet," Nack says, adding that the 8100, though described as mature by IBM, is still a live product and the only machine currently powerful enough and capable enough to be the DISOSS controller.

Some users clearly believe that the 8100's death knell has been sounded, and one user described a recent GUIDE/8100 user group meeting as "resembling a funeral service." An innovative Los Angeles 8100 user says that Travelers Insurance in Hartford, Conn.—the largest known 8100 user with some 600 systems—intends to desert the machine in two years. (Travelers was unavailable for comment at press time.) Others, like Great Western's Marks, claim such a step would be premature and unnecessary.

"When pressed, IBM has told its 8100 users that the machine will not be replaced by the System/36 and that their investments in data and programs are perfectly safe," Marks reveals. "Based on what I've been told, IBM intends to replace both the 8100 and the System/36 in three or four years with a more powerful successor that is compatible with both."

Other sources say that this machine, code named Fort Knox, is now under development by the so-called 3X group—the builders of System/34, 36, and 38—at Rochester, Minn. The code name may prove to be unusually appropriate, since IBM's Quinlan conservatively reckons that by 1989 nearly half the total revenues of the whole information processing industry will come from the gold mine of office systems.

As well as inheriting this market potential, Fort Knox will be compatible with its other 3X stablemates, which together constituted a worldwide base of some 200,000 units at the end of 1984. The Gartner Group, a market research firm in Stamford, Conn., claims in the absence of IBM figures that the System/36 alone racked up 40,000 unit sales in just 18 months.

"IBM intends to replace both the 8100 and the System/36 in three or four years with a more powerful successor that is compatible with both."

Until Fort Knox comes along, the System/36 will mature, gaining more power and DISOSS support along the way. Marks predicts that full DISOSS support—including the ability to file, store, and retrieve documents on the host DISOSS mainframe—will be slow in coming for the System/36. "The incompatibilities between the data stream and database structure of DISOSS and the System/36, which was designed in splendid isolation in Rochester and was never intended to be a mainstream product, are too great at this time," Marks stresses.

The System/36's low manufacturing costs, rugged qualities, and what users claim is a two-year-plus mean-time-between-failures rate make it the perfect vehicle for IBM's low-cost producer strategy, and for a price-slashing run at the distributed and departmental machines business. For IBM, it seems to be the best choice, even though at 0.2MIPS it is clearly underpowered for the role. A push with a more powerful high-end 4300 cluster controller would require significant price-cutting and may divert demand away from small 308X mainframes. Should it choose to exploit the cluster controller market with its System/38, IBM could shift demand away from the 370 family in general, since the two are incompatible.

IBM's marketing pitch is attuned to its financial needs and its technical ability to deliver a product, says Bob Djurdjevic, president of Annex Computer Research in Phoenix. "The 36 is the machine of today, but that could change." Djurdjevic and some IBM vars believe IBM could be readying a small departmental 4300 for a fourth-quarter announcement: "What makes more sense [than a more powerful System/36] is a hardware architecture for the office that is consistent with 370."

Other experts disagree. "The greater complexity of VM and the 4300 make them more appropriate vehicles for engineering and scientific departments," says Myron Kerstetter, an analyst at the Gartner Group. "This is how I think they'll be used."

All experts concur, however, that IBM is playing a smoke and mirrors game with the System/36 in an all-out effort to commit users. "But it's really absurd that a 16-bit architecture with no DBMS and no obvious growth path should be touted as the DISOSS controller," Kerstetter argues.

Perhaps this is why the most frequent phrase heard at the recent meeting of the Common user group in Louisville, Ky., was "larger and smaller. There is little doubt that IBM has been sitting on the 36 so that its rapid elevation doesn't eat into System/38 sales. Sources claim that a 24-bit architecture and a doubling of MIPS "at the flick of a switch" is latent within the machine. The best guess from sources is that a configuration offering up to 4 megabytes of main memory and over 2 gigabytes of auxiliary DASD (through connections to the bigger 3370 disk found on the 38) will be commonplace on next year's System/36.

As one wag noted, "The smoke will be just that little bit thicker then." ◉

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PROCUREMENT

A NEW THREAT TO PCMS

Congress is considering a 20% surcharge on Japanese computer imports.

by Thomas Murtha and Willie Schatz

These are the times that try Congress's soul. And when the soul of our tax and tariff makers is stirred, everyone worries. The most savage anti-Japanese rhetoric since World War II is flying all over Capitol Hill. At stake is more than just the usual tax shelter schemes of the rich—this time dp procurement practices are vulnerable.

A slew of protectionist bills—about 35 at last count—have emerged from an aroused House and Senate, ready to defend American telecommunications and computer vendors. The proposals range from banning the U.S. sale of telephones, PBXs, and datacom gear produced in Japan until U.S. firms have equal access in Japan, to proposing a 20% or 25% or 35% surcharge on all Japanese imports.

All of the trial balloons and rhetoric are causing a considerable tremor in the computer industry. Give it a 6.8 on the Richter scale. "This would be a sword that cuts through the entire electronics business," says Wayne McIntyre, director of special purpose systems at Amdahl in Sunnyvale. "You'd have increased costs of memory on virtually any computer by whatever amount that tariff is. IBM is the only one with its own memory. Everyone else gets it from Japan."

That includes the low end as well as the high end. Cray buys a substantial amount of logic circuits and direct access storage devices from Japan. Control Data's disk drive business, already being pounded by Fujitsu's selling below CDC's cost, would be dealt a potentially fatal blow. Sperry's personal computer is literally made in Japan, by Mitsubishi Electric. Even Big Blue isn't so big in this field. It's a major importer of chips and subassemblies. A great deal of the PC is imported from Japan. All in all, the widespread oeming of systems and components from the Orient is threatened, as well as the American sales arms of the Japanese firms.

While Congress may be focusing on the Toyotas and Nissans of the computer industry, its proposals endanger a number of American firms. That, in turn, leaves many dp managers vulnerable, because the dedication to a second source for IBM-compatible systems may be tangled in a web of congressional and international intrigue that makes the voluntary quotas on car imports look like a day in the park.

"We'd be in bad shape," admits a government relations executive at a top 10 computer company. "I don't think any computer company is happy with any of this."

But some are less happy than others. Amdahl, for instance. Its high-end products are almost entirely from Fujitsu. It's also 49.5% owned by the Japanese company. How about National Advanced Systems, the computer piece of National Semiconductor? It's married to Hitachi. The relationship experienced a difficult courtship—just ask IBM—but has endured rather well. Finally, there's BUNCH member Honeywell. It recently made a major splash with its new manufacturing automation equipment, MAP-compatible and all that. At the foundation of the company's high-end line is the DPS 90, the company's five-model step-up from its previously most powerful DPS 88 series. And what central system technology is the DPS happening to be using? NEC, you say? You're right. Then again, Honeywell has been wedded since 1983 to that Japanese company.

"These bills will clearly affect us more than someone who doesn't get as much from Japan," admits Doug Baily, NAS's vice president for worldwide marketing. "A quarter of the revenue derived from the computer business comes out of Japan. If there was a discriminatory tariff, it would affect that quarter. That means two things would happen: vendors would have to raise prices, and that would reduce profits and raise all the attendant problems of staying in business. Those vendors would have a reduced market share.

"That, in turn, means it would be more difficult for users to justify major systems. That would tend to allow IBM to have a more powerful position in the marketplace. Then we and others like us would have to take lower margins, which makes you less competitive all the time."

Many dp managers are already concerned. A 20% surcharge "would kill Amdahl and NAS," notes Carl Reynolds, staff vice president of communications and dp for Hughes Aircraft Co., Long Beach, Calif. "They haven't got a 20% margin to play with. But the real damage will come in two or three years. Then there'll be a 100% differential, as in the the late '60s and early '70s, when IBM was charging twice what the technology was worth. And anything that cuts competition in the industry has to be good for IBM and bad for everyone else." As for his own shop, Reynolds is relatively sanguine. "This market isn't terribly price sensitive to a 10% to 20% increase. We lose 15% to 20% a year anyway because of technological advances. A surcharge would be annoying and delay things some for me. But it wouldn't kill me."

Another big danger is the potential long-term impact on innovation and competition in the U.S. Startups, unless they could really do it on their own, could forget turning those garages into multi-million-square-foot plants by using overseas manufacturing companies to get started. The companies already in business would have to fight that much harder to maintain the status quo.

"If it drives our costs up, it's going to drive up all American companies' costs too," Amdahl's McIntyre says. "If it knocks us out of the running, the market isn't going to be nearly as competitive. Then the user pays."

Doesn't he always? The surcharged companies aren't about to eat whatever percentage they're hit with for dinner. They're going to pass it on. And the buck stops at the user.

The tough talk in Washington could be especially bad for Japanese pcmers already having their margins squeezed by Big Blue. While Fujitsu is far more vulnerable than the more diversified Hitachi, both mainframers could kiss their meager American market shares goodbye if they lose their niche: superior price/performance.

"A 20% surcharge would kill Amdahl and NAS."

"Trade restrictions would be devastating for our pcm business," frets Kanji Nekal, manager of the product planning department of Hitachi's computer division in Tokyo. "We simply don't operate on wide enough margins to withstand a 20% surcharge. It's really hard to say what would happen over the long term. We're constantly improving our price competitiveness, but we would almost surely lose our cost/performance edge in the American market. Everybody would suffer. Import restrictions are not a reasonable solution to the problem."

So now the question becomes whether any of these bills will reach the President's desk. After fanning the protectionist flames, Reagan finds himself desperately trying to put them out before they start a real fire. He has consistently played up any Japanese initiative, no matter how small. He's also trumpeted how seriously the Japanese are taking their obligations and how committed they are to

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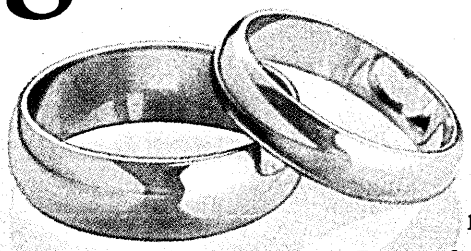

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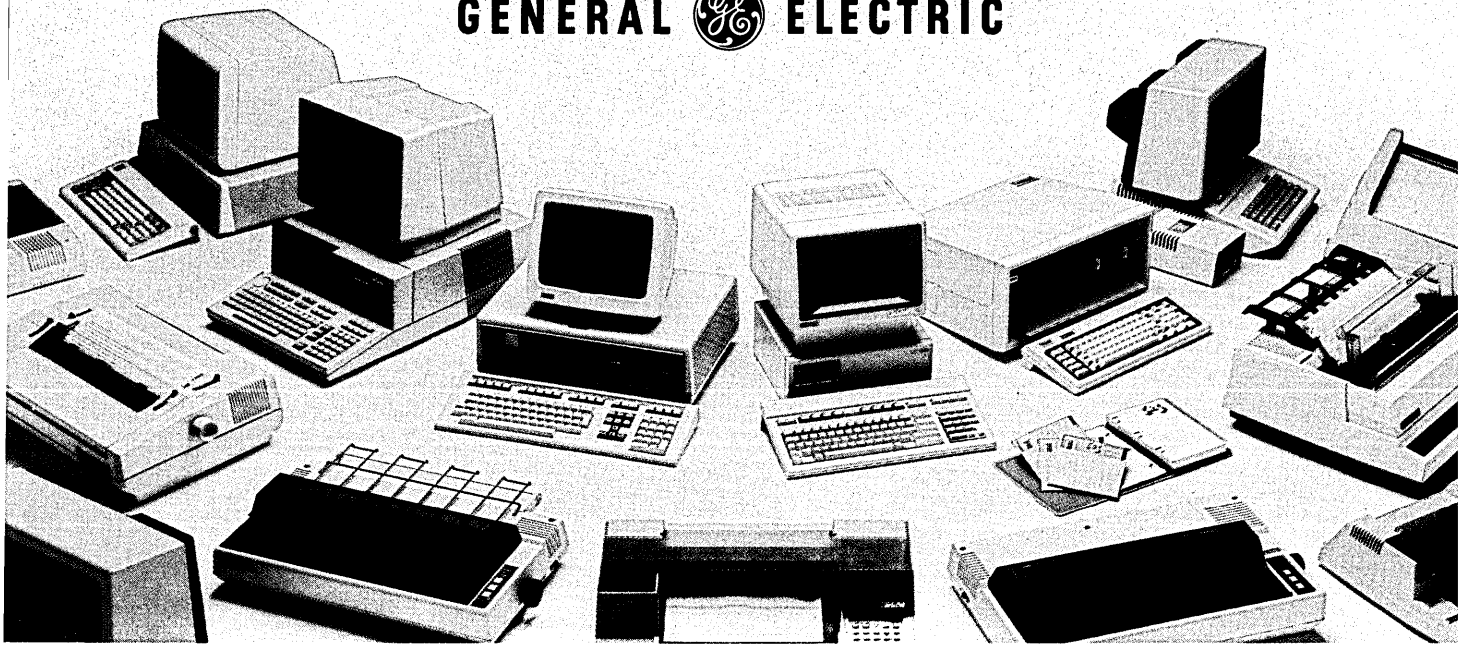

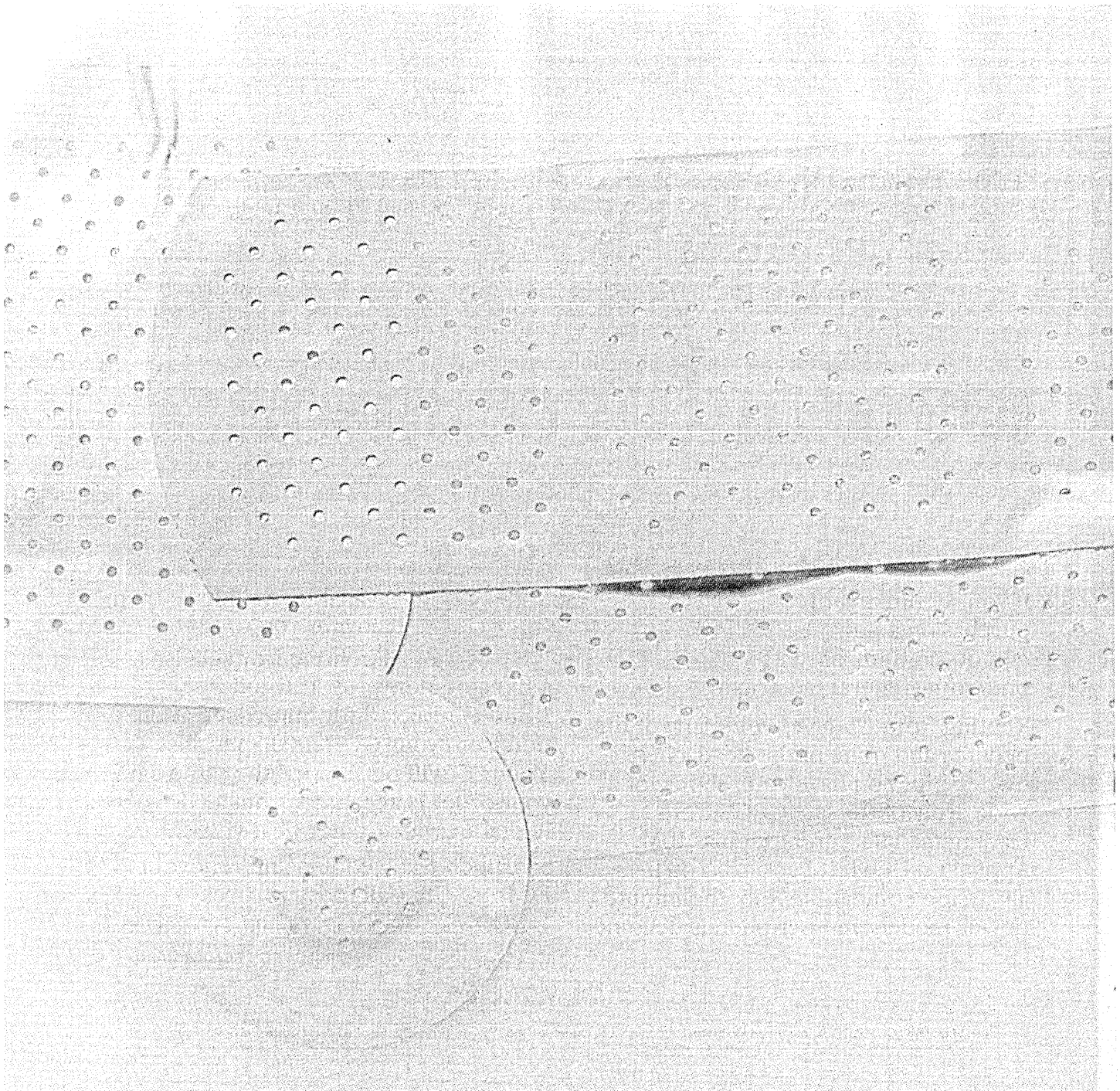

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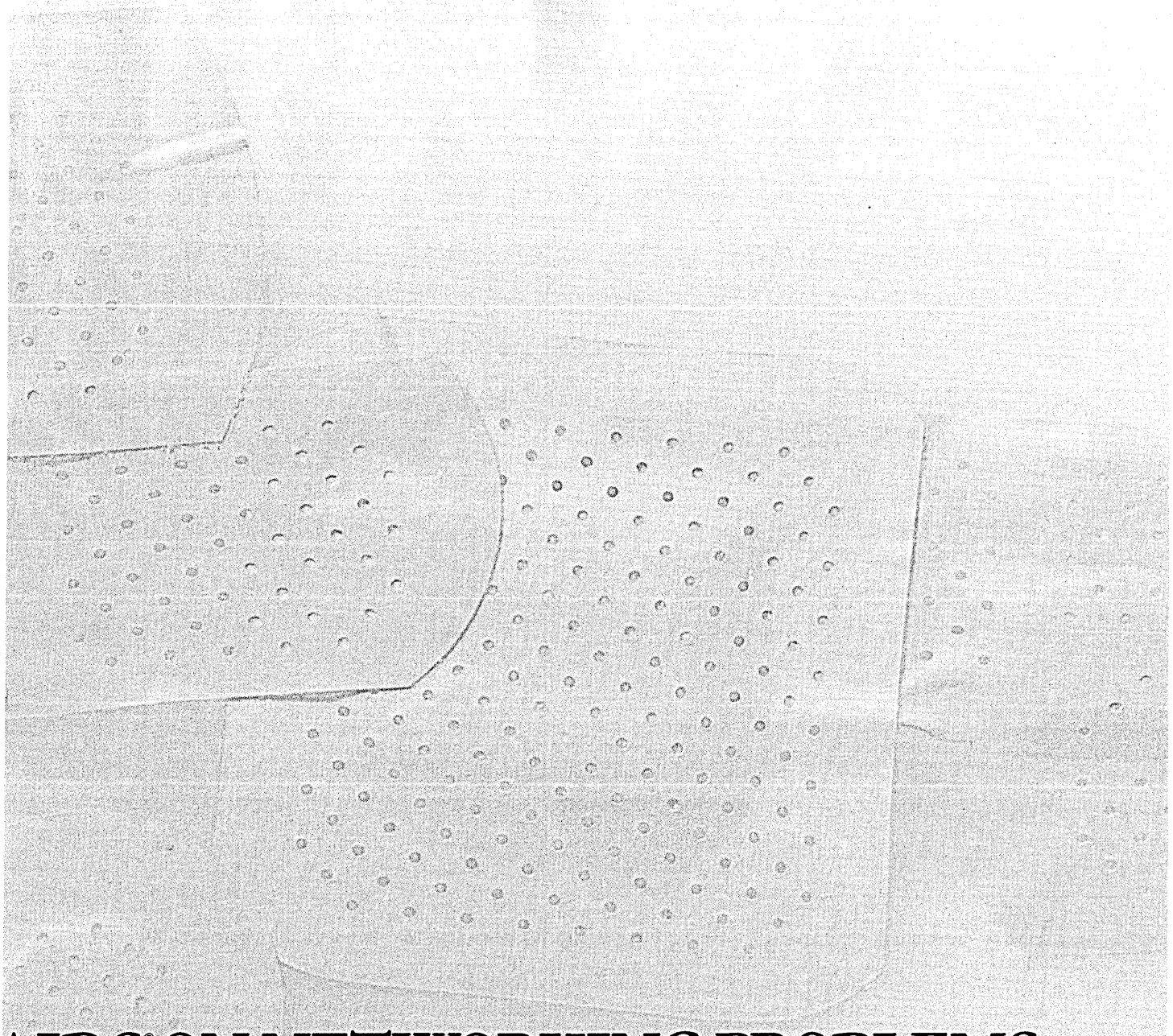

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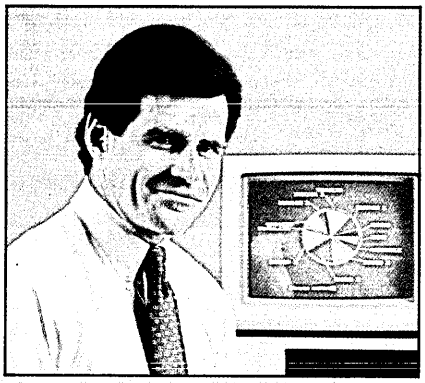

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working things out. Odds are he'll veto any protectionist measure that makes it to his desk. But in this political climate all bets are off.

"The talk has died down momentarily, but it all depends on Japanese concessions and the budget and tax reform," says a staffer on the House Subcommittee on Trade. "The Ways and Means Committee has reserved 34 days between May 1 and July 15 for tax reform. That paralyzes subcommittees like ours from holding hearings on the Japanese situation. I don't think the votes are there for pure retaliation against Japan. But if the surcharge money can somehow be combined with the budget deficit, it might pass."

All of this storm is over the apparent recalcitrant Japanese position regarding imports of American telecom gear. After the first squall in Congress, Japanese politicans didn't waste any time coming up with concessions to placate American trade negotiators. The Ministry of Posts and Telecommunications (MPT) got orders several weeks ago to give ground to U.S. officals and industry representatives seeking to open up the Japanese market for terminal equipment. The result was an agreement to demystify standards and certification procedures affecting the sale of telecommunications equipment and services in Japan. From the U.S. side, it looks like a drop in the bucket.

"It's wrong to say that all the problems in telecommunications are resolved," stresses Don Abelson, director of technical barriers for the United States Trade Representative in Washington. "In our negotiations we tried to reduce the discretionary authority of bureaucrats. We got an agreement that MPT would eliminate some regulations we thought were unnecessary and simplify others."

Adds Jack McDonnell, chairman of the Electronic Industries Association Telecommunications Committee and a member of the U.S. delegation that came to Tokyo to persuade MPT to clean up its regulatory act, "The fact is, we have done a service for companies like NEC because they are actually selling more advanced PBXs in the U.S. than in Japan. This is a specific example of how standards written too tightly can restrict progress. There are a number of innovative U.S. products that could not be sold in Japan because there were no specifications under which they could be sold. In the past, NTT was judge and jury because they wrote the specifications. That's no longer true."

U.S. negotiators demanded and got the resignation of the directors of the industry board reviewing American telecom gear. The Japanese conceded because the inspectors were also affiliated with Hitachi, Fujitsu, NEC, and Oki, suppliers of competing gear. The U.S.'s insistence that the agency's inspectors also resign was not a complete victory—their retirement and seniority benefits continue to occur and they return to their "previous" employers.

That's just one example of the institutional cronyism that some Americans would unfairly call institutionalized corruption. The Japanese don't see it that way. Preserving carefully cultivated relationships between businessmen and bureaucrats is more important than free competition open to all comers. Blood is thicker than water, right? Tokyo-based Americans carefully monitoring the agreements remain far from satisfied.

Are Japanese trade practices just institutionalized corruption?

"We're still in the final stages of closing the deal," cautions a U.S. government official in Tokyo. "We've got to make sure we get what we bargained for and that the Japanese side honors their commitments. Everything that has been agreed to verbally and in writing must exist somewhere in the Japanese administrative system. Until we see how a firm can fill out the forms and walk through the process to get approval for selling its equipment, we are still in the endgame."

So what does this mean in terms of balancing the U.S.-Japan telecom trade imbalance? Not much. In 1984, the export-import ratio was a whopping 11.7 to 1 in favor of Japan. Blame it on the AT&T divestiture—the regional telephone operating companies more than doubled their imports of Japanese equipment as representatives of the rising sun walked in with the right stuff at the right price. Meanwhile, American exporters got less than 5% of a $2.25 billion Japanese market. Most of this went to the national telephone monopoly, NTT.

With that in mind, Congress launched its protectionist measures, and, typical of all well-meaning solons, there may be unintended consequences. Will the threat of a surcharge stampede Japanese traders in the wrong direction?

"If you were a Japanese businessman and knew there was a possibility of surcharges, wouldn't you send out every bit of inventory available to stockpile your U.S. warehouses?" asks Herb Hayde, chairman of Burroughs Co. Ltd. and president of the American Chamber of Commerce in Japan. "The trade deficit is going to be bigger, not smaller."

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SOFTWARE

THE PICK PUSH

New software and enthusiastic users promote Dick Pick's operating system.

by Edith Myers

Mention of the Pick operating system in a room full of Pick users is likely to evoke looks of near rapture.

Mentioning it in a typical computer store or to top management considering a systems buy is more likely to draw looks that are blank. Vendors and licensees are trying to change that.

"We all still feel strongly about the operating system and we want more acceptance in the marketplace," says Donald G. Heitt, president of the Computer Division of General Automation Inc., Anaheim, Calif., which offers the Pick operating system on its Zebra line.

Adds GA president Leonard Mackenzie, "Today the Pick operating system is a boutique system at best." He advises the Pick vendors to stop thinking of one another as the competition and to realize "the rest of the computing world is our competition. . . . We need some sort of universal agreement on how we're going to admit that we have something in common. We are a scrappy, ragtag group of wild-eyed fanatics." A few months ago Mackenzie used the phrase Pick revolution, but recently he has toned down the rhetoric. "I'm not sure it's a revolution. For business applications the Pick system is the leader. Things are moving today considerably faster than they have till now."

Mackenzie would like to see adoption of a symbol for Pick, "like the cotton industry came up with the cotton ball when it was losing business to the synthetic world. The companies involved were competitors but it was in their interest to let the world know that cotton is pretty good too," he says.

The International Data Base Management Association, San Diego, is leading the movement to popularize Pick because, explains president Gus Giobbi, "We're a professional marketing organization with no competing products." He described the participating vendors as "19 fierce competitors determined to preserve their uniqueness but not with the notion of a proprietary operating system. The death of that notion is total. The new thrust is to emphasize commonality."

But can Pick Systems Inc., Irvine, Calif., find the resources to promote the Pick system in the way AT&T is promoting Unix? And while AT&T is seen as a nurturing and friendly influence in the Unix world, it's not all hugs and kisses between Pick Systems and its customers. "Pick Systems is difficult to deal with," says Giobbi. "They've had problems packaging products to finality."

Dennis Brown, president of Seattle's Data Enterprises of the Northwest, which has installed some 100 systems based on Pick or Pick-like operating systems on machines from General Automation, Prime, Ultimate Corp., Advanced Digital Data Systems, and IBM (Series 1), says, "Trying to get a signed contract with Pick takes months," whereas "attorneys could agree on [it] in a few days." Brown is not overly optimistic about the future of the Pick system although he says "it's great." As for Dick Pick, founder and president of Pick Systems Inc. and developer of the Pick operating system, Brown says he "marches to his own drum." In a few years, Brown adds, there will be four or five quite different versions of Pick. "It's not going to die, but 10 years from now it'll be an asterisk."

But, he adds, "In some ways Dick Pick is still the best thing about the Pick operating system. The man is a genius, able to see farther ahead than most of us."

Pick Systems isn't sitting back allowing others to beat the drums for its operating system. It is planning Pick Fair, a trade show to be held in the Dallas Infomart Nov. 4-6 to promote the OS both inside and outside of the Pick community. "It'll be at least as large and probably larger than the Spectrum shows [put on by IDBMA]," says Richard Lauer, marketing and sales vice president for Pick Systems.

Another boost for Pick could come from additional success in the IBM world via an implementation on the System 36, something Lauer says he feels confident will happen some time in 1985, possibly under more than one agreement. Pick and two of its licensees, ADP of Roseland, N.J., which already offers Pick on Altos and Microdata systems, and Ultimate Corp., East Hanover, N.J., which has implemented Pick on Honeywell Level 6 machines, are said to be talking to

"In some ways Dick Pick still is the best thing about the Pick operating system."

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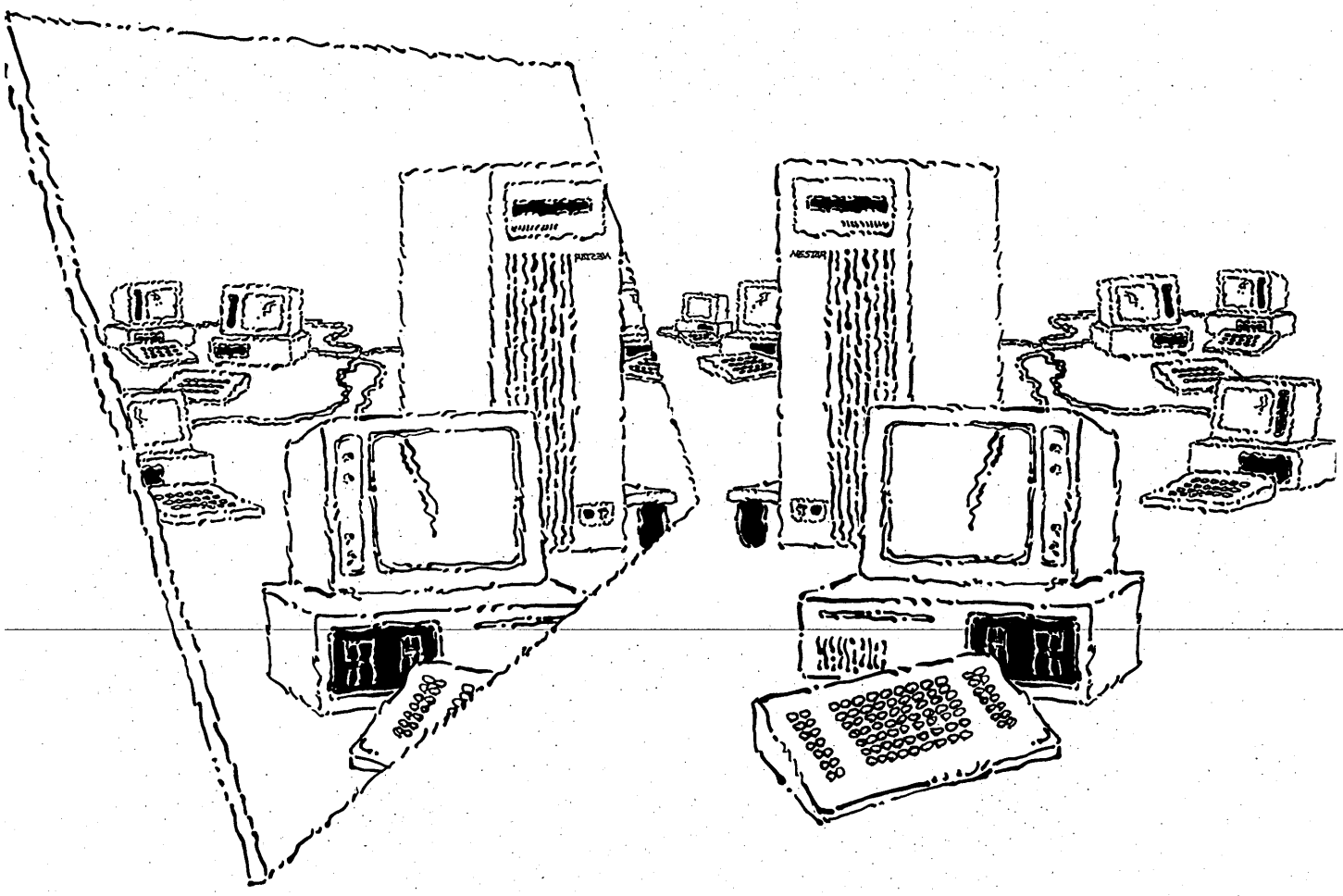

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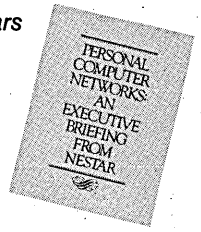

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IBM about this. The Pick system already is available on the 4300 series via Systems Management Inc., Rosemont, Ill.

Lauer expects "three or four new Pick licenses to be announced [in the second quarter] for major companies from the BUNCH. We're excited about the interest from major companies," he says.

Comparisons with AT&T and Unix aren't valid, Lauer notes. "Pick and Unix can clearly coexist. Pick is absolutely the business data processing system without peer. Unix has the functional and computational capabilities that are important in engineering. We don't claim to be the choice for those applications," he says. Lauer estimates the number of Pick operating systems installed at "about 35,000 and growing."

John Lynn, president of R-Computer, Palatine, Ill., which is selling Zebra-based systems to McDonald's restaurant franchise owners, says of the Pick operating system, "It answered our need for an on-line, interactive system for small businesses. We looked at Unix but it's far too complex for end users and there's nothing that Unix could do for us that Pick can't do."

At a birthday party in March to "celebrate 20 years of continuing development and improvement" of the operating system that bears his name, Dick Pick said the occasion marked "the beginning of a new phase of growth for the company, during which it will take a very aggressive marketing stance to gain widespread acceptance of the Pick system for the multi-user micro market."

Pick's system had its beginnings in 1965 when he was working with TRW on a software project that led to that firm's Generalized Information Management system. In October 1965, the Army contracted with TRW for continued development and implementation of a project called Integrated Technical Data Systems. Pick worked on the Army project and the ITDS software went into public domain.

In May 1968, while working for now defunct General Analytics Corp., Pick conceptualized a way to use the software with minicomputers and implemented it on a Microdata 800. He continued this development after the company went bankrupt, both within his own company and as a consultant to Microdata (now McDonnell Douglas Computer Systems Corp., Irvine, Calif., and a major Pick provider) from 1973 through 1976. Lauer says today Pick has 21 licensees running the operating system on 21 different machines.

Recently the company announced its newest development, called Open Architecture, which Lauer describes as "a rewrite of the internals of the Pick operating system, which adds communications functions and makes it easier to add new features."

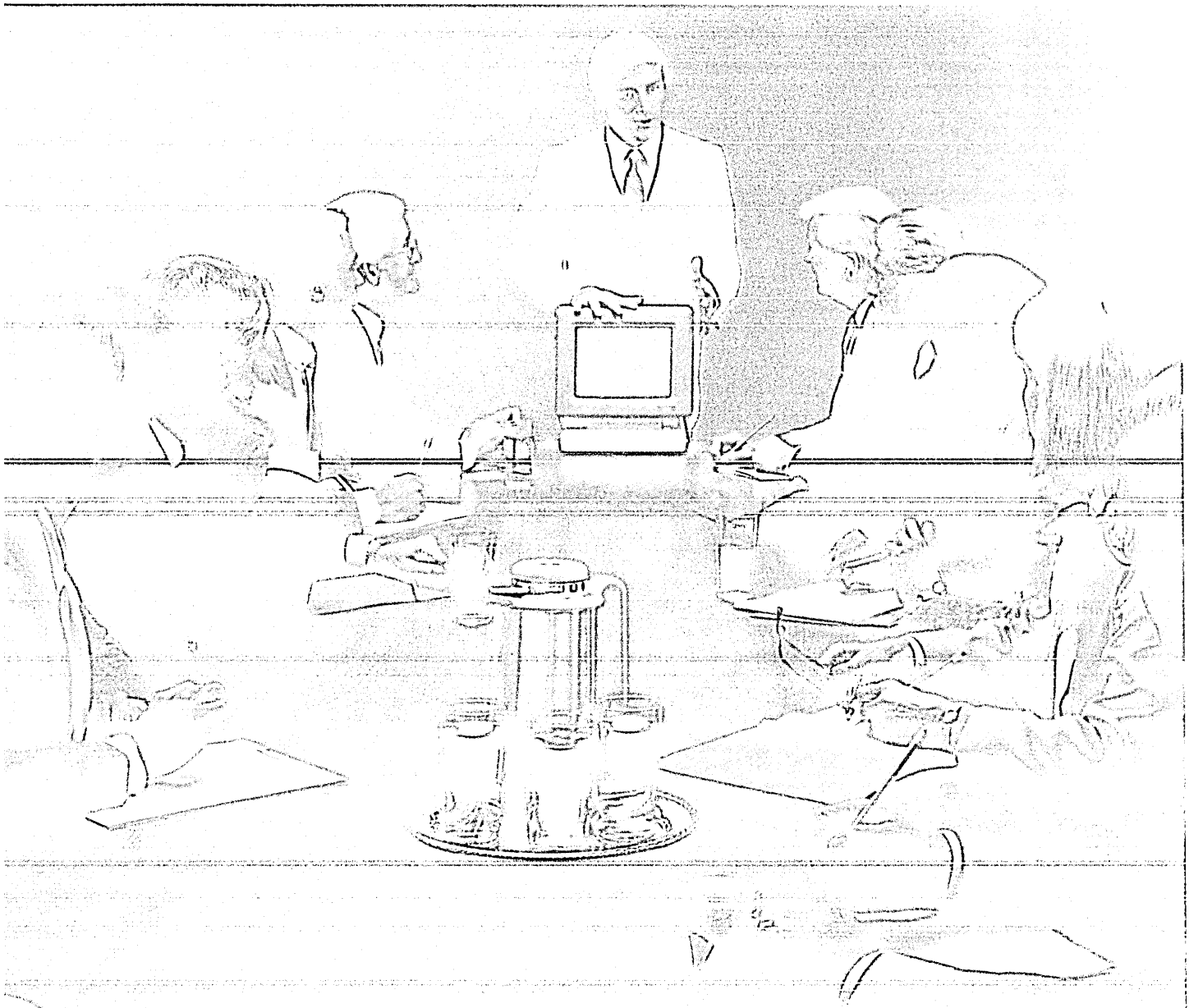
Brown of Data Enterprises says of Open Architecture, "It's long overdue. Till now, Pick couldn't talk to anything but Pick. Open Architecture overcomes this." He also noted that Pick's pc version "helps [the popularization of the system] but it takes over the whole product. It doesn't run on top of MS/DOS and to really get on IBM machines you have to go that way."

"Open Architecture is a rewrite of the internals of the Pick operating system that adds communications functions and makes it easier to add features."

Steve Kruse, marketing director, Cosmos Inc., Seattle, which since March 1983 has been offering Revelation, a Pick-like operating system for micros, says his company's offering has always had open architecture. And it runs on top of DOS. "We have an applications environment that wraps around the operating system. It runs on top of Unix as well." He says Revelation is installed in 8,600 sites and has some 12,000 users via links to Novell and IBM PC networks. "We've been on a tear here lately," he said recently. "The Fortune [1,000] companies are after us because we want to site license."

Would he like to see the Pick operating system promoted more aggressively? Most definitely, yes. "At 15% to 20% of our installations, people have never ever heard of Pick. We're proud of the Pick concept. We think it's the best possible solution."

Increasingly, international companies are looking at Pick. At a recent Spectrum conference, Mark M. Takeuchi, president of C. Itoh Electronics Inc., whose Irvine, Calif.-based subsidiary, CIE Systems Inc., offers the Pick system with its family of multi-user business computer systems, explains the choice of Pick. "I believe we've made the right choice in selecting the Pick system because we are looking at the world market, not just the U.S. The Pick system has exactly the characteristics needed to address a worldwide market: its suitability for managing databases, the availability of application software, its flexibility for application program development, and its portability. Its easy accommodation of operators who need to interface with their computers in foreign languages is a key selling point in non-English speaking countries," Takeuchi says. More than 40 have been in-



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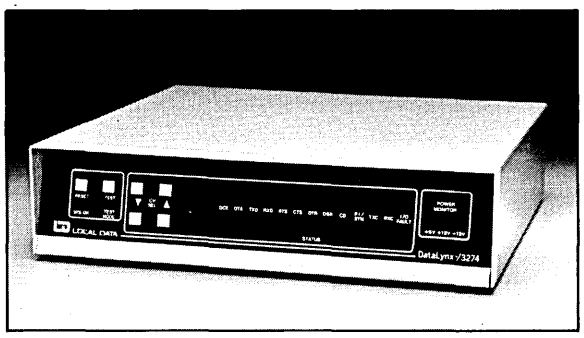
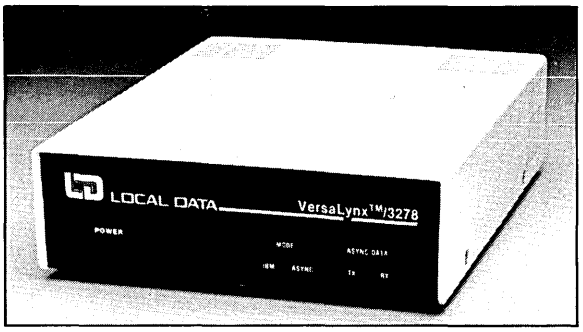
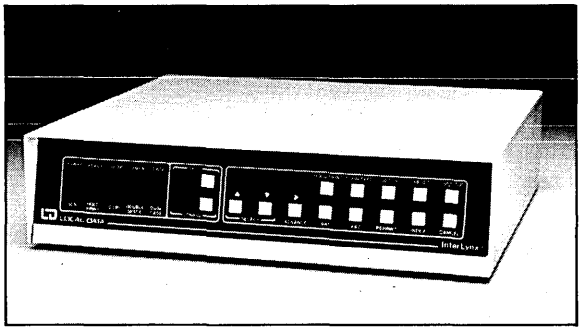
Local Data Protocol Converters



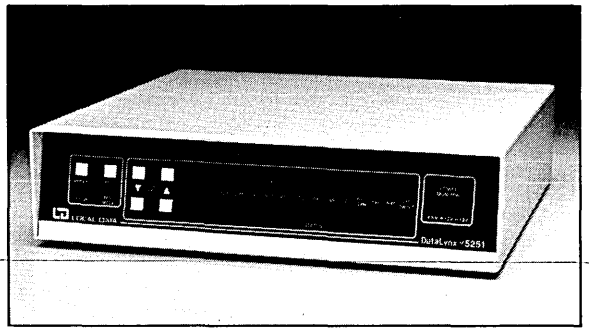
DataLynx/3274 connects 1 to 9 async CRTs and printers to a 3270 multipoint network, SNA or BSC.



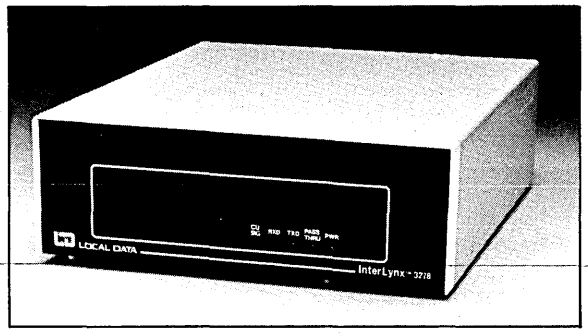
VersaLynx/3278 allows an IBM 3178/3278 terminal to access ASCII systems using asynchronous protocols.



InterLynx/3287 attaches low cost serial ASCII printers to IBM Type "A" coax ports on 3274/3276 controllers and 4331 CPUs.

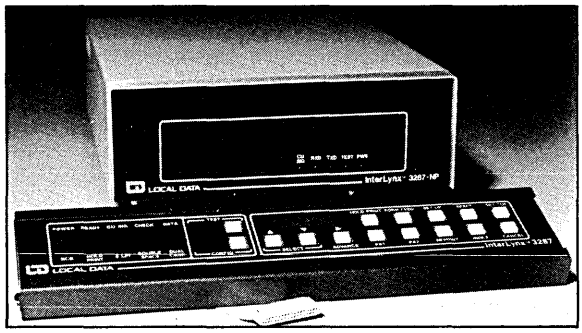


DataLynx/5251 connects 1 to 9 async CRTs and printers to a system/3X host.



InterLynx/3278 attaches low cost ASCII CRT terminals or PCs to Type "A" ports.

DataLynx/3780 connects asynchronous devices or mini-computers to 2780/3780 BSC networks, and has CRT and printer port and file transfer utility.



InterLynx/3287 NP is the InterLynx/3287 packaged in a smaller unit with the security of tamper-proof, no panel construction. Options are set by the portable plug-in panel.

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stalled in the past year or so.

Other new multinational Pick licensees include Nixdorf Computer Corp., which is attacking the market at the high end, at first with its 8890 series of computers made up of IBM-compatible mainframes ranging from the Model-12 (.4MIPS range) to the Model-72 (.8MIPS).

Fujitsu, another licensee, chose the Pick operating system for the first product to be introduced in the western hemisphere with the Fujitsu label displayed. The Japanese giant's licensing agreement with Pick Systems is for all processors it manufactures so that eventually the operating system will be available on machines from the low end to models comparable to top-end IBM class processors. The first product, a low-end system called the Pick Machine-System 2000, was introduced at the Spectrum conference several months ago.

"Pick [the operating system] is almost a religion with its users," says Brown of Data Enterprises.

Among the users are some self-styled converts. One of these, Bruce Powell, systems director for Standard Alloys of Port Arthur, Texas, says he thought IBM was "the only way to go" until five years ago when he switched jobs. "I was quickly converted. I like its [the Pick operating system's] ease of use, its flexibility, and the fact that it's easily upgraded."

Powell, running a Honeywell Level 6, says, "I'd challenge any IBM machine with comparable core, a 34, 36, or 38. I could run rings around them with this sucker. With new releases there are no problems ever. There never was a conversion with IBM that was not a problem and that's not sour grapes. It's a fact of life."◉

VERTICAL MARKETS

RETAIL'S NEW TWIST

PacTel InfoSystems is plunging into the risky world of selling into vertical markets.

by Irene Fuerst

It would seem the worst of times to open a chain of computer stores. Microcomputer retailers, tired of feeling like showrooms for mail-order houses, are feverishly wracking their brains for ways to shelter their profit margins. Industry observers, shying away from the term shakeout, instead say dealers are "undergoing a period of consolidation." Yet San Francisco-based Pacific Telesis, California's local phone service company, is rolling out a chain of stores under the aegis of its PacTel InfoSystems subsidiary.

"Conventional business telephone systems and microcomputer systems are integrating. We want to be in front of that particular parade," says Will Luden, president and ceo of PacTel InfoSystems. The subsidiary is also leading another parade, and it's that that could change the face of the retail marketplace. Where PacTel InfoSystems differs from most computer store chains is its ground-up dedication to selling integrated systems to vertical markets. PacTel is targeting legal, accounting, investment, retail, wholesale, and other vertical markets, Luden says.

Users within those niche markets are skeptical of PacTel's efforts to sell to their colleagues. A consultant at one of the Big Eight accounting firms who helps clients select and implement computer systems says of retailers targeting vertical markets, "Most of the time it's a lot of hot air. Someone at a retail store 90% of the time doesn't understand accounting. He

may know the terminology or hold classes, but there's a whole lot more to it." The consultant says that in order to provide adequate service, "you need to be on-site, helping day to day."

Tony Phillips, an accountant in Pasadena, Calif., who distributes software, concurs. "Retailers can't even get close. There are corners in all projects that only an accountant who uses the software on a daily basis knows about."

Yet Martin Dean, an attorney and chairman of the board of Kentfield, Calif.-based Information Systems, a subsidiary of Summa Technologies, Beaverton, Ore., argues that PacTel can provide comparable service. He is advising the staff on selling systems to lawyers. "They're not selling computers per se in retail; they're in the retail business first. That's a distinct advantage," he says.

"Retailers may know the terminology or hold classes, but there's a whole lot more to vertical marketing than that."

"Lawyers are known to be the most difficult market to sell to in the software industry," says San Francisco attorney Rey Montez. "You have to think like a lawyer from a real day-to-day practice point of view. You have to have been a lawyer or a legal professional. Without that empathy, I don't think any retail store or consultant can succeed."

There are certainly enough retailers who are trying. Among people who sell computer systems, "vertical market" has become almost as much of a buzzword as "user friendly" has among people who write software ad copy. That's because in the generalized (horizontal) market, both hardware and software have become commodities, often competing on the basis of price alone. "One strategy is to sell a product that erects some difficult barriers to competitive entry," says David Gold, publisher of *Vertical Market Report* in San Jose.

Vertical market packages, oriented toward specific trades or professions, have proliferated, ranging from the fairly mundane, such as medical or dental billing, to the truly specialized, such as swine management. As an example, although a seller might lock up the market for all the funeral homes in the area, there are problems with the vertical market strategy. "One obvious problem is that the market tends to be small by definition," Gold says. "It tends to be a labor-intensive sell, and you tend to sell to smallish customers who require a lot of handholding and a lot of postsale support."

More than half of 4,300 stores surveyed by Future Computing of Dallas last December said they were selling to vertical segments, but only 20% to 25% of those surveyed are aggressive about it, a figure that Future Computing analyst Erna Arensen concedes is "fairly generous."

Consultant Lynda Schubert of Schubert Associates Inc., Boston, says, "Higher-end computer retailers are uniformly attempting vertical market selling." She also says that the investment in time and money to effect a transformation from providing shelf space to providing a "total solution"—which is what vertical marketing is all about—is beyond all but the best-capitalized retailers.

The "total solution" Schubert mentions means that the person who sells the product also sells services—needs analysis, installation, and postinstallation service. The salesperson is more like an account manager, a role that most retailers aren't ready to tackle. "They do what major computer companies with direct sales forces do," she says.

Gold calls the heavy support needs of vertical marketing a "dual-edged sword. If the system is sold correctly—with the expectation that the customer will pay for support—you can turn support into a revenue stream and the opportunity to sell more product. It begins to look like a service business."

PacTel InfoSystems is skewed heavily toward the service. "We compete by the value added, not the price," Luden says. "If we tried to support the bulk of value added one-on-one through the salesperson, we would fail."

Luden's structuring of his retail outlets may become a model for competitors hoping to target vertical markets. "Salespeople have one goal, and that's to make the sale," he says. "They don't want to give demos or provide technical support. If we asked one person to be technically adroit in every product we sell, we would dramatically limit the number of products we could sell," he adds. The result would be that the store would end up selling the same popular programs everyone else does.

PacTel InfoSystems has a support staff broken down by vertical application. "We have six people to start with for the first store—almost as many as we have salespeople," Luden says. "We're taking functions away from the salesperson and giving them to other people in the organization. The salesperson will be free to sell more products." The natural progression will be to add more products.

PacTel InfoSystems is actually a combination of retail, direct sales, and telemarketing. The target customers are small to medium-sized companies. The nation's largest corporations aren't as attractive because they are serviced by the national direct sales forces of the major vendors, Luden says.

"We're primarily a vendor with a separate sales force. The real small customer will walk in the door. The medium-sized businesses are used to having salespeople call on them. Telemarketing crosses both types." The telemarketing effort, which has been in operation for a year and a half, is successful for less complex sales; the average sale closed over the phone is worth about $3,000.

Too many uncertainties surround vertical marketing to say PacTel InfoSystems' approach is a surefire formula for success or is irremediably marked for failure. The haziness of vertical marketing itself—most retailers say they sell to vertical markets, but much could be window dressing or a bandwagon effect—only adds to the confusion.

Indeed, observers like Montez see little difference between chains like Businessland and PacTel. PacTel appears to be another retail store making an earnest effort to address professionals like lawyers, but they're not there yet."

Montez feels that PacTel will continue to be perceived as a telephone company trying to penetrate the computer market, but "I've been impressed by their staff and its concern about proper customer support."

Even if gearing up its InfoSystems subsidiary loses money for PacTel in the near term, it could prove profitable in the long run. "They are trying to step in front of the customer," says Jean Graham, a telecommunications analyst with San Jose-based Dataquest. "They are trying to pay the price to be there first when office automation takes off."

Is PacTel just another retailer attempting to appear a var?

PacTel's first store made its debut in May in San Mateo, Calif., a few miles south of PacTel's San Francisco headquarters. Luden is planning to add about one store a month, growing to six to eight stores by year's end.

Chris Yalonis, president of the Jupiter Group, a market research firm in Sausalito, Calif., says PacTel InfoSystems is "going to have to spend a whole lot of money" to establish itself.

That may be no problem for PacTel, Graham says. "The Bell operating companies feel like they're money rich." PacTel InfoSystems is joining Bell Atlantic of Philadelphia and Nynex of White Plains, N.Y. Bell Atlantic joined the fray by purchasing the 53-store CompuShop chain this spring and Nynex by opening two Datago stores in the Northeast at the end of 1984.

"Is this a good time to start?" Yalonis asks. "No, unless you're PacTel." ◉

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NEWS IN PERSPECTIVE

BENCHMARKS

DECEPTION? IBM's heralded microcode sorting assists to MVS and its new release of the DFSORT program product may actually deliver far less than they promise, according to one competitor. Syncsort Inc., which controls 70% of the market for MVS sorting software, filed a complaint with the Federal Trade Commission charging that IBM misrepresented the capabilities of the new DFSORT release 7 in its product literature. According to IBM's Feb. 5 announcement, the new release offers performance improvements over release 6, including a 25% reduction in processor time required for sorts and a 69% reduction in I/O required. Syncsort charged that the basis of comparison was inequitable, since in IBM's test cases release 6 was allocated a maximum of 768KB of memory while release 7 was given 2MB, despite IBM's repeated statements that the amount of memory allocated to the sort procedure is a crucial determinant of performance. Syncsort, based in Englewood Heights, N.J., replicated IBM's test cases, but gave release 6 the same 2MB memory allocation and said the results were that "Release 7 uses 10% less cpu time, but required 19% more I/O counts." IBM has not yet publicly responded to the allegations, but sources said that the firm was preparing new comparisons.

GOBBLE, GOBBLE: For the second time in six months, Value Software Inc. has fallen into the hands of a new suitor. And for the third time in three years, Computer Associates International Inc. has taken over a weaker mainframe software competitor. CA purchased Value, which sells the Data Center Management System and other production control software packages for MVS installations, for an undisclosed sum from its three shareholders, after they had purchased VSI—then called Value Computing—from its founders for the fire sale price of $1 million. Value, based in Cherry Hill, N.J., had revenues close to $7 million in 1984, but suffered a significant decline in market share to competitors Uccel and CA. (Of the one third of all MVS sites using production control systems, Uccel's UCC 7 alone has 50%.) CA now has over 40,000 installed products on IBM or compatible mainframes.

NEW PARTNERS: Datapoint Corp. and Fujitsu Business Communications (AKA American Telecom, a subsidiary of Fujitsu America) have announced a "cooperative marketing and support" agreement to sell "integrated business information and communications systems" in North America. The partnership, in which the companies hope to combine their respective expertises at networking and telecom, gives FBC an entrée into the American market and San Antonio-based Datapoint a powerful partner in its bid for survival. FBC president and ceo Jose Reines said there would be no joint development of products per se, although his counterpart at Datapoint, Edward Gistaro, did hint at "a major announcement . . . in the near future" in the area of smart buildings. Datapoint is currently trying to recover from the damage done by investor Asher Edelman's takeover of the company, and Gistaro admitted that Datapoint's main objective now is to reinstill confidence in the company's once-mighty customer base. Edelman, now chairman of Datapoint's board, insisted that defecting customers have already returned. Datapoint is also joining forces with Mohawk Data Sciences, an Edelman-raided company in Parsippany, N.J. in an enterprise formed by merging their service arms. Concentrating on "big system users," the company will boast 42,000 customers, 3,000 employees, and expected revenues of $275 million.

BIG DEALS: Still not giving up on the microcomputer marketplace, Tandy Corp. has signed a contract with Iomega Corp. in which the disk drive manufacturer will provide Tandy with private-label versions of its fast-selling Bernoulli box for its IBM PC-compatible line. The product is a half-height 10MB or 20MB removable disk cartridge subsystem designed to allow high-density data recording on flexible media with performance matching that of hard-disk drives. The deal may bring the Ogden, Utah, firm $12 million to $15 million in the first 12 months, said president Gabriel Fusco.

COMPETITION: Just when many observers expected IBM's large-scale disk drive competition to roll over and play dead, Storage Technology and Memorex each announced answers to IBM's double-density 3380 drives. StorageTek's announcement came along with a new marketing campaign aimed at convincing customers that the bankrupt company could survive and turn profitable. New ceo Ryal Poppa said that despite first-quarter orders 50% below expectations, the firm has had a positive cash flow and would be able to submit a reorganization plan later this year. Though the new 8380 models offer twice the capacity of the original models with 1.6 times the density, they have a larger data zone and will not be delivered until late 1986. Current 8380 models, however, can be field-upgraded to the new models, unlike current IBM 3380 models. The Memorex 3680 HDP also provides twice the capacity without twice the density of the original product. The DASD unit has eight HDAs instead of the four on the earlier product, and consumes 42% less floor space. Shipments are slated to begin this fall.

HARRIS REALIGNS: With the acquisitions of Exxon's domestic office systems business and Lanier under its belt, Harris Corp. is reorganizing its information systems sector into 12 business units, after duplication of marketing last year cut into profits. The role of wp vendor Lanier and its chief, Wes Cantrell, will be greatly expanded as of July 1 to include sales of large office automation systems to large companies in addition to its traditional niche with small- and medium-sized customers. A senior company official says Harris, with $800 million in dp revenues last year, is interested in acquiring other office automation system vendors "if any opportunity presents itself," but is not actively shopping.

CONSOLIDATION: The micro business continues to shake itself out, and recent victims include some of the young industry's earliest entrants. Software Arts, the Wellesley, Mass., firm that developed VisiCalc, was recently acquired by Lotus Development Corp., Cambridge, Mass. The value of the deal was not disclosed, but sources estimated it at $5 million. Software Arts had been primarily an R&D firm until its relationship with San Jose-based VisiCorp turned acrimonious. The legal battles over VisiCalc severely bruised Software Arts and cost VisiCorp its independence, as it fell into the hands of Paladin Software. Lotus, which has hired Software Arts founders Daniel Bricklin and Robert Frankston, beat out Ashton-Tate, Culver City, Calif., for control of the company. Ashton-Tate, meanwhile, picked up Forefront Corp., Sunnyvale, Calif., for an undisclosed sum. Forefront developed the Framework integrated software package for Ashton-Tate.

On the hardware side, Apple Computer Corp. dropped its Macintosh XL, saying it would cease manufacturing the model but continue servicing it. Only 60,000 XLs—once called Lisas—have been sold, according to Infocorp, a Cupertino, Calif., research firm. The machine's introduction in January 1983 set a new standard in microcomputer hype and ushered in an era of icon and window technology. Despite all the attention, the $10,000 price proved too high. Two major cuts—first to $7,000 and then to $4,000—failed to help. "It is baffling that Apple would stop making it just four months after renaming it," said Montgomery Securities analyst John Dean. "People were beginning to think that Apple had its act together." ◉

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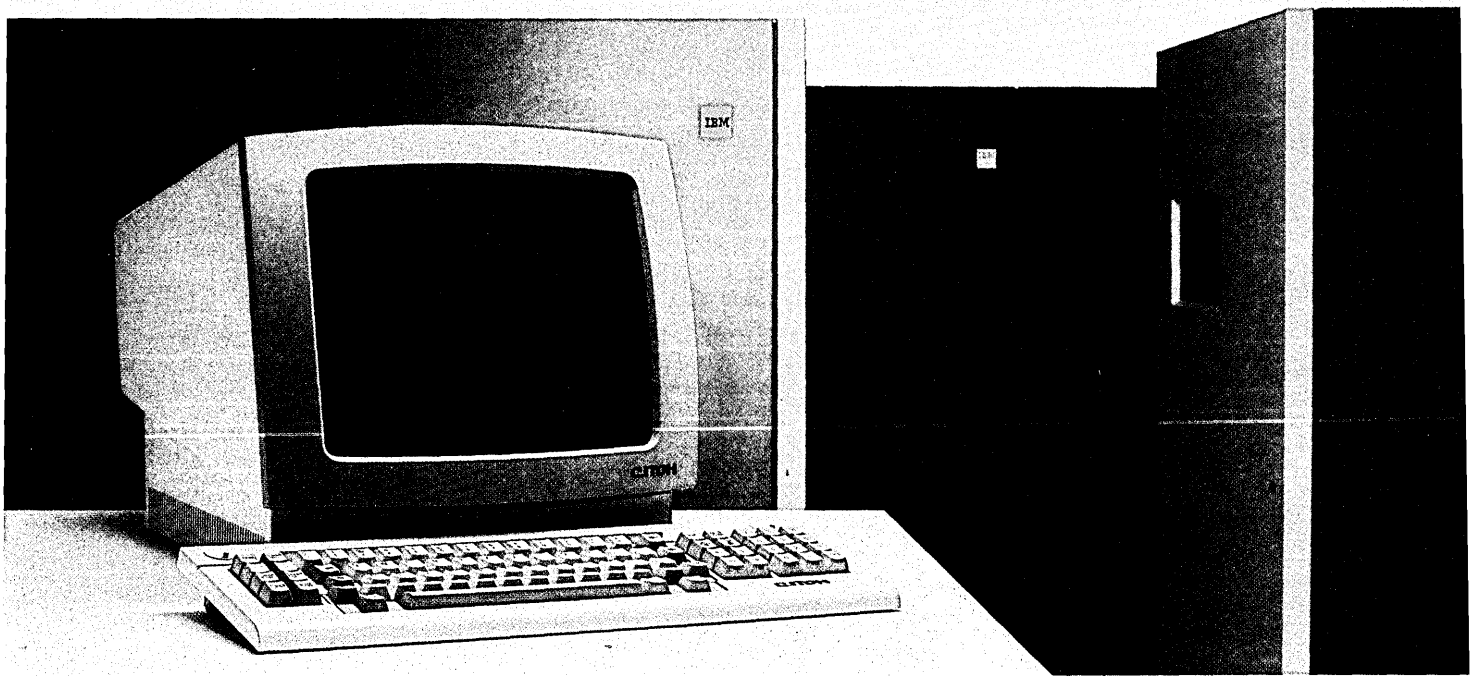

WORLD WATCH

TOKYO-AT&T is using Unix to make mainframe magic with a samurai sorcerer. AT&T's Oriental wizard Fujitsu may be conjuring up an industrial-strength Unix for big dp applications. Fujitsu hopes the operating systems will do the trick for its entire product line from micros to supercomputers. Its apprentice Amdahl isn't about to disappear either, since Fujitsu would need another American ally to make the magic work.

STOCKHOLM-Swedish telecom titan Ericsson is not at all happy with its sibling, EIS, which is losing money at a fast and furious pace. So fast in fact that its parent didn't catch on to the disaster until last November, when Ericsson prez Bjorn Svedberg discovered, much to his dismay, that "Ericsson Information Systems was in complete disarray."

NEW DELHI-IBM, which used to be the thorn in the side of the Indian nation, may turn out to be the dp jewel in the crown. The Big Blue raj is currently training a slew of Indian software engineers on IBM wares in Europe and elsewhere in preparation for reentering that realm in a big way.

CANBERRA, AUSTRALIA-Rumor has it that the government is itching to put Cironet, the nation's largest datacom network, up for sale because it can't afford the steep operating costs. That would certainly throw a monkey wrench into plans that are afoot to launch a nationwide road show starring the net's new $9 million Cyber 205 mainframe.

PARIS-Sooner is better than later, at least that's what the French must be thinking as they rush Thomson and CIT Alcatel to the altar 18 months earlier than expected. Scheduled to take place early next month, the shotgun marriage between the nationalized couple will spawn the world's fifth largest telecom maker.

TOKYO-While Epson isn't exactly exiting the micro market, it is throwing in the towel when it comes to peddling pcs under its own name. Still hot for oem orders, Epson will need this business to prop up sales that could slump when IBM puts the pressure on in the PC printer field.

OSLO-Norsk Data must be fond of India ink, since it's using a lot of it lately to sign agreements in the Far East nation. The Norwegian mini maker just closed a deal that allows Indian manufacturing conglomerate Indchem to churn out its 16-bit ND-100. It's also preparing to put pen to paper on a pact for the government-owned ECIL to produce its ND-500 supermini.

STOCKHOLM-A mini version of Japan's heavily hyped fifth generation computer project will get under way next year at a new research center in the Stockholm suburb of Kista. The artificially intelligent institute will recruit about 60 researchers for the program.

LONDON-Sperry's U.K. arm is flexing its Unix muscles in an effort to put the squeeze on its stronger local rivals Altos, Fortune, and Digital Equipment. Sure of its Unix might, Sperry will set up a special hot line for U.K. Unix users.

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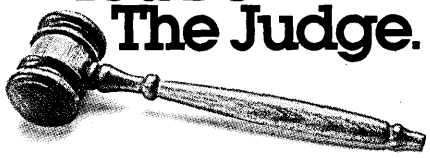

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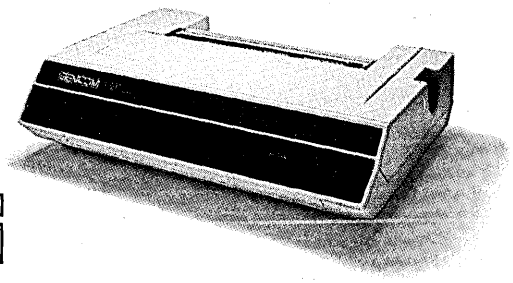

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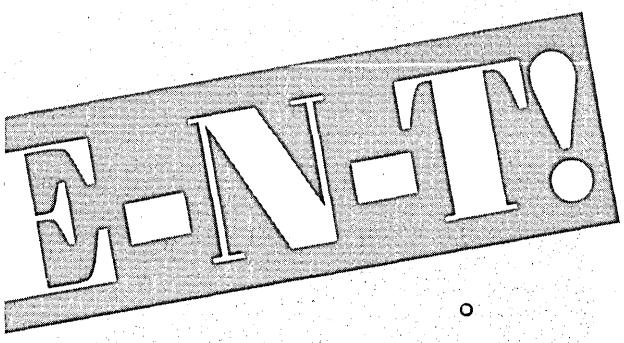

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CIRCLE 39 ON READER CARD

A lot of pc users find their software difficult to learn and confusing to use. What are dp departments doing about it?

BEFRIENDING THE BEFUDDLED

by Steve Ditlea

Data processing professionals, having realized they can't lick micros (for individual cost estimating, departmental budgeting, etc.), are helping to join them onto the corporate landscape under the banner of end-user computing. The once fanciful notion of a personal computer on the desk of every Fortune 1,000 company manager who needs one is now within sight.

Getting the most out of this significant investment has become a question not of hardware but of software management. When multiplied by the thousands, downtime due to poorly designed software packages, lack of program compatibility, confusing documentation, and hit-or-miss training can turn out to be costly indeed. And how many pcs serve as nothing more than expensive desk ornaments because their would-be users never get beyond formatting MS/DOS disks?

Corporate microcomputing is bringing dp veterans into contact with a whole new cast of characters. Among the most notable personal software users are such potential sources of headaches as the virgin, who may never consummate the act of employing a personal computer, and the power user, full of bravado and jargon but sometimes short on solvable problems.

MIS pros who have mastered pc software management have found the adventure challenging—and rewarding. Not too long ago, a new breed of "micro managers," many of them with no previous dp experience, could build entire fiefdoms because of the desperate need for guidance in the use of personal computers (see "The Micro Marshall Hits Town," April 1, 1984, p. 80). Now requests for such organization-wide services as software support and training are bringing it all back home to centralized MIS departments and their satellite pc information centers.

Pc assurance at Home Insurance. "There are end users who just never get it and others who turn into hotshots," observes Tony Graffeo, vice president of MIS for the Home Insurance Co. in New York. "It's the old bell-shaped learning curve. You can't teach everyone to be a sophisticated pc user." While he says that both the virgin and the power user can be difficult, he offers a mixture of respect and wariness for the latter. "We have expert users who are as good as our own tech support people, but they are often looking for things in the software that just aren't there. They tend to push programs to the hilt. They're the ones who run their spreadsheets with a desk accessory program like Sidekick, even though we don't recommend doing so. And then they call our toll-free 800 support phone number and wonder why their keyboards have locked up."

The pc program at Home Insurance has been in existence for over three and a half years, with the bulk of its centralized buying activity occurring in 1984. The firm now has 400 personal computers (virtually all IBM PCs, XTs, and ATs) within its administrative offices, and another 1,300 similar machines with local independent insurance agents across the U.S. From its lower Manhattan location, Graffeo's department has also been responsible for supporting another 1,000 pcs throughout the City Investing conglomerate, which until recently was Home Insurance's parent company. (As part of the reorganization of City Investing, Home Insurance has since spun off as an independent firm, curtailing some of Graffeo's responsibilities.)

Here at Home, as in most large firms, managing micro software involves a multipronged strategy. First, the pc support group functions as a kind of internal store, purchasing items and then reselling them to other departments. By buying software at a group rate, the group can offer anyone with a company affiliation a discount of 25% or more on recommended products. To this incentive for standardization—a carrot, if you will—is added the stick, a policy of not supporting any but recommended programs. "We just can't support 27 flavors," Graffeo explains.

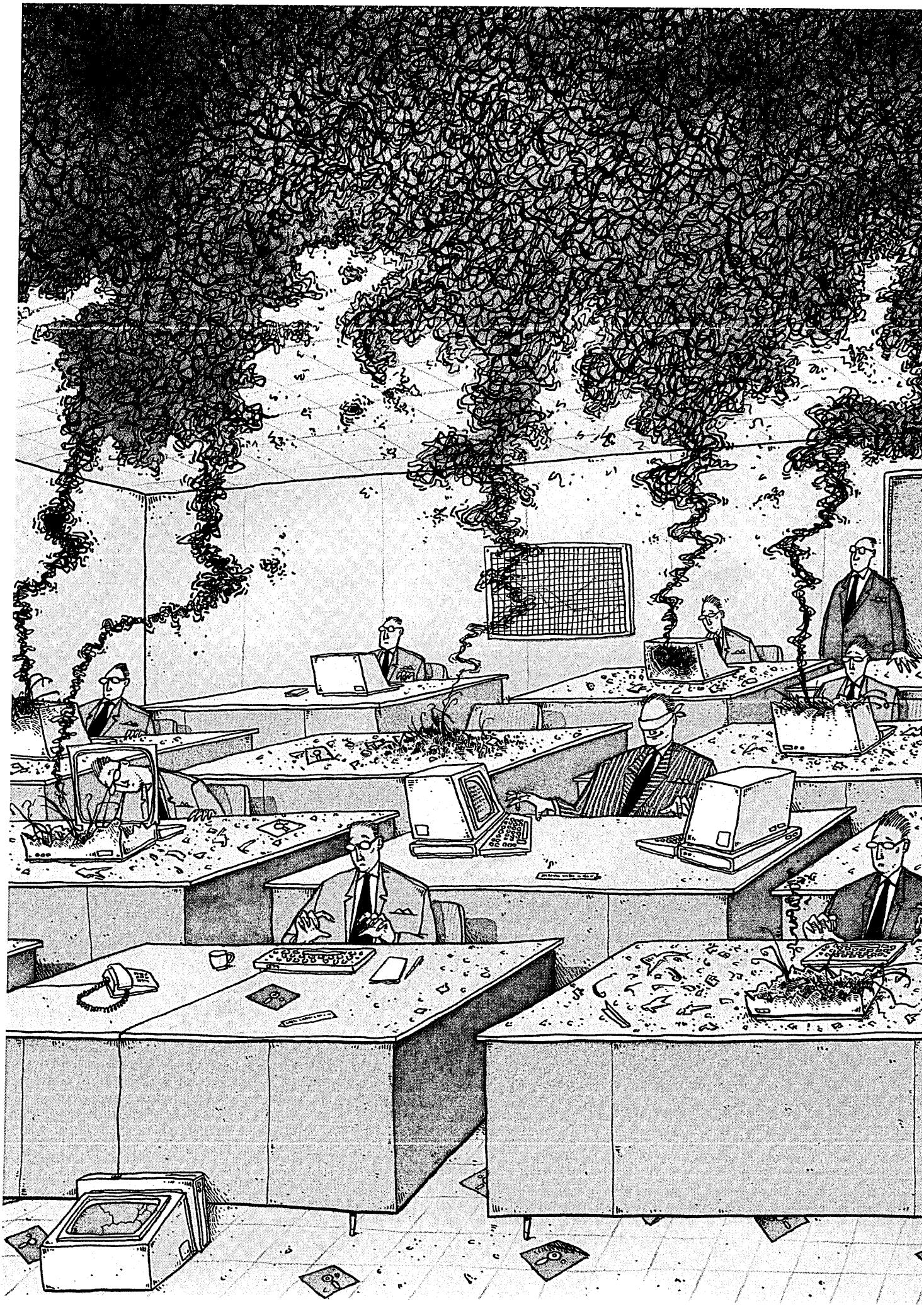
TECHIES ADVISE ON SOFTWARE

Software recommendations are made by his department's tech group. Among the authorized programs are best-sellers Lotus 1-2-3 for spreadsheets and the integrated Symphony; word processors WordStar, MultiMate, and VolksWriter; dBase II for data management; telecommunications packages Crosstalk (from Microstuf, Roswell, Ga.) and Relay (from VM Personal Computing, New York); and desk accessory Sidekick (from Borland International, Scotts Valley, Calif.). Graffeo has put applications programs off limits to his pc support group. "Early on, we tried to recommend applications programs, like agency management packages and accounts receivable. But now we don't want to take the blame for a specialized program that turns out to be inadequate for someone's needs."

Software support takes many forms: testing every copy of every program the pc support group sells (each package is then warranteed by the group); an 800 toll-free number available during office hours for questions regarding authorized software; Home's "PC Cookbook," the company's own documentation for getting agents started with their IBMs and MS/DOS; and training courses in most frequently used packages like Lotus 1-2-3.

Of all these software support functions, training is the most time and personnel intensive. To conserve scarce human

ILLUSTRATION BY STEVE ATTOE



For all the autonomy implied by end-user computing, there is an increasing role for MIS departments.

resources, the pc support group's handful of technical specialists concentrate on a strategy of "training the trainers." Trained by specialists at software vendors like Lotus, Home's trainers impart their expertise to local "pc coordinators," who will in turn train their coworkers in the arcanum of spreadsheets and data management. The pyramid structure also serves as an efficient conduit for updates and software upgrades. As part of its policy of decentralization, the support group does not write applications programs for the pcs it supports, but upon request will supply special purpose spreadsheet templates composed by users within the company.

INCREASED ROLE FOR MIS

For all the autonomy implied by end-user computing, Tony Graffeo sees an increasing role for MIS departments, and he cites the example of telecommunications at Home Insurance. While there are two permissible choices for pc communications packages (Crosstalk and Relay), only Hayes modems are authorized. And to access account information in the firm's System/36, a pc must emulate an IBM 5250 terminal and use the support group's combination of Crosstalk, ProKey (a keyboard redefinition program from Rosesoft, Seattle), and a security module. "With our software we're turning pcs into intelligent terminals," Graffeo remarks. "You will be seeing more of end-user computing turning into distributed data processing."

General Foods' micro menu. At General Foods' headquarters in White Plains, N.Y., end-user computing caught on so fast that the personal computing support group has had to train over 4,000 people in the past two years. Most of that effort went into teaching the fundamentals of Lotus 1-2-3 in three-hour sessions. Developed in-house, this confection of modular instruction (allowing users with different levels of expertise to proceed at their own pace) and practical examples has proven successful enough for General Foods to occasionally offer the training to outside firms.

According to Gary Schnorr, manager of office automation and microcomputer systems at General Foods, there are now over 600 personal computers at company headquarters and another 800 in offices around the country. The five-person support group makes central buys of personal computers (90% of them are now MS/DOS-based systems). The group also recommends software, providing phone as well as walk-in consultations and an in-house personal computing newsletter with a circulation of 5,000.

"We don't like to talk pcs. Instead, we look at appropriate applications," says Schnorr. "We're not trying to force technology on anyone." If a software package not on the approved list fits in with an end user's particular needs, his department will support the product. "We're not a closed shop. Just recently we had a spreadsheet accounting application where Multiplan turned out to be a better choice than Lotus 1-2-3. We believe in keeping our systems open." One reason personal computers are never underutilized here is the recommendation that pcs in an office be kept in the open, where different users can help each other with their software packages.

Of the end users he encounters, Gary Schnorr finds neither the virgins nor the power users difficult to handle. "It's the intermediate users who need the most handholding. They have a low frustration level because of all the things they still don't understand." While electronic spreadsheets are usually the first software packages end users request ("almost everyone has an application for a spreadsheet"), interest quickly turns to programs for business graphics, presentations, and telecommunications. "End users come to our personal computer information center, where our technical consultants can discuss their applications. We can even prototype some software applications for them, though we won't write applications ourselves."

Hardest to deal with are end-user requests for vaporware—software that has been announced but is not yet available. "They read about a product and have to have it before you've even heard about it. Then they won't believe that the program some magazine reviewed was a demo and a final version may not be available for months." Schnorr's department has first-hand knowledge of the delays involved in developing commercial software packages, having served as a test site for Lotus's Jazz, the long-awaited integrated program for Apple's Macintosh. "Jazz looks easy to learn for first-time users. They can get up to speed quicker." Will Jazz justify the use of Macintoshes in the corporate computing environment? Schnorr is noncommittal. "We're starting to see MS/DOS products for the IBM PC that have the look and ease of use of Macintosh software."

Integrating programs at Hughes. For all the hoopla surrounding software packages like Symphony and Framework, which include five-function integration (spreadsheet, graphics, database, word processing, and telecommunications), large firms have been cautious in adopting them. Even in those companies where such programs are supported, alternative stand-alone packages are often suggested. "You don't always get the best features in a single package," explains Frank Devonald, director of consulting services for the corporate communications and data processing group at Hughes Aircraft in Long Beach, Calif. While offering training in Symphony, Devonald's pc department also suggests the alternative trio of Lotus 1-2-3 for spreadsheets, Multimate for word processing, and Relay for telecommunications, with data swapped through standard format MS/DOS files.

Centralized software support is a modest affair at Hughes, mostly because of the privately held firm's decentralized organization. Autonomous divisions (which Hughes calls management groups) establish their own procedures, with pc procurement handled internally through internal computer stores. There are over 1,000 IBM PCs or compatibles throughout Hughes, with about 200 in the corporate communications and data processing group. But in addition to providing support for his group's pcs, Devonald's department offers corporatewide consulting and training for personal computer software.

Central software support is kept to a handful of standard titles: 1-2-3, Symphony, dBase III, Multimate, and Relay. "We will customize standard packages or write applications if a department is willing to pay for it," adds Devonald. Classroom training in the standard programs, as well as an introduction to pcs and advanced 1-2-3 courses, is taught on-site by his department's consultants and software evaluators. The training devised at Hughes makes extensive use of an oversized video monitor to demonstrate software in action. Total corporatewide attendance at these courses has recently topped the 5,000 mark.

FORUMS FOR INFO EXCHANGE

To efficiently communicate updates to those who have taken the training (and to end users who haven't), Devonald's pc support team is readying a newsletter called *Monitor.* User groups for exchanging information and tips on specific software packages are also being encouraged. A centralized user group provides a forum for coordinators of these gatherings. "Right now we're trying to encourage Lotus user groups to form," Devonald remarks. "Though things are so decentralized here, some may already have gotten started that we don't know about."

The sole common denominator between end users at the various Hughes fa-

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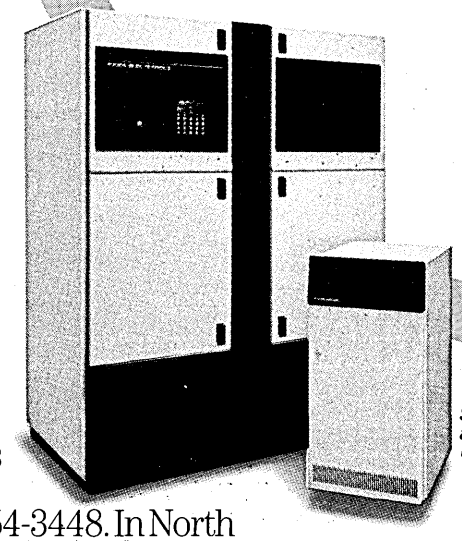

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CIRCLE 40 ON READER CARD

Total attendance for pc training at one corporation recently topped the 5,000 mark.

cilities throughout the Los Angeles basin area is the need to glean data and even process it on mainframe computers. "Pcs just don't have enough power for complex applications like project tracking," according to Devonald. "Program managers use mainframe-based software like Project II and Easy Track and like to have the results downloaded to their pcs."

Upwardly Mobil software. The growing link between pcs and corporate mainframes is reflected in Jon Frierson's title, manager for personal computers and timesharing, at Mobil's Manhattan headquarters. The company's pc support program was started two years ago, and Frierson emphasized the importance of tying into the company's mainframe database from the outset. "We only support one communications software product, Wide Term," he says. Developed at Yale for linkups to mainframes (and available from the Yale Computer Center), this software emulates a number of widely used terminals.

While actively supporting pcs, Frierson sees their use as limited. "In effect, they're efficient report machines," he says. For the kind of management support Mobil headquarters requires, "our tech group is in the middle of looking at an IBM System/36 and software." Still, for financial and administrative planning, personal computer spreadsheets have become essential. In keeping with this, Frierson reports directly to Mobil's executive vp for finance.

When it comes to personal computer software, Frierson sees his function primarily as guidance. "We offer advice. We have a standard product list of packages we support. If end users want to try something else, they're on their own." Support includes walk-in consultation and a special phone line for help. Frierson's department also offers training sessions in spreadsheets on Lotus 1-2-3 and in micro-mainframe linkups with Wide Term. Though Lotus's five-function Symphony package is on the standard product list at Mobil, the integrated program is not actively supported. "It's harder to get users up to speed. The fact that Symphony takes so much memory is a big drawback." One widely used data management program, Ashton-Tate's dBase II, is not to be found on the standard software list here. "We avoid anything that isn't menu driven," Frierson explains. It's hard enough teaching someone to use 1-2-3."

"I miss the old days when you had a bartender to talk to."

CARTOON BY ARTEMAS COLE

MAJOR BRAND PCS SUPPORTED

While an increasing majority of personal computers at Mobil are IBM PCs, other major brands are supported. This year, to get out the word, Frierson's department held a computer fair in a conference room, where representatives of IBM, Hewlett-Packard, and Apple demonstrated their wares for a week. Over 400 Mobil managers and employees came to have their end-user computing needs assessed. "Most people don't really care what machines they use," Frierson contends. "They're usually interested in a single application only."

To further take the load off his department, Frierson would like to follow the lead of other companies that have started end-user groups to trade information and tips about specific software and applications. "We just haven't had time yet to set up user groups," he confesses. "There are many things we could do, if only end-user computing weren't happening so fast."

Supporting software support. The above success stories are encouraging, but they may be exceptions to the rule. Most dp departments seem to be moving only slowly to meet the challenge of pc software. In a 1984 survey of 453 companies, accounting and consulting firm Arthur Young found that only 25% of the businesses offered formal training programs to teach employees how to operate microcomputer equipment and software.

In another Arthur Young survey, this one of 300 pc coordinators in corporations, training in hardware ranked far below software in order of importance (spreadsheet instruction was mentioned by 73% of the respondents, word processing by 49%). This survey also pointed out that even firms with pc coordinators were not always equipped to initiate software training courses; of the respondents, 59% provided courses developed internally, 48% sent people to outside seminars or courses, and 19% brought outside training consultants in-house.

To answer the need for pc software management and education in large firms, an entire subindustry of consultants and trainers has begun to blossom. Arthur Young has taken a two-month spreadsheet course developed to train 1,000 of its employees and made it the basis of a division called Arthur Young Business Systems (based in Stamford, Conn.). The startup's

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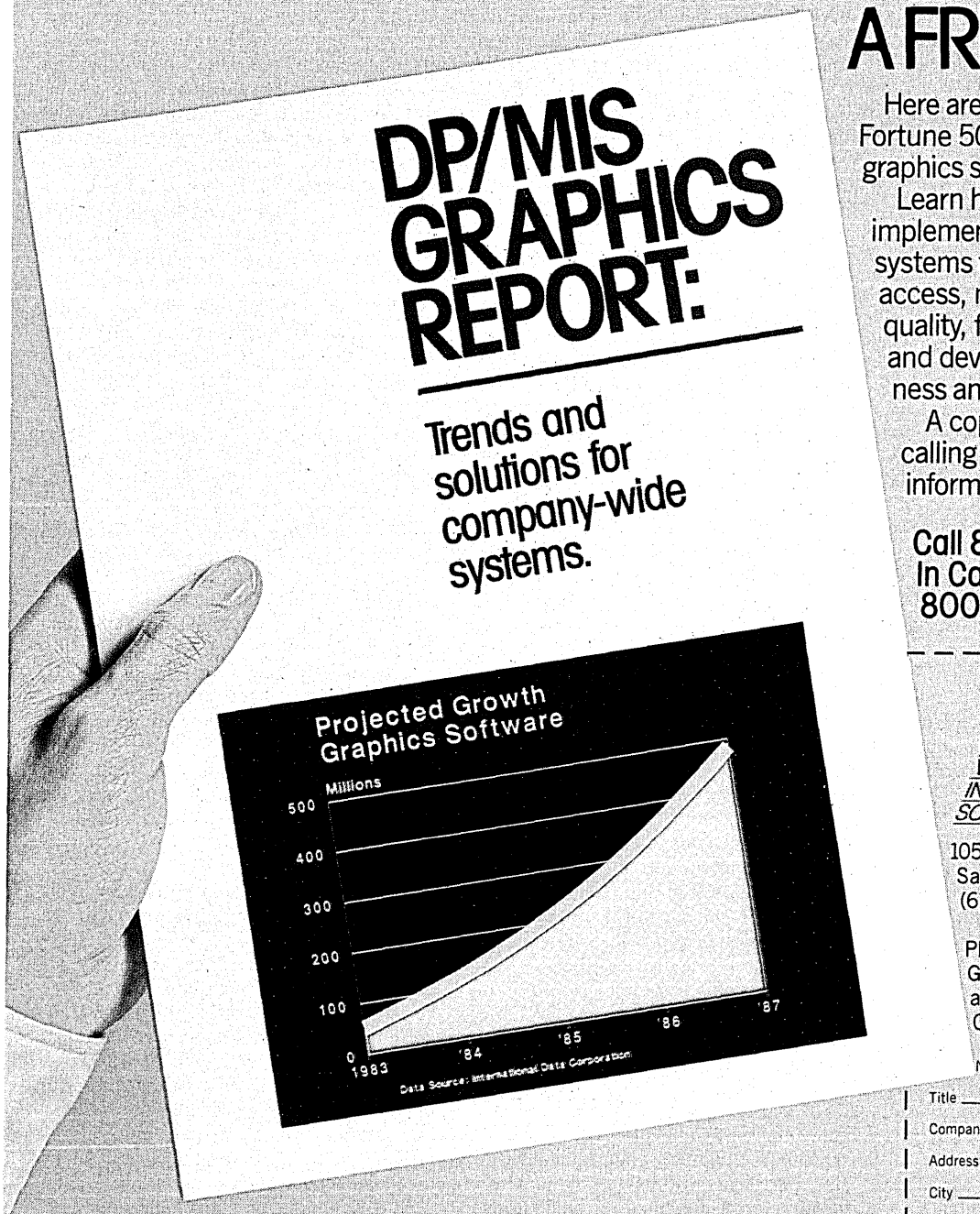

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CIRCLE 41 ON READER CARD

An entire subindustry of consultants and trainers has begun to blossom to answer the need for pc software management and education in large firms.

inaugural offerings are Arthur Young Self-Teaching Courses, which use videotape cassettes, computer disks, and reference guides. The VisiCalc version is $299, the Multiplan $349, and the Lotus 1-2-3 $399. Large companies are being offered unlimited use licenses.

Under the direction of Australian Bill Middleton, the division's president, Arthur Young Business Systems has targeted the growing corporate educational market in microcomputers. "We are offering a self-standing package," Middleton explains, "but we can also provide hardware and a classroom environment with a facilitator, a person who is familiar with the equipment." Built around do-it-yourself examples in budgeting and cash-flow analysis, the course in VisiCalc (complete with 91-minute videocassette) takes eight hours to complete; the course in 1-2-3 (three-hour videotape) takes 16 hours from start to finish. "In practice, if you already know something about computers, you can skip ahead and get a spreadsheet running in an hour or two."

Among the corporations that have bought the Arthur Young programs are American Express, Xerox, and the Gillette Co. "There are good reasons why, among numerous training formats, self-study courses are so popular," says Middleton. "Convenience and economy are at the top of the list. The cost of one person attending a class on Lotus can range from $150 to $350. It's a whole lot more cost-efficient to have 10 people use one $400 course, one that can also be readily used for review in the future."

The videotape software tutorials have proven so popular that Arthur Young Business Systems has begun distributing similar courses prepared for WordStar, Multimate, dBase II, and dBase III by third-party developers. The division's next offerings in software support will be spreadsheet templates, adapted for such special applications as manufacturers' budgeting and cash flow. Now in testing, these "megatemplates" employ macro commands for streamlining large-scale operations.

UNIQUE SOFTWARE TRAINING

A unique approach to pc software training—combining MBA-style case studies and hands-on computer use—has been originated by Micromentor of Cambridge, Mass. Aimed at providing management education as well as familiarity with personal computer software, the course is customized to each client firm's particular concerns and vocabulary. Typically such training will last for three full days, including approximately half a day devoted to computer software fundamentals.

"You come away knowing how to use Lotus 1-2-3, for instance, to figure capital appreciation or whether to buy or lease a locomotive, if that's the business you're in," says Eric Vogt, president of Micromentor.

Problems covered in the training are the result of consultations with clients over several weeks of development time. Among the software packages taught, where appropriate, are dBase II and III; Framework; Symphony; and the easy-to-learn PFS series of data management, word processing, and spreadsheet standalone programs. In the past three years courses have been delivered on-site in locales as far-flung as San Francisco and London.

THE ROLLS OF PC SOFTWARE

At $1,500 per trainee, Micromentor's is the Rolls-Royce of pc software instruction. Eric Vogt describes it as "high-speed executive training." Among recipients of the training to date are 400 top financial managers at General Electric. "The controller of GE asked IBM for an education program to teach executives about using PCs," recalls Vogt. "IBM's national accounts division referred him to us." The training was so well received it is now being revised for future sessions with 1,000 GE middle managers.

Recognizing the importance of corporate computing (65% of this year's total pc software sales will go to national accounts, according to consultants Future Computing), software vendors are increasingly providing support directly to MIS departments. Among those to take the plunge is Ashton-Tate, publisher of dBase data management software and the integrated Framework. Ashton-Tate is currently offering MIS departments such services as a toll-free phone support number, a corporate users' newsletter and tech notes, start-up kits for user groups, and on-site technical assistance provided by engineers out of Ashton-Tate district offices.

According to Karen Orton, Ashton-Tate's director of corporate and commercial marketing, this is the first stage in implementing a "laundry list of 30 suggestions" compiled from interviews with over 25 MIS managers. In keeping with these recommendations, this April Ashton-Tate offered its first end-user training courses for MIS departments. More will follow. Also in the offing are semiannual regional MIS user group meetings.

Another software vendor working in end-user training is Lotus Development. Having created 1-2-3 tutorials that were used by over 3,000 of its dealers, Lotus proceeded to develop course materials and training for large firms. "We maintain a large staff for training companies' trainers on-site or in regional centers; it's the only way we can keep up with the demand," says Rick Treitman, who oversees Lotus's educational effort. In addition, a number of independent dealers offer their own local training based on Lotus materials.

For companies setting up end-user training courses, Lotus provides copies of its courseware, including instructor and student manuals and disk-based exercises. Offerings include 1-2-3 Introductory, 1-2-3 Advanced, and Symphony courses. The 1-2-3 titles are packaged in no-frills three-ring binders ($825 for one instructor's guide and 10 student workbooks), while Symphony courseware comes with ample space for note taking ($545 for one instructor's guide and five student workbooks). "A lot of people learn in a lot of different ways," Treitman adds, "so we wanted to be sure they could learn to use our products through the documentation, training, or even through books." As part of this plan, the company has also begun a line of books for Addison-Wesley. The first tome is the *Lotus Guide to Learning Symphony.*

In addition to software vendors and third-party trainers, pc software support is a central concern of the Microcomputer Managers Association, a professional organization for corporate pc managers, with headquarters in Boston. At local chapters in Boston, New York, Detroit, Chicago, San Francisco, Los Angeles, and Dallas, micro managers gather monthly to discuss common problems, often having to do with software. Says MMA executive director Marty Butler, "We pay special attention to concerns unique to large environments, like training for large numbers of users."

Membership in MMA is open to those responsible for micros in major corporations (no one has less than 50 pcs in his organization). Dues are $20 yearly to the national organization plus local assessments. The association has primarily attracted members from banks, insurance companies, and brokerage firms, but according to president Alan Gross, manufacturing and service companies are increasingly being represented. "More and more of our members are coming from traditional MIS departments." Their methods of managing pc software differ, but MMA members all have a common goal: "The need to support, not control end users." ◉

Steve Ditlea is the editor of *Digital Deli* from Workman Publishing.

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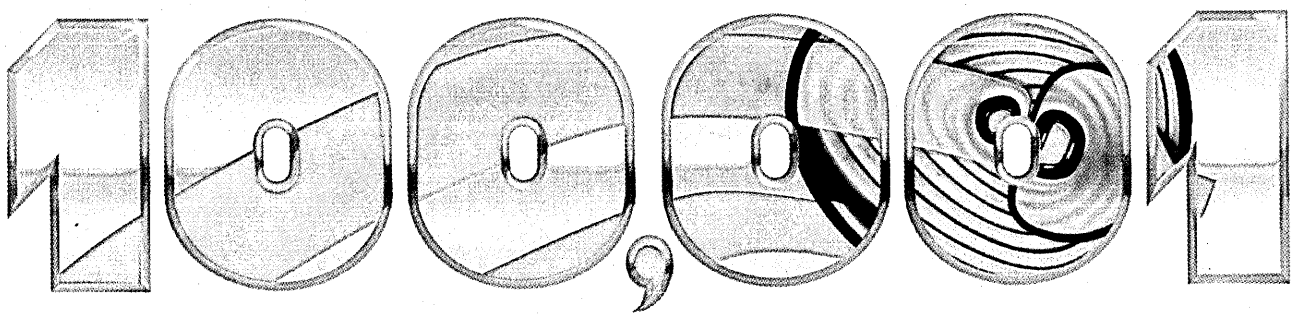

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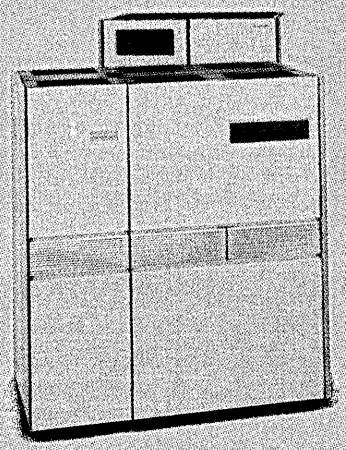

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CIRCLE 44 ON READER CARD

The battle among integrated programs accelerates as IBM enters the fray.

PC SOFTWARE INTEGRATION

by Morton Rosenthal and Richard Loftin

Software integration on the personal computer. What good is it? Who needs it? Is it a fad or here to stay?

For more than a year, software integration has been one of the hottest topics involving business software for the personal computer. The battle among the integrated programs started last summer with the introduction of Lotus Development Corp.'s (Cambridge, Mass.) Symphony and Ashton-Tate's (Culver City, Calif.) Framework, and the war intensified earlier this year when IBM began shipping its software integrator TopView.

Although there's been much talk about software integration, not everyone agrees on exactly what benefits integration is supposed to provide. Essentially there are four main reasons for integrating software:

- to allow data to pass easily from one application to another;
- to provide a uniform user interface that makes the software easier to learn and use;
- to make it easy to switch from one application to another; and
- to allow simultaneous processing of multiple applications.

Perhaps the most widespread demand for integration comes from users who use multiple programs to manipulate a common set of data. For example, a salesperson may maintain a file of prospects with a database program, then feed this information to a word processor to produce personalized sales letters.

Integration is also useful for combining data from several applications into a single document. For example, you may wish to insert a graph that illustrates business data into the middle of a word-processed report.

People who are constantly shifting from one program to another will also appreciate the benefits of integration. If you spend most of your day at your pc keyboard working on various applications, integration will make your life easier by providing a convenient mechanism for switching from one application to another. If you want to leave one application running while you switch to another, integration can be that much more valuable.

Another type of user that can benefit from software integration is the new user who is faced with learning several computer applications simultaneously. An integrated set of applications with similar user interfaces is far easier to learn than a collection of dissimilar programs.

Although software integration is a great idea for many, not all pc users need the benefits of integration. There are a large number of users—perhaps the majority—who spend their computer time with a single application. Secretaries who do only word processing and financial analysts who do only spreadsheet work fall into this category. These users could not care less about integration.

For the users who need integration, the burning question is how best to get it. There are essentially two choices: an integrated package and a program integrator. Symphony and Framework are integrated packages; they combine a number of functions—spreadsheet, graphics, word processing, data management, and communications—into a single product. TopView is a program integrator. It allows the user to run multiple standalone programs through windows on the display.

Integrated packages provide most of the benefits of integration, but some do it better than others. Most allow data transfer between applications, but some make the process much easier than others. Some provide a simple user interface that makes the program easy to learn, while others are so complicated that only experienced computer users should have anything to do with them.

ALL-IN-1 PROGRAM BENEFITS

All of the integrated packages make it relatively easy to switch from one application to another, and all provide the added benefit of convenience: you deal with a single program from a single vendor instead of with a collection of programs from a variety of vendors. The all-in-one program is also generally less expensive than a collection of standalones.

The biggest problem with the integrated package is that it doesn't allow you to pick and choose the programs that are best for your needs. While there are exceptions, the applications in most integrated packages are generalized for a broad range of users. Heavy-duty users simply can't get the power they need from integrated packages, and users with specialized needs can't find an integrated package that does precisely what they need it to do. A professional project manager, for example, may need a pc software product that combines advanced project management functions with presentation-quality graphics and a simple word processor. The only way to get that kind of capability is through three separate standalone programs.

The other problem with integrated packages is that they don't provide concurrent processing. You can't have more than a single application running at once. If it takes your database manager 15 minutes to sort a file, that's 15 minutes for you and your other projects to sit idle.

In our estimation there presently are four noteworthy integrated packages for the IBM PC, and each provides a different set of advantages for the user seeking the benefits of integration.

Symphony is the most popular of the four, yet ironically it's the least integrated. In fact, its popularity comes from the fact that it's a superspreadsheet, not that it's the paragon of integration. Because the other applications within the package are little more than spreadsheet add-ons, you probably won't appreciate much of what Symphony has to offer unless you're a hard-core spreadsheet user. And if you're new to personal computing, you'll find that the program's complexities make it quite challenging to learn.

Framework is a better-balanced package than Symphony. It even has a powerful spreadsheet. But like Symphony, its other functions can't compare to a collection of good standalone programs. Framework is best at integrating several

TopView is by far the most visible integrator and the one most likely to become a standard.

applications into one—merging text, numbers, and graphs into a single document. The program is easy to learn, so it can be used by computer novices.

Enable is a relatively new integrated package from the Software Group, Ballston Lake, New York. Its claim to fame is that it packs the power of a collection of the best standalone programs into a single product. While the package can't match Framework in its ability to combine data into a single document, it does provide easy transfer of data among applications. Most important, Enable has enough power to please most heavy-duty users. On top of everything else, it runs on only 256K!

At the other end of the spectrum is Alpha Software's (Burlington, Mass.) Electric Desk—the least powerful of the leading integrated packages but the easiest to learn. The program's similarity of operation from one application to another combined with its simplicity make it ideal for the new pc user who is eager to become productive quickly in a variety of areas. Electric Desk is the product of choice for beginners seeking an unintimidating all-purpose product.

The alternative to an integrated package is a series of standalone programs held together by a software integrator such as IBM's TopView. Although IBM isn't the only vendor with a software integrator, we feel that TopView is by far the most visible integrator and the one most likely to become established as a standard; thus it is the integrator we'll focus on in this article.

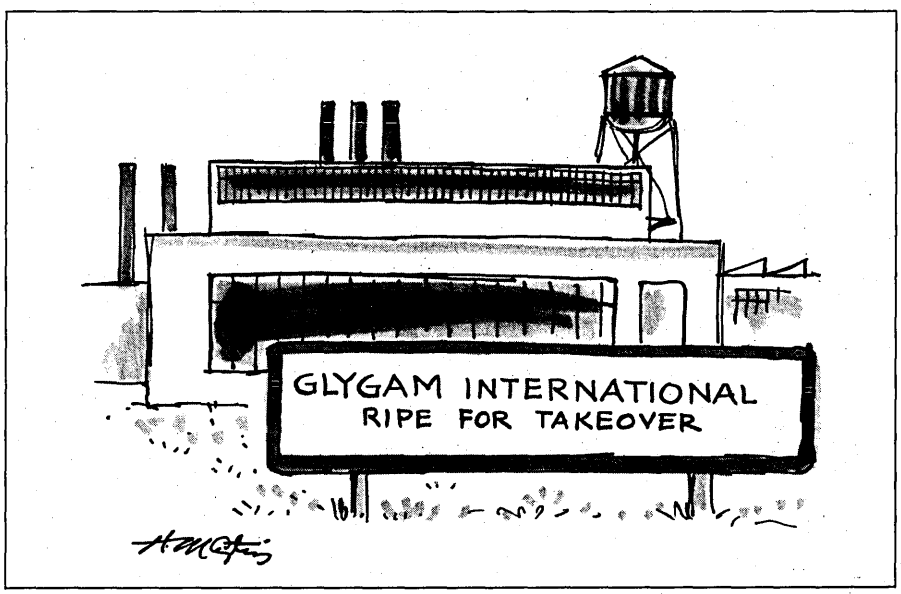
TopView allows you to run a program by opening a window on the display. Switching to a new program involves merely opening a second window. You can return to an application at exactly the point where you left off, or you can let the application run in the background until you return to it. The foreground program can occupy the full screen, or you can look at multiple programs running in multiple windows.

AN IDEA WHOSE DAY WILL COME

TopView is unquestionably a great idea. After selecting the best of the standalone programs, you can use IBM's integrator to start a program, quit the program, and start another without losing your place; transfer data among your programs; and even have programs run concurrently. If all this sounds too good to be true, it is. In its present form, TopView is severely lacking.

In theory, TopView makes data transfer easy, but in practice it flunks the test. Most programs have not been modified to take advantage of TopView's data transfer facility, and without special programming they can't receive data from TopView's buffer. Moreover, for the few programs that do allow data transfer there is a limit of 2,000 characters (about a screenful) at a time. And even when data can be transferred it's unlikely that they will arrive in a form that can be manipulated by the receiving program because control codes and conventions vary significantly from program to program.

Nor will most programs execute in the background. Any programs that bypass standard PC/DOS conventions, which 1-2-3 and almost all others do, are limited to foreground processing only. And the handful of programs that run in the background cannot drive a printer when they're in background status.



CARTOON BY HENRY MARTIN

Other problems with TopView are that it can't run programs that use bitmapped graphics, and that it significantly slows down the execution speed of the programs running under it—even when only a single program is being processed. One software reviewer told us that a single task runs 10% to 20% slower with TopView than without it.

Still another problem with TopView is that it has a ferocious appetite for memory. Even with a 640K machine you may find that there's room for only one program after you load TopView. It may sound like a silly question, but what does it mean to integrate a single program?

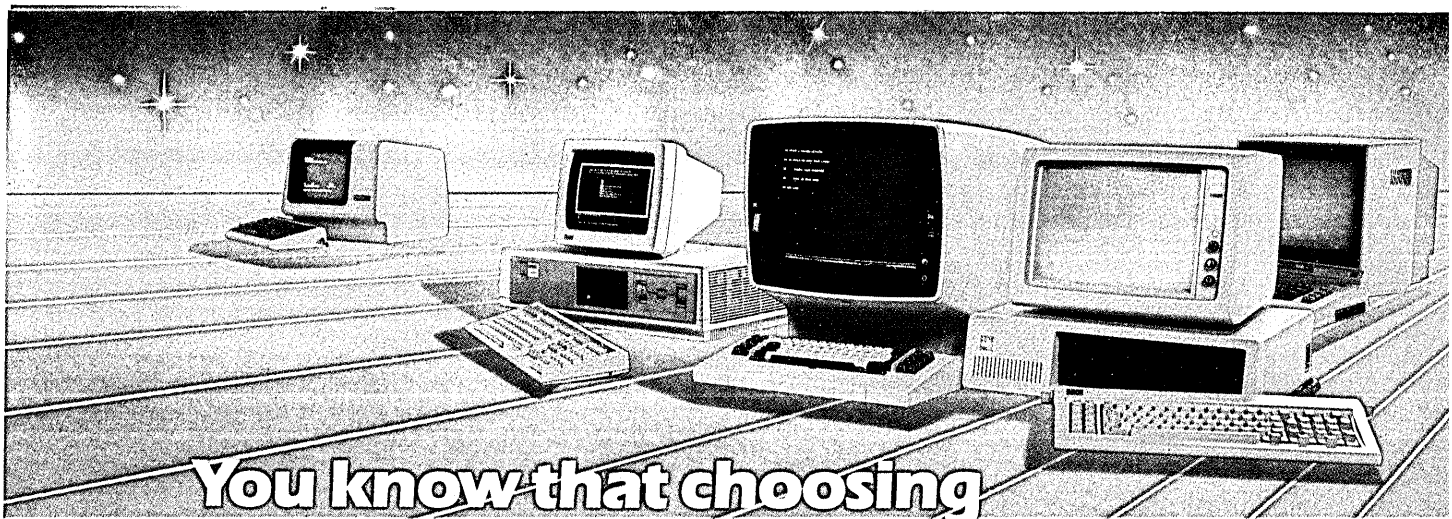
These limitations are largely irrelevant, however, for the programs that won't run under TopView at all. It's not that these programs are incompatible, but rather that each program operating under TopView must have its own program information file containing information about the program's operating characteristics (such as data file locations, minimum and maximum memory constraints, and range of software interrupt vectors swapped). Unfortunately, there are quite a few programs on the market for which this information is not readily available. IBM publishes PIF information for the popular programs, but for others you'll have to get it from the software vendors or determine it yourself through trial and error.

One thing TopView does not purport to do is provide similarity in operation among individual standalone programs because it doesn't claim to change the way a program operates. In fact, the beginner may find that it makes standalone programs more difficult to use because it adds another level of complication that must be mastered to make the machine productive.

Okay, so TopView isn't the ideal software integrator. Does that mean it will die on the vine? We doubt it.

The concept of TopView is sound. The memory problem will be solved in short order when the next generation of personal computers comes equipped with more RAM. Future versions of TopView will correct its limitations and improve its operating speed. The only serious impediment in the way of TopView's success is the software developers.

How serious an impediment are they? Although we know that some publishers are reluctant to adapt their products to TopView for fear of assisting IBM's entry into the software marketplace, we doubt that they will ultimately fail to cooperate. The logic of TopView is too compelling to believe that the product won't evolve into a standard of IBM proportions, and no devel-



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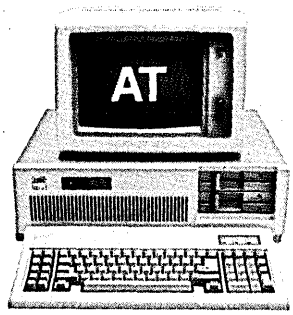

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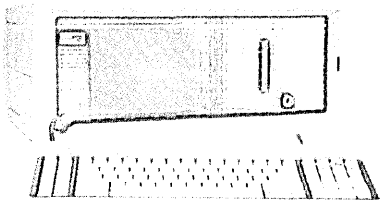

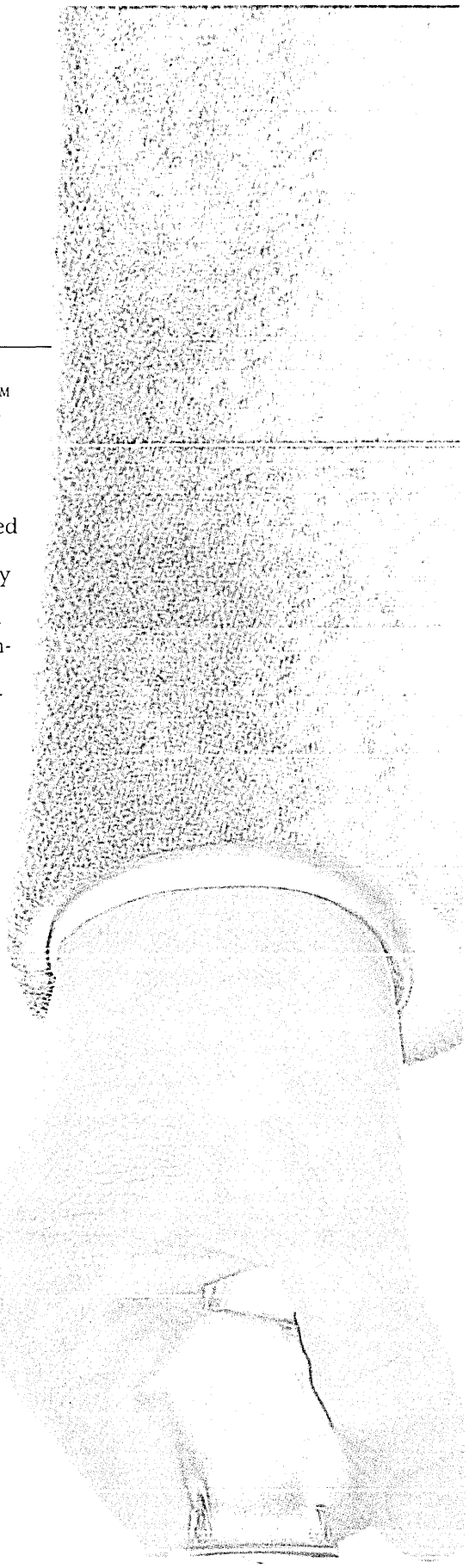

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Right now, some of your users might inadvertently be committing a crime by copying pc programs.

CAUGHT IN THE ACT

by James D. Smiddy and Linda O. Smiddy

Your company has acquired a spreadsheet computer program for the vice president of sales to use on his desktop pc. He keeps the program diskette on the bookshelf in his office. An employee from across the hall borrows the diskette the same way he would borrow a book. That employee then makes a copy of the diskette to use with his own computer so he won't have to keep borrowing the vice president's copy. He also makes a copy for the person at the next desk to use on *his* pc, and another one that he mails to his counterpart in one of the branch offices. Finally, the employee makes an extra copy to take home so he can complete his calculations on his own pc or let family members use it to do their work.

If some or all of the foregoing have occurred within your company, both the employees and the organization could be subject to civil and criminal penalties. Copying and using computer programs without the software developer's permission often violates federal copyright statutes and software licensing agreements.

Within the past year and a half, it's become increasingly clear that software developers are willing to take a tough legal stance to prevent their customers from making unauthorized copies of their computer programs. In January 1984, Lotus Development Corp., Cambridge, Mass., sued Rixon Corp., Silver Spring, Md., for $10 million. Lotus charged that Rixon had violated both the copyright laws and the Lotus license agreement by making at least 13 unauthorized copies of the Lotus 1-2-3 personal computer program disks and distributing them to Rixon's branch offices. The case was settled out of court for an undisclosed but reportedly substantial amount. In addition, Rixon consented to a permanent injunction against its making further copies of the Lotus 1-2-3 program. Lotus's attorney stated the suit was intended as a message to corporate users of Lotus 1-2-3 that such practices would not be tolerated. Several months later, Lotus filed a similar suit against a health care organization located in Tennessee. That suit also was settled for an undisclosed amount.

More recently, on Jan. 17, 1985, the Association for Data Processing Service Organizations (ADAPSO), Arlington, Va., and MicroPro International Corp., San Raphael, Calif., sued American Brands Inc., New York, and its subsidiary, the Wilson Jones Co., Chicago, for unauthorized copying of, among others, MicroPro's MailMerge, SpellStar, and WordStar software packages. The complaint claimed violations of the copyright laws, breach of MicroPro's license agreement, and unfair competition by the defendants.

By aggressively using lawsuits to protect their copyrights, software developers have followed the lead of book publishers who filed suits to protect their copyrights. In 1982, nine major book publishing companies sued New York University and several N.Y.U. professors for the unlawful reproduction and distribution of the plaintiffs' copyrighted works. During that same year, Harper & Row Inc. sued American Cyanamid Co. and E.R. Squibb & Sons Inc. for copyright infringement because both made in-house library and photocopying services available to their employees.

The concerns of software developers and ADAPSO about widespread copying are not chimerical. A recent study conducted by Future Computing Inc., a Dallas-based research firm, concluded that there is one pirated copy of business software (for pcs) in use for every copy authorized by the software developer, and that piracy cost the software industry $1.3 billion in lost revenues between 1981 and 1984. Losses may have actually been higher. The 50% rate of piracy is considered a conservative estimate of software piracy in the personal computer market.

PROTECTED DISKS ALSO COPIED

Most developers use both legal and technological methods to protect their software from unauthorized copying and use. They rely on copyrights and license agreements, as well as on copy protection devices on the software diskettes. Many developers, however, have come to believe that current copy protection devices are ineffective. For example, the study on software piracy revealed that

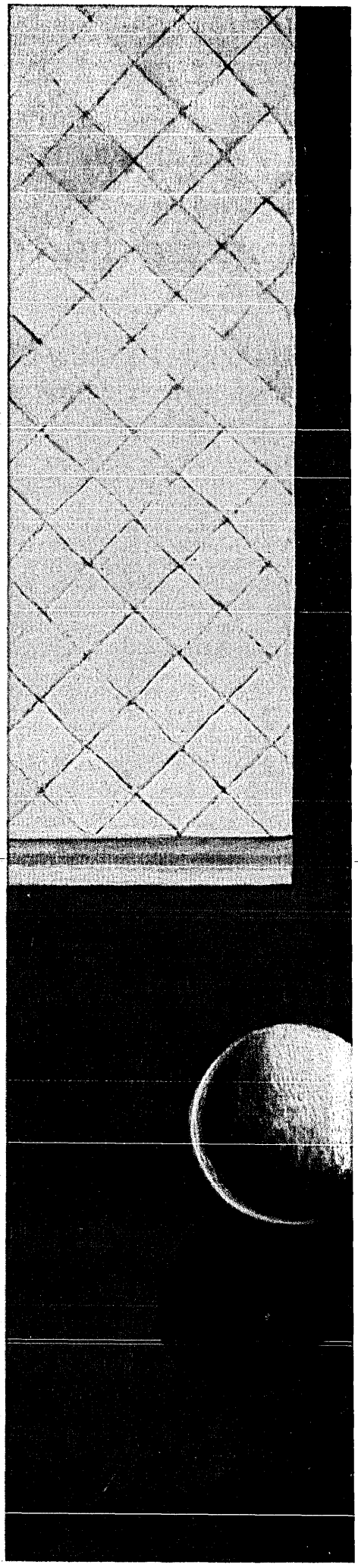
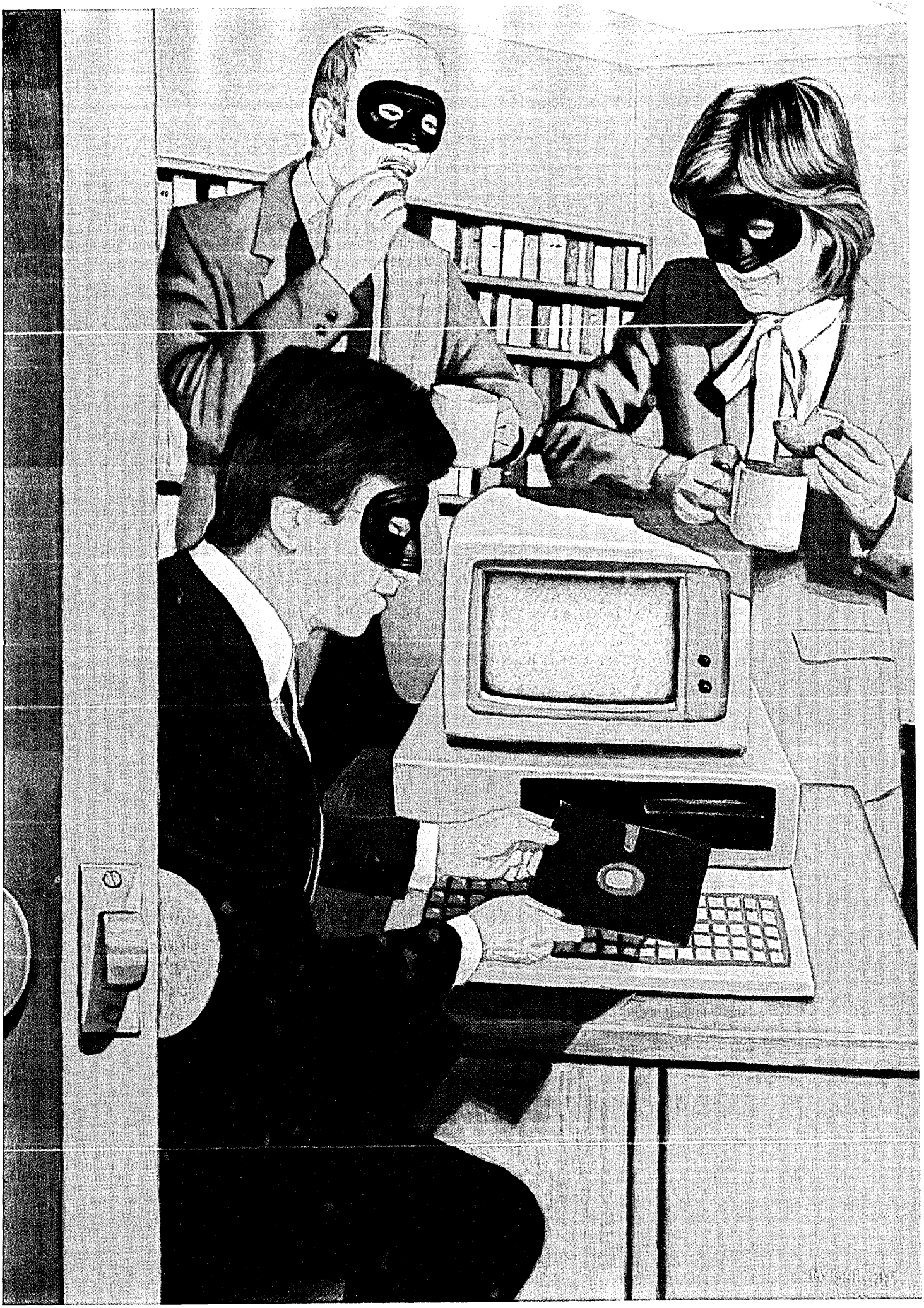


ILLUSTRATION BY MICHAEL GARLAND



The Copyright Act permits the user to make one copy of the computer program for backup purposes.

copy-protected software is pirated at almost the same rate as unprotected software.

The developers' disenchantment with protection devices has prompted them to rely more and more on copyright and licensing agreements to safeguard the use and distribution of their products. Therefore, to determine what a user may or may not do with software, one must consider two separate but interrelated questions:

1. What are the rights and responsibilities of the software user under the Federal Copyright Act?

2. To what extent must the user adhere to the terms of the license agreement accompanying the pc computer programs?

The Federal Copyright Act applies to individuals and corporations. It expressly protects computer software programs from unauthorized copying, whether these programs are in humanly readable source code or machine readable object code.

The act grants the software developer (assuming the developer is also the copyright owner) the exclusive right to make and distribute copies of a copyrighted program. The user of a copyrighted program therefore may not copy or duplicate that program without the developer's permission.

There are, however, two exceptions to this rule. The first is that the user may load a computer program into the internal memory of a computer to use it. At the time of use, there are two copies of the program: the one on the diskette and the one executing in memory. The copy of the computer program located in memory is not an infringing copy.

The second exception is that the Copyright Act also permits the user to make one copy of the computer program for backup, or archival, purposes. The user may not, however, create additional copies of the program or use the archival copy for other than backup purposes without the consent of the copyright owner.

Based on the foregoing, it is doubtful that a user would be permitted to take a program on a diskette and load it into several computers or to load a copy of a program into a central computer and then distribute or download it over communication lines to several personal computers. The copyright law is silent on these situations and the courts have not dealt with them as yet. Nevertheless, this type of copying would violate both the spirit and the purpose of the copyright law, which is to stimulate creativity and to protect the investment of copyright owners. Interpreting the copyright law to mean that one program could be copied into several computers for use at the same time would cause substantial financial hardship to the software developers, especially when a copy of the software had been acquired by a large company with many computers.

In some situations, the copyright law permits the software user to sell or give away his copy to some other party. The user may not, however, transfer his copy to a third party and also retain a copy for himself. He must give up all rights to the program. Although this type of transfer may be permitted under the copyright laws, the user is frequently prevented from transferring the software to another person by a licensing agreement that usually accompanies the software.

There are no known reported court cases on what constitutes permissible copying of a computer program by an end user. The landmark 1983 case of *Apple* v. *Franklin* involved copying by competitors. The 1984 United States Supreme Court case, *Universal City Studios Inc.* v. *Sony Corp. of America* (popularly known as the Betamax case), deals with a similar situation. In that case, the Supreme Court held that home videotaping of television programs was not an infringement of Universal's copyrights. The court concluded that copying tv programs for private home use constitutes "fair use" of the copyrighted material.

ADVERSE EFFECT ON MARKET

It could be argued that the court's reasoning might be extended to permit individuals to copy computer programs in their homes for their private home use. It would seem unlikely, however, that the decision would be further extended to a company making copies of software for its own internal use. The court indicated that making copies for a commercial or profit-making purpose would be unfair. The widespread copying of computer programs by corporations could have an adverse effect on the potential market and value of a copyrighted computer program. It is therefore doubtful that the Betamax case ruling would be extended to a corporation making other than permissible backup copies of computer programs.

As already stated, a user may not copy a program except for backup purposes and loading it into internal memory. Several civil penalties can be imposed on software users who make unauthorized copies of a copyrighted program. Moreover, the court may saddle the user with penalties equal to the vendor's lost sales, royalties, or profits. Additionally, the court may impose money damages that are fixed by statute and may be as much as $50,000 or more, as well as the costs of the litigation and attorney's fees. Any person who willfully infringes on a copyright for commercial advantages or private financial gain may also be subject to criminal penalties of imprisonment for not more than one year or a fine of $10,000 or both.

In addition to being protected by copyright, computer programs for personal computers are almost always accompanied by a license agreement. This agreement is usually enclosed with the computer program diskette in a clear, plastic-wrapped package and is visible to the prospective user before he opens the package. These agreements are known by various names including tear-me-open and shrink-wrapped agreements. Shrink-wrapped license agreements usually limit the use of the software to a single computer and permit copying of the software for backup purposes only. Generally, the agreements prohibit the transfer of the software to another party, the making of unauthorized copies of the computer programs, the use of unauthorized copies of the computer programs, the use of the program on multiple computers, the use of the program in a timesharing network, and the transmission or downloading of the program over a communications network. These restrictions are intended to ensure that even uses that might be permitted by the Federal Copyright Act will not be permitted by the license agreement.

There is some uncertainty as to the enforceability of the shrink-wrapped license agreements because they do not follow the traditional contract law rules of offer, acceptance, and signature by the parties.

Usually, contracts are negotiated by designated representatives of the purchaser and the seller. License agreements for personal computers, however, are not negotiated by anyone. Instead they are shipped to the buyer as part of the package containing the computer program. When the software is purchased by a company, the purchasing department often forwards the entire software package, including the agreement, to the employee who requested the software. Thus, designated company representatives may never review the agreement. The enforceability of these agreements is therefore in some doubt for two reasons. First, it is uncertain whether anyone authorized to enter into contracts on behalf of the company ever saw the agreement. Second, there is no assurance that the employee agreed to abide by the terms of the contract just because he opened the package.

There are two main categories of shrink-wrapped license agreements in the marketplace. The most common involves a notice printed on the outside of a package

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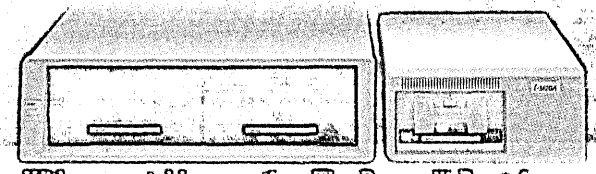

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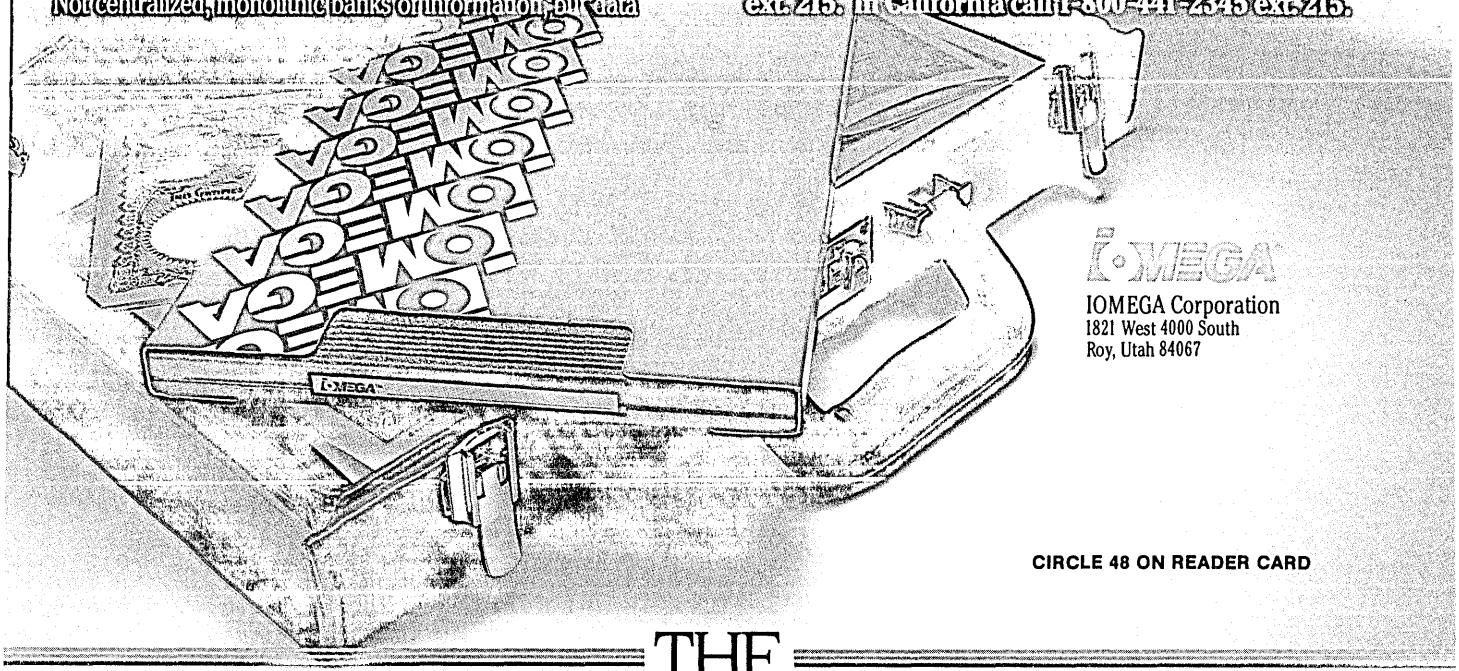
For the dealer nearest you, call 1-800-556-1234 ext. 215. In California call 1-800-441-2345 ext. 215.



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THE BERNOULLI BOX™

Courts have been divided in their opinions on whether shrink-wrapped agreements are in fact enforceable.

explaining that acceptance of the agreement automatically occurs when the customer opens the package. In this situation, no signature by the user is contemplated. If the user does not agree to be bound by the terms and conditions of the agreement, then the software may be returned unopened for a full refund.

MAIL-IN WARRANTY METHOD

In the other widely used method of licensing, an acknowledgement card and license agreement are contained in the software package. The purchaser is required to sign the card and mail it to the vendor in return for the vendor's promise to extend the warranty period or provide support and maintenance. This scheme may give the vendor a greater opportunity to enforce the terms and conditions of the license because the acknowledgement has been signed and returned. Nevertheless, it is questionable whether the user will be bound by the agreement since his signature may only have been intended to obtain the warranty or maintenance.

There are no known reported court cases on the enforceability of the shrink-wrapped license agreements. A comparison can be made, however, to other types of preprinted agreements that don't require a signature to be binding. One similar type of agreement that has been litigated frequently is the agreement printed on tickets issued for parking lots. These agreements usually limit the liability of the parking lot owner in the event of loss or damage to the customer's automobile. Courts have been divided in their opinions whether these agreements are in fact enforceable.

Back in 1970, two judges ruling on two similar cases came to two different conclusions. The first case involved damage to an automobile that was parked in a parking lot. To avoid responsibility for the damage, the parking lot owner relied on a disclaimer of liability printed on the face of the claim ticket. Ruling against the parking lot owner, the court held that there was no evidence the automobile owner had ever seen the clause, and under such circumstances he was not bound by the disclaimer.

In a similar case decided that year, the court reached a different conclusion. In this case a car owner had parked his car in a parking lot. When he returned, his battery had been stolen. He made a claim against the parking lot owner for the cost of the battery. The parking lot owner asserted that under the terms written on the parking ticket, the car owner was bound to the terms of the agreement. The court reasoned that the fact that car owner had not read the terms of the contract printed on the parking ticket did not excuse him. The court further observed that an individual has a duty to read and inform himself of a contract's terms.

STILL SUBJECT TO DEBATE

As these cases indicate, the question of whether preprinted agreements are enforceable is still subject to debate. Nevertheless, the last case discussed and others like it suggest that courts may be willing to enforce preprinted agreements even when there is no indication they have been read.

The results of these cases are also consistent with rules of contract law established by the Uniform Commercial Code (or UCC), which deals with contracts for the sale of goods. The UCC provides that the conduct of the parties may create a contract. Therefore, if the user opens the software package containing the license agreement and visible printed information on the package admonishes him that opening the package is acceptance of the license agreement, such conduct may well be sufficient to establish a contract.

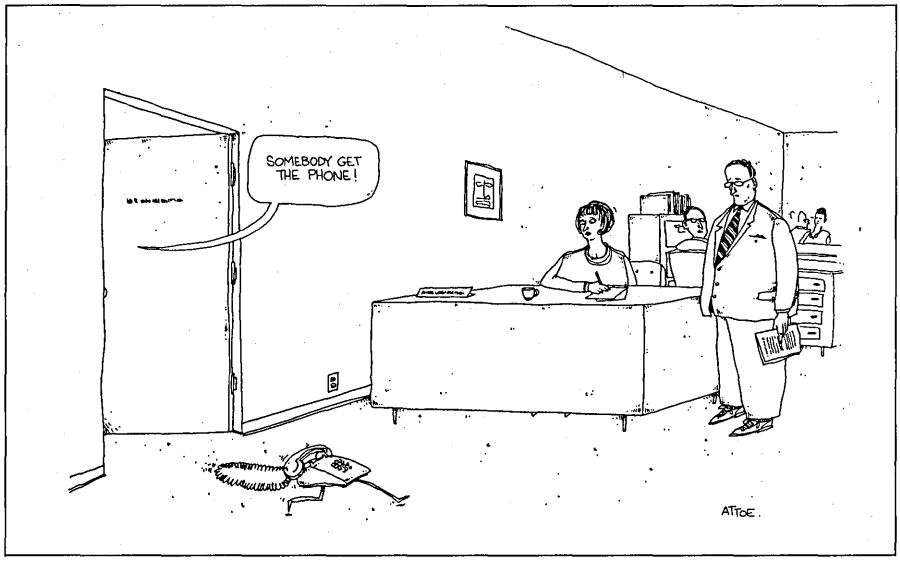
Although there is as yet no clearly established law as to whether these shrink-wrapped licenses create a valid enforceable agreement, there is increasing evidence that vendors are taking action to enforce them and that such action will yield results. The Lotus Development and MicroPro suits discussed earlier are cases in point. Those lawsuits involved claims based on copyright and on the licence agreement.

In addition, a movement has begun indicating that these agreements will become enforceable. A software license enforcement statute has been enacted in Louisiana that makes these shrink-wrapped license agreements enforceable in that state.

It has been reported that similar legislation is under consideration in California, Georgia, and Connecticut and a lobbying effort has been formalized to promote the introduction of this legislation into other states too. Such legislation generally provides that if the shrink-wrapped license meets minimal standards of visibility and legibility and makes provisions for full refund of the purchase price if unopened, then the agreement is enforceable if the package is opened by the purchaser.

ADAPSO advocates that other steps be taken as well. A committee within that organization is working to develop a software lock that will prevent copying.

ADAPSO has also stressed the need for education among the user community. It recently completed a nationwide mailing of 65,000 brochures to chief executive officers, in-house corporate counsels, heads of universities, and superintendents of schools explaining why copying of software is illegal. In addition, the authors and another attorney are involved in the production of a videotape that will help educate pc software users. The videotape is scheduled to be released in the fall. Geared to the needs of corporations, it will explain to employees why unauthorized copying is illegal. ◉



CARTOON BY STEVE ATTOE

Linda O. and James D. Smiddy are attorneys with the Computer Law Group of Cummings & Lockwood, Stamford, Conn. Both had substantial experience with IBM as data processing professionals before joining the legal profession. The Smiddys were members of the committee that drafted Connecticut's recently enacted computer crime legislation.

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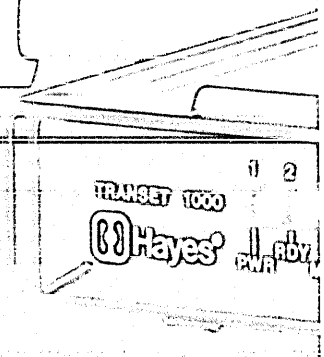
CIRCLE 49 ON READER CARD

Introducing The Single Solution To Many Problems That Can Tie Up Your Personal Computer.

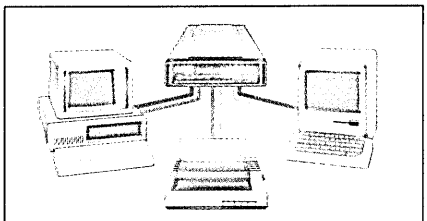


Transet 1000™ The print buffer, communications buffer, port expander, printer sharer and I/O switcher. All in one.

Anyone with a personal computer and one or more peripherals has faced the all-too-familiar dilemma. You need your computer to do an important job. But you're forced to wait for the system to finish one job (printing, communicating, whatever) before you can go on to the next one. Or you need to stop what you're doing to switch cables when you want to use another peripheral.

Wait no more. Now Hayes introduces an innovative new device that lets you perform many jobs—at the same time—independent of your computer. Transet 1000. It works with a wide range of systems and configurations. And it allows you to continually expand your system as your needs grow.

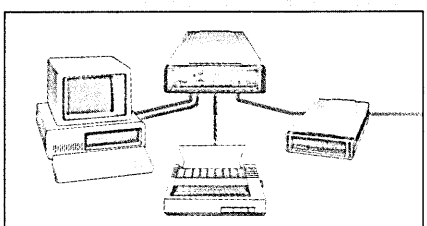
Transet 1000 frees your computer from waiting on your printer or modem—so you and your computer can go on to another task. It even lets you print out documents in pre-set formats without having to go back into your computer. At the same time, Transet 1000 can operate unattended mailbox communications—24 hours a day—even if your computer is turned off.



Two computers can share one printer with Transet 1000. Or, you can use Transet 1000 to let two computers communicate with each other.

In addition, Transet 1000 is a port expander and software-controlled I/O switcher. Now files can be easily directed and redirected to different peripherals, without physically changing cable connections.

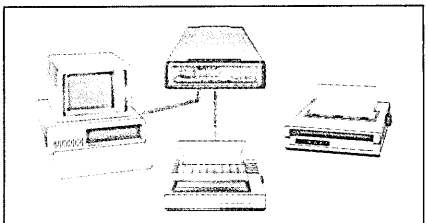
Transet 1000 contains a stand-alone microprocessor, and comes with 128K of memory. It operates with any RS-232 interface computer, and has optional accessory kits available for the IBM® PC and PC XT, Macintosh™ and Apple® IIc. Kits contain the necessary host cable, a user guide and menu-driven software that lets you graphically set up or customize port parameters and printing formats. Cables available for IBM PC AT, other computers and peripherals.



Even while printing, Transet 1000 acts as a communications buffer and 24-hour mailbox. And I/O switching lets you route information among peripherals, without switching cables.

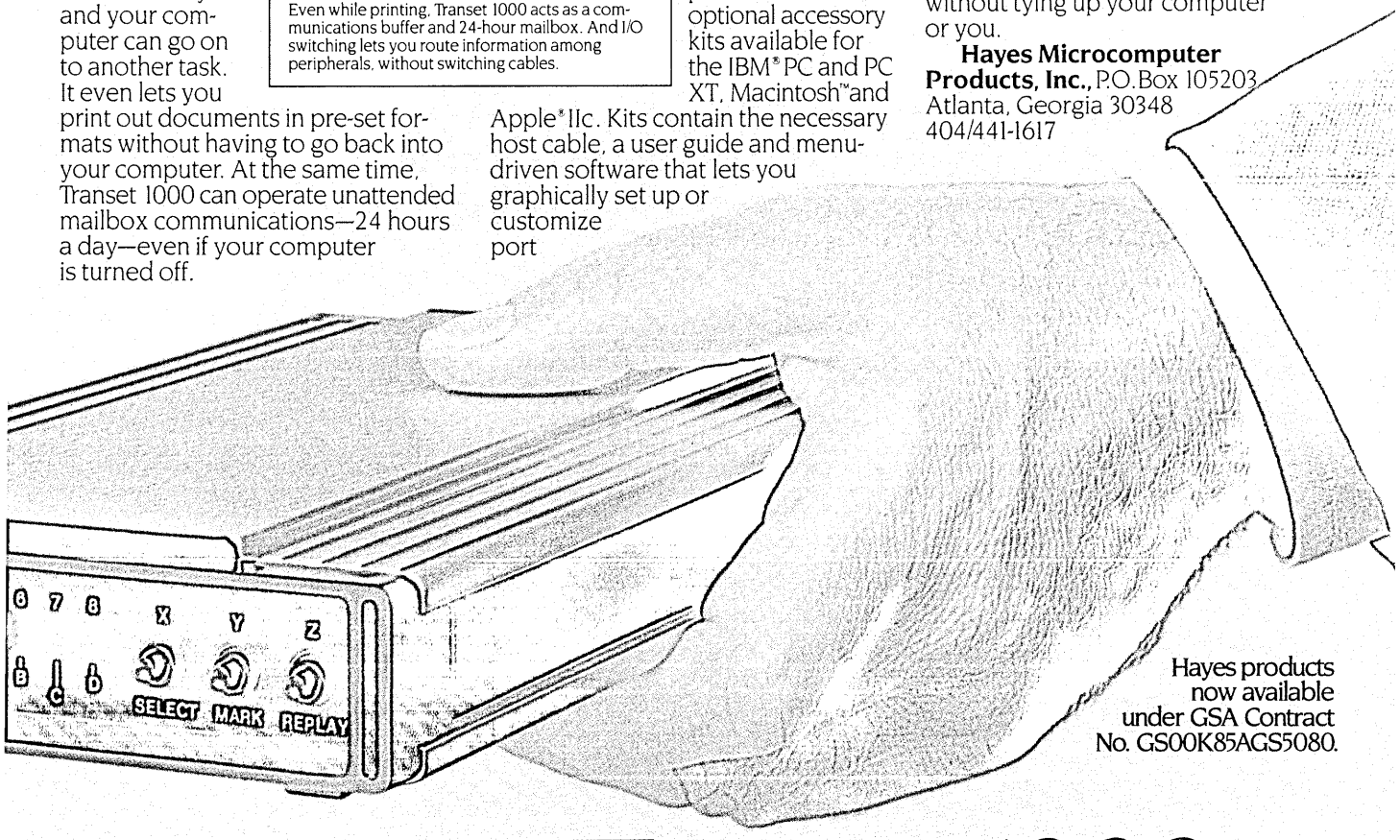
Like all Hayes products, Transet 1000 combines sophisticated capabilities with easy operation. Just as Hayes set the standard in personal computer communications, now Hayes is taking the lead in computer task management.

Contact your authorized Hayes dealer to see how Transet 1000 can help you get a lot more productivity out of your computer system—without tying up your computer or you.



Transet 1000 allows printing on both a dot matrix printer and letter quality printer, while freeing your computer for other tasks.

Hayes Microcomputer Products, Inc., P.O. Box 105203 Atlanta, Georgia 30348 404/441-1617



Hayes products now available under GSA Contract No. GS00K85AGS5080.

Hayes® Transet 1000

Innovative products for enterprising people

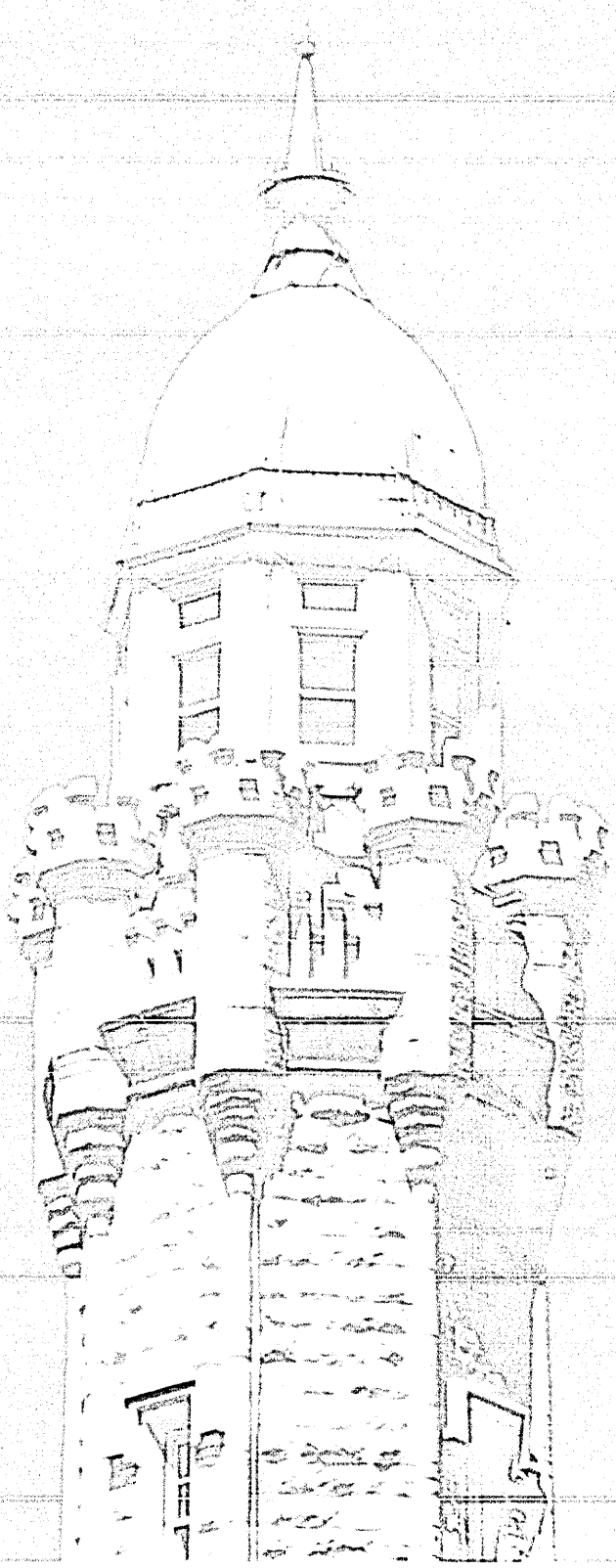
CIRCLE 50 ON READER CARD

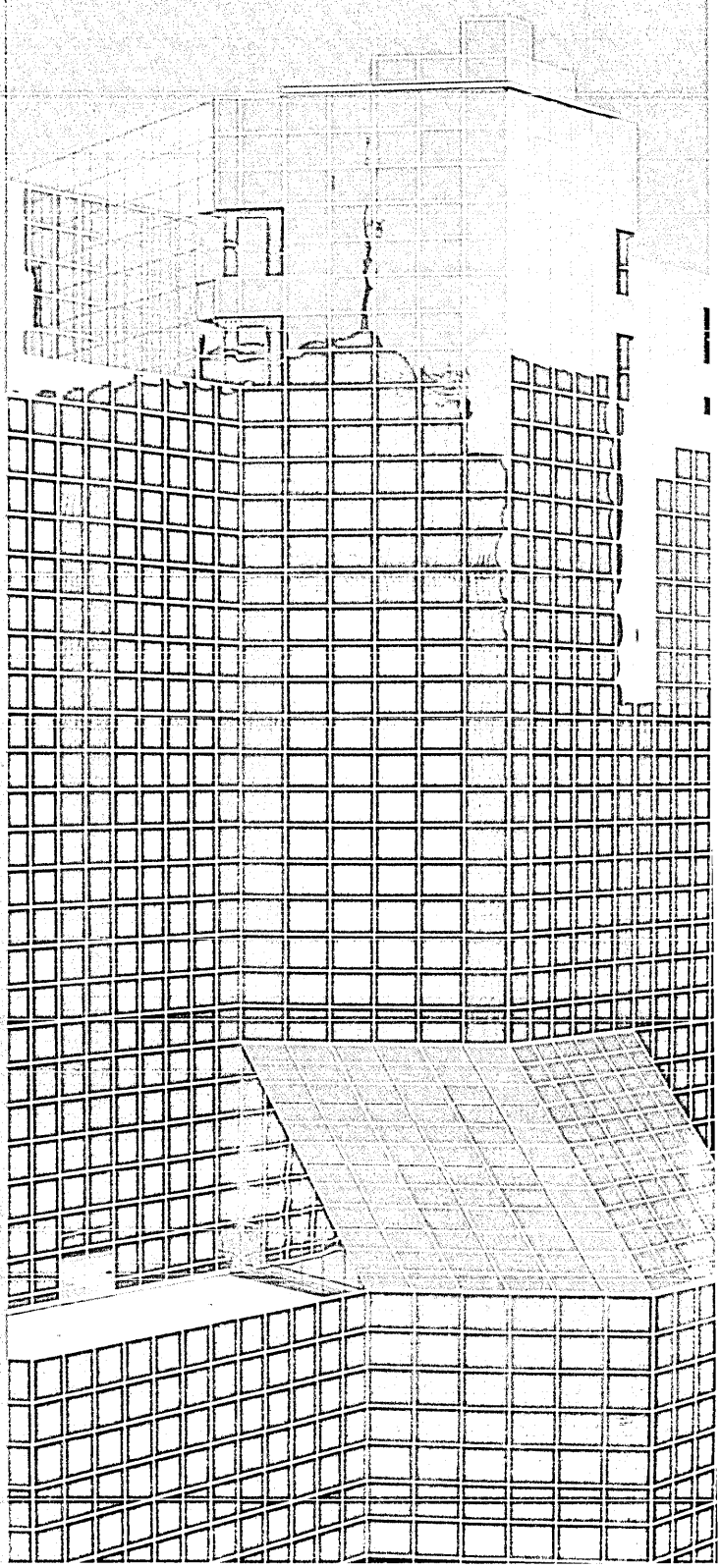
Dp people take to the toddling town for NCC '85.

SHOWTIME IN CHICAGO

While technology's horizons may indeed be expanding, the number of places where NCC can happen is rapidly reducing. With over 700 manufacturers exhibiting, NCC's 1985 spatial requirements are staggering. In 1981, the greatest computer show on earth happened at McCormick Place in Chicago, where later this month, it shall return. Since '81, the show has gone west to Houston in 1982, still further west to Anaheim in 1983, and then back east to Las Vegas last year. If NCC were a square dance, its chorus would be "Honey, honey, go back the other way!"

Considering that NCC '85 takes place July 15 through 18, Chicago's climate is certainly preferable to that of the other possible host cities. Lakeside breezes are

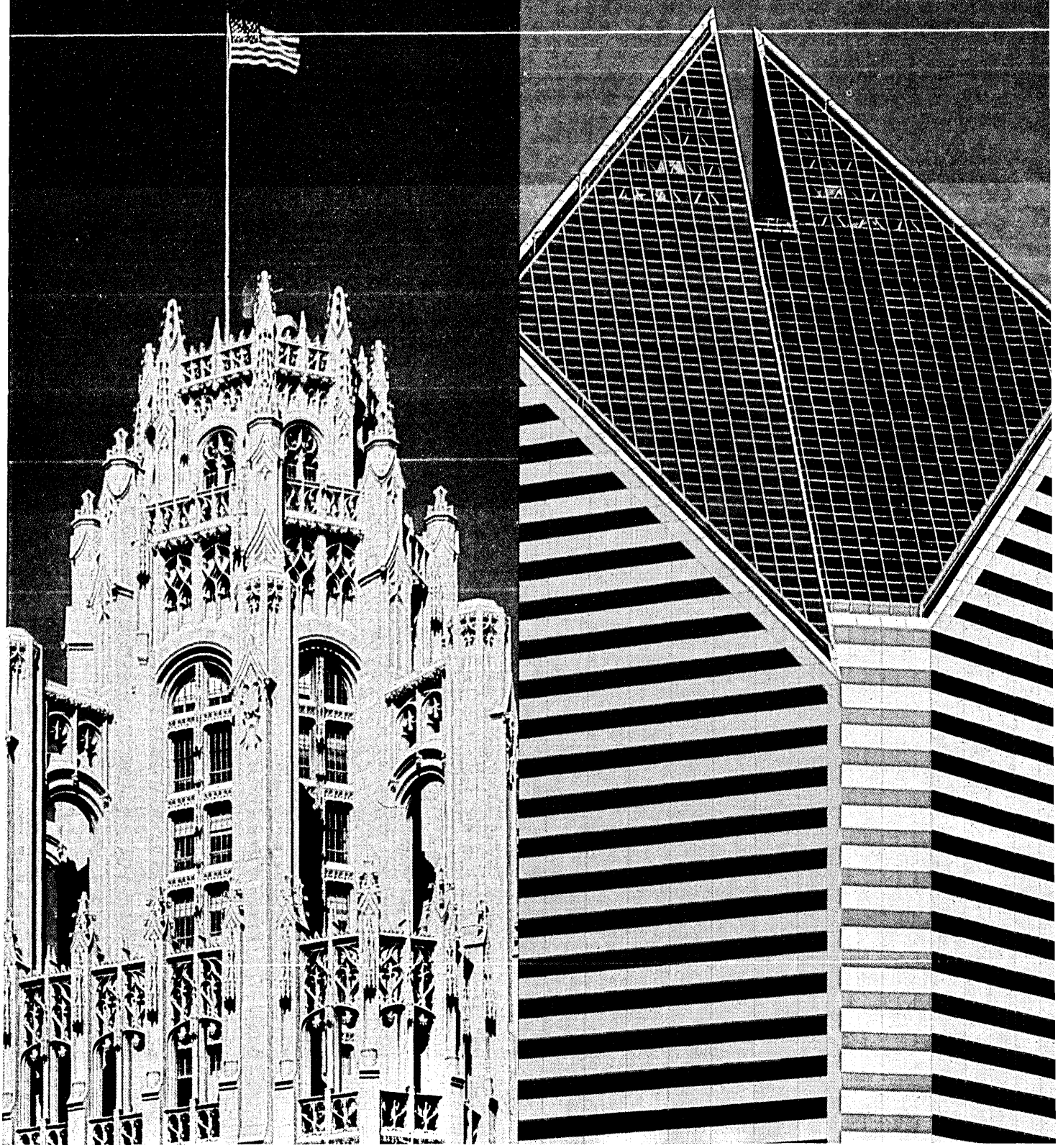




an easy winner over the desert siroccos. Rejoice! You can stand, even walk, out of doors this year—unless, of course, the city experiences one of its occasional blistering heat waves.

But, with such a diverse and exciting schedule of technical sessions, why would you want to be outside anyway? Conference chairman Karl E. Martersteck, executive director of the Digital Switching Systems Division at AT&T Bell Labs, and program chairman Anthony S. Wojcik, professor of computer science and electrical and computer engineering at the Illinois Institute of Technology, have done their best to keep you indoors. With the theme "Technology's Expanding Horizons," this year's NCC will contain nine different tracks: Artificial Intelligence, Networking, Personal Computing, End-User Computing, Information Systems Management, Business Applications, Software Systems, Future Architectures & Supercomputing, and Educational & Societal Issues.

As is now standard, Pioneer Day festivities will take place on Wednesday, July 17. This two-part special session will focus on four computers—the AVIDAC, ORACLE, ORDVAC, and ILLIAC—that were developed for nuclear research during the '50s at the Argonne National Laboratory, the Oak Ridge National Laboratory, and the University of Illinois. It's an appropriate program for a Chicago conference.



PHOTOGRAPH BY JAN STALLER

INTRODUCING

THE NEXT STEP FORWARD—A UNIQUE

Recently, AT&T Information Systems introduced a product destined to set a new standard for business computers.

Its name: the AT&T **UNIX** PC Model 7300.

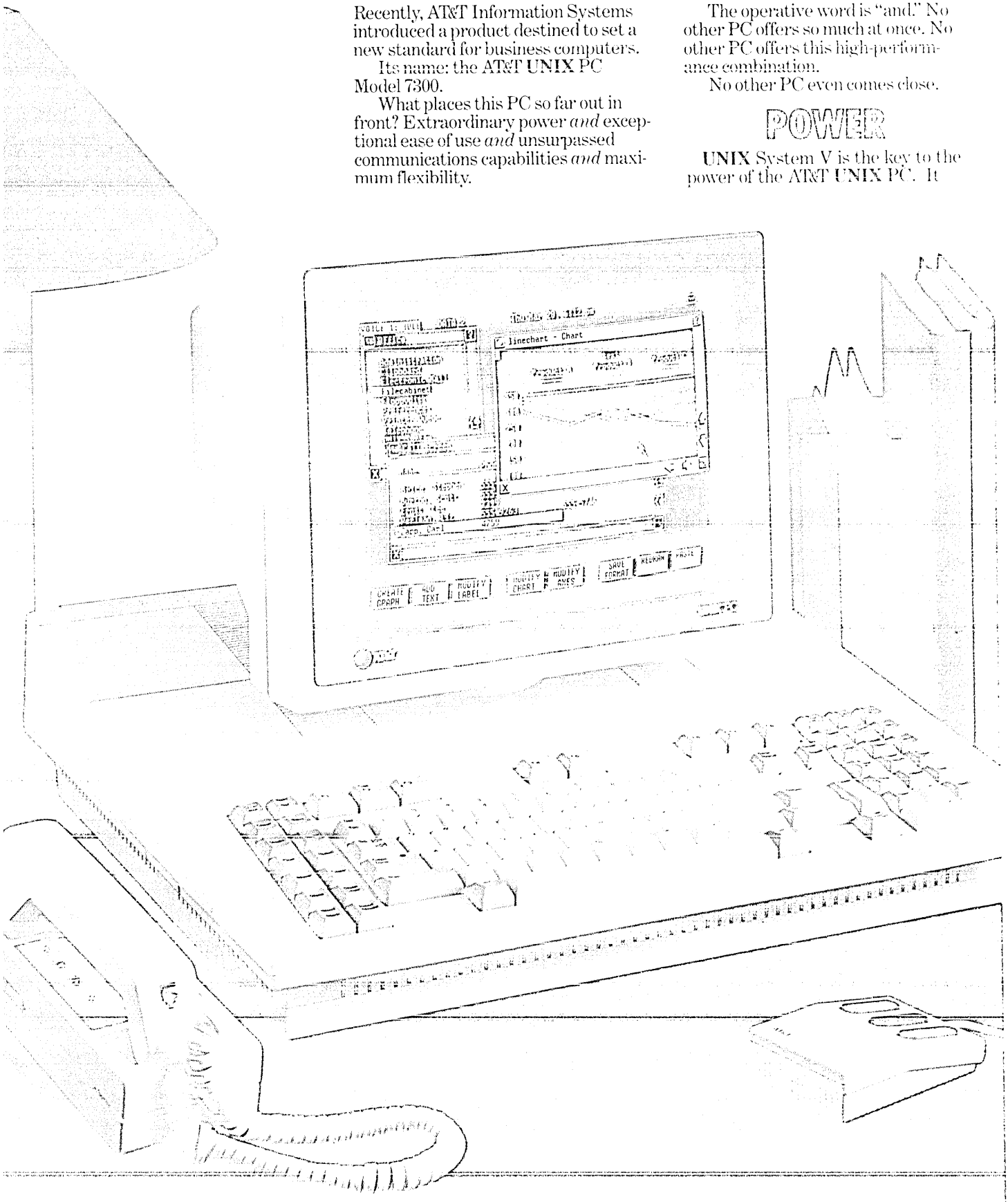
What places this PC so far out in front? Extraordinary power *and* exceptional ease of use *and* unsurpassed communications capabilities *and* maximum flexibility.

The operative word is "and." No other PC offers so much at once. No other PC offers this high-performance combination.

No other PC even comes close.

POWER

UNIX System V is the key to the power of the AT&T **UNIX** PC. It



THE AT&T UNIX™ PC

COMBINATION OF COMPUTER CAPABILITIES

allows you to process more data faster. (Not a little more data a little faster. *Lots* more data *much* faster.)

And keep it stored. It's equipped with 512K RAM that can be increased to 2MB with expansion cards. And the AT&T **UNIX** PC will store up to 20 megabytes of data.

This super power also lets you take advantage of the multi-tasking talents of **UNIX** System V. You can perform a number of tasks simultaneously on as many as 12 active windows.

SPECIFICATIONS	
Processor	Motorola 68010, 10 MHz clock speed, 32-bit processing, 16-bit data bus
Operating System	UNIX System V
Memory	512K expandable to 2 MB, Virtual Memory
Disk Storage	1 ½MB 5¼" double sided/double density drive (unformatted) 10 MB or 20 MB hard disk (formatted)
Communications Devices	1 RS 232C serial, 1 Centronics parallel, 2 Tip/ring line jacks (with cords) 1 Telephone set jack, 1 300/1200-Bps modem
Expansion Slots	3
Display Screen	12" diagonal screen, Monochrome green on black phosphor, 720 x 348 pixels, 80 columns x 29 rows, Reverse, underline, blinking, and high intensity

EASE

You might think that a PC able to perform such varied and complicated tasks would itself be complicated.

Not so. We went to a lot of time and trouble so you won't have to. Even a novice can learn to use the AT&T **UNIX** PC in a matter of hours, thanks to features such as a simplified keyboard. A three-button mouse and help function.

And the User Interface—an electronic office manager that works the way you work. Using words that you use: clipboard, file cabinet, telephone, and wastebasket, for example.

The AT&T **UNIX** PC proves that it can be as easy as apple pie. Or the Apple* Macintosh** for that matter.

COMMUNICATIONS

When is a PC more than a PC? When it's able to integrate voice and data communications. Something the AT&T **UNIX** PC does far better than any of its competitors.

You'll be able to use your computer to handle interruptions without effort. And a built-in modem lets you send data over phone lines.

Not surprisingly for an AT&T product, your phone plays a starring role. Easy-to-use communications features include speed calling, call history, call timer, and call notes.

SOFTWARE

You won't have any trouble getting started on the AT&T **UNIX** PC. Many programs are available, all ready to meet your business needs.

They include the AT&T Business Accounting System. Packages for day-to-day business needs such as word processing, financial spreadsheets, and business graphics. And to drop just a few of the well-known names that can run on the AT&T **UNIX** PC—Multiplan,' dBase III,'' and Microsoft''' Word.

Or you can design your own programs with our Systems Programming Software. The AT&T **UNIX** PC is on speaking terms with the most popular programming languages: FORTRAN, C, COBOL, and BASIC.

That's just for starters. Many more are on the way.

THE COMPUTERS WITH THE FUTURE BUILT IN

Where you go tomorrow will be determined in part by computer choices made today.

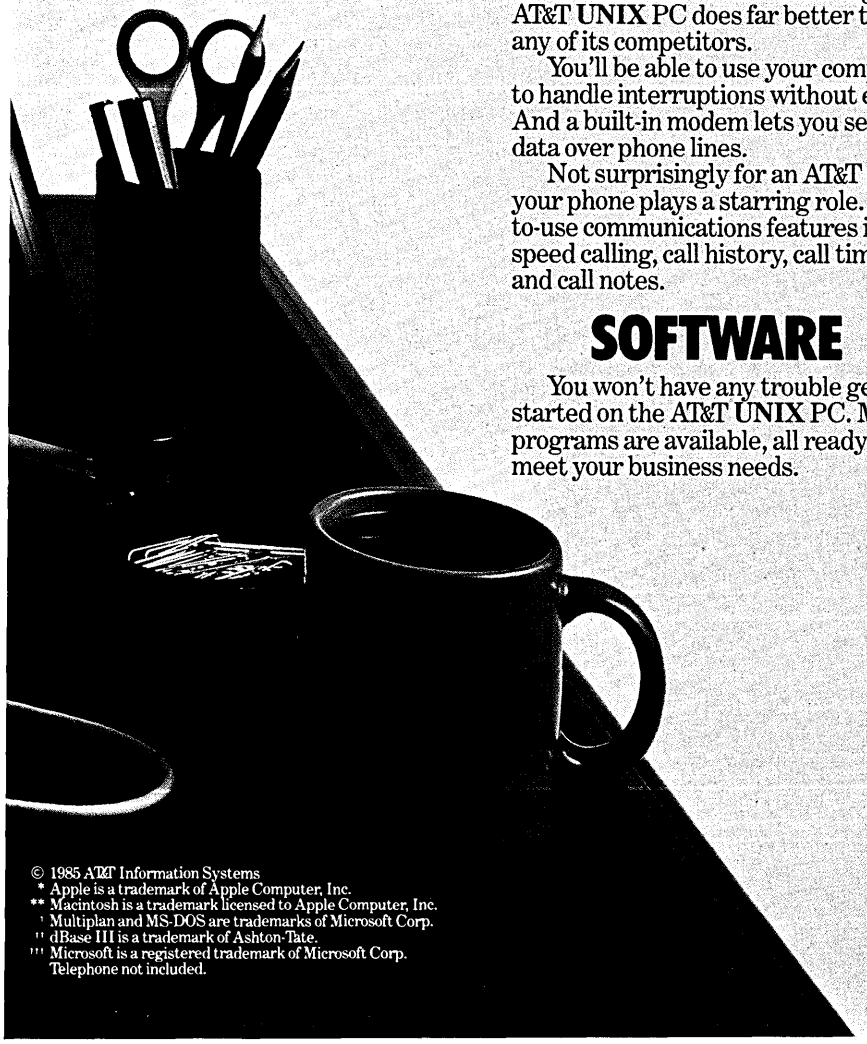
So we designed the AT&T **UNIX** PC to be as flexible and compatible as possible. To help you keep your options open, your growth unrestricted. With expansion slots and industry standard interfaces.

And the AT&T STARLAN Network—a low-cost, high-speed local area network that's easy to install using existing telephone wiring. To integrate many kinds of computers, including those running on **UNIX** System V and MS-DOS!

No wonder we call this a computer with the future built in. *Your* future built in.

And why you'll call the AT&T **UNIX** PC the right choice.

For more information, call your AT&T Information Systems Account Executive, visit an authorized AT&T dealer, or call 1-800-247-1212.



AT&T

The right choice.

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Telephone not included.

There are precedents to be set and fortunes to be made. That's why lawyers are swarming to . . .

COMPUTER LAW

by Joseph Kelly

Not too long ago, "computer law" existed mostly in legal journals. The vendors, of course, had their counsels, both in and out of house, but that was about it. "It was all theoretical," recalls John C. Lautsch, chairman of the computer law division of the American Bar Association's Section of Science and Technology. "You would read about it and say to yourself, 'Well, that's interesting,' and then return to your divorce cases."

It's not theoretical anymore. The reason is simple: the tremendous growth of the computer industry. This $140 billion business now includes thousands of computer companies—hardware and software firms, systems houses, stores, dealers, distributors, consultants. At the same time, there are hundreds of thousands of businesses buying computers and becoming absolutely dependent on them. All of this gives urgency to formerly theoretical questions: what liability do vendors have? What kinds of protections can users negotiate? How can employees be prevented from stealing trade secrets? What rights do employees have to programs they develop on their own time? When is it permissible to copy software? How do you stop a company from selling a product that's a rip-off of yours?

Companies all across the country "are turning to their local law firms," observes Michael Keplinger, past president of the Computer Law Association, "and asking what used to be considered very esoteric questions." Adds Susan Nycum, a leading computer lawyer, "The high-tech lawyer of today will be the general practitioner of the twenty-first century."

Among the computer vendors, Apple and IBM have been quick to flex their legal muscles about copyright and trade secret issues. On the other side, companies saddled with computers that don't work right have also benefited from the new legal climate. Last December an arbitrator in Los Angeles leveled an $18 million judgment against the now defunct Northrop Data Systems over an errant $100,000

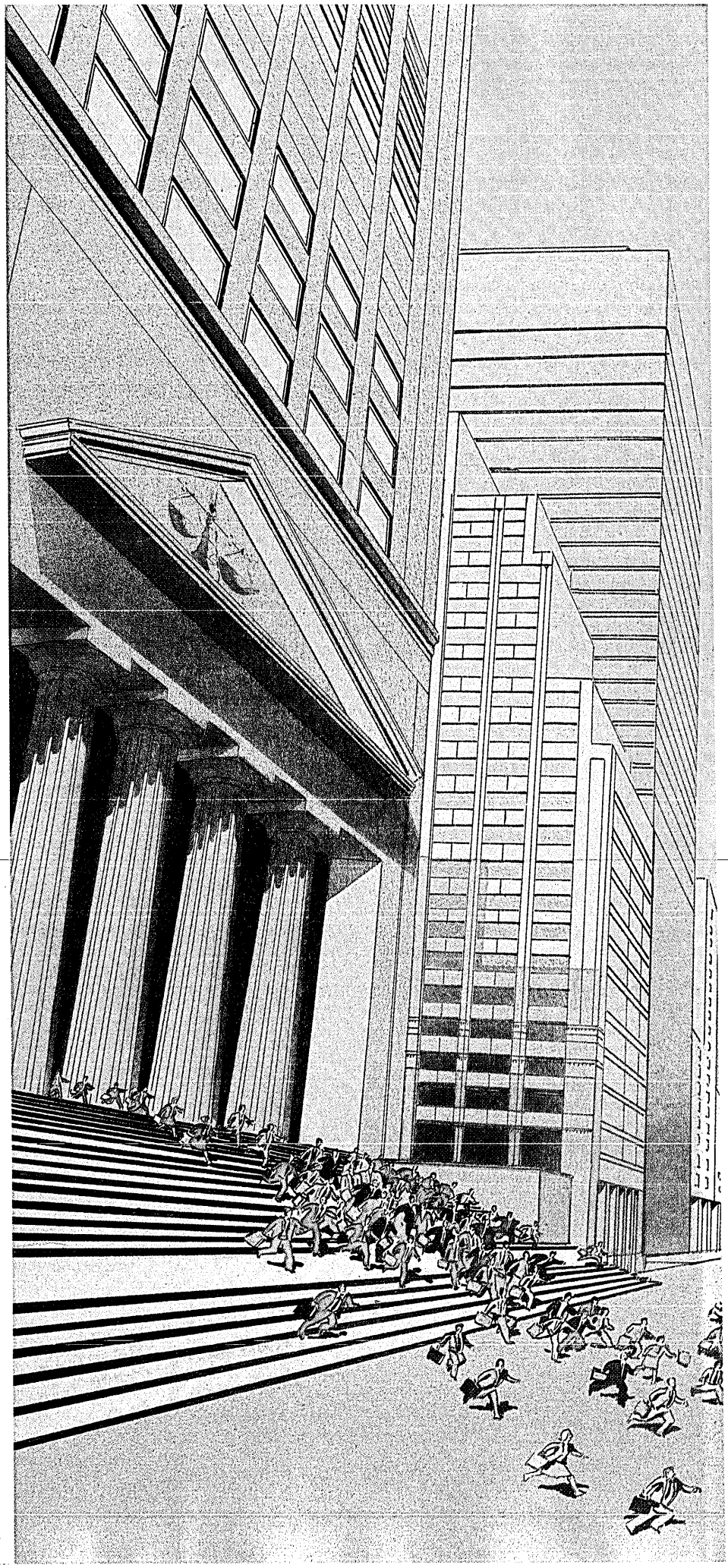
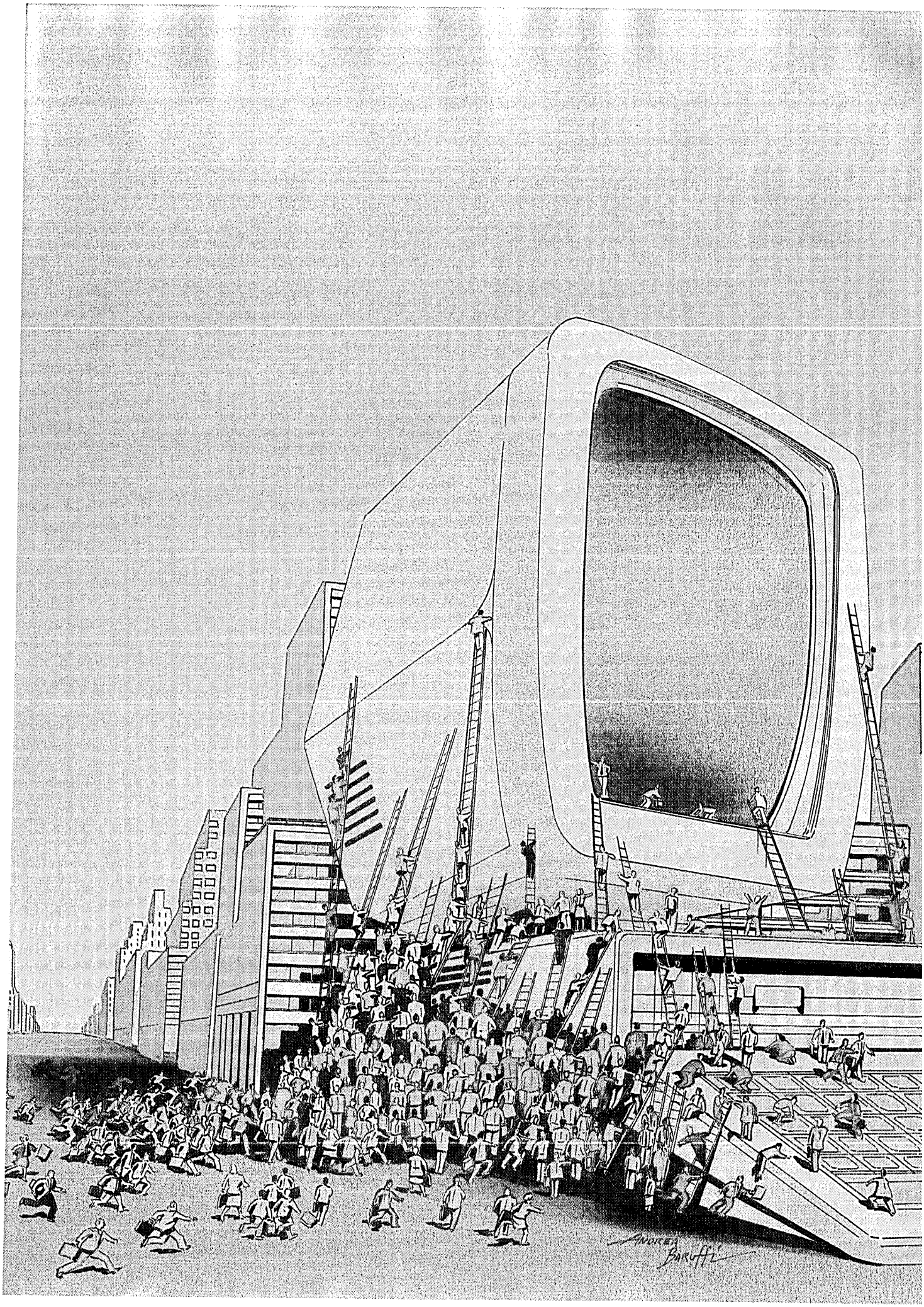


ILLUSTRATION BY ANDREA BARUFFI


ANDREA
BARUFFI

"The high-tech lawyer of today will be the general practitioner of the twenty-first century."

minicomputer it sold to a doctors' group in rural Wisconsin. (The award is now being contested.) In February, a jury in San Francisco awarded the Beaver Insurance Co. $800,000 in damages for a B800 system it leased from Burroughs Corp. It is the largest judgment ever against Burroughs, which is also challenging the award.

IMPACT ON RIGHTS OF DPERS

And in dozens of other cases, judges are interpreting the law in ways that could have a profound impact on the rights of dp professionals and the way they do their jobs. Consider:

A dp expert can sue for fraud. Accusystems, a New York-based service bureau, was forced out of business when its Honeywell minicomputer system failed repeatedly. The service bureau owner, William Selden, a former IBM executive with nearly 25 years in the business, sued Honeywell for breach of contract, negligence, and fraud. A federal judge denied the first two charges but upheld the fraud claim, rejecting Honeywell's argument that Selden's expertise in computers made it impossible for him to claim he was defrauded.

A bank can be held liable for not stopping a check. When FJS Electronics of Philadelphia asked Fidelity Bank to stop payment on a check, it misstated the amount by 50 cents. The bank's computer was designed to pull a check only if every digit on the check matched the numbers on the stop payment order. The Pennsylvania court found in favor of the customer, ruling that the total reliance on the accuracy of each digit required the bank to assume the risk that its system would fail to stop a check.

Worldwide noncompetition restriction is upheld. When a programmer quit software firm Business Intelligence Service to go work for a competitor, BIS sued, charging it was a violation of the contract the programmer had signed that barred her from doing any work for a competing firm anywhere in the world for one year after leaving BIS. A federal judge in New York held that the worldwide restriction was reasonable because Business Intelligence Service had offices worldwide.

The legal community is well aware of the precedents to be set and dollars to be made. Membership in the ABA's Computer Law Division has jumped to over 500, a tenfold increase in the last four years. The independent Computer Law Association, based in Springfield, Va., boasts 900 members. Last year, the 4,500 attorneys who belong to the 88-year-old American Patent Law Association agreed to change the name of their group to the American Intellectual Property Law Association, to emphasize their interest in software. Scores of books and articles on computer law are rolling off the presses. Seminars and conferences are heavily attended and the proceedings widely circulated. There are so many publications covering the field (see Fig. 1) that one publisher is predicting a "shakeout."

A definite sign of the field's arrival is the decision by a number of major law firms to establish computer law departments. Boston's Gaston, Snow and Ely Bartlett became one of the first to do so in 1980 when it recruited Susan Nycum for its San Francisco office. An attorney whose résumé includes a stint as head of the Stamford University Computer Center, Nycum heads a department of about 25 lawyers, making hers one of the largest such departments in the country. Another Boston firm, Brown, Rudick, Freed & Gesmer, established a computer law department when it brought in Roy Freed, one of the first attorneys to write about computers and the law back in the early 1960s.

Scores of smaller "boutique" firms have also set up shop to specialize in computer law. Robert Bigelow was one of the first to do it when he started a solo practice in 1966. As high tech thrived along Route 128, so did Bigelow's practice. In 1980 he formed a partnership, Bigelow & Saltzberg, and this year announced a formal affiliation with Warner and Stackpole, a large Boston firm.

Already some firms that have started out as specialists in computers and other high-technology areas are evolving into full- service law firms. Fenwick, Stone, Davis & West of Palo Alto, which helped Apple Computer Corp. get off the ground, now has 60 lawyers in three offices around the country. Another Palo Alto firm, Ware, Fletcher & Friedenrich, started out as a two-man partnership in 1969 and now has over 60 lawyers.

Some attorneys and their firms have become specifically identified as being either vendor- or user-oriented firms. Tom Christo of North Hampton, N.H., handles users exclusively, as does Richard Perez of Orinda, Calif., the attorney who represented Beaver Insurance in the Burroughs case. On the other side, Jack Brown of Phoenix's Brown & Bain, considered a leading authority in the intellectual property area, primarily represents vendors, including Apple (in its Franklin suit) and IBM. New York's Reavis & McGrath has specialized in defending computer vendors, including Data General and Burroughs, since 1978. Perhaps the firm best known for representing vendors is Cravath, Swaine & Moore, which represents IBM.

THE FIRST COMPUTER CASE

Although computer law has burgeoned only recently, legal questions were raised almost from the moment computers appeared on the scene. According to the *Computer Law Service Reporter,* a newsletter Robert Bigelow edited from 1974 until its demise in 1981, the first computer case involved the admissibility of computer-generated traffic statistics at a 1951 hearing before the Interstate Commerce Commission. Other cases around that time dealt with the impact of computers on employee rights, such as whether keypunch operators should qualify as a separate bargaining unit and how dismissals and transfers resulting from the introduction of computers should be handled.

The first lawsuits by unhappy users of computers appeared in the late 1950s, according to the *Computer Law Service Reporter.* The Industrial Supply Corp. of Florida sued Sperry Rand to recover $75,000 it had paid for a Univac 60. Earlier, the Federal Reserve Board took action against a company called the Wegematic Corp. over a $230,000 system. In both instances the users emerged victorious.

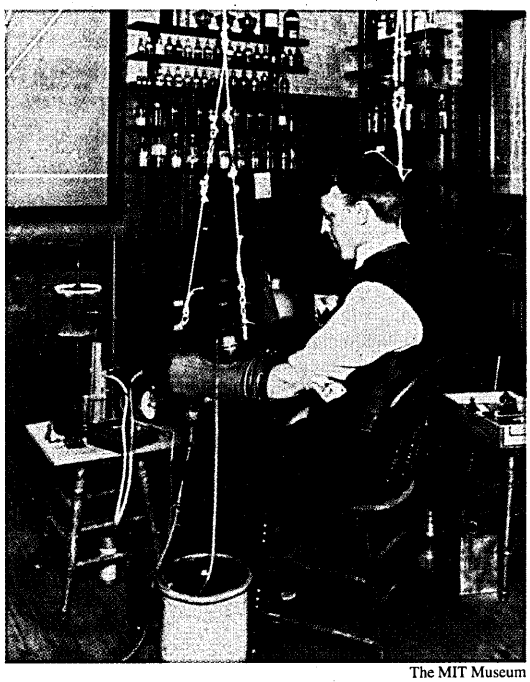
The first reported case of computer crime occurred in 1966 in Texas, when a programmer for Texas Instruments tried to sell some programs to Texaco. In a landmark ruling, a Texas judge held that a software program, though invisible and intangible, should be considered "property" under the definition of the state's larceny statute.

As the industry picked up steam in the late 1960s and early '70s, there was an increase in the number of cases involving dp employees jumping ship to join competing firms or start their own. In 1970 virtually the entire Connecticut office of the Republic Systems and Programming Inc. resigned to set up their own company nearby, and immediately began soliciting their former employer's customers. Because they had signed no employment contracts and Republic had made no effort to protect its customer list as a trade secret, a Connecticut court found no violation of the law.

Privacy issues also came to the fore around this time. The 1965 attempt to establish a federal Data Center was dropped after extensive criticism. Courts, however, upheld the use of computers to cross-check the earnings of recipients of government benefits, a tactic that the Reagan administration has lately reinvoked.

Software protection, the most

Oddly enough, most offices are better equipped for the future than the people who will create it.



The MIT Museum

According to recent reports, this last year, businesses spent over $10.5 billion automating America's offices.

Meanwhile, many of the scientists and engineers responsible for designing and developing America's new products are still using hand calculators.

Which is just preposterous.

Especially now that there's computer-aided analysis software that does what all technical professionals spend most of their time doing: analyzing data.

It's called RS/1™. And it's from BBN Software Products Corporation.

RS/1 is fully capable of making technical professionals 4-5 times more productive. Which in turn, will allow them to create considerably better, considerably more reliable new products. In a fraction of the time it now takes. In fact, a single copy of RS/1 running on a single computer has already saved one company over $7 million. In one plant. In one year.

Many leaders in American industry are already using RS/1 to get their new products out into the marketplace faster.

Don't expect them to tell you about it, though. They'd just as soon you continue spending your money only on getting your letters out faster.

For information call 1-800-251-1717, in MA 617-491-8488.

This one's for the VAX and PDP-11.

This one's for the PRO 350/380.

NOW ON THE IBM PC XT AND AT.

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CIRCLE 52 ON READER CARD

How we improved Structured Query Language.

Actually, we didn't change a thing.

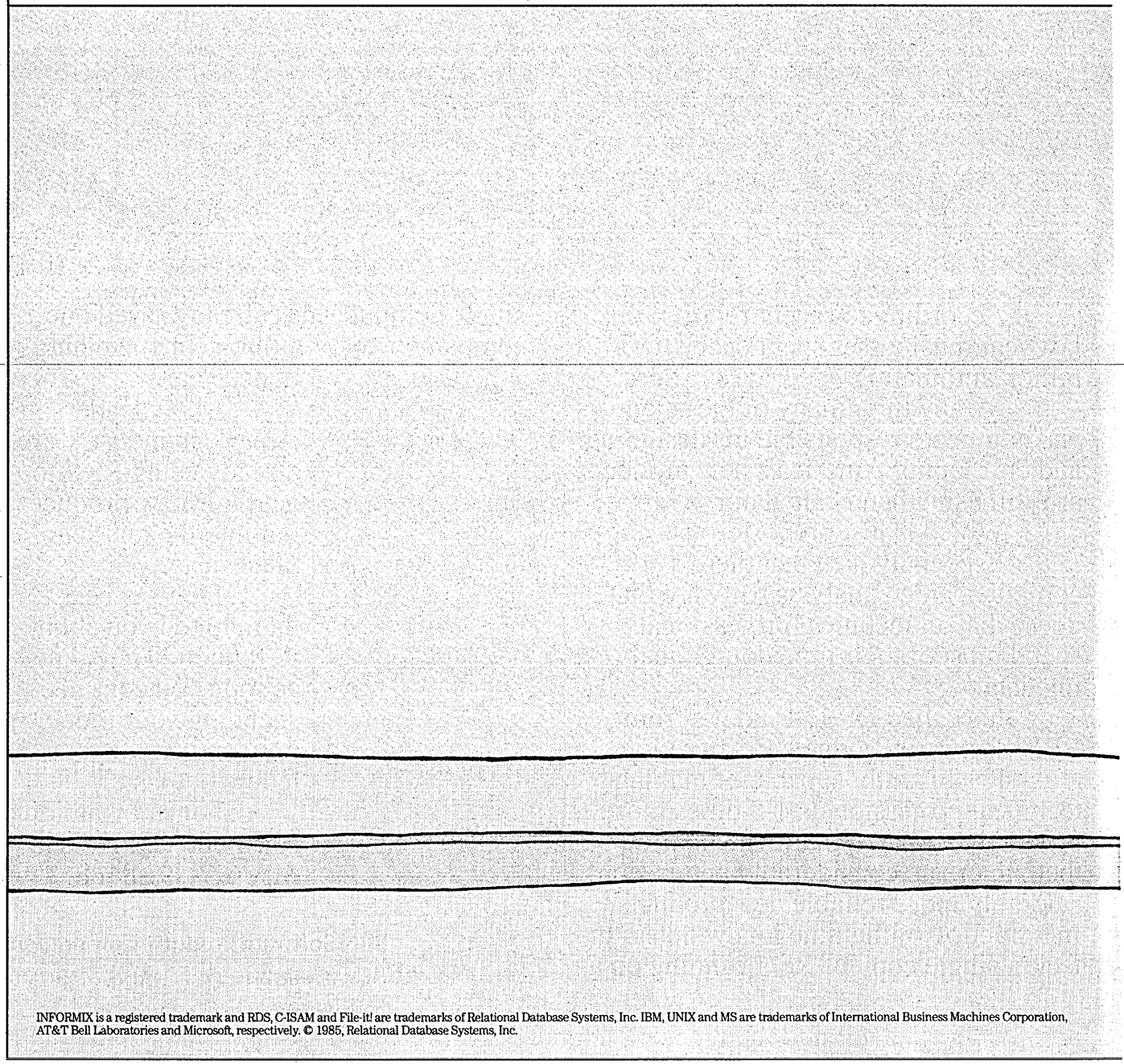
We just combined it with the best relational database management system.

Introducing INFORMIX®-SQL.

It runs on either UNIX™ or MS™-DOS operating systems. And now with IBM's SQL as part of the program, you can ask more of your database. Using the emerging industry-standard query language.

To make your job easier, INFORMIX-SQL comes with the most complete set of application building tools. Including a full report writer and screen generator. Plus a family of companion products that all work together.

Like our embedded SQLs for C and COBOL. So you can easily link your programs with ours. File-it!™, our easy-to-use



file manager. And C-ISAM,™ the de facto standard ISAM for UNIX. It's built into all our products, but you can buy it separately.

And when you choose RDS, you'll be in the company of some other good companies. Computer manufacturers including AT&T, Northern Telecom, Altos and over 60 others. And major corporations like Anheuser Busch, First National Bank of Chicago and Pacific Bell.

Which makes sense. After all, only RDS offers a family of products that work so well together. As well as with so many industry standards.

So call us for a demo, a manual and a copy of our Independent Software Vendor Catalog. Software vendors be sure to ask about our new "Hooks" software integration program. Our number: 415/424-1300.

Or write RDS, 2471 East Bayshore Road, Palo Alto, CA 94303.

And we'll show you how we took a good idea and made it better.

RDS™

RELATIONAL DATABASE SYSTEMS, INC.

CIRCLE 53 ON READER CARD

Legal questions were raised almost from the moment computers appeared on the scene.

talked about topic in computer law today, has been slowly gathering momentum as an issue. The Copyright Office agreed to accept programs for registration in 1964, but it was not until two years ago with the *Apple* vs. *Franklin* decision that a court specifically extended copyright protections to software. Attempts to obtain patents on computer software met with mixed success until the Supreme Court upheld software patentability in its 1981 *Diamond* vs. *Diehr* decision.

A large body of cases interpreting these rulings will have to develop before their exact meaning becomes clear and lawyers can translate them into practical advice for their clients. "It's hard to advise clients when you don't have the cases," observes Michael Scott, an attorney and publisher of the *Scott Report.* "People right now are kind of shooting from the hip."

MANY QUESTIONS UNASKED

The computer industry has grown fast, leaving many questions undecided or even unasked. Still, the body of cases is growing, slowly but surely. One lawyer contributing to the process is Thomas Christo, who nine years ago left his $11,500 a year job as an assistant district attorney in Boston to represent the Catamore Co. of Providence, R.I., which was suing IBM. Catamore, a small jewelry manufacturer and distributor, claimed that its IBM 360/20 was causing it to lose millions of dollars.

Specifically, Catamore's president said the applications software was failing to match incoming orders with inventory records, and IBM had reneged on an oral agreement to take care of the problem. IBM argued that software wasn't mentioned in the written contract it had with Catamore and therefore it wasn't responsible.

The trial lasted 58 days, a record for a jury trial in Rhode Island. Christo, then 26, facing a phalanx of IBM defense lawyers, carefully provided the judge and jury with an education in the basic concepts of data processing. Having worked as a computer consultant during his law school days, Christo was perhaps a bit stronger in computers than he was in the law. Catamore was his first civil case, and when he had trouble framing the questions, the judge sometimes helped out.

In any event he proved a persuasive advocate. After deliberating 11 days the jury awarded Catamore $11.4 million in damages—an amount some 25 times greater than what had been awarded in any previous computer dispute. An appeals court later ordered a new trial and Catamore, anxious to get the matter over with, settled for an undisclosed amount.

"People laughed at me back then," recalls Christo. "They didn't like my consumer-oriented approach." In the years since the Catamore case, Christo has compiled a remarkable track record, winning a string of million-dollar-plus lawsuits against vendors and settling, by his own count, 200 others on favorable terms without ever going to trial. During the past two years Christo successfully represented Computer Systems Engineering of Boston and Datapro of Detroit, two distributors of a defective computer program developed by Mohawk Data Sciences Qantel. Christo successfully showed in court that the program, Solutions, was capable of dividing five by two and getting two as an answer. He won $17.3 million for Boston-based CSE (later reduced on appeal to $5 million) and $12.8 million for Datapro of Detroit (later reduced and settled privately).

It was not until this year that Christo suffered his first significant defeat. An arbitrator recently ruled in favor of NCR and against Christo's client, Underground Camera, a 16-store retail chain that sued NCR for $5.6 million, claiming that the 8200 system it acquired in 1979 never worked as promised.

Predictably, the new legal climate is changing the way dp people do business. Many users are no longer waiting until they go to court to hire a lawyer. They are bringing their attorneys along to the negotiating table when they first buy their systems. "Five years ago, people never even thought about the contracts they signed," said William Doyle, an attorney for the Colonial Penn Group, an insurance holding company. "They signed the standard boilerplate agreements that the vendors offered. Now users are not as overwhelmed by the technology. They are starting to look at other issues and ask, 'How can I protect myself?' "

Doyle, who handles all computer acquisitions for the Philadelphia-based Colonial Penn Group, said he frequently negotiates for a more favorable warranty as well as changes in the clause that limits the vendor's liability for damages in case the system fails. "We never sign a boilerplate agreement on anything over $100,000," Doyle says.

LAWYERS DEFINE STANDARDS

Lawyers can also play a key role in the contracting process by defining specific performance standards that the vendor's system must live up to. "If the performance standards aren't spelled out, it's that much more difficult to convince a judge that you are not getting what you said you paid for," according to Esther Schachter, a New York attorney who writes the *Computer Law & Tax Report* newsletter.

A big challenge is developing specific performance standards for custom software projects. An example of this is the current legal battle that has pitted the candy division of the M&M/Mars Co. against the Milford, Conn.-based Creative Output Inc., the U.S. marketing arm of the Israeli software firm, Creative Output Ltd.

On one side is Mars, which is known for being publicity shy but has gone out of its way to attract attention to this suit, going so far as to hire a public relations firm. Its adversary is the very publicity conscious Moshe Eliyshu Goldratt, the 37-year-old Israeli physicist who founded Creative Output and whose software and ideas on manufacturing have been the subject of major stories in *Fortune* and *Business Week.*

Mars became involved with Creative Output four years ago when it licensed the off-the-shelf manufacturing simulation program developed by Goldratt and known as Optimised Production Technology (OPT).

OPT allows managers to simulate their plants' manufacturing processes on a computer, identifying potential bottlenecks. Based on what they learn, managers can better control the flow of materials in those bottlenecks, scheduling man- and machine-hours accordingly. The results can seem unorthodox. OPT may advise that some workers be idled or that a part of the plant (a kiln, say) not run at full capacity. The goal is to keep inventory and production costs to a minimum.

Once OPT was up and running, the candymaker entered into a second agreement with Creative Output to develop a piece of custom software, a Planned Order System (POS), to enable Mars to better anticipate customer demand. A letter, signed in May 1982, called for Creative Output to produce a working version of the program by the end of July while Mars paid a fee of $115,000 a month. When the allotted time was up, both parties agreed a working program was not available. In August, an anxious Mars offered another $75,000 to get the program finished as soon as possible.

By the following spring, both sides were in court. Creative Output filed a $17 million suit charging Mars with breaking a verbal agreement calling for POS to be a joint development project lasting two years. Mars does not deny that a two-year time frame was discussed. According to Lanny Davis, the Washington attorney representing Mars, papers were drawn, but never

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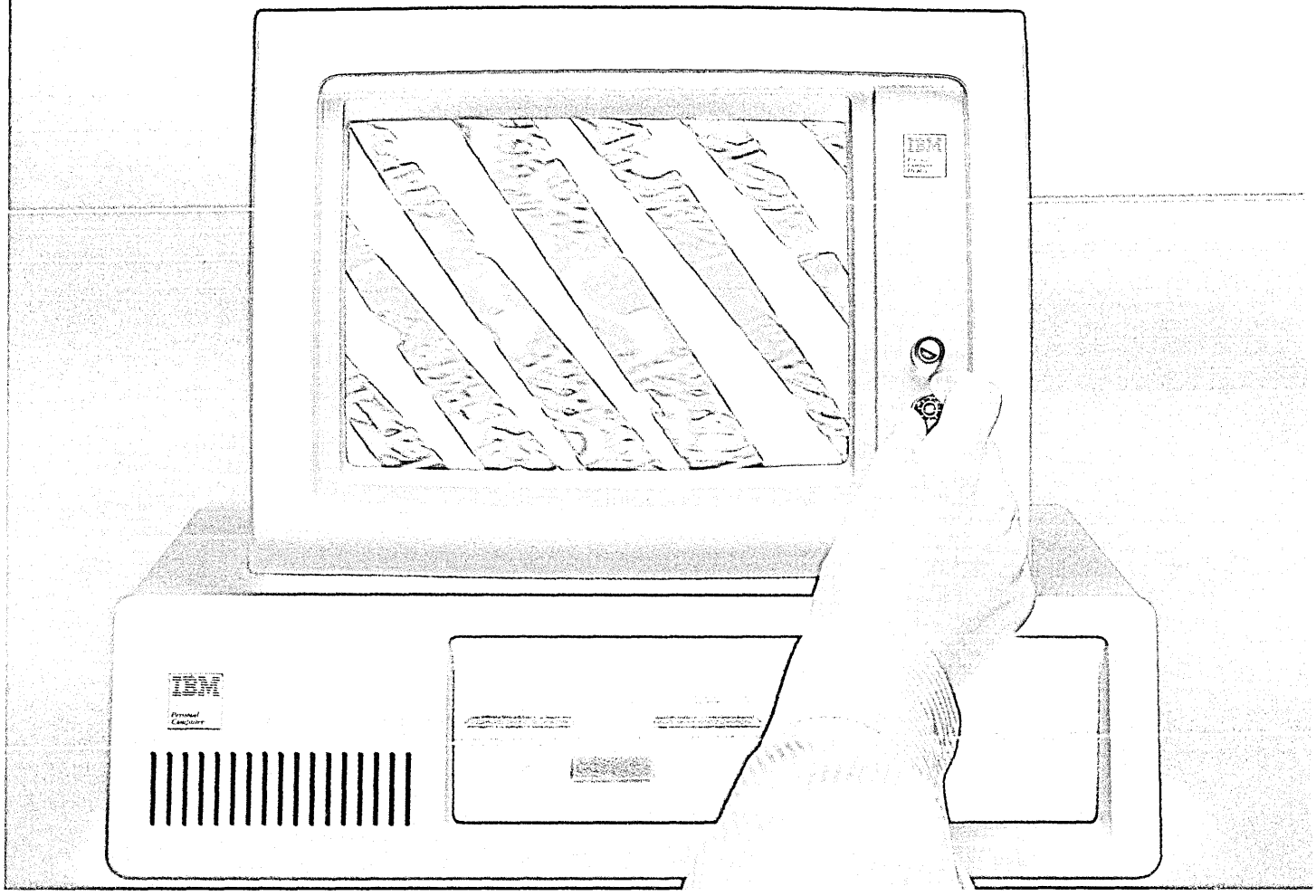

In a relatively short time, the local area network (LAN) market has attracted a host of suppliers. Each has a LAN system to sell. And each is fighting for a proverbial piece of the LAN pie.

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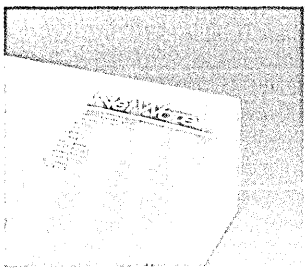

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*LAN Benchmark Report, May, 1985, Novell, Inc. and "Software, Not Hardware Key to LAN Performance," *PC Week* 1/15/85.

NOVELL

CIRCLE 54 ON READER CARD

signed, to formalize the verbal agreement. But Mars maintains in a suit filed in federal court in New Haven that Creative Output breached the contract contained in the May 1982 letter requiring a workable program to be developed in three months. (Last June, a federal judge issued a prejudgment ruling in favor of Mars.)

Also in 1982, Mars became disenchanted with OPT. Specifically, the company claimed that OPT was designed to simulate "job shop" productions where distinct, discrete steps are involved. Mars now says it used OPT this way to plan the production of the sugary outer shells of its various candies. The firm maintains, however, that OPT was unsuccessful at simulating the process required to produce the chewy nougat interior of the candies. "Producing the nougat involves a 'continuous flow' production process," according to Davis. "It's not like an automobile assembly plant; it's like a lady in the kitchen throwing in a lot of ingredients."

Mars has sued to recover the $300,000 it paid under the OPT license, while Creative Output has counterclaimed for $1.5 million, the benefit it claims Mars received from using OPT to produce the candy shells.

At the heart of the dispute is the question of what was contracted for by Mars and what was promised by Creative Output. Would Mars be in a better position today if it had spelled out more clearly what it was seeking to gain from Creative Output? Davis, the coauthor of a book on computer contracts, says no. "As a matter of good contract policy you have to be as specific as possible," says Davis. "But when you are on the cutting edge of technology, you are literally at the mercy of the expert. When you are buying a car you can go out and road test. He [Goldratt] is selling a black box."

Robert Morris of Bridgeport, Conn., an attorney for Creative Output, doesn't completely disagree. "When you are at the cutting edge of technology you have to be willing to devote a certain amount of money to research." But Morris maintains Mars got what it asked for. "In the OPT case for M&M we think they had a workable program." As for POS, Morris claims that, in addition to reneging on the two-year agreement, Mars kept changing the specifications.

SETTING A NEW PRECEDENT

If nothing else, the Mars-Creative Output imbroglio has set a new precedent in computer law. Last year, a federal judge in New Haven ordered Creative Output to turn over the OPT source code to Mars.

A Mars attorney explains that by examining the source code they hope to establish that the algorithms used in the OPT program are incapable of simulating a production process that involves continuous mixing. "Once you look inside, you can see if there is a square peg that won't fit into a round hole," the attorney says.

Typically a software developer's most zealously guarded possession, source code has been ordered revealed in some trade secrets cases. This was the first instance in which a user alleging nonperformance has been allowed to examine it.

Unlike Mars, the majority of companies are still unwilling to go to court on computer cases. The threat of a long-drawn-out, costly legal suit against a powerful vendor in an area where they lack expertise is enough to keep most users from seeking legal redress. "Most users don't feel real comfortable attacking a vendor on his hallowed ground," observes Norman Cohen, a former NCR marketing manager whose firm, Interactive Systems Corp. of Atlanta, provides expert witnesses and consulting services to firms suing NCR.

To attract clients, Cohen placed an advertisement in the *Wall Street Journal* earlier this year urging unhappy NCR customers, particularly those who have used NCR's 8200 or 9000 computers, to get in touch. When Quality Books Co. of Northbrook, Ill., which had experienced serious problems with a Burroughs B800 minicomputer, placed a similar ad in the *Journal* in July 1980, it received 400 telephone calls. Several hundred suits were eventually filed, according to Chicago attorney Marvin Benn, who handled 65 of them. James W. Olson, associate general counsel for Burroughs, says most of the cases were settled out of court and that his company "now

REQUIRED READING

Growing interest in computer law has created a market for newsletters aimed at users, vendors, and their lawyers.

COMPUTER LAW AND TAX REPORT
Warren, Gorham & Lamont Inc.
210 South St.
Boston, MA 02111
$78
Monthly. Primarily for users. Covers new laws and offers general advice. Written by New York attorney Esther Roditti Schachter.

COMPUTER LAW MONITOR
Research Publications Inc.
P.O. Box 9267
Asheville, NC 28815
$49.50
Quarterly. For users and vendors. Summarizes and comments on court cases. Edited by Buffalo attorney Patricia A. Hollander.

COMPUTER LAW NEWSLETTER
Bigelow & Saltzberg
100 Tower Office Park
Woburn, MA 01801
$300
Bimonthly. Focuses on developments in Massachusetts and the Northeast.

COMPUTER LAW REPORTER
Computer Law Reporter Inc.
1519 Connecticut Ave. NW
Washington, DC 20036
$550
Bimonthly. Reprints recent decisions and carries articles discussing legal issues and laws. Primarily for lawyers. Edited by Gary J. Rinkerman.

COMPUTER LAW STRATEGIST
111 Eighth Ave., Suite 900
New York, NY 10011
$165
Monthly. For lawyers, users, and vendors. Explores issues and offers practical advice. Edited by Julian S. Millstein of Brown, Raysman & Millstein, New York.

COMPUTER LAWYER
Law & Business Inc.
855 Valley Rd.
Clifton, NJ 07013
$175
Monthly. In-depth articles, primarily for lawyers. Edited by Miles Gilburne of Blanc, Gilburne, Williams and Johnston.

COMPUTER NEGOTIATIONS REPORT
Sunscape International Inc.
1513 E. Livingston St.
Orlando, FL 32803
$265
Monthly. User-oriented advice on contracting and acquisitions. Edited by Charles E. Harris of Arky, Freed, Stearns, Watson, Greer, Weaver & Harris of Orlando, Fla.

COMPUTER USERS LEGAL REPORTER
Computer Law Group Inc.
Attn: Subscription Dept.
191 Post Rd. West
Westport, CT 06880
$89
Monthly. Broad coverage of issues plus advice. Edited by Charles Pritzker Lickson.

THE SCOTT REPORT
Law & Technology Press
P.O. Box 3280
Manhattan Beach, CA 90266
$167
Monthly. In-depth analysis of legal developments. Edited by Michael Scott.

SOFTWARE PROTECTION
Law & Technology Press
P.O. Box 3280
Manhattan Beach, CA 90266
$72
Monthly. Focuses exclusively on legal, technical, and practical aspects of protecting software. Edited by Michael Scott.

The new legal climate is changing the way dp people do business.

has only a fraction of the litigation we had then." The recent Beaver Insurance case involving the Burroughs B800 was a holdover from the earlier wave of litigation, says Olson.

Most users are also put on the defensive by the vendor-supplied agreements they sign when they acquire their systems. Most vendor contracts limit liability to the amount of the contract. Other provisions may severely restrict the vendor's exposure to consequential damages such as lost profits or the time the business spends trying to correct the problem.

"The agreements they sign at the time of purchase are so loaded in favor of the vendor that most users think they have no rights at all," according to Richard Perez, an attorney in Orinda, Calif.

To get around the limitations imposed by the sales contract, many attorneys have successfully sued for fraud (which entails showing that the vendor willfully misled the customer). "If you establish fraud, you can get around all of the contract limitations," Perez explains. In 1982 Perez represented an Oakland dry cleaning firm and won a $2.3 million judgment against NCR. Most of the award represented punitive damages resulting from the fraud claim. It is one of the largest rulings on behalf of a user to hold up all the way through the appeals process.

LIABILITY A FUTURE HOT TOPIC

Damage awards for disgruntled computer users . . . wrangling over software protection . . . . privacy . . . antitrust . . . trade secrets . . . . computer crime. These are the hot topics in computer law today. But they may be only a prelude to the major issue that many attorneys see looming on the horizon—liability. Consider these cases:

A computer-controlled hospital life support system suddenly goes haywire. The system used by an architecture firm incorrectly calculates the stress requirements of a new, large public building. The computer-controlled fuel measuring system on an aircraft fails and the plane runs out of fuel in midflight. A software package to help dieters lose weight contains advice that proves harmful to some users.

"The growing array of liability-laden situations is so unbelievable," says Daniel Brooks, an attorney in the Washington, D.C., office of Cadwalader Wickersham & Taft, "that those who discuss them openly risk sounding like Chicken Little constantly screaming that the sky is falling."

In a 1982 liability case, the computer division of Litton Industries was held liable to the family of a Ford Motor Co. employee who was killed by an automated parts retrieval robot that continued working while the employee tried to fix a malfunction.

John Lautsch, of the ABA's Computer Law Division, speculates on how the law will deal with a computer programmer who writes a program that injures someone. "The author of a cookbook is not responsible for a recipe that proves poisonous," he says. "If I were representing a software company, I would argue that writing a program is just like writing a book."

If computers lead to a rethinking of liability laws, it won't be an event without precedent. Lawrence M. Friedman explains in his *History of American Law* that it was the industrial revolution, particularly the railroad, that dramatically changed American law in this area. "From about 1840 on, one specific machine, the railroad locomotive, generated on its own steam (so to speak) more tort law than any other in the 19th century. The railroad engine swept like a roaring bull through the countryside, carrying out an economic and social revolution; but it exacted a toll of thousands, injured and dead."

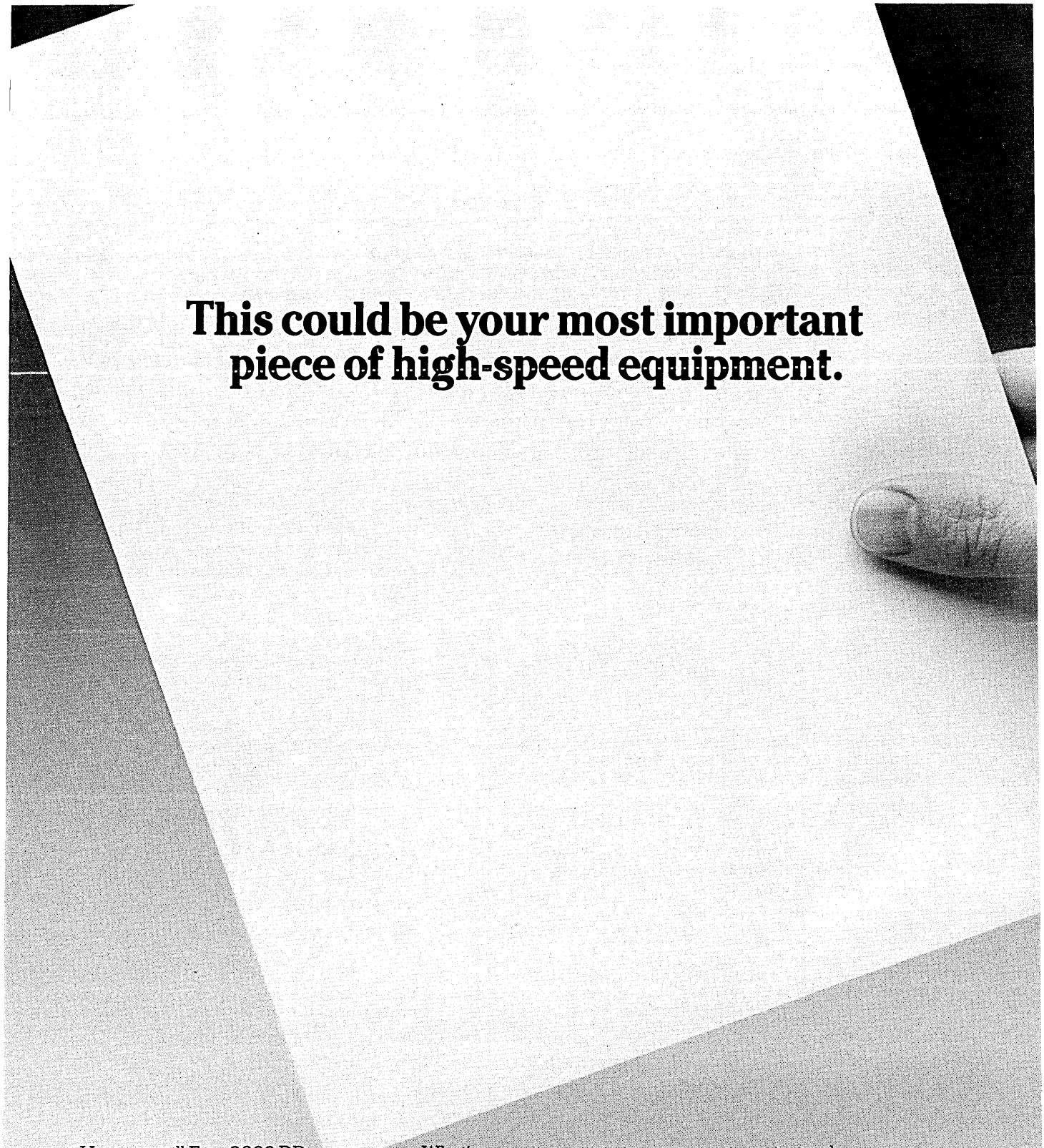
So far, computers haven't been accused of mayhem on this scale. As the ABA's John Lautsch puts it, "Computers are really pretty reliable. Their main use is in areas that don't cause severe harm to people. They don't blow up in your face. They've just been used to manipulate information."

In the long run, though, that makes them, for good or ill, the most powerful machines of all. ◉

CARTOON BY SIDNEY HARRIS

Joseph Kelly is a free-lance writer based in New York City.

This could be your most important piece of high-speed equipment.



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CIRCLE 56 ON READER CARD

IBM ON TELECOMMUNICATIONS

Q. IF A MODEM IS A MODEM IS A MODEM, DOES IT REALLY MAKE A DIFFERENCE WHICH ONE I BUY?

A. The fact is, all modems are not created equal. For example, some modems are better signal processors than others. And these superior modems can make an important difference in your total network performance. A difference that can lead to important savings in telecommunications costs.

Q. How can a modem make a difference in my telecommunications costs?

A. The primary purpose of a network is to move information to and from end users and thereby improve their productivity. And a superior modem can improve the performance of your network in at least four areas: It can make your network more reliable. Give your end users faster response times. Minimize the time you and your people spend on network management. And a superior modem can also save you money in line charges.

Q. What makes a superior modem?

A. As you know, a modem converts a data stream into a signal that can be sent (usually over a phone line) from Point A to Point B.

Now that may sound simple enough, but there are a number of variables in that seemingly simple scenario. Such as, what's the distance between Points A and B? What's the line between the points? What's the condition and stability of the line? And many, many more. The point is, each variable carries technical implications that affect the design of the modem. And simply stated, a superior modem enjoys a superior design.

Q. Be specific. How can a superior modem save my company money?

A. Let's face it, modems are not the most expensive part of your telecommunications network. Chances are, line charges are. If you design a modem that can send data more reliably, then that modem can begin to affect your line charges. Every time a modem has a "hit," or an unsuccessful transmission of data, the data must be retransmitted, slowing down response time. The net effect is a reduction in the amount of information carried by the network.

If you use superior modems that give fewer hits, you'll have lower line costs per data unit transmitted and better throughput. Better throughput translates into time and cost savings.

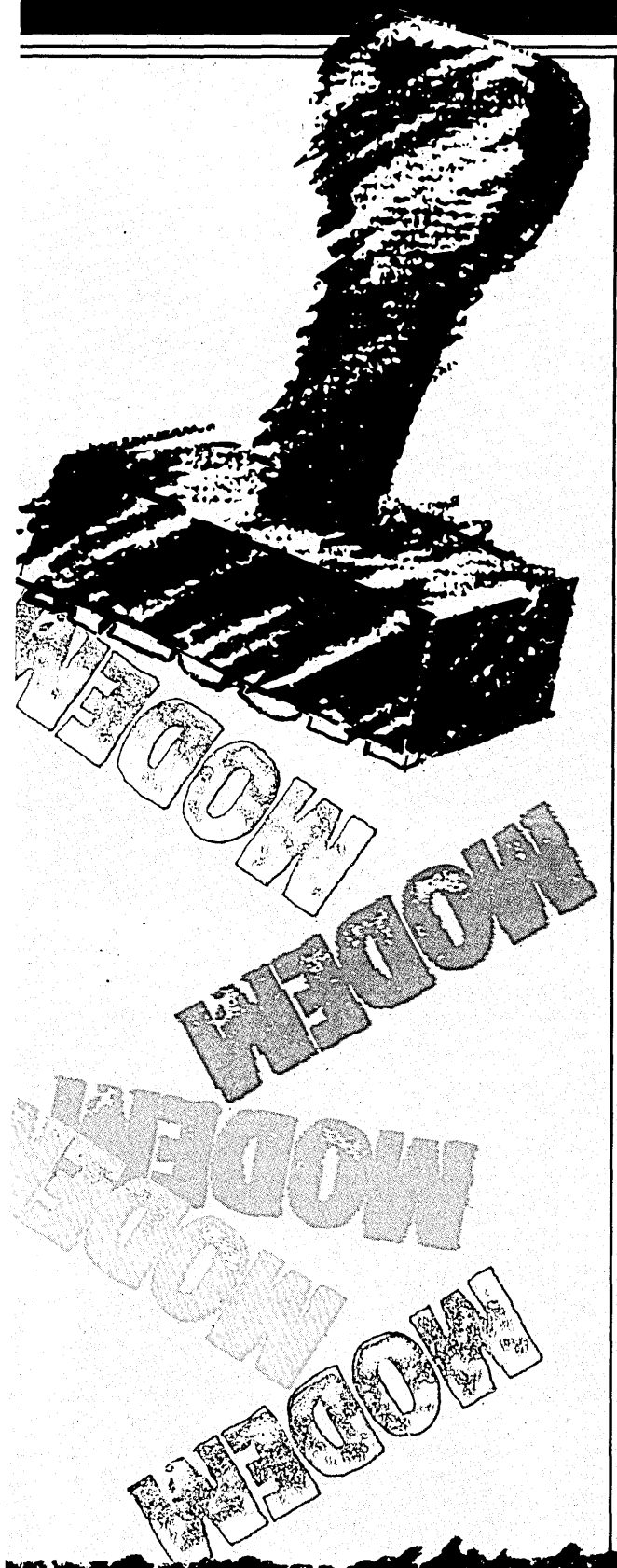
Q. Can a superior modem correct the problem of faulty lines?

A. A superior modem can go a long way toward compensating for poor line conditions—and thus make marked improvements in the hit rate.

Take the IBM 3865 Modem, for example. It contains a custom microprocessor with an advanced algorithm that in effect enlarges the target area of acceptable transmissions. The result is that this reliable 9,600 bps modem can operate very effectively over unconditioned lines. Now imagine all the line conditioning charges you won't have to pay your common carrier.

Q. How can I go about proving the superiority of IBM modems?

A. Take your most troublesome line and put IBM modems on it. We believe you'll see an



impressive improvement. Which leads us to another benefit of superior modems—you'll spend less time troubleshooting your network simply because line conditions that once were considered problems aren't really problems any more.

There are a number of other good reasons why you should consider IBM's line of 2,400, 4,800 and 9,600 bps stand-alone and rack-mounted modems. Not the least of which is that we've recently announced two new modems—the IBM 3833 and 3834—which feature lower prices, smaller packaging and improved serviceability. And like all IBM modems, they can fully utilize IBM's Communication Network Management capability.

The New IBM Modems

	IBM 3833	IBM 3834
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Compatibility	3833, 3863-1,* 3868-1	3834, 3864-1,* 3868-2
LED Diagnostic Indicators	standard	standard
Communication Facilities	4-wire, point-to-point or multipoint	

Both modems operate over nonswitched telephone lines that can be leased (common carrier or PTT) or private.

*Must be in native mode. For full diagnostic capability, must be equipped with the Extended Diagnostic feature.

What's more, we've also recently lowered the prices of the IBM 3863, 3864, 3865 and 3868 Modems by as much as 29 percent. And there are also volume discounts available. If you're looking for modems that offer reliability, can improve end user productivity and are competitively priced, talk to your IBM marketing representative.

If you would like to receive a free brochure on IBM modems, call 1 800 IBM-2468, Ext. 82. Or use the coupon below. After all, it pays to be informed, because not all modems are created equal.

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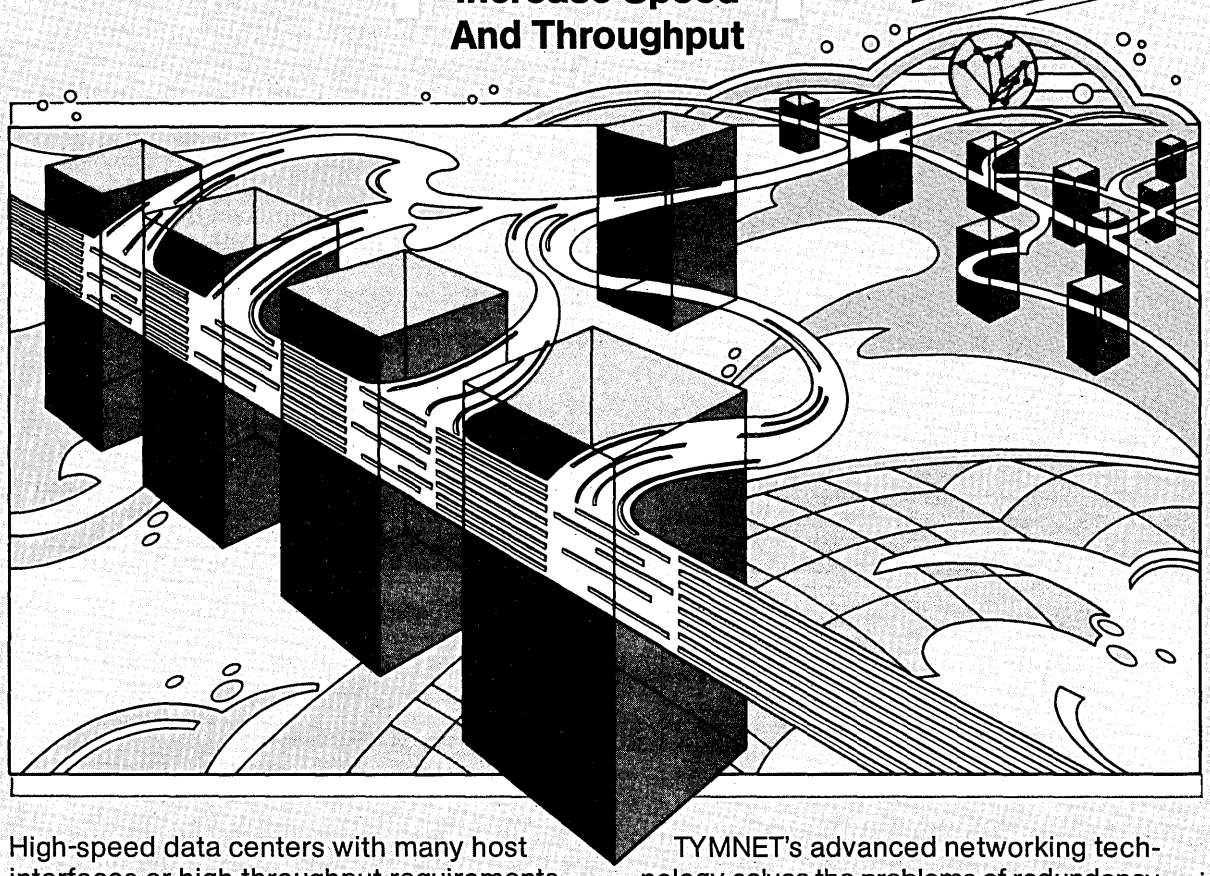

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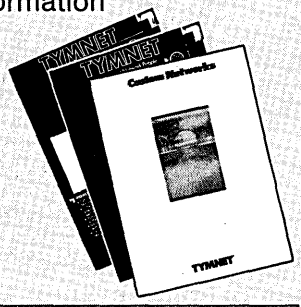

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"Do you want it right or do you want it Friday?" Today's development tools can solve this age-old dilemma.

MANAGING DATA-DRIVEN DEVELOPMENT

by Frank Sweet

In "Painting a New Picture," the May 15 story on data-driven screen design, we saw how widening computer literacy among users is helping dpers build mainframe applications from stock prototypes rather than designing each around individual tastes. In this sequel we explore the second force now transforming our industry: improved tools. Application generators let us keep doing it until we get it right, and we still come out ahead.

We've always known that humans are terrible doers but wonderful learners. Our flaw is that when we first try anything, we usually make a mess of it. Our great gift is that our performance improves with each repetition. Yet until now, languages and compilers exacted such a penalty for redesign that we had to attempt first-time perfection. We adopted development phases that assumed every project reaches a stage where users sign off and all that's left is coding.

Today's application generators carry no such price. Some developers have quintupled programming productivity, in person-days per delivered screen function, through use of modern tools. Programming cost is dropping almost to the point where we can do it, throw it away, and do it again until we get it right. Yet, paradoxically, we must become better project managers if we're to continue to get the job done. Precisely because coding shrinks to a small fraction of application development cost, other factors become more important.

In a moment, we'll examine five of these factors: feature negotiations, mainframe-to-micro downloading, and three keys to successful project management—planning, teamwork, and standards. But first, consider two assumptions underlying the discussion: knowing why we're doing it, and keeping it small.

We assume that before we set out to build an application we find out why we're doing it. There are countless horror stories of projects run amok, costing millions, lasting years, producing nothing. After such disasters, postmortems usually show that users and dpers did not share an understanding of what they were building. Not that one's outlook conflicted with the other's. Often, neither could articulate an understanding of what they were trying to accomplish. We are able to avoid some problems by writing what the system is supposed to do before we start building it. The notion is that if we write it down people will understand and remember it.

But the notion is only partly right. Project size is a more serious problem than lack of documentation. If an application is so big that nobody can grasp it, documentation doesn't help, it hinders. Attempts to document specifications for a monster project simply result in monster specs, and a three-inch pile of project documentation is worse than useless. It creates the dangerous illusion that someone knows what's going on. No project should be too big to easily be understood by everyone. There are two ways of keeping projects down to 60 person-days or less. The first is to be ruthlessly specific about what we're trying to do. A six-month project to improve management decision-making can often be redefined as a one-month project to keep track of shipments. Second, if we face a truly big job, we split it into pieces and do one at a time.

NEGOTIATE FEATURES WITH USER

The most time-consuming and challenging part of development is negotiating features with our users. At its most fundamental, our job is simply to write computer programs for a fee. Our customers are our firm's executives. Each pays, directly or indirectly, for every hour of our time. To succeed (indeed, to survive) we rely on their returning when they need new applications. This means we must keep a realistic arm's length relationship between ourselves and our customers. We must continually monitor understanding of the negotiation process. What do they think they're buying? What do we think we're selling?

User/developer negotiations cover two subjects: data and functions. They are most easily handled individually—data first.

In the case of a screen-flow diagram, data negotiations aim at defining precisely what fields appear on each screen. Since each screen's top tells about the record it details, one might think its fields would simply mirror the record's. But this assumes we already have a record layout and all we have at this stage are two diagrams: Bachman and screen flow. Record layouts emerge from data negotiations rather than the reverse. The quickest way to determine what fields should be on a screen is to prime the pump, or in other words, to make a first-draft sketch of the screen showing the fields we propose and ask the user to recommend additions or deletions.

Sketching first-draft screens is straightforward. There are only two kinds of data entities in the world: objects and events. Records that model objects are stable (often called master data) and have low volatility (few new records added each month). Examples are vendors, products, customers, employees, and departments. Object-modeling records hold elements like ID number, name or description, and location or address. Event records (sometimes called permanent work files) are volatile, have high turnover, and tell about things that happen. Deliveries, receipts, payments, orders, and jobs are examples. They carry data like date, time, and amount or quantity. So if we simply figure out whether each screen displays an object or event, put in the corresponding data items, and sprinkle in a handful of derived fields, we won't go far wrong.

Beware of pitfalls, though. When data negotiations go askew, it's usually due to one of four traps.

First, data negotiations are slow and not much fun, so we're tempted to leap in and begin coding before they're concluded.

When data negotiations go askew, it's usually due to one of four traps.

If we're fortunate enough to own an application generator that accepts new data elements with as little effort as does a piece of paper, we could get away with it. Otherwise it's best to hold off, at least until the first wave of design changes has passed.

Second, there's a tendency to get sidetracked into discussing output. Many users find it easier to tell what they want out of a system than what they must put in. If screens are perceived as output mechanisms we'll wind up overusing selection criteria and derived fields. We must remind our client that all we're dealing with at this point is updating the database, not reporting on what's in there. On-line inquiry, exception reporting, summary reporting, and the like all turn raw data into information. We'll discuss this subject in a moment, along with query languages and downloading to micros. Our best strategy, while negotiating data, is to reassure our customers that once the data are in there, we'll be able to extract information in countless meaningful ways. We need not define them now.

The third obstacle is inadequate understanding of standard data control, window control, and data validation functions. If our client has never been exposed to data-driven screens, we'll repeatedly backtrack and reexplain how they work. It's time-consuming and doesn't seem to move negotiations forward, but to press on in the face of confusion is courting disaster. At least we can console ourselves with the thought that for each user, we'll only have to do it once.

Finally, we can be trapped by overcommitment to our Bachman/screen flow. It's not unusual to find, in the midst of data negotiations, that the wretched thing just will not hang together. The Bachman was flawed and doesn't accurately model the situation. Records must be split or merged, new records or relationships are needed, and the entire screen flow is affected. Facing this, our impulse is to desperately search for a way to patch it up. Relax. All we've invested so far are two one-page diagrams and a handful of screen sketches. Throwing them out and starting over may be psychologically painful but it's far less costly than maintaining a warped system.

DISCUSS OPTIONAL FEATURES

Once a screen's data elements are nailed down, we negotiate optional features. The important thing is to make sure our users understand how much each feature will cost. Thus, they can intelligently select each option by comparing its price with what it offers. The two obstacles to our user's grasping the issue are time vs. cost, and accountability.

Even in fully charged-out development shops, some users are less concerned with how much an application will cost in dollars than in how long it will take to build. In fact, I recall many clients who were indifferent to price but for whom delivery date was critical to contract acceptance. Such customers cannot meaningfully select functions by their cost. Instead, we present how many calendar days each option would add to the system's delivery date.

The accountability problem springs from the undeserved awe in which programming is held by many high-level executives. I've seen user vice presidents, who insist on approving any purchase of more than $15, delegate application feature selection to entry-level clerks. The unhappy result can be overkill on a scale unimagined by the executive. Nevertheless, whether we're in-house developers or consultants, our professional responsibility is the same—to do the most cost-effective job we can. The solution is to list the basic system's price (or calendar days) on a development contract, followed by each optional feature selected and its price, and ask the boss to sign it. Any executive worth his salt will question the extra-cost items and we can fade into the background while specifier and authorizer hammer it out between themselves.

So far, we have focused on data collection—storing data in the mainframe database. We've ignored data extraction—pulling useful information out. We avoided discussing output during negotiations by reassuring our users that if they can put the data in, we'll be able to extract useful information in countless ways.

Now let's look at this other half of the application development business. We'll see the impact of modern tools in this area by focusing on how information gets from mainframe to user. We'll first consider the source, the mainframe database, and work our way downstream to the end result. First, recall the difference between data and information.

Raw data are what are stored in the mainframe database. They consist of hundreds of thousands of detailed facts about day-to-day business operation. They are collected from many sources, such as the screens we've described. Their storage emphasizes accuracy, security, and timeliness because all else is downstream. They are most economically handled as a centrally shared pool—a database—because redundant data imply redundant updaters and it's pointless for two people to do the same job. Their direct users are data entry clerks. They are located in the mainframe because scattered micros cannot economically compete in the widely shared bulk data arena. In their raw form, in terms of running the business, they are useless.

Information is the result of processing raw data. It is what we get when we select, tabulate, compare, and summarize large numbers of detailed facts to detect trends, identify problems, and recommend action. Information is distributed to decision-makers in whatever form is most comfortable to each. It is most economically presented at a micro or local terminal because that's the least costly way of repeatedly altering selection rules or format (report, graph, spreadsheet) and producing new output. Information depends on available detailed data as its raw material.

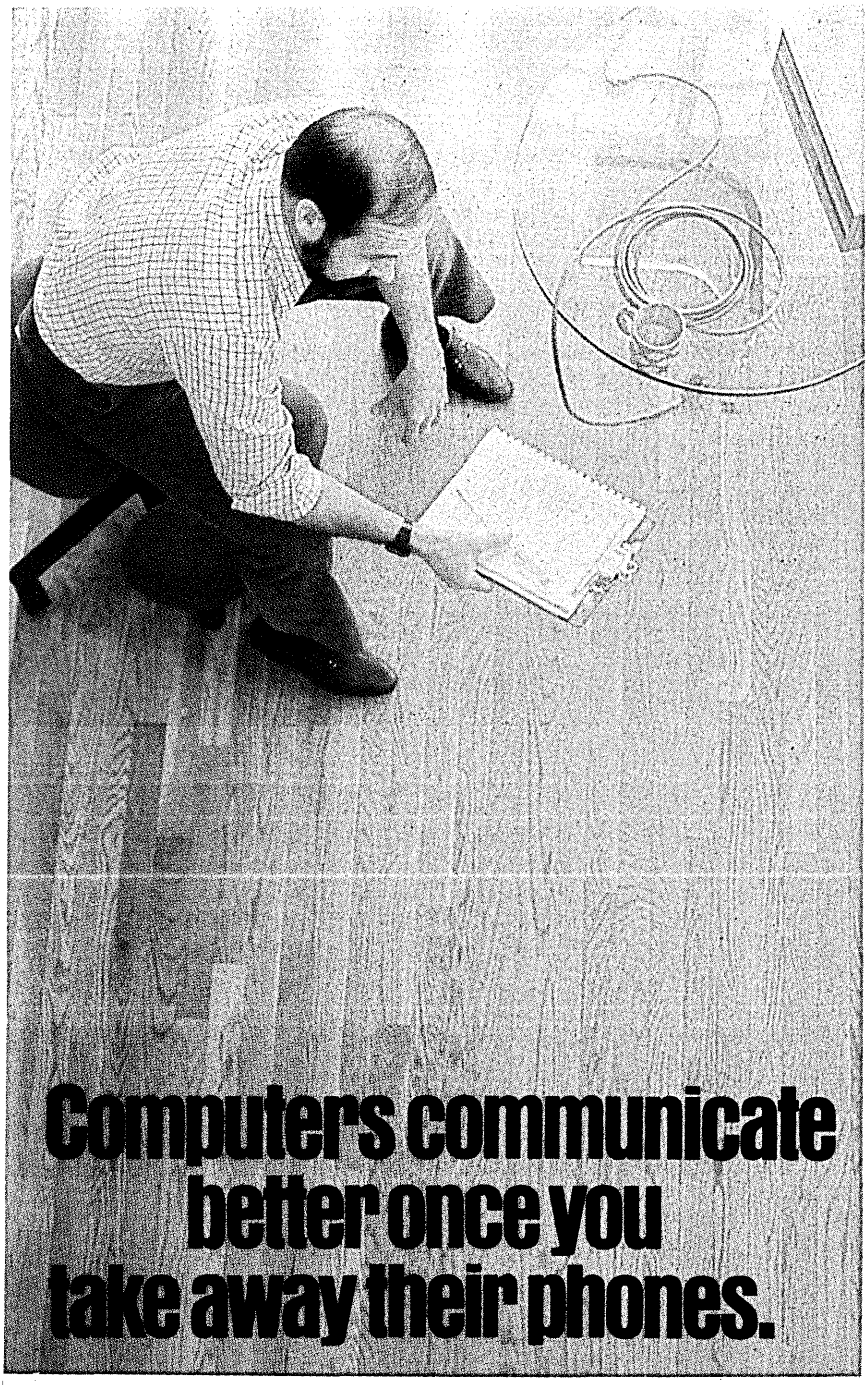
MICRO-MAINFRAME CONNECT

We've seen how application generators and data-driven design are changing the way we collect raw data. We are familiar with information-producing tools in micros. What about the in-between—the mainframe-micro connection? How do we get data from IBM's IMS into Visicorp's VisiCalc? From Cullinet's IDMS to Lotus 1-2-3? From any database to any information processor?

The in-between tools have lagged behind those at either end. The problem has been market forecasting, not hardware incompatibility—protocol converters, hard and soft, have been available for some time. We simply did not foresee the demand. Today's in-between tools situation is reminiscent of where data dictionaries were 10 years ago: the need is urgent, some in-house shops are writing their own, and software houses are working feverishly to supply the demand.

We can already see hints of what they'll look like. Cullinet's Information Database, for example, is now available. Although this in-between product only handles Cullinet software at each end (IDMS in the mainframe, Golden Gate in the micro), it has the right idea. It provides end-user micro commands that extract and download data from the mainframe database as easily as it loads a diskette. Before long, we'll see similar products that are not software-limited to a specific database management system or a specific micro package, but can link any mainframe DBMS to any micro information generator.

The in-between tools will affect our industry as profoundly as did teleprocessing monitors. Ten years ago, most dp shops had large groups of data-entry personnel. Users filled out data collection forms and sent them to dp, where they were keyed in large batches for overnight file updating.



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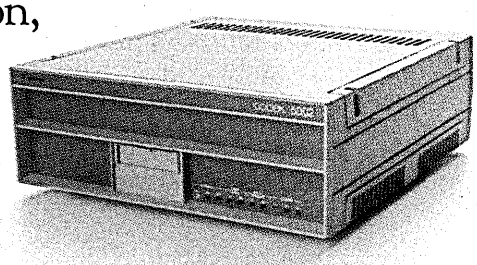

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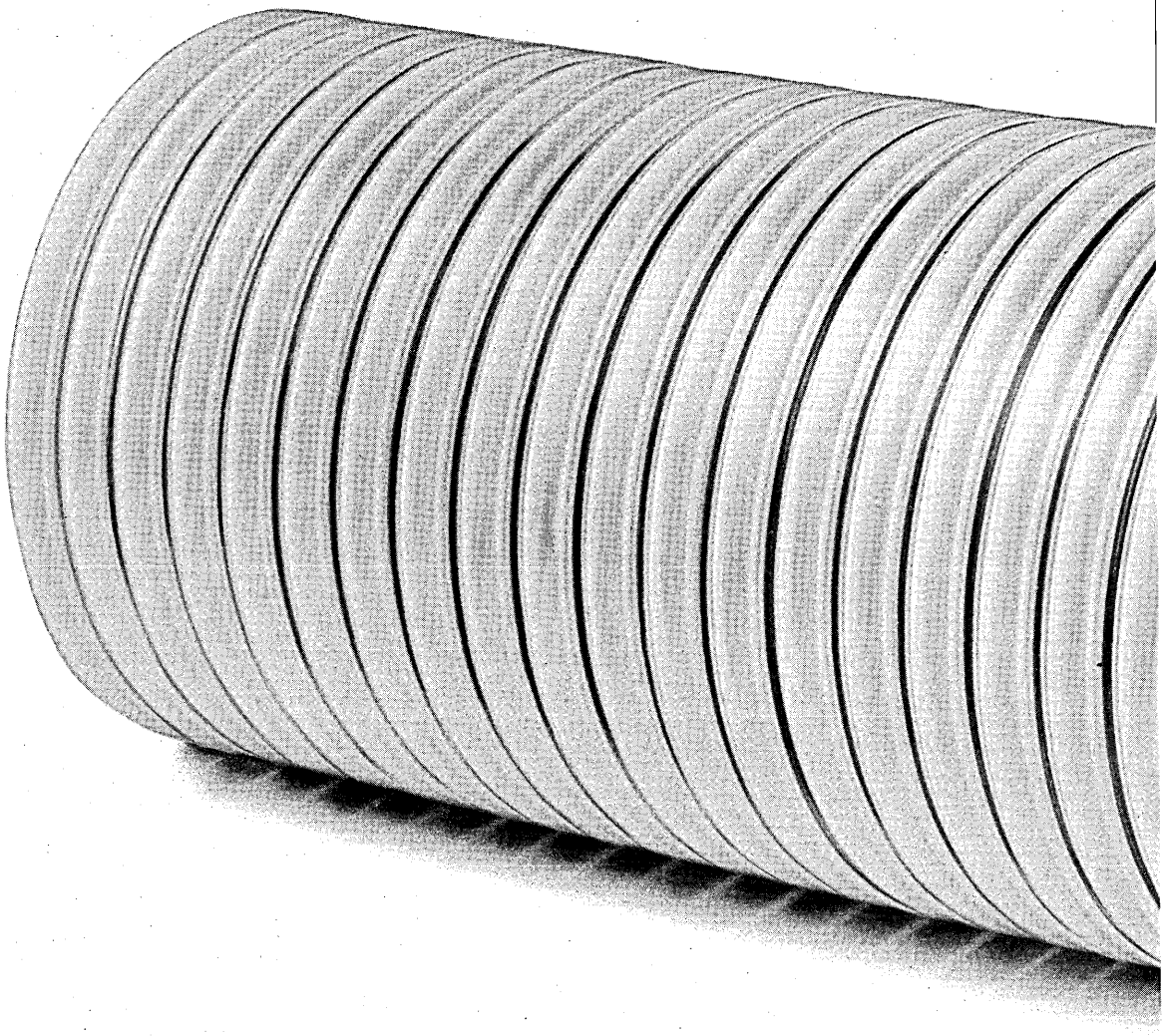

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Because they're abrasive.

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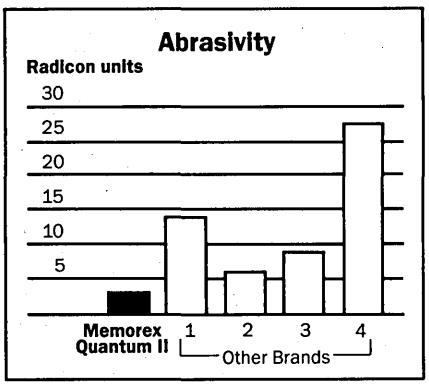

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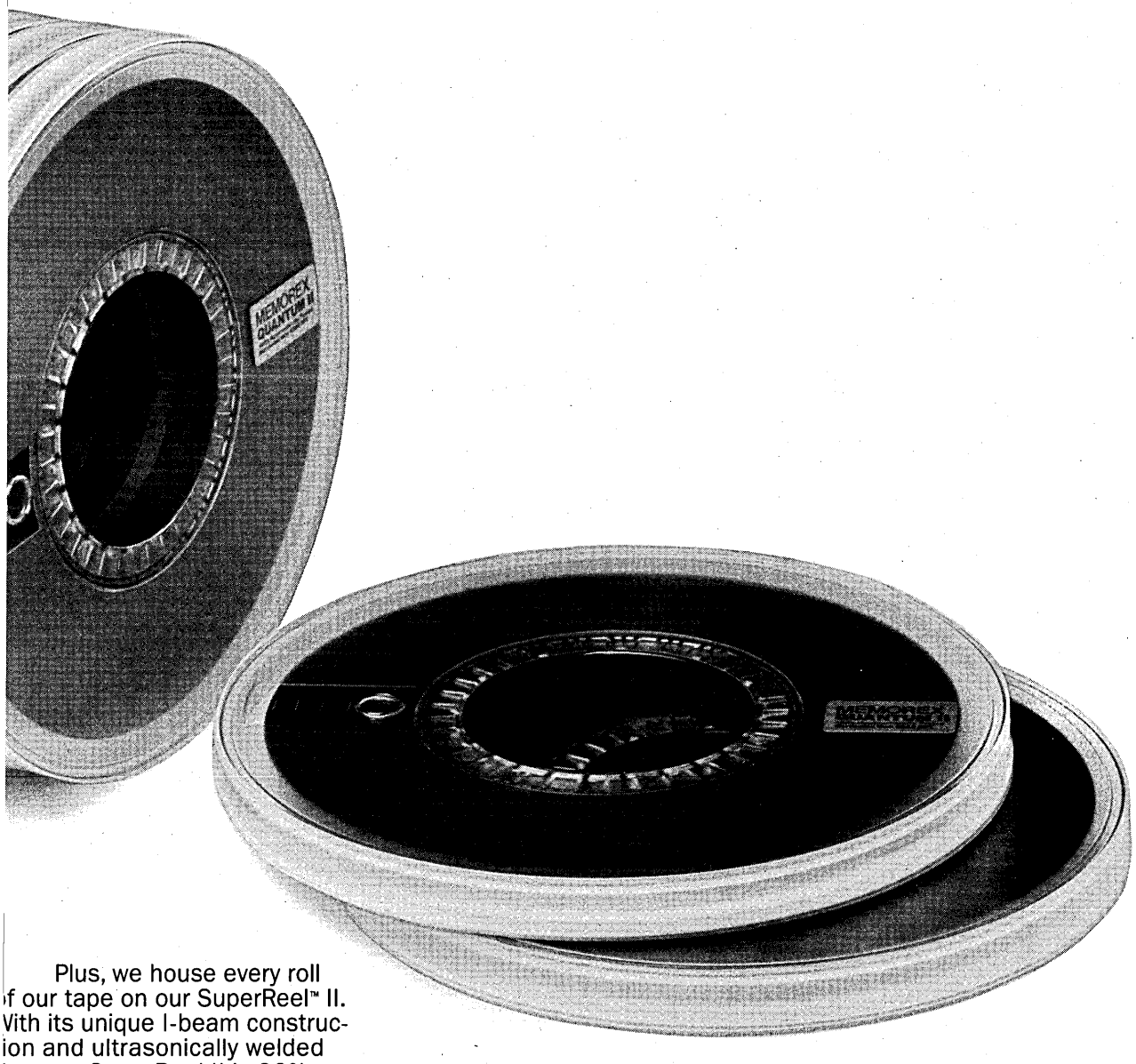

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MEMOREX

MEMOREX HAS THE EDGE

Dp people will still be doing the programming, but they'll be doing it on micros instead of mainframes.

The economy of on-line updating virtually eliminated centralized batch data entry and scattered the workload among our users. The micro-mainframe connection will have the same effect on centralized batch report scheduling. It will eliminate it, dispersing the function among micro users. Each user will extract and download data for information production whenever he or she wants.

The impact on application development is not hard to see. Mainframe report writers are becoming less useful as the micro revolution proceeds. They're being replaced by spreadsheets, graphers, and the so-called micro databases (a less confusing term would have been micro report/display generators, but that's life). Dpers will still be doing the programming, of course—designing templates, writing extract parameters, and so forth. We'll just be doing it in micros instead of mainframes. Few people have the knack for computer programming. We're all there is.

PLANNING, TEAMWORK, STANDARDS

Although we won't be replaced, our jobs are changing measurably. We have long ignored three elements of project management that are becoming vital to our success: planning (think what we're going to do before we do it), teamwork (do it as a group), and standards (improve the models, don't reinvent them for every user).

Many years ago, before switching careers to data processing, I was a project engineer designing process machinery (paraxylene dehydrators and the like). For years after becoming a dper, I was appalled at the carelessness with which some of my new colleagues approached application development. The most fundamental rules of sound design and construction were often ignored. Independent design reviews, safety factors, reusable modules, zero-defects quality control, and other rules were given no more than lip service. Errors in the design and workmanship of products delivered to customers, instead of destroying careers, were shrugged off with the euphemistic word "bugs" as though they were caused by some external agency.

Amazed and horrified, I saw developers start hammering away, building large complex units without a blueprint of what the thing was supposed to look like. In some cases, they didn't even know what functions their construction would be expected to perform when it reached completion.

I was younger then and still believed in Truth and Justice. I truly expected lightning to strike at any moment, as soon as the world realized the fraud we were perpetrating. It never did.

Please be advised, dear reader, it just has.

The productivity improvement we can achieve with today's application generators is staggering. The fivefold reduction in labor cost per function effectively quintuples our numbers. It's as though there were suddenly five times as many developers around competing for the same work. The honeymoon is ending. The shakeout has begun. The pressure of competition will change our maturing industry as it has changed all others. Those of us who can adapt will flourish and survive.

Planning is the first key. Measured in person-days, coding and testing amount to about 6% of the total effort consumed by an on-line data-driven project. The rest is planning. (Writing a users' instruction manual is costly and time-consuming, but most of it is reusable and spread over many applications. The application-dependent part—screen sketches—is produced during planning.) Measured in elapsed calendar-days, the difference is even more dramatic. Since user/dper negotiations involve getting appointments and calling meetings, they drag on for weeks with little or no developer workload.

We can see the importance of planning in three changes that have taken place in our work habits.

First, design teams typically spend days arguing over tiny details of screen flow and Bachman diagrams. Dozens of alternatives are painstakingly proposed, discussed, and settled for every box, every arrow. It seems excruciatingly time-consuming to the uninitiated until one realizes that, once settled, the design will be fully implemented in a few hours.

Second, it's not unusual to see two or three people handling three or four major projects simultaneously. The long waits between user negotiation meetings are filled by writing specs or improving the standard instruction manual. Once an application's specs are finally approved, it's brought up virtually overnight. Workload follows the same pattern as that of a multiprocessing mainframe where developers play the role of tasks and our users are like I/O devices. Work is planned and dispatched accordingly. In one shop, during a one-year experiment, a three-person team's most severe morale problem was boredom, waiting for the next project.

The third is an odd twist to the adage, "Every project takes longer and costs more than we expect." According to the development manager, today's projects consistently take longer and cost less than expected. They take longer because we tend to underestimate the time it takes to arrange and conduct user meetings. Nothing in new tools or methods makes users more available. Projects cost less because of the multiprocessing we just described.

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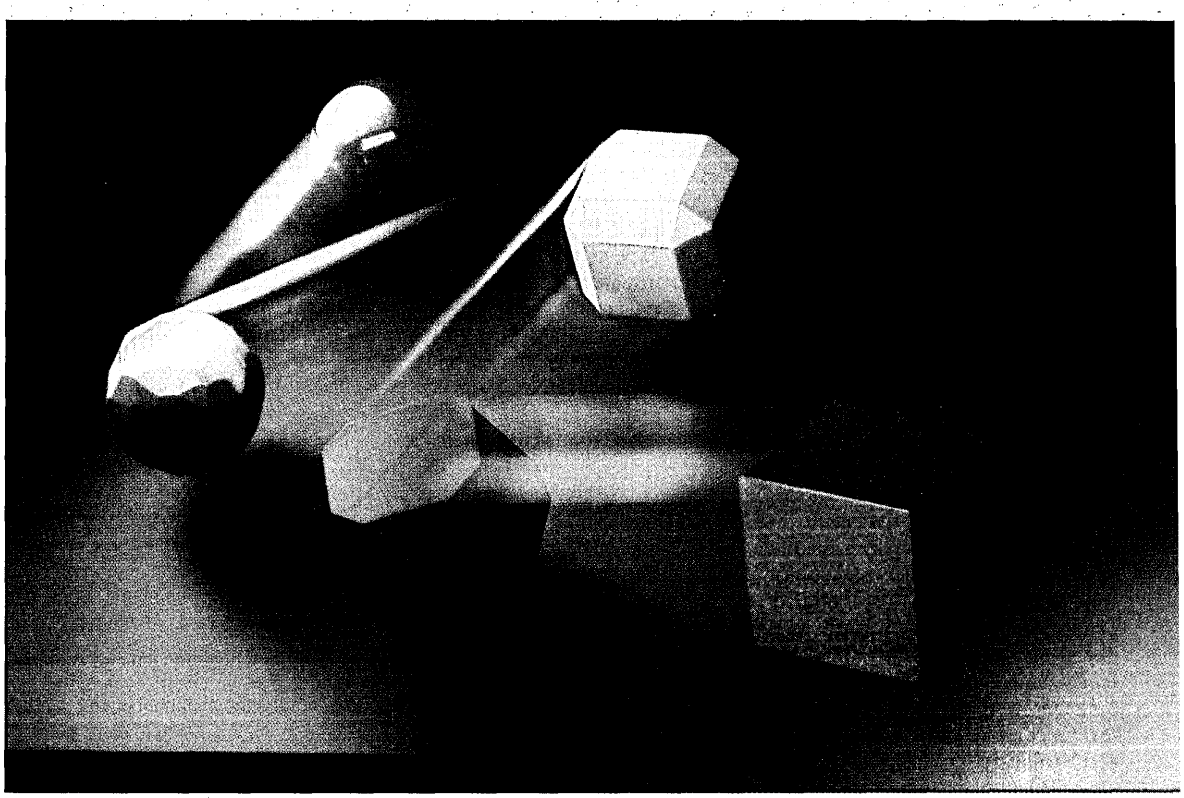

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A teamwork environment encourages developers to ask one another for help on the slightest excuse.

TEAMWORK IS SECOND KEY

After planning, teamwork is the second key—do it as a group. For quality, for training, and for maintainability, we do it as a group. Quality assurance demands it. An application's scope/goals statement, its Bachman diagram, and its screen flow have too many far-reaching consequences to be one person's work. Pride of ownership is collectively shared. We may assign one individual to make a first draft, but that's all it is—a first draft. Every member of the development group feels personally responsible for the professional quality of the group's products. All applications produced by the shop enjoy the same consistently high level of quality. A competent manager can still measure individual performance. The client's product is not the place to do so.

Group designs accelerate training. A teamwork environment encourages developers to ask one another for help on the slightest excuse. I suspect that six months of exposure to the ideas of many others yields more experience than six years of toughing it out on one's own.

Maintainability depends on independent review. The worst possible person to sign off that a screen has been tested and works as planned is the one who designed and programmed it. Like adding a column of numbers three times and getting the same wrong answer each time, everyone can be fooled by his or her subconscious. The answer is to have someone else sign off that a screen works. Team review of each screen would be overkill, of course—no one screen is that far-reaching. But after the author is satisfied that a changed screen works, he or she chooses someone else from the group and requests that individual's sign-off. The method is similar to what we do with written text: anyone can write it and anyone can edit it as long as they're two different people.

One team told me they had a policy among themselves that was neither approved nor disapproved by their management. They explained that once a reviewer signs off a screen, the reviewer (not the author) must fix it if it breaks. This has two desirable results. First, it gives reviewers incentive to do a thorough testing job before signing off. Second, it ensures that at least two people are intimately familiar with each screen. Interesting.

Notice that we are talking about teamwork, not structured walkthroughs. Walkthroughs, as they are usually implemented, too often make a mockery of the original idea. One designated individual creates a product. Then, after developing personal pride in the work, that person is expected to defend it against critics. It does not work. It cannot work, for human beings cannot react objectively to such a situation. Either the producer labors longer and harder than ever to avoid criticism, thereby intensifying possessiveness, or the critics pull their punches so they'll be spared when it's their turn, thereby sacrificing quality.

The answer is to avoid possessiveness at the outset. For designs (Bachman, screen flow), the manager makes sure that the first draft is done quickly and incompletely. It belongs to no one. The collective goal is not to find its flaws—they'll be obvious—but to improve it to a quality level acceptable to all. For individual screen sketches, as we mentioned, group review is unnecessary overkill.

IMPROVE, DON'T REINVENT

Standards are the third key. Spend creativity improving the models, not reinventing them for each user. About a year ago, I was lecturing on the importance of standards and independent reviews. I said, "Some application developers honestly believe computer programming is the last stronghold of individual artistic creativity in a cold technological world." An attendee raised her hand to ask, "Well it is, isn't it?"

It is, indeed, at least one remaining stronghold. But misdirected creativity is costly in development and even more costly in maintenance. When the first COBOL compilers became available, they produced assembler-language listings rather than executable object programs. (Actually, they can still do so.) Many programmers wasted countless person-years inspecting and modifying these listings before assembling and link-editing programs. COBOL was seen as a productivity tool enabling us to build assembler programs with less effort. It was years later that we accepted COBOL as a replacement to assembler language. An important obstacle was our fear of losing the opportunity to be creative. Sure, our excuse was that COBOL was "inefficient," but that's always been our excuse for resisting change—it's persuasive and cannot be disproved.

Application generators and data-driven design threaten us the same way. We fear we'll lose the opportunity to create, so we avoid them by claiming they're inefficient. The outcome will be the same as with COBOL. Some will find creativity using the tools—producing more adaptable designs, more perceptive proposals, more lucid specifications, or more readable instruction manuals. Others will find creativity improving the tools themselves.

Consider the analogy of boilerplate, guts, and word processors. "Boilerplate" is what we call stock paragraphs of documentation, reused in each application. An example is the opening paragraph of a specification document, explaining that we've completed design, are ready to implement, and request approval to do so. It's important, cannot be eliminated, and identical in every system.

"Guts" is application-dependent text—the part we write from scratch each time. Boilerplate comprises about 30% of proposals, 60% of specifications, and 90% of user instruction manuals. We produce a development document by writing guts and invoking a word-processor program that extracts the appropriate boilerplate template from a file and inserts the various pieces of guts in the right places. Since we are continually polishing the boilerplate templates, finished documents appear well-written. Since developers need write only the guts fraction of an application, the job gets done faster and more easily. Some find creativity writing the guts, others in improving the reusable boilerplate. All agree it sure beats writing each document from scratch.

Similarly, on-line screen programs are about 70% boilerplate (prototype code) and 30% guts (application-dependent programming). Under data-driven design, we produce application code with the same word processor. We write the guts and invoke a program that finds the appropriate prototype code and inserts application data names into it. Since we continually polish the prototypes, finished screens work smoothly and efficiently. Since we need write only application-dependent code, we work fast. Once people get used to the idea, they find precisely the same outlets for creativity.

I've found teams using data-driven design with application generators outproducing older methods five to one. I believe they are the wave of the future because they perceive this ratio themselves. One individual—emerging from a two-day marathon session where a six-box Bachman was torn apart and reconstructed a dozen times—had this comment: "For the first time since I've been in applications, I'm having fun at this job."

And when you get down to it, I suspect that's why we're all here—to have fun. ◉

Frank Sweet is corporate manager of data administration for the Charter Co., a Fortune 100 company in Jacksonville, Fla.

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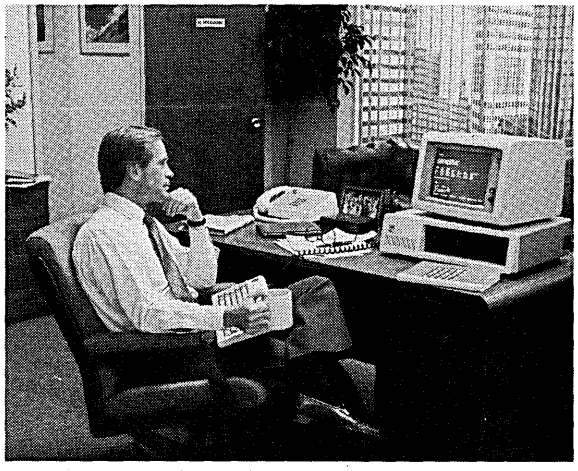

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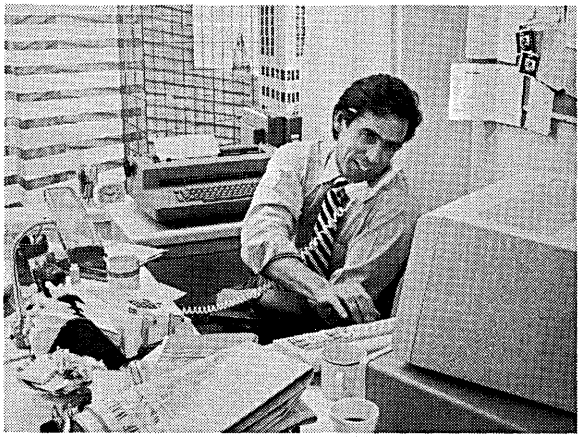

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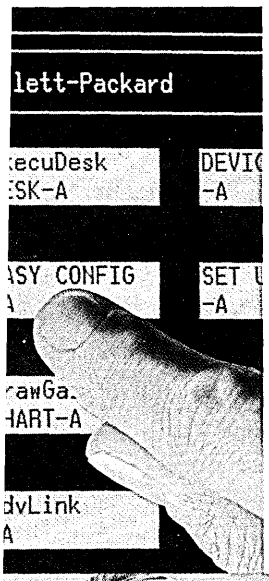

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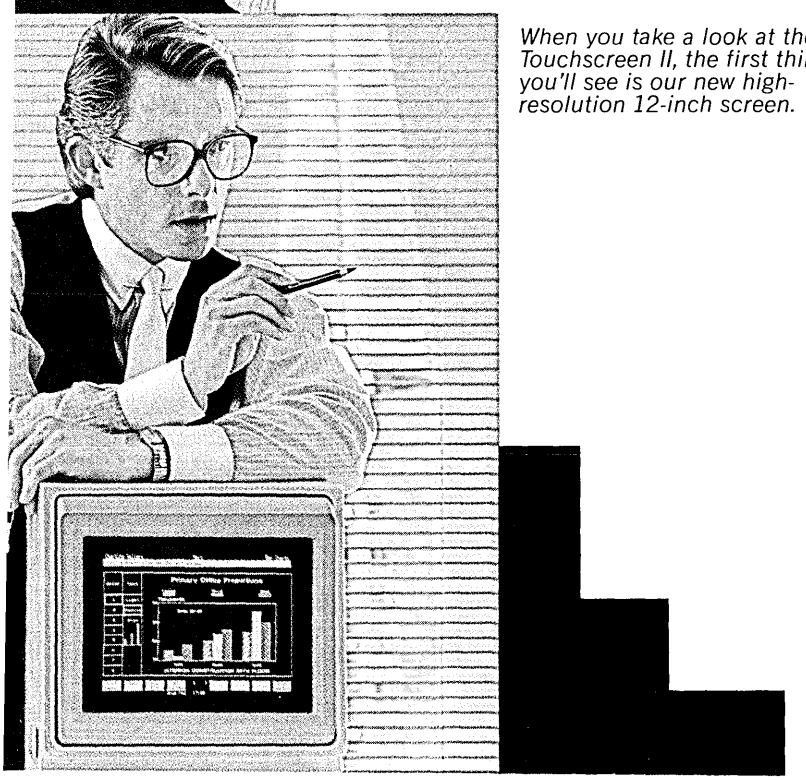

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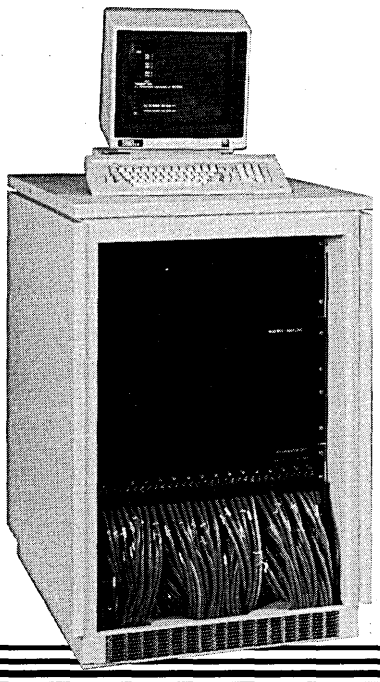


CIRCLE 61 ON READER CARD

DATA SWITCH CORPORATION

HARDWARE

OFF-LINE

More and more, the number nine is turning up in mainframe nomenclature. There is the IBM 3090, Honeywell DPS 90, Sperry 1100/90, and the NCR 9000. All these computers are offering their respective user bases more performance and more MIPS. Today, the 9000, 1100/90, and Sierra-class DPS 90 are available. Only the 3090, which is setting the pace for these mainframers, won't be generally available until 1987 (although a few 3090s are starting to hit the beta sites). The 3090 announcement has forced many of the BUNCH to upgrade their commercial systems.

Sperry has added the Integrated Scientific Processor (ISP) as an enhancement to the 1100/90. Like the array processor on the DPS 90, the 1100/90 with the ISP enhancement offers the scientific and engineering communities number-crunching capabilities on commercial mainframes. The ISP enhancement allows the 1100/90 to operate at 133MFLOPS, bringing it near the range of supercomputers. Sperry also announced an entry-level 1100/90 system with processors ranging from 5.5MIPS to 25MIPS. Sperry has yet to announce its Sierra-class machine, though the ISP feature does offer the Sperry user community some options. Sperry has also added additional internal main memory expansion capabilities to its 1100/61 and 1100/62 mainframes -- computers that have had a surprising second wind among the user base.

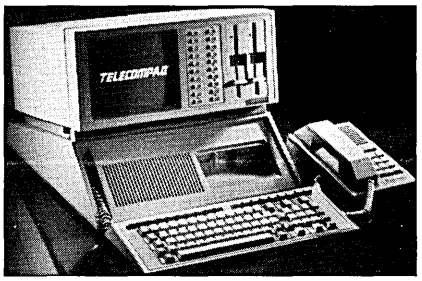
It has been seven months since Sperry announced it would offer Unix from the micro to the mainframe, and in that time the user response has been a deafening silence. A recent survey by Cowen & Co. revealed that only 8% of its 90/30 and 40 users, 15% of the 1100/60 and 70 users, and 16% of the 1100/80 and 90 users thought Sperry's Unix System V operating system software capability would be desirable on their mainframes. Most interested users are running scientific shops, not commercial shops. These findings raise serious questions regarding prospects for Sperry's developing Unix thrust in midrange systems. The survey also found lackluster interest in Unix among other BUNCH users.

What started with Sperry inking an oem deal with NCR for Tower superminis has spread to Honeywell and Control Data, which signed an oem agreement under which Honeywell will integrate CDC's Keystone high-density, half-inch GCR Phase encoded magnetic tape subsystem with selected Honeywell small computer systems. So far, only Burroughs has been left out.

Results just released from a survey conducted at Dexpo West in Anaheim, Calif., last winter by the marketing research firm of Ralph Head and Affiliates, Princeton Junction, N.J., reveal that four out of five current Digital Equipment Corp. users have or plan to have computers in the DEC VAX line. Of the DEC users polled, 12% have MicroVAXs with 11% planning to purchase. Some 67% of those surveyed have the larger VAXs and another 6% plan to add one or more VAX systems in the near future.

PERSONAL TELECOMPUTER

The Telecompaq is a series of what the vendor calls "telecomputers," which combine telecommunications with a desk-



top personal computer. Designed for business managers, the products are available in six models with fixed or flexible disks and connectivity to both analog and digital phone systems.

Available at the touch of single buttons are personal computer applications, autodial phone communications and directory, electronic mail, data communications, calendar, electronic notepad, and calculator. Depending on configurations, Telecompaq ranges in price from $4,200 to $6,400. Compaq Telecommunications Corp., a subsidiary of COMPAQ COMPUTER CORP., Houston.

FOR DATA CIRCLE 301 ON READER CARD

DESKTOP SERIES/1

The desktop versions of the Series/1 computer consist of two models. Each model has two cards, one of them with a Series/1 processor on a chip, and the other with either an IBM PC AT or a modified IBM PC XT. Users can run existing Series/1 applications programs on these models, as well as attach multiple display terminals and up to two printers.

The products can be installed in agencies or small outlets of large organizations for connection to their Series/1 networks. When not running as Series/1s, the computers can be restarted and operated as PCs.

In another announcement, the vendor said that networks of IBM PCs can now use Series/1 processors as gateways

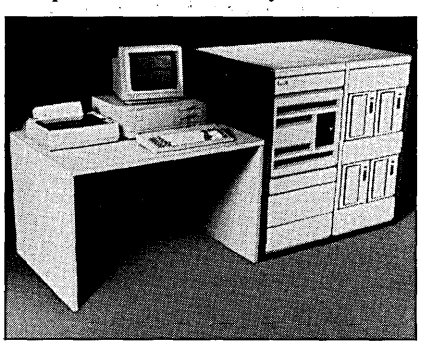
to communicate with other PC networks or IBM mainframes. Enhanced programs for the Series/1 include a Unix System V-based operating system for the largest Series/1 processor, the IBM 4996; a transaction processing system for medium and large Series/1s; and enhancements to the two main Series/1 operating systems. Prices start at $8,100. IBM CORP., Rye Brook, N.Y.

FOR DATA CIRCLE 302 ON READER CARD

DATABASE PROCESSOR

The Sperry Shared Relational Data system (SHARED) shares data between Sperry and IBM mainframes and personal computers. The system integrates the Britton-Lee relational database processor and MPI disk drives with one or more Sperry and IBM mainframes. Sperry and IBM pcs can also be directly attached to the system. The database processor has its own disk system and attaches to a Sperry 1100 mainframe through a block multiplexor channel.

The system can store corporate information in up to 50 databases and share it with multiple systems. It can also provide information to one 1100, share information with two 1100s, or with an 1100 and one IBM mainframe using VM/CMS. The product has the ability to deliver information to pcs without going through the mainframe. Software tools include a data extract facility to the Sperry Mapper development system and the Structured Query Language.

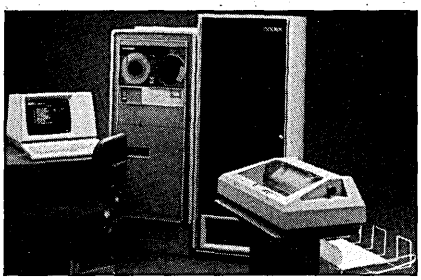


The basic configuration includes a Britton-Lee IDM 500/2 processor with 2 million bytes of main memory, an 1100 host interface, a database administrator's workstation, and 600MB of mass storage. The system is expandable and prices start at $250,000. SPERRY CORP., Information Systems Group, Blue Bell, Pa.

FOR DATA CIRCLE 303 ON READER CARD

NETWORK CONTROL

The Codex 4800 series assists companies in the control and management of their communications networks as a corporate asset. It ensures efficient and reliable data transfer and integrates network control and network management functions in a central site.



Features include menu-driven software, monitoring and diagnostic test functions for point-to-point and multipoint lines, continuous on-line monitoring, modem and line test functions, main channel fallback or reconfiguration, and hot spare switch over. Network management features include site reports, equipment reports, problem reports, and alarm reports. There is also a report generator that gives the network manager control over the format and content of reports.

The basic Codex 4800 comprises an independent computer system that operates through secondary channels of master and slave modems. Components include a 32-bit minicomputer, distributed network processor, and a network control terminal. Prices for the 4800 series start at $84,000. CODEX CORP., Mansfield, Mass.

FOR DATA CIRCLE 304 ON READER CARD

DUAL-HEAD PRINTER

The Twinriter 5 is a combination daisywheel and dot matrix printer. The dual-head product is able to produce letter-quality text with its daisywheel printhead, and graphics with its dot matrix printhead. Manually, or through software-driven commands, users can switch between the two printheads.

According to the vendor, the dual-printhead technology allows one printer to print letter-quality text with the daisywheel printhead and then switch to the dot matrix printhead for draft speed printing, near letter-quality printing, and graphics. The product prints at 36cps using the daisywheel printhead and 140cps or two pages per minute using the nine-pin dot matrix printhead. Available with a Centronix parallel interface and an optional RS232C interface, it is compatible with most microcomputer applications software packages. The Twinriter 5 sells for $1,300. BROTHER INTERNATIONAL CORP., Piscataway, N.J.

FOR DATA CIRCLE 305 ON READER CARD

EVALUATES TAPES

The Series 6000 is designed for maintaining and evaluating the condition of computer tapes used on 800bpi, 1,600bpi, and 6,250bpi drives. It combines fast throughput, higher cleaning efficiency, improved testing accuracy, and automated analysis to test results with a field-upgradable design.

According to the vendor, the upgradability gives smaller dp shops a way of working into a full-capacity tape tester without spending $17,000 up front. With the Series 6000, small dp centers can buy a full-function tape cleaner for under $10,000 and then add physical damage detection, magnetic recording testing, automated analysis, remote communications, static discharge capability, and other options as their need or budget permit.

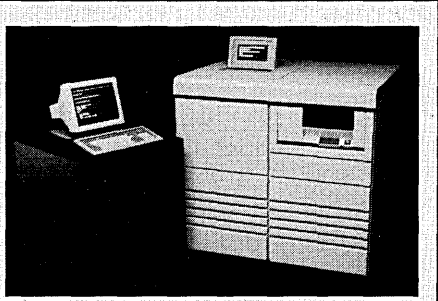
At 600ips, the product cleans, tests tensions, removes static charge, and precision rewinds a 2,400-foot reel of tape in under two minutes and performs the full clean, test, and rewind cycle in under three minutes. Test results are displayed on a screen, printed on a strip chart, and using dual RS232C ports, can be printed out on a printer or communicated to an-

HARDWARE SPOTLIGHT

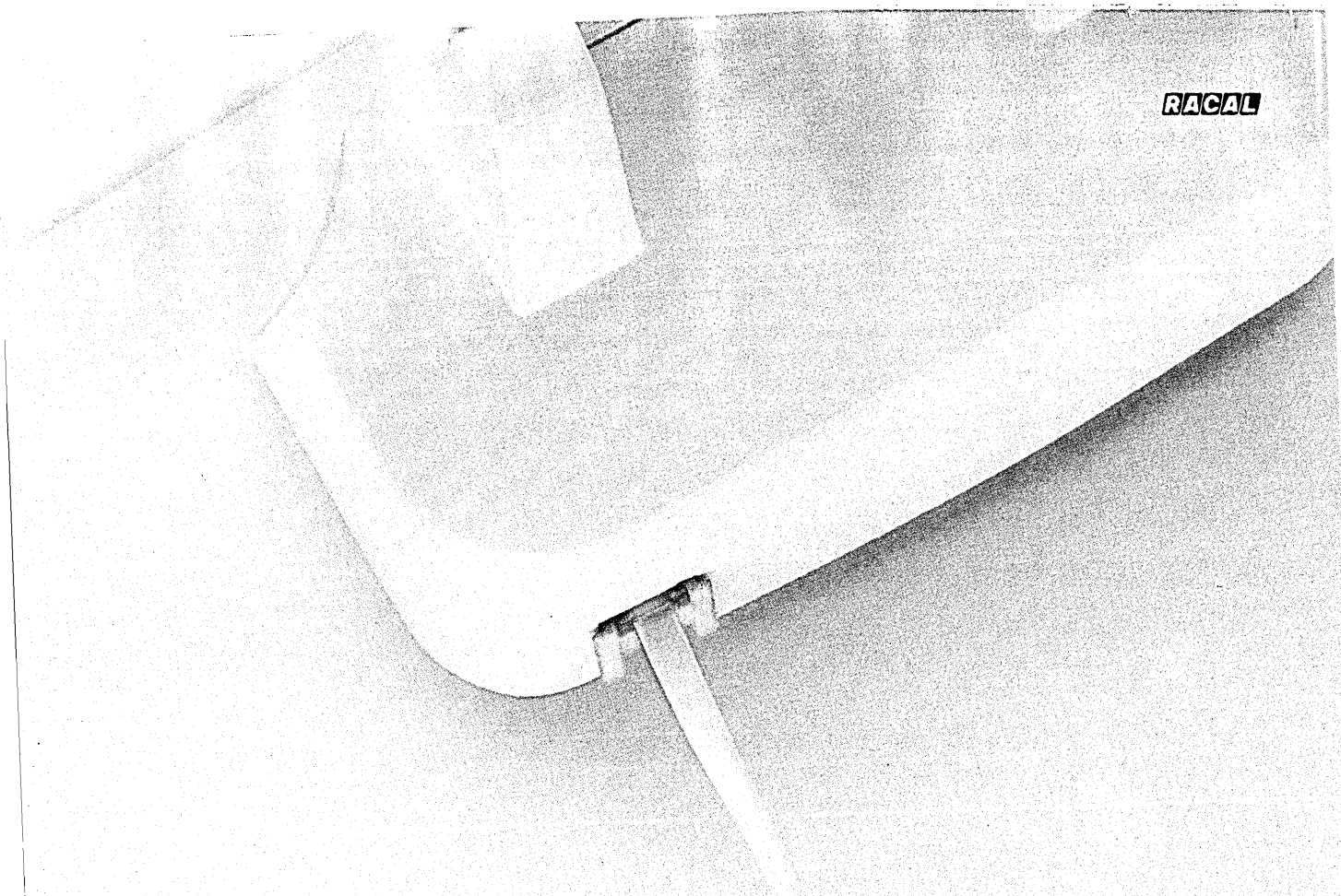
5MIPS AND 7MIPS SUPERMINIS

The Harris HCX-7 and Harris 1200 are superminicomputers for scientific, aerospace, engineering, and business applications. The HCX-7 is a 7MIPS Unix-based RISC mini. It is designed for technical multi-user and timesharing applications. It runs under Unix System V with Berkeley 4.2 enhancements. According to the vendor, the HCX-7 is the first in a series of Unix-based superminis to be offered.

The Harris 1200 replaces the 1000 as the top-of-the-line supermini in the vendor's H Series (the H 1000 is still being offered). The 5MIPS 1200 incorporates several advanced memory technologies to boost performance 55% higher than the H 1000. It is designed for the higher precision needs of simulation, CAE, and other computationally intensive tasks. Supporting up to 224 users, the H 1200 utilizes 100K ECL (emitter coupled logic) and gate array circuits. The H 1200 software is compatible with the rest of the H Series. Prices for the HCX-7 start at $225,000. The H 1200 starts at $249,000. HARRIS CORP., Computer Systems Division, Fort Lauderdale, Fla.



FOR DATA CIRCLE 300 ON READER CARD



WITH OUR BRAND NEW MUX, YOU CAN KEEP USING THE SAME OLD LINE.

That makes it easier to own a mux. And a lot less expensive.

Because when you connect our 7400 Series statistical multiplexer to an ordinary phone line, you pay only for the calls you make. Not for the use of a leased line, 24 hours a day.

Obviously, this is no ordinary mux. For starters, it can handle 4 or 8 channels. And features (among other things) remote configuration and remote diagnostics. How remote?

You or your service people can examine and reset the 7400 from anywhere you can find a phone. And that's something no other multiplexer can offer.

Of course, the 7400 sends data over leased lines, too. Just like any other multiplexer.

But the way we look at it, why pay for a leased line if you don't really need one? What you do need is a brochure and that's free.

For yours, call (800) 543-3000, Operator 507. In California, call (408) 946-2227.

But don't stay on the line too long. One of our muxes might be trying to get through.

Racal-Vadic

CIRCLE 62 ON READER CARD

PROUDLY HYATT.

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The more you travel, the more you see the difference between hotels. So it's no surprise that both frequent business travelers and travel experts prefer Hyatt hotels.*

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In Illinois Center overlooking Michigan Avenue and Lake Michigan.

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Hyatt Regency Crystal City is the closest hotel to National Airport.

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For reservations, call your travel planner or 800-228-9000. ©1985 Hyatt Hotels Corp.

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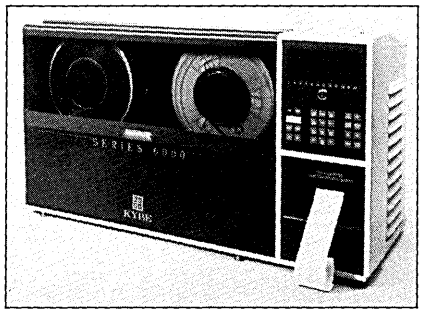
HARDWARE



other system. It accumulates data and analyzes test results on an ongoing basis. A real-time error log reports individual tape statistics including volume, serial number, operator, date, time, leader length, and tape length; totals for light transmission errors; permanent write errors; one-, two-, three-track, and edge condition errors; plus exact footage position for all errors. DENNISON KYBE, Waltham, Mass.

FOR DATA CIRCLE 306 ON READER CARD

DISPLAY TERMINALS

The HDS200 line of video display terminals includes ANSI standard, graphics, and APL models. The terminals combine a 15-inch monitor with large, high-density characters in a housing with a one-square-foot footprint. The terminals are designed for a diverse range of applications in business, engineering, and scientific computing.

The graphics model has 720-by-350 resolution. All terminals provide 88 square inches of viewing area and 32 user-defined overstrike characters. The products feature DEC VT 220 and Tektronix 4010/4014 emulation. Prices for the graphics terminal start at $1,300. The ANSI/DEC-compatible terminal includes 80- or 132-column display, 50 user-defined nonvolatile keys, multiple character sets, and four pages of memory. It costs $1,000. The APL terminals are priced at $1,500. HUMAN DESIGN SYSTEMS INC., Philadelphia.

FOR DATA CIRCLE 307 ON READER CARD

PACKET SWITCH

The Esprit One virtual circuit packet switch provides data transportation paths that transfer information from origin to destination without format or protocol conversion. The virtual circuits are bidirectional and independent of differences in media, speed, attached devices, and their protocols.

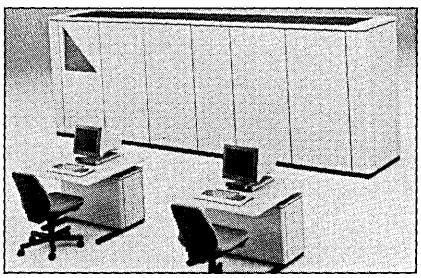
The product consists of the vendor's proprietary printed circuit boards. Each board contains a 10MHz MC 68000 microprocessor and up to 1Mb of RAM. The switch has three applications that can operate separately or concurrently. First, a single switch can have up to 16,000 concurrent virtual circuits to operate as the communications hub for a data network. Second, it can be linked with up to 99 other Esprit One switches to form the backbone of a larger network with more than 500,000 users. Third, it can be connected to the vendor's Elite One to serve as the switch between Elite One network links to provide a data distribution system.

The switch supports multiple concurrent protocols, including async, bisync, SNA, SDLC, and X.25. In addition, security via passwords and restricted user groups, end-to-end error control, internal diagnostics, port contention, and integral network management are included. The product supports data transfer rates up to 19.2Kbps and network trunk data transfer rates up to 72Kbps. It switches at 2Mbps in full redundant mode independent of loading. Continuous data transmission is provided by an alternate routing capability. Battery backup is included. Basic unit price, including redundant switching and dual bus is $42,000. DOELZ NETWORKS INC., Irvine, Calif.

FOR DATA CIRCLE 308 ON READER CARD

PCM

The AS/XL series of IBM plug-compatible mainframes features 2,000 ECL switching speeds as fast as 0.2 nanoseconds. It is designed for mainframe users looking for high performance in the XA and 370 environment. The AS/XL model 80 is a dyadic processor with performance rated at approximately two and one half times that of the vendor's AS/9080. The AS/XL-60 is priced at $4.8 million and the AS/XL-80 is



priced at $8.9 million. NATIONAL ADVANCED SYSTEMS, Mountain View, Calif.

FOR DATA CIRCLE 309 ON READER CARD

LASER PRINTER

The NCR 6480 laser printer uses a cold fusion print adhesion process rather than the conventional heat fusion process. With cold fusion, the vendor says paper keeps its natural texture. The product can also print on sensitive forms such as pregummed labels and forms with address windows. It prints at 14.58 ips, or 103 pages per minute, using 8½-inch-deep fanfold paper. It has a resolution of 57,600 dots per inch. Many types, sizes, and combinations of character fonts are offered, and changeovers can be made instantaneously. A standard optical forms overlay facility permits printing of existing forms. Output can be customized. The NCR 6480 is priced at $210,000 for the basic unit. NCR CORP., Dayton, Ohio.

FOR DATA CIRCLE 310 ON READER CARD

DISK STORAGE

The Memorex 3690-2 is an IBM plug-compatible disk storage subsystem that is functionally equivalent to the IBM 3370-2. It attaches to IBM 4300 cpus, including the 4331 models 2 and 11, 4341, 4361, and 4381. The product can also be attached directly to IBM 3880 storage control units, integrated DASD adaptors on the 4331 and 4361, or to high-speed block

multiplexor channels via the Memorex 3888 or 3696 dual direct storage control units.

The fixed-block architecture device has storage capacity of 729MB per spindle. Each unit within the 3690-2 contains a single spindle with a vertically mounted head disk assembly, and up to four units can be included in each string. It has two independently addressable actuators. Purchase price is $35,500 for the 3683-2 string controller and disk drive and $26,600 for the 3690-2 disk drive units. Leasing arrangements are also offered. MEMOREX, a subsidiary of Burroughs Corp., Santa Clara.

FOR DATA CIRCLE 312 ON READER CARD

PORTABLE BUSINESS PC

The PPC400 Series of transportable IBM-compatible personal computers feature high screen resolution and built-in IBM graphics emulation. It has a screen resolution of 640 horizontal dots by 400 lines and allows users to run graphics packages without having to add a graphics board. The 16-bit 8088-based comes with bundled software including MS/DOS, GW/BASIC, and tutorial and instructional software. Memory ranges from 256KB to 512KB. The PPC400 Series is available in three models priced from $2,650 to $4,300. CORONA DATA SYSTEMS, Thousand Oaks, Calif.

FOR DATA CIRCLE 313 ON READER CARD

—Robert J. Crutchfield

With over 100,000 boards already in place, few would argue that IRMA™ has become the standard in micro-to-mainframe communication links in the 3270 environment.

Especially since IRMA's grown into a family of compatible hardware and software products.

Now IRMA's family is about to grow once ag
Introducing IRMAlink/Windows™.

IRMAlink/Windows is an inexpensive an
easy-to-use software product that gives the
user the ability to display a single host sessio
and a PC session on the screen at the very sa

Now IRMA even does windows.

e. No flipping back and forth between the PC
l the host sessions.
With DCA's host-based software speed you'll
ıble to transfer files from the mainframe in
kground mode while working in PC mode.
ich will help you increase your productivity.

Find out more about IRMAlink/Windows.
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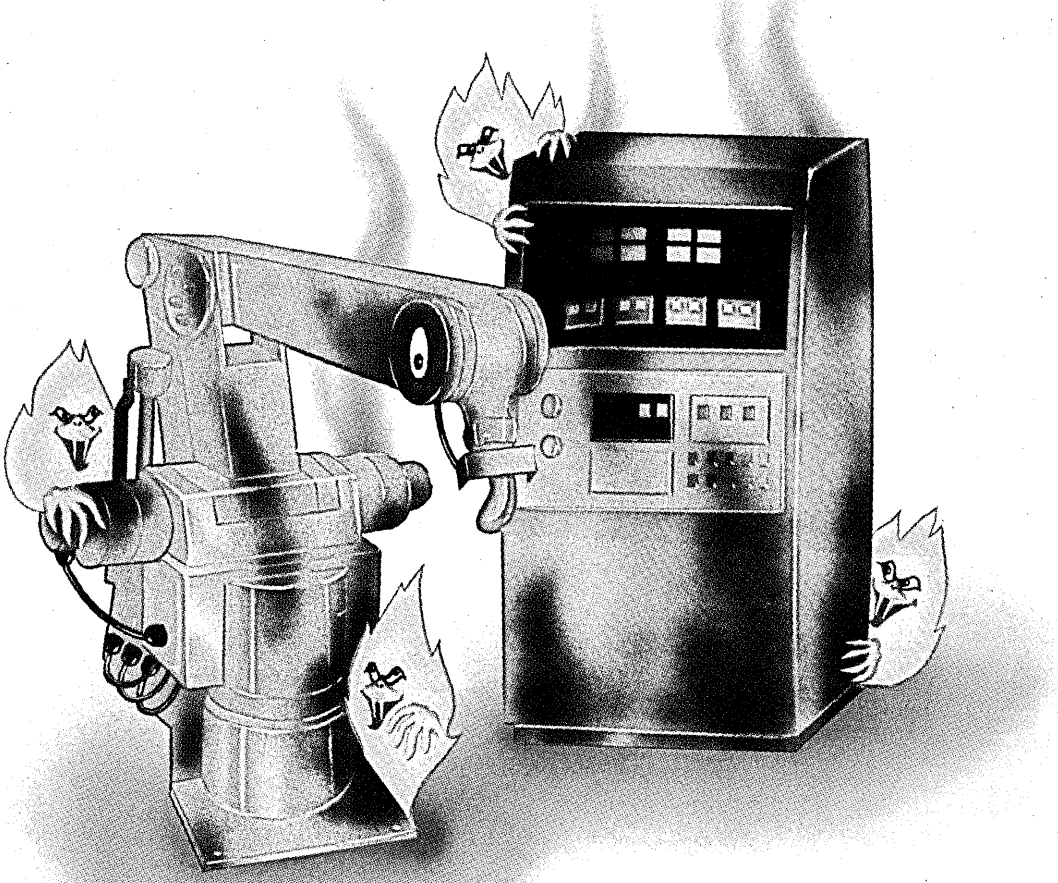
CIRCLE 64 ON READER CARD

WARNING! TODAY'S AUTOMATED PLANTS REQUIRE A NEW APPROACH TO FIRE PROTECTION.



Facts you should know:

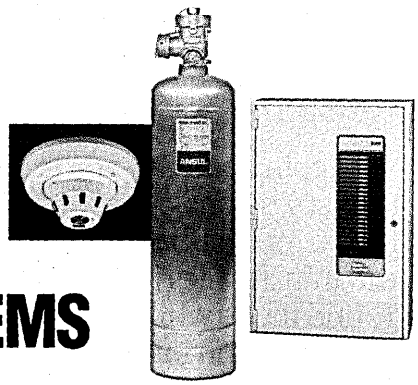
1. Fires *do* occur in and around automated production lines, process control rooms, and robotic installations—more often than most people realize.

2. When they do, equipment loss can be costly—but interruption of your production operations can be even more devastating.

3. Traditional fire extinguishing agents—water, dry chemicals, foam and carbon dioxide—provide excellent protection for many plant applications. But only one agent—Halon 1301—is right for electronic equipment and software.

4. There *is* a fire protection system specifically designed for electronic installations—the Ansul Halon 1301 System. Fast, clean, safe, automatic... and cost effective.

Let us send you our free booklet, "Facts About Protecting Electronic Equipment Against Fire." Write Ansul, Box R, Marinette, WI 54143. Or call (715) 735-7411.



ANSUL HALON SYSTEMS

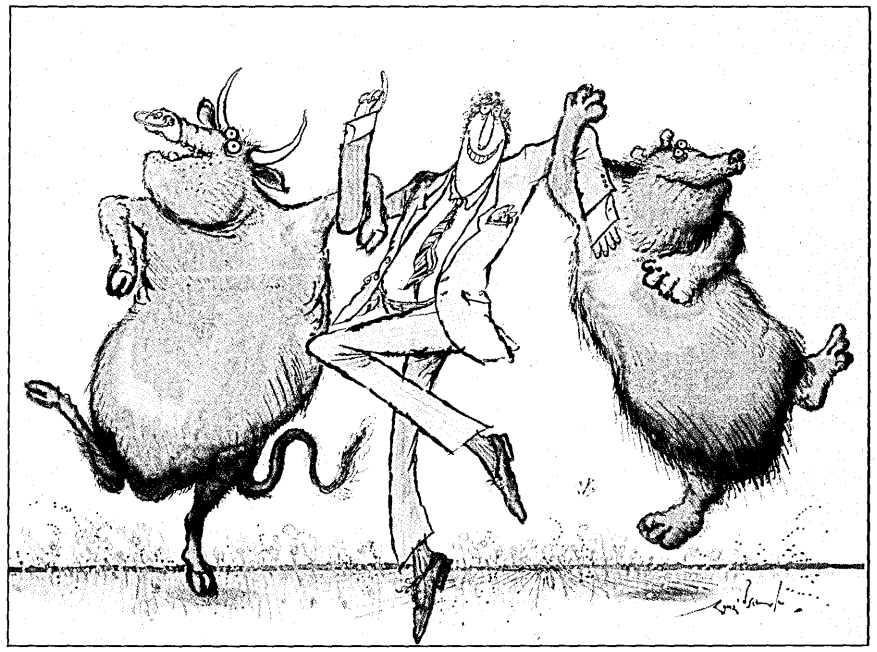
CIRCLE 65 ON READER CARD

SOFTWARE AND SERVICES

UPDATES

Some studies indicate that many personal computers sitting on corporate desktops are underutilized. So why should that situation be any different in the home, where computer sales have stalled? Some vendors air commercials depicting round-the-clock use of the home computer by various family members who couldn't live without one, but the failure of the IBM PCjr stands as clear evidence that home computers have yet to catch on. People have been reluctant to spend $1,000 or more for a home computer just to play games, store recipes, or learn algebra. Nor, for that matter, have many professionals brought diskettes home from their (underutiltized?) office pcs to use there.

Still, many believe there is a market for home computing -- even in the wake of the PCjr's demise. And the thing that will give a boost to this market is software. Take Interactive Data Corp. and its Active Investor package. It runs on the IBM PC and compatible machines and offers a range of portfolio management, technical charting, and fundamental analysis capabilities. The software connects by modem to Interactive Data's financial databases, so that users get daily pricing information for all stocks, bonds, options, funds, and warrants traded on United States and Canadian stock exchanges, as well as company data on publicly traded firms. The pc software costs $500, and there's no connect charge to the vendor's database. Quotes cost 3 cents apiece, and include the high, low, close, and volume of shares.



The software cuts to the heart of a minor trend in home computing: software for the yuppies themselves and not for their children. The product is targeted directly at upper income people who have enough money to manage a portfolio and buy and sell securities regularly. It seems obvious that these people also have some disposable income to channel into a pc and lots of software. Not surprisingly, studies indicate that home computers are purchased primarily for households with incomes of more than $25,000 per year. Products like this investment package may appeal to as many as 100,000 to 200,000 of these upscale users.

The trend can continue in either of two ways (or both). First, the home pc, now that it has found its true calling as a securities analyst, may still wind up doing double duty as a babysitter, replete with games and educational material. (Don't expect many users to set up home finance applications, though. Home finance, as in the electronic checkbook, was thought to be one of the most promising home applications but turned out to be a dud at the cash register. That brings up an interesting paradox: budding financiers can do complex stock transactions on their pcs but concurrently are not willing to use the home computer to balance their checkbooks.)

Second, if users really endorse programs like Active Investor, the next step may well be specialized communications software. Yuppies could then connect their traveling lap computers into financial databases, using the cellular telephones in their Saabs.

SOFTWARE AND SERVICES

FORMATTED FOR PC

The Information Center Management System (ICMS) gathers, organizes, and dynamically maintains corporate information stored in mainframe and subscription databases, departmental minicomputers, and personal computers, and makes it available to users in a variety of formats.

Designed for the IBM mainframe marketplace, ICMS enables an organization to utilize its existing hardware and software resources. Through previously announced agreements with a variety of minicomputer vendors, the product provides the capability to link such departmental systems with the IBM environment.

When used in conjunction with Goldengate integrated pc software, or the vendor's link products for Lotus 1-2-3, Symphony, and other pc software, ICMS also facilitates the flow of information among personal computers. According to the vendor, ICMS offers pc users access to corporate information that they can use with their software for planning and analysis. CULLINET SOFTWARE INC., Westwood, Mass.

FOR DATA CIRCLE 326 ON READER CARD

BLACK BOOK

The Little Black Book is a 400-entry telephone directory and address book costing $50—including a 30-day money back guarantee and a leatherette cover. According to the vendor, the product will fit in a disk drive and the output in a shirt pocket. It can be updated as often as the user likes to keep track of business contacts, favorite restaurants, or other information subject to change.

The complete directory prints out on standard printer paper. The user then cuts along the dotted lines, staples the pages to the backing provided, and inserts the directory into the Little Black Book cover that comes with the software. One benefit of this product is that if a copy of the book is lost, another can be printed out. Multiple copies of the directory can also be made from the software. The Little Black Book is designed for use with IBM and compatible personal computers, and works in background with Lotus 1-2-3, Symphony, and most PC/DOS software programs.

Each of the entries contains a name, telephone number, address, and notes. The user can define up to 30 different index categories, and put a name into multiple categories for cross-indexing. Each category holds up to 30 entries. In addition to printing out a personal telephone book, the software will automatically dial telephone numbers, including access codes to services like MCI and Sprint. An optional accessory dialer board is available for $70. CYGNET TECHNOLOGIES INC., Sunnyvale, Calif.

FOR DATA CIRCLE 327 ON READER CARD

ENHANCES DECNET

DECnet-DOS enables IBM Personal Computers to participate as full members of a Digital Equipment Corp. DECnet network. Five additional software products were also announced by the vendor to allow system users to communicate with IBM mainframes. The software includes DECnet-DOS, a product that allows IBM personal computers into a DECnet network, three software packages that help users communicate between DEC and IBM SNA-based systems, and two protocol emulators providing communication links from DEC's Micro/RSX operating system to the IBM environment.

With DECnet-DOS software, an IBM PC or PC XT can be integrated into a DECnet network. As part of a DECnet network, IBM pcs for the first time can function as network nodes that can communicate and share data with other DECnet nodes, rather than just acting as dumb terminals running terminal emulation software to host computers. It also has file transfer and remote data access capabilities for sharing data across a network, remote resource access for sharing peripheral devices, virtual disk capability, task-to-task communications, and network management.

DEC/SNA VMS Advanced Program-to-Program Communications/LU6.2 software (APPC) is designed to free programmers from protocol concerns. The Applications Programming Interface (API) takes the SNA interface one step further. API is a flexible interface for the VMS applications programmer who has a specific need to interface to an IBM application system. API is a collection of routines allowing user-written applications running on VAX/VMS and MicroVAX/MicroVMS systems with a DECnet network.

DECnet/SNA VMS 3270 is designed to insulate users from the SNA environment, but is still specifically designed for 3270 emulation interfaces. The Data Stream Programming interface with specially designed SNA functionality enables users to build a color graphics interface.

Micro/RSX 2780/3780 and 3271 are layered software products that communicate with IBM systems using the Binary Synchronous Communications protocols in both a batch and interactive manner. Micro/RSX 2780/3780 with Micro/PDP-11s emulates the communications protocol of a 2780 or 3780 batch terminal. The Micro/RSX 3271 turns a DEC VT 100 or VT 200 into an IBM 3270 terminal. The Micro/RSX 2780/3780 product emulator costs $1,200. The Micro/RSX 3271 costs $900. DECnet-DOS costs $500 per pc. The DECnet/SNA VMS costs $2,500 and the DECnet/SNA VMS Applications Programming Interface costs $1,500. DECnet/SNA VMS 3270 Data Stream Programming Interface sells for $2,500. DIGITAL EQUIPMENT CORP., Maynard, Mass.

FOR DATA CIRCLE 328 ON READER CARD

MARKETING SOFTWARE

CLOSE is a software system for sales and marketing. It runs on an IBM mainframe and allows a company to automate its entire sales and marketing operation. The product includes comprehensive processing, tracking and support for inquiry response, direct mail programs, telemar-

SOFTWARE SPOTLIGHT

COMPUTER CONDOMINIUM

Computers are now joining the Florida condominium craze. Martin Marietta Data Systems is offering a data center product called Orlando 4000, the Computer Condominium. According to the vendor, this service permits managers to concentrate on their business needs instead of computer management. Basically, Orlando 4000 combines some aspects of leasing and timesharing into a repackaged offering.

Orlando 4000 combines hardware, software, and communications with the support of personnel to provide what literally becomes the user's data center. It is targeted at medium-sized companies in the IBM 4300 range that do not want the capital commitment associated with an in-house center. Orlando 4000 will run all the user's existing software as well as work with the programmers and analysts to develop and implement new applications.

The vendor configures the "condo" to the user's needs for processing power, storage, and communication. According to the vendor, the product is very much like a condominium because users get the amenities of a luxury home without any of the hassles. Since each user is able to share the costs with other users, Orlando 4000 users can get the benefits of a data center for less than the cost of an equivalent in-house facility. The entry price for Orlando 4000 is $6,000 per month. Capacity steps are provided in 12 increments and cost up to $170,000 per month for the equivalent of an IBM 4381-2. Capacity changes can be made with as little as seven days notice and can be accomplished with no operational or financial penalties. MARTIN MARIETTA DATA SYSTEMS, Greenbelt, Md.

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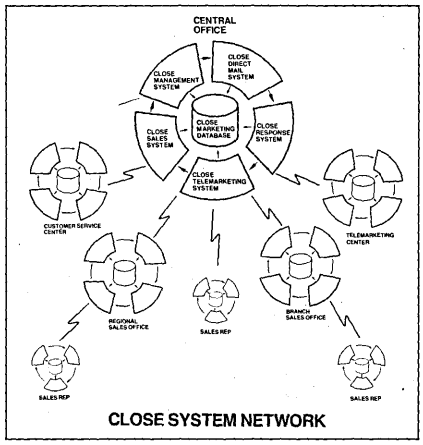


CLOSE SYSTEM NETWORK

keting, sales force optimization, and management reporting.

The system gives the company a consistent structure for sales and marketing efforts including a companywide mechanism to collect and transfer information among operating divisions, branches, and offices. It gives sales managers a way to direct and plan sales activities. It is designed to automate the selling and marketing functions in business-to-business selling. And, according to the vendor, the product offers a competitive advantage to companies introducing new products, penetrating new markets, or managing a dedicated or independent sales force. Depending on configuration and modules selected, CLOSE ranges in price from $30,000 to $60,000 on an IBM mainframe. ADELIE CORP. Newtonville, Mass.

FOR DATA CIRCLE 329 ON READER CARD

SATELLITE NETWORK SERVICE

TYMSTAR is a public satellite network service that is the result of a joint venture between Tymnet, McDonnell Douglas Network Systems Company, and Satellite Technology Management Company. The service, based on STM's STARMUX technology, will utilize two-way micro earth stations to provide cost savings for leased line data communications applications.

TYMSTAR is a full-duplex digital communications service based on a proprietary and highly versatile packet-oriented Time Division Multiple Access design. The speed and capacity of the service will be high, but the product's cost competitiveness for lower-speed applications won't be sacrificed, according to the vendor. The transmit capacity of a single micro earth station will be up to 96Kbps. The receive capacity will be up to 15Mbps.

Each micro earth station will have a minimum of four ports. Additional ports can be added up to a total of 24 ports. The protocols supported in the first release will be Asynchronous PAD, X.25, and 3270 SDLC. Port speeds for the synchronous protocols will be up to 64Kbps. The micro earth station will support Tymnet's own proprietary network protocol.

Pricing for the TYMSTAR public network service will be comprised of three main elements: usage or bandwidth costs, hub port connections (if needed), and the micro earth stations. Two-way and one-way micro earth station pricing will be volume dependent. The two-way unit will start at $25,000 and the one-way at $5,000. Lease options will also be available. TYMNET INC., San Jose.

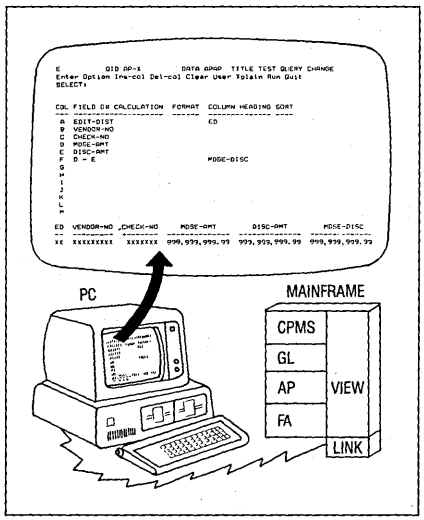
FOR DATA CIRCLE 330 ON READER CARD

QUERY FACILITY

DD-View is an interactive query facility and DD-Link is a personal computer interface that combines the mainframe database query capabilities of DD-View with the flexibility of a microcomputer. Both DD-View and DD-Link are available for use with IBM mainframes. DD-Link runs on IBM PCs and compatibles.

DD-View eliminates the need for a report writer and enables users to directly create on-line screens displaying the financial information they want using English language commands to access data from the on-line versions of the vendor's query systems.

DD-Link can be used as a full-function mainframe terminal as well as a dedicated pc. DD-Link lets users download information from a mainframe to a pc for use with software packages like Lotus 1-2-3. The basic price for the DD-Link option for DD-view, which includes mainframe and pc software, is $10,000. DATA DESIGN ASSOCIATES, Sunnyvale, Calif.



FOR DATA CIRCLE 331 ON READER CARD

WORD PROCESSING FOR 1-2-3

OptionWord+ runs under Lotus 1-2-3 and features a word processor plus Graphmate for instant graphics, calendar management, a phone directory, and a "to do" list. It is designed for 1-2-3 users who would like to do word processing without having to change programs.

The product features many word processing commands and menus. Functions include edit, copy, move, justify, insert, delete and erase text, and paragraph and margin setup. The word processing commands are displayed at the top of the screen, replacing the standard 1-2-3 menu. It also notifies users on screen where page breaks occur.

In addition, the product makes use of 1-2-3's spreadsheet by allowing mathematical tables to be constructed in the word processing area. The file options allow sample documents to be reviewed and allow frequently used letters to be stored and retrieved. OptionWord+ costs $100. OPTIONWARE INC., Bloomfield, Conn.

FOR DATA CIRCLE 332 ON READER CARD

SPREADSHEET FOR MAC

Excel is a spreadsheet offering from Microsoft that combines business graphics and an on-sheet database with spreadsheet power. A key feature is the software's ability to automatically define macros. Other features include user-defined functions, array handling, and two-way file compatibility with Lotus 1-2-3.

This product is being billed as a spreadsheet with depth and performance with graphics and database management and not as a fully integrated software package. It is designed for "power users" in a business environment and runs on the Apple Macintosh with 512KB of memory. The spreadsheet has more than 16,000 rows by 256 columns giving users more than 4 million cells.

Users can build interactive visible links between worksheets with the linking capability. With a recorder built into the software, users can create macros while carrying out actions. Users don't need to learn a macro language to write a program. With the recorder, repetitive tasks are automated while the recorder is on. Charts and spreadsheets can be viewed simultaneously and are interactively linked. All charts are presentation quality and work with most printers.

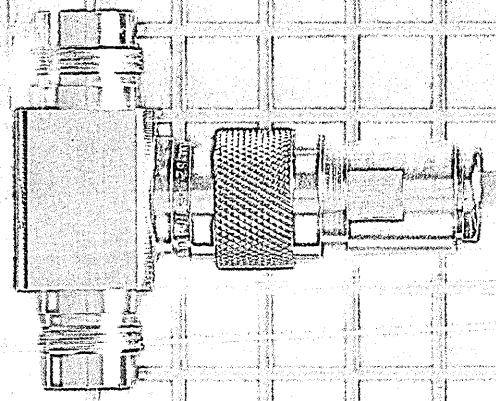
The database addresses the specific needs of number processors to extract selected data for analysis. Any part of the worksheet can be managed like a database without opening a separate window or learning a new set of commands. Through the Apple Switch utility (included in Excel) users can switch between Excel and Microsoft Word.

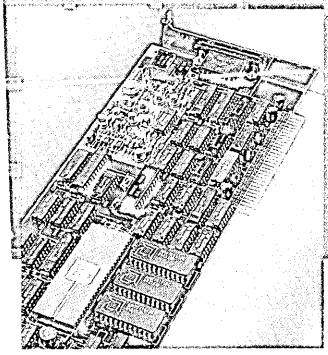
Excel will be available in September and will be priced at $400. MICROSOFT CORP., Bellevue, Wash.

FOR DATA CIRCLE 336 ON READER CARD

—Robert J. Crutchfield

Direct PC to System 34/36/38 Connections Using Standard Twinax Cable





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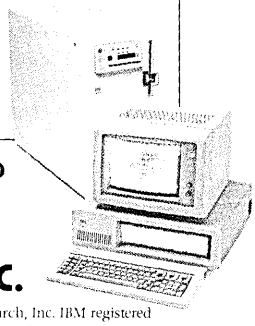

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ON THE JOB

GET A JOB

Whether you're a programmer seeking a management position or a dp manager hoping to make a lateral move, you could probably use a refresher course in job-seeking skills. The first thing you need to examine is your résumé. Remember that list of what you've been up to for the past several years? Well, dust it off and prepare to attack!

Before you take the easy way out—adding your current position to the top of the list and dropping your last—think about where you're headed. Your résumé should reflect the type of career move you're planning, say Arthur R. Pell and George Sadek, authors of *Résumés for Computer Professionals* (Monarch Press, New York, 1984). Pell and Sadek explain that résumés should be tailored to the specific type of job for which you're applying. If you want to break into management, make sure any management background you have from previous jobs is highlighted in your résumé. This does not mean you should omit your technical accomplishments, but you should incorporate any supervisory positions you have had or any leadership positions held outside of the office to show you have the qualifications to be a manager. Pell and Sadek also suggest that if you know of a particular job opening you're interested in, write a specific résumé for that job. They emphasize that "you have an immense advantage in this situation because you can tailor your background to fit what the company is seeking."

Remember, less is more in a résumé. A novel is not necessary to impress a prospective employer; if she wants your life history, she'll call you. Keep in mind that a résumé is supposed to be a one-page summary of your experience. Be clear and concise. Make your résumé ooze with your accomplishments.

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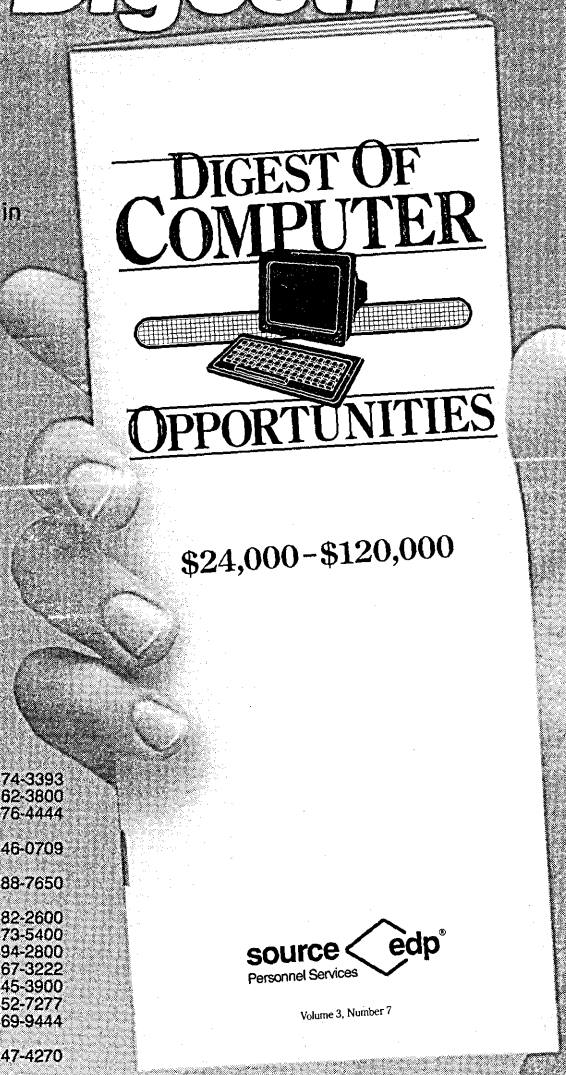

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ON THE JOB

Professional to Corporate Manager (John Wiley & Sons Inc., New York, 1984), David E. Dougherty touches upon the enormous task of finding the right job. He quotes Jim Emmett, manager of personnel at Clairol Inc., as stating that "more jobs are found by networking than by all other approaches combined." This approach really can pay off, especially after you've been in the business for a number of years and have built up a pool of contacts. According to consultants at Costello, Erdlen & Co., an employment consulting firm in Wellesley, Mass., neglecting to use networking contacts who are in a position to make direct introductions is a common mistake made by job seekers. Jack Erdlen, chairman of Costello, Erdlen, notes, "Employers tend to give every possible consideration to persons suggested by their employees." He adds that employee referrals are particularly fruitful when companies offer bonuses to employees for recommending individuals who are hired.

Of course, recruitment advertising is also responsible for a considerable number of new hires. Many new job seekers, however, are skeptical of responding to blind ads. Erdlen maintains that this can be detrimental to your job search because many companies advertise for valid, important openings in this manner.

Employment agencies are another avenue to finding the right job. "Selection of a good agency is critical since they are a significant job source," says Erdlen. Just do a little reference checking before wasting your time with an ineffective agency.

Now it's interview time. Are your palms sweaty already? Does your stomach have butterflies? Don't despair; just the mention of an "interview" makes many people nauseous. Being prepared for the interview is half the battle; preparation combats the worries and smooths that crucial meeting. Dougherty suggests you obtain copies of a company's annual and quarterly reports, or even call your stockbrocker, if you have one, for some useful information. According to a survey of vice presidents and personnel directors of 100 large companies, conducted by employment author Robert Half, the most frequent interview mistake made by job candidates is not making an effort to learn something about the company for which they profess a desire to work. A simple trip to the library before you go on the interview will help considerably, advises Dougherty. Take out some books on interview techniques. Go over sample interview questions and write down your answers so you can review them later on, before the interview. Try to find some current articles on the company, or better yet, do some research and locate any articles written by the person who will be interviewing you. Dougherty believes you will probably receive a job offer if you show your knowledge of the interviewer's article and compliment him.

Once at an interview, be enthusiastic and responsive. Half points out that interviewers are impressed by candidates who ask pertinent questions, know something about the company and act in a pleasant, businesslike manner.

Part of Half's survey covered the most unusual things job candidates did at interviews. One candidate "said he wasn't interested because the position paid too much." A prospective employer complained, "While I was on a long phone call, the candidate casually put a box of Kentucky Fried Chicken on my desk and started eating." Another "brought his mother into the room for the interview.' One interviewer recalled a job seeker who "told me if I didn't hire her, she'd have her grandmother put a curse on me.' Whoever said interviews are dull?

—Mary Ann Haritos

An exchange of readers' ideas and experiences. Your contributions are invited.

READERS' FORUM

TOOLS FOR THE TOOLMAKERS

The plain white envelope arrived on my desk during the night. Not in my in-basket with the rest of the office mail, this missive was centered directly on top of my appointments calendar where I was sure to spy it. The trick worked; I opened it first thing. The message inside read:

"Dear Employee: Our company currently has shortages in important programming, analysis, and other computing skill areas and we're asking you to help us find the right people to fill them. We need your referrals of individuals you believe can be strong contributors to our company's team. A cash bonus will be awarded if your referral is hired into a critical skill position. For details about the program, pick up an employee referral form from your personnel representative or any industrial relations center."

Intrigued, I looked around at the desks of my coworkers. They too had plain white envelopes waiting in strategic spots. By midday the word was out: everyone even remotely connected with data processing was being offered a reward for finding qualified candidates to join our beleaguered crew. The backlog of unimplemented applications had finally driven management to action.

The mystery was, why this particular action? Sure the company needed more productivity out of its programming shop. The trouble was, we already had enough people to require three levels of data processing management. Why, the payroll even lists some programmers who, instead of producing programs, spend virtually all of their time acting as technical experts for what has become a never-ending series of project management and liaison meetings. Those programmers and analysts who actually do produce code do so laboriously, amenities like terminals having only recently been installed on a limited basis in special workrooms.

Most of my coworkers spend their work days hunched over writing tablets at their desks or in transit to and from the computer room. Documents such as design specifications, operations manuals, memos—everything except computer instructions—are initially handwritten before being turned over to a secretary for typing. Once typed (on a word processor), materials are returned to the originator for proofing, with corrections again fed back to the secretary in a continuing cycle. Computer instructions follow a similar pattern; instead of being given to a secretary, however, coding sheets are walked to our computer room data entry staff, with "card image" listings later returned for checking. Only when this cycle is complete does the programmer get a chance to personally use the computer to make changes to her work.

Several years ago, in a fit of frustration, one of the younger members of our staff made an analysis of how far a typical data processing employee walked each day. The precise number escapes my memory at the moment, but the distance was measured in miles. He walked more than that a few weeks later when he figured his time could better be spent working someplace that paid him to strengthen his mind rather than his feet.

Remembering all this, none of us could figure how management had determined that adding more people would help, reward or not. What we desperately needed was some automation. Here we were automating the company's everything: from payroll to inventory control to milling machines. To do it, we ourselves were using tools and techniques dating from prehistory—or 1965, at least. Why couldn't the company spend a few bucks on some tools for us, like crts on our desks, printers every few rows, a good text editor, program design languages, and documentation aids?

A few of the older hands furnished the answer. Money for equipment and purchased software is considered a capital expenditure by our employer. Labor, on the other hand, is an expense. Capital expenditures are depreciated, expenses get written off in one year. Most important, the company internally funds capital from one budgetary area while expenses, particularly labor, come from another. As with many large companies, the technique for transferring a savings in one area to the other is complex and extensive, requiring the understanding and approval of numerous non-dp executives.

The result: acquisition of tools (capital) to improve productivity (labor) is just too cumbersome to accomplish. In addition, our employer routinely attempts to minimize fixed assets to keep the cash flow high and the break-even point low. Any capital tools acquired must be mandatory to support production of the firm's primary products. Tools to support an internal service function (i.e., data processing) are all but impossible to justify.

Eventually, of course, we will get better tools. The new terminals in the special workrooms are the harbinger. The catalyst that will finally move us into the modern era will be the results of management's new employee referral program: slim to none. Even if sufficient numbers of new qualified computer people could be added, any improvements to productivity would be minimal. We already underuse and misuse the current personnel. Some alternative will have to be found, and hardware and software tools will be the answer. Soon, I hope.

—David A. Feinberg
Seattle, Washington

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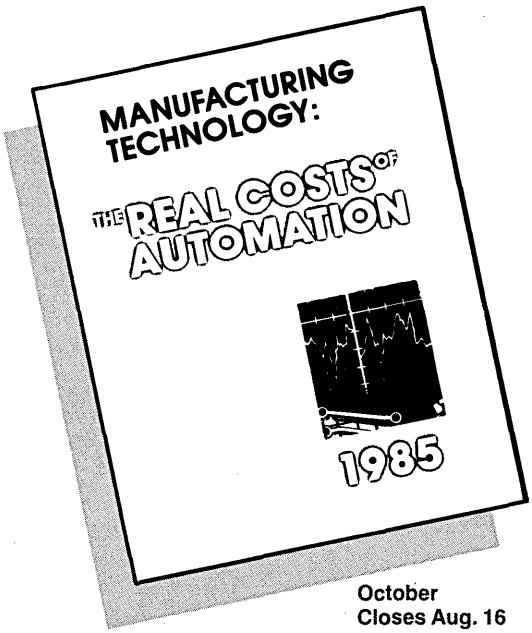

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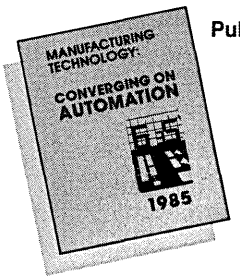

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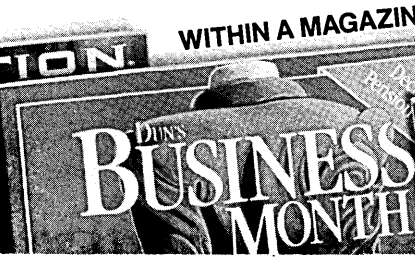

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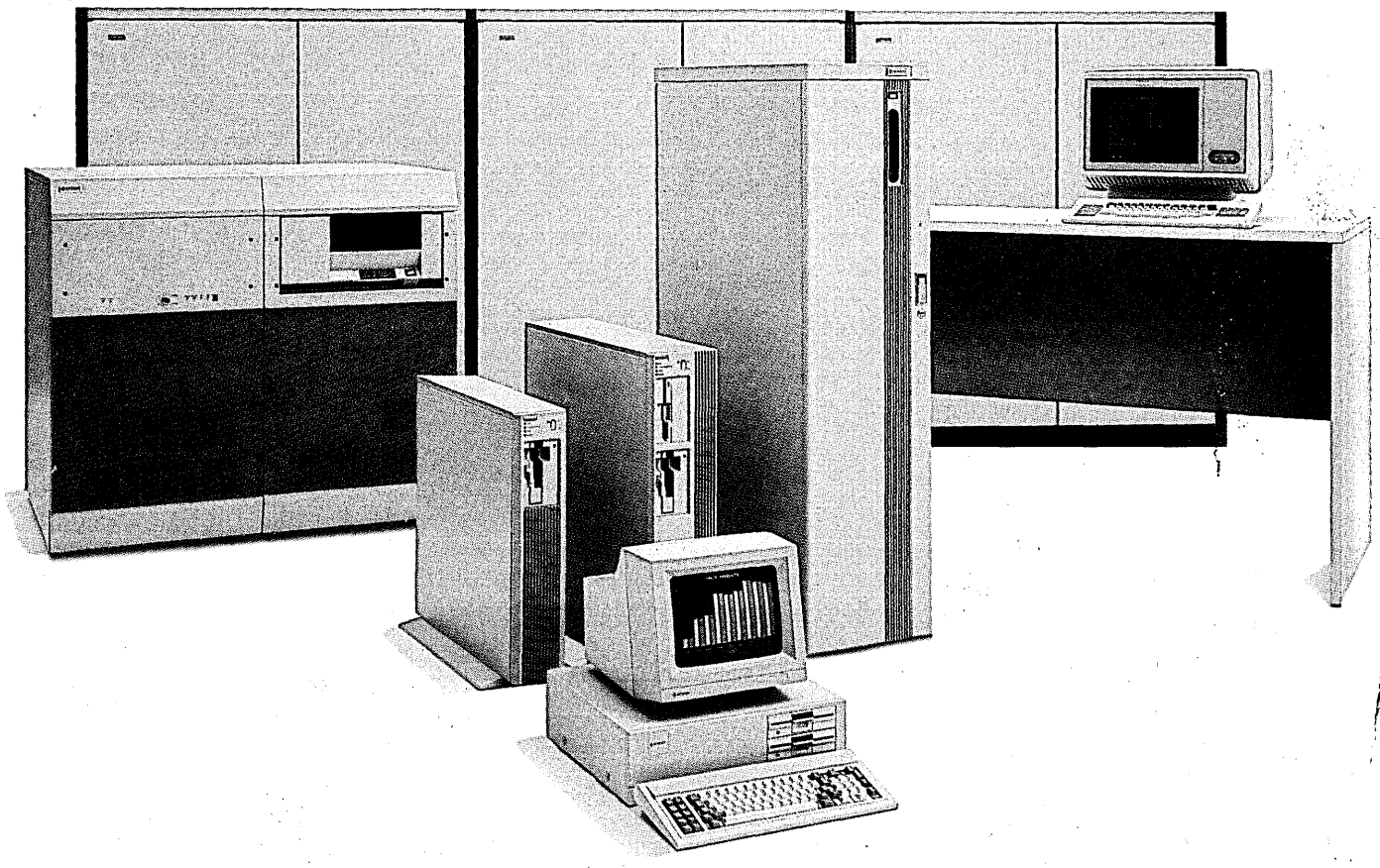

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