

DATA MATION

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BEATING THE PLANNING CAPACITY BOTTLENECK

SYSTEMS/2000 FOR THE 1990S



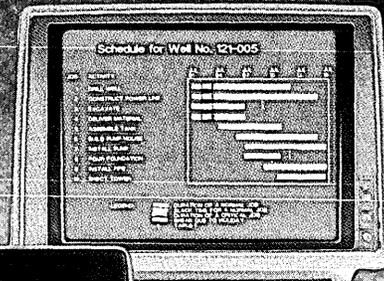
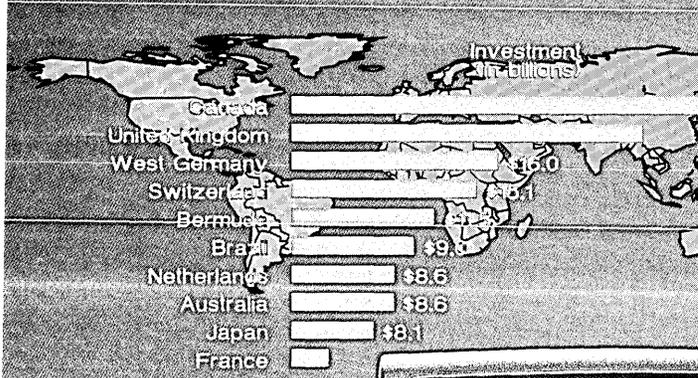
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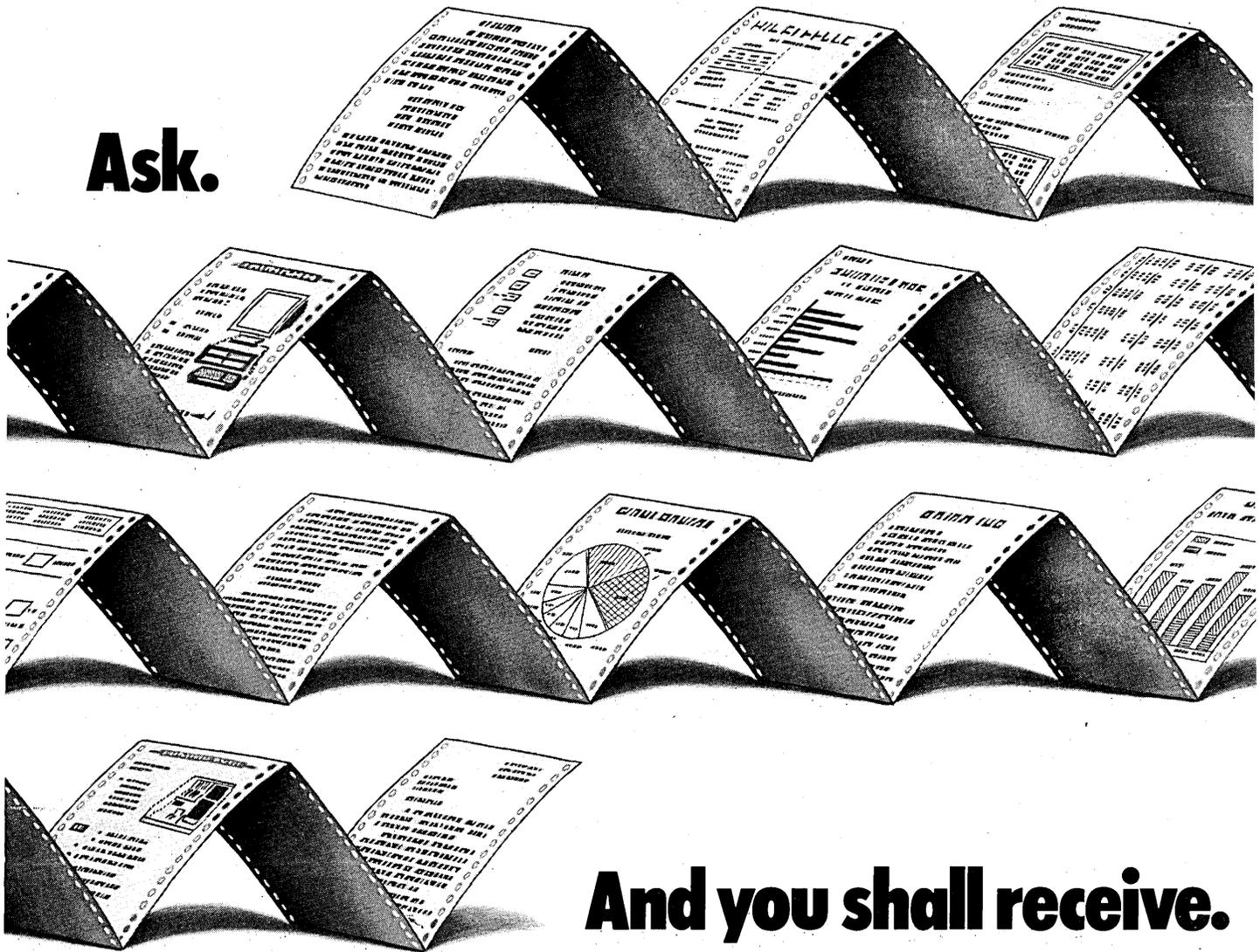
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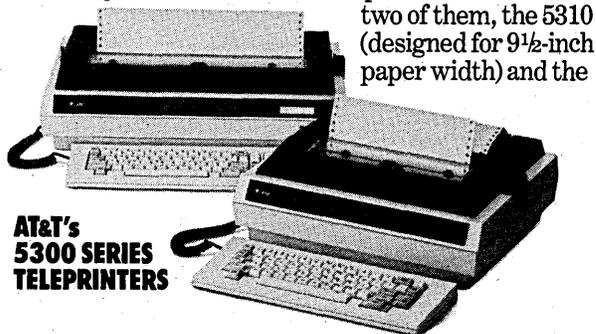
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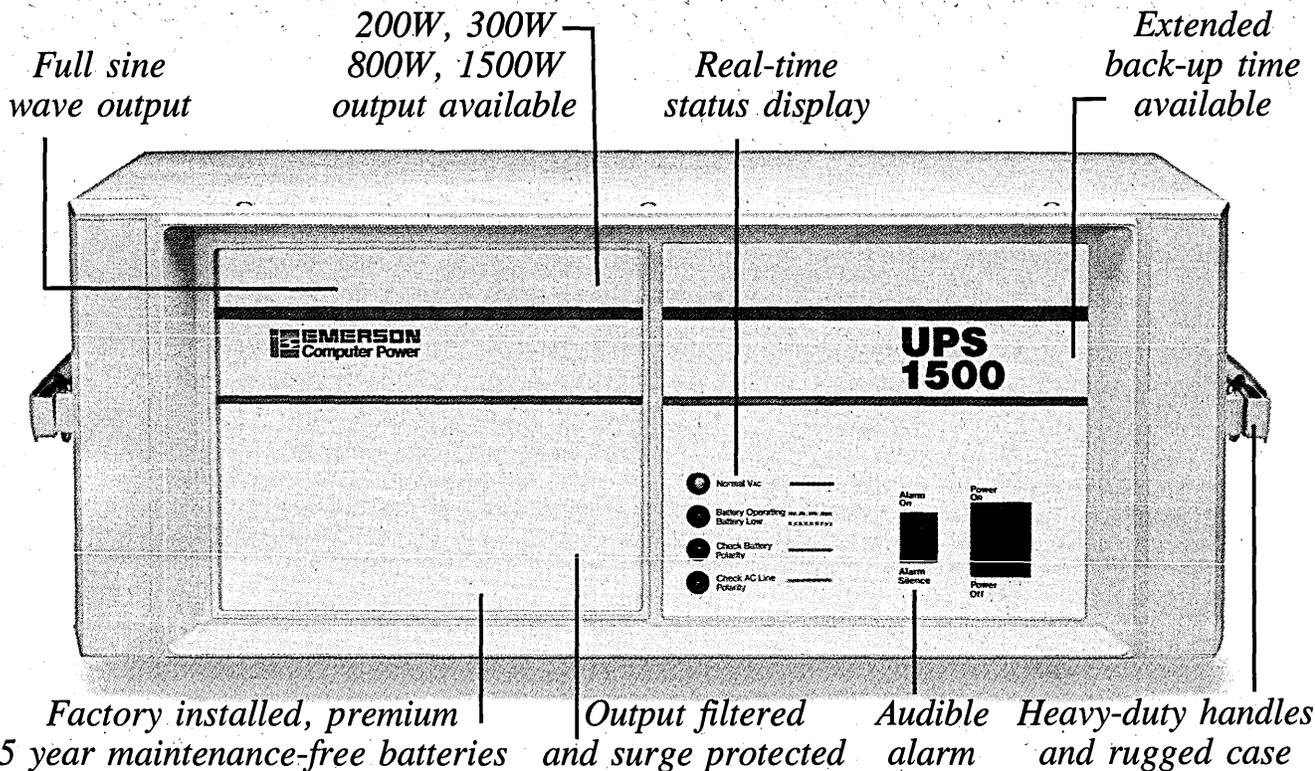
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DATA MATION

DECEMBER 15, 1985/\$3 U.S.A.
VOLUME 31 NUMBER 24
This issue, 191,368 copies

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COVER ILLUSTRATION BY DANIEL ADEL

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America's largest car makers, banks, brokerages, and some of the U.S. government's key installations have chosen to depend on Stratus Computer, Inc. for their newest, most critical on-line applications. Even the world's largest computer companies have put their names on Stratus fault tolerant computers.

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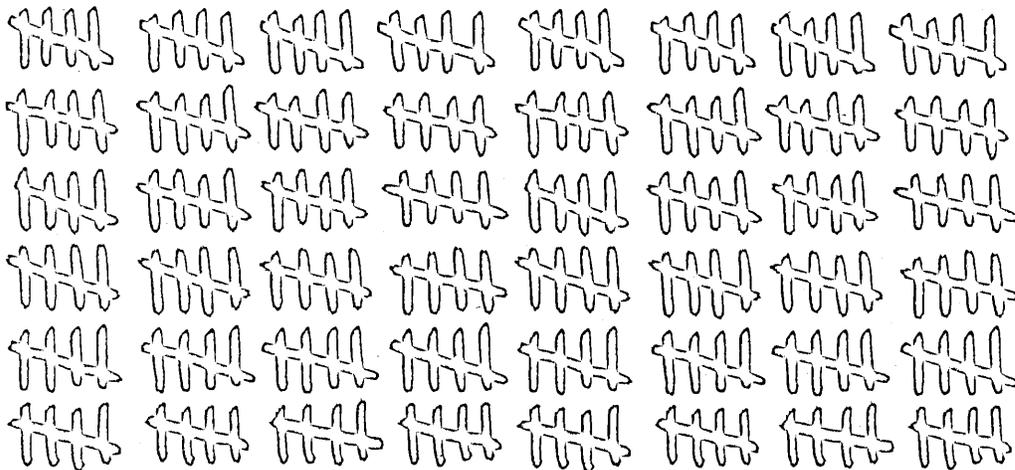
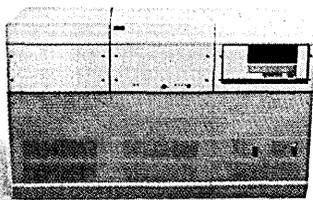
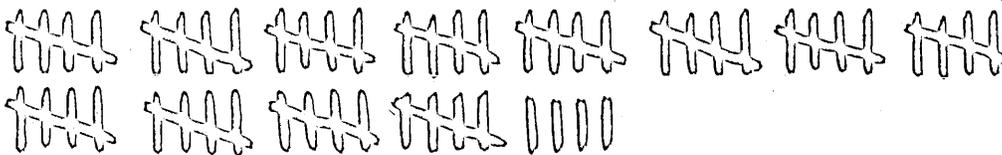
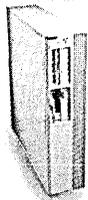
It is for many reasons that all center around one word—reliability. Because after all, when you want to be known for reliability, you have to excel in everything you do.

As we move into an age of greater and greater computer dependency, many of the giants of business and industry are lining up with the one they have decided is better, Stratus. Apparently they prefer to do their thinking for themselves. Perhaps that's how you get to be a giant. For information call Peter Kastner in Massachusetts at (617) 460-2192, or toll-free at 1-800-752-4826. For a copy of our annual report, write: Marketing Communications, Stratus Computer, Inc., 55 Fairbanks Blvd., Marlboro, MA 01752.

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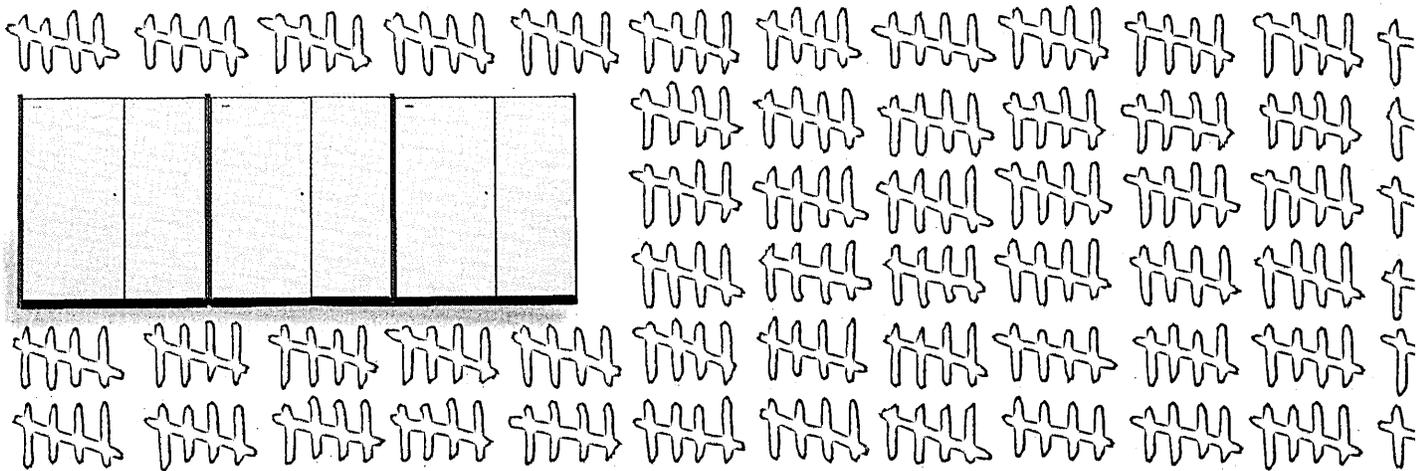
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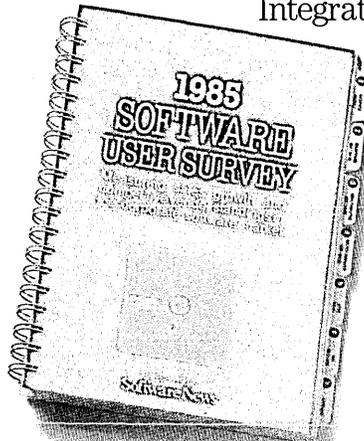
Cullinet is the vendor of choice in the Software News User Survey.

In a Software News survey of 1000 companies, Cullinet was the vendor of choice for anticipated manufacturing application software purchases in 1985.

Maybe it's because the Cullinet Manufacturing System is a 4th Generation manufacturing system that provides all the necessary tools for improved control over planning, production and operations. And maybe it's because the system is part of a complete information strategy.

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For a copy of excerpts from the Software News survey or for information about Cullinet Seminars in your area, phone 1-800-551-4555.



Software Category: Inventory control			
Percent of Installed User Base 1983	Percent of Installed User Base 1984	Percent of Installed User Base 1985	Percent of Sites Considering Vendor For 1985
IBM	38.4	38.4	18.7
M	6.8	6.8	18.7
H			18.7

Software Category: Purchasing management			
Percent of Installed User Base 1983	Percent of Installed User Base 1984	Percent of Installed User Base 1985	Percent of Sites Considering Vendor For 1985
IBM	43.6	43.6	24.6
Arthur Anders			24.6
Hewlett-Packard			24.6
Comserv			24.6
Honeywell			24.6
Cincom			24.6
GMD System			24.6
Martin Marietta			24.6
NCA			24.6

Software Category: Bill of material processing			
Percent of Installed User Base 1982	Percent of Installed User Base 1983	Percent of Installed User Base 1984	Percent of Sites Considering Vendor For 1985
IBM	42.7	42.7	18.0
Comserv	9.8	9.8	18.0
Honeywell	6.1	6.1	18.0
Cincom	6.1	6.1	18.0
GMD System	4.9	4.9	18.0
Martin Marietta			18.0
NCA			18.0

Software Category: Manufacturing resource planning			
Percent of Installed User Base 1982	Percent of Installed User Base 1983	Percent of Installed User Base 1984	Percent of Sites Considering Vendor For 1985
IBM	34.5	34.5	16.7
Comserv	8.1	8.1	16.7
Martin Marietta	6.9	6.9	16.7
Burroughs			16.7
IBM			16.7
Sperry Univac			16.7
Comserv			16.7

Software Category: Master production Scheduling			
Percent of Installed User Base 1982	Percent of Installed User Base 1983	Percent of Installed User Base 1984	Percent of Sites Considering Vendor For 1985
Not included in 1982			27.0
IBM	36.7	36.7	19.3
Comserv	12.3	12.3	19.3
Honeywell	6.1	6.1	19.3
Martin Marietta	6.1	6.1	19.3
Burroughs	4.1	4.1	19.3
MSA	4.1	4.1	19.3
Thomas, Laguban & Associates	4.1	4.1	19.3
Xerox Computer Services	4.1	4.1	19.3
All others (11 firms)	22.4	22.4	19.3
IBM			19.3
Comserv			19.3
MSA			19.3
NCR			19.3
Software International			19.3
Sperry Univac			19.3
Thomas, Laguban & Associates			19.3
ASK			19.3
Cullinet			19.3
Martin Marietta			19.3
All others* (14 firms)			19.3

Cullinet

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CIRCLE 5 ON READER CARD

LOOK AHEAD

NEW DETAILS ON IBM/NTT DEAL

Prior to nailing down an agreement with Japan's Nippon Telegraph and Telephone to jointly develop telecommunications services, IBM Japan spurned an offer to collaborate with Japanese mainframers on developing interfaces between IBM computers and pcm machines, one of the goals of the IBM-NTT deal. "We asked IBM Japan to participate with Internet Planning Corp. members NTT, Fujitsu, Hitachi, NEC, and Nikkei for the purpose of linking our network architectures," Takuma Yamamoto, president of Fujitsu and chairman of the Communications Industry Association of Japan, told DATAMATION. "But IBM refused on the grounds of possibly violating antitrust laws by collaborating with competitors. If the reasons for rejection are true, we can't understand IBM's actions. NTT is not only a common carrier, but also competes against IBM with its Digital Information Processing System." IBM did not respond to inquiries by press time. CIAJ has protested the deal to NTT, the Japan Free Trade Commission, and the Ministry of Posts and Telecommunications. First services from the NTT-IBM deal are expected next year. Meanwhile, Fujitsu sources say the company is moving ahead on its own to develop interfaces between its own network architecture and IBM's Systems Network Architecture using OSI protocols.

IBM MAY WIN ONE DP SITE . . .

Sperry Corp. stands to lose a major Univac installation to IBM at NBC, the New York-based broadcasting company. The network's new information systems manager, Maurice Greenfield, was recently ordered to bring in IBM 370s. NBC, which has been using IBM systems, has run Univac 1100s in its Briar Cliffs, N.Y., data center for years in a number of advertising trafficking applications. The trouble lay mainly in the systems' operating software, based on Sperry's airline reservation package, which has been doctored by NBC so much that there seemed little chance of maintaining it much longer. Some ex-Univac people may leave NBC, too. Greenfield did not return calls, and Sperry officials could not be reached by press time.

. . . AFTER ANOTHER

Meanwhile, IBM seems to be winning a high-profile transaction processing installation at Citibank, the nation's largest bank. The New York institution's automated teller machines have for years been driven by a bunch of minicomputers built by Citi's Transaction Technology Inc. subsidiary, but now an IBM 308X mainframe, running IBM's TPF software (the former ACP), is being prepared to take over. It will get some help in the back end from a Teradata multiprocessor database machine. Citibank and Teradata, of Los Angeles, are collaborating on a TPF-SQL interface.

LOOK AHEAD

PRIME TAKES RISC PLUNGE

Prime Computer Inc., Natick, Mass., has signed a multiyear deal for RISC technology with MIPS Computer, Mountain View, Calif. Sources believe the deal could be worth \$100 million over three years to MIPS, which takes its name from the MIPS RISC processor designed at Stanford University and according to which MIPS is developing commercial applications. Prime declined to disclose the terms and amount of the contract, which calls for board-level RISC hardware and compilers for engineering workstations it intends to announce late in 1986. "We will consume a considerable amount of MIPS production," says a spokesman for Prime, "but we're not prepared to say any more at this time."

Q1 TARGET FOR NEW 3274

IBM's long-awaited 3274 replacement, code-named Columbia, is expected to finally emerge in the first quarter of the new year, sources say. Unlike the present 3274 cluster controller, it will work with multiple mainframe hosts, PCs, LANS, SNA and X.25 networks, as well as 3270 terminals. The new 3274 will allow PCs to talk to each other without going back through a mainframe, sources add. The price of the new controller will range from \$18,000 to \$25,000 depending on configuration, it is believed. A rash of clones from the plug-compatible industry and from leading vendors is expected in the wake of the announcement.

A QUESTION OF NOTICE

Manufacturers in Silicon Valley, where mass layoffs can come at lightning speeds and usually without much severance pay, may be in for a huge fiscal headache as the result of a \$13 million wrongful firing lawsuit recently filed in Santa Clara County Court. The Employment Law Center, a nonprofit public interest law firm in San Francisco, is protesting the layoffs of some 600 Atari workers who were abruptly fired for economy measures back in February 1983. John True, a lawyer for the center, has named Atari Inc., parent Warner Communications Corp., and then-Atari ceo Ray Kassar as defendants. True cites Section 1922 of the California Labor Code, which holds that employment can be terminated by notice from either party. "The question is, just how much notice must be given?" asks True. Lawyers for Atari, Warner, and Kassar moved to have the suit tossed out on grounds that the labor law does not support the lawsuit. That motion was denied. "Right now we're going at it hammer and tongs, taking depositions," says True. How much advance notice would True consider to be adequate? "Studies that have been made that are now being reviewed by the California legislature for possible action show anywhere between as little as two weeks and as much as six months," says True. Trial could get under way by next June.

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CALENDAR

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Hawaii International Conference on System Sciences.

Jan. 8-10, Honolulu. Contact Kim R. Lucak, HICSS-19 Conference Coordinator, Center for Executive Development, College of Business Administration, University of Hawaii, 2404 Maile Way, C-202, Honolulu, HI 96822, tel. (808) 948-7396, telex RCA 8216 UHCED.

PTC '86 (Pacific Telecommunications Council Eighth Annual Conference).

Jan. 12-15, Honolulu. Contact PTC '86, 1110 University Ave., Suite 308, Honolulu, HI 96826, tel. (808) 941-3789, telex 7430550PTC.

Satellite Communications.

Jan. 13-14, New York. Contact Carol Every, Frost & Sullivan Inc., 106 Fulton St., New York, NY 10038, tel. (212) 233-1080, telex 235986.

BUSCON/86 (The Bus and Board Conference and Exposition).

Jan. 15-16, San Jose. Contact Anne Weber, General Manager, BUSCON/86, 17100 Norwalk Blvd., Suite 116, Cerritos, CA 90701-2570, (213) 402-1610.

COMMTEX International.

Jan. 16-20, Las Vegas. Contact Jerome Raymond, International Communications Industries Association, 3150 Spring St., Fairfax, VA 22031-2399, (703) 273-7200.

Britain Has IT.

Jan. 22-23, London. Contact Colin Leeson, PA Consulting Services, International Office Automation Division, 192 Sloane St., London, England SW 1X 9QX, (01) 235-9088.

Saudicomputer 86.

Jan. 26-30, Riyadh, Saudi Arabia. Contact Brendan Jennings, Overseas Exhibition Services Ltd., 11 Manchester Square, London W1M 5AB, England, tel. (01) 486-1951, telex 24591.

Communication Networks '86.

Jan. 28-30, Washington, D.C. Contact Registration Services, CW/Conference Management Group, Box 880, Framingham, MA 01701, (800) 225-4698.

Systems Design & Integration Conference.

Jan. 28-30, San Francisco. Contact Systems Design & Integration Conference, 8110 Airport Blvd., Los Angeles, CA 90045, (213) 772-2965.

Micro-Computer '86.

Jan. 29-Feb. 2, Frankfurt, West Germany. Contact G.J. Vigier, Messe Frankfurt GmbH, Ludwig-Erhard-Angale 1, 6000

Frankfurt 1, West Germany, tel. (069) 7575-0, telex 69 90952 MESSE F.

FEBRUARY

ATI '86 (Seventh Symposium on Automation Technology).

Feb. 3-7, Monterey, Calif. Contact Dr. Jeffery Smith, ATI, P.O. Box 242, Pebble Beach, CA 93953, (408) 624-5892.

OFC '86 (The Conference on Optical Fiber Communication).

Feb. 24-26, Atlanta. Contact the Optical Society of America, 1816 Jefferson Place N.W., Washington, DC 20036, (202) 223-0920.

Nepcon West 86.

Feb. 25-27, Anaheim, Calif. Contact the Cahners Exposition Group, 999 Summer St., Stamford, CT 06905, (312) 299-9311.

MARCH

Comdex in Japan.

March 3-6, Tokyo. Contact the Interface Group Inc., 300 First Ave., Needham, MA 02194, tel. (617) 449-6600, telex 25845.

Automation '86.

March 9-12, Houston. Contact Guy Rabbat, Automation '86, P.O. Box 202350, Austin, TX 78720-2350, (512) 331-0662.

Federal Dp and Communications Conference & Expo.

March 11-13, Washington, D.C. Contact the Interface Group Inc., 300 First Ave., Needham, MA 02194, tel. (617) 449-6600, telex 951176.

Hannover Fair CeBIT.

March 12-19, Hannover, West Germany. Contact Hannelore Stockhammer, Deutsche Messe- und Ausstellungs-AG, Messege-lande, D-3000 Hannover 82, tel. (511) 89 23 89, telex 9 22 728.

Networking '85.

March 23-31, Tokyo. Contact Brad Ketchum Inc./High Technology Publishing Corp., 38 Commercial Wharf, Boston, MA 02110, (617) 227-4700.

OAC '86.

March 24-26, Houston. Contact American Federation of Information Processing Societies Inc., 1899 Preston White Dr., Reston, VA 22091, (800) OAC-1986.

Artificial Intelligence '86.

March 24-27, Singapore. Contact Karin Van Schouten, North-Holland, P.O. Box 1991, 1000 BZ Amsterdam, the Netherlands, or Elsevier Science Publishing Co., P.O. Box 1663, Grand Central Station, New York, NY 10163, (212) 370-5520.

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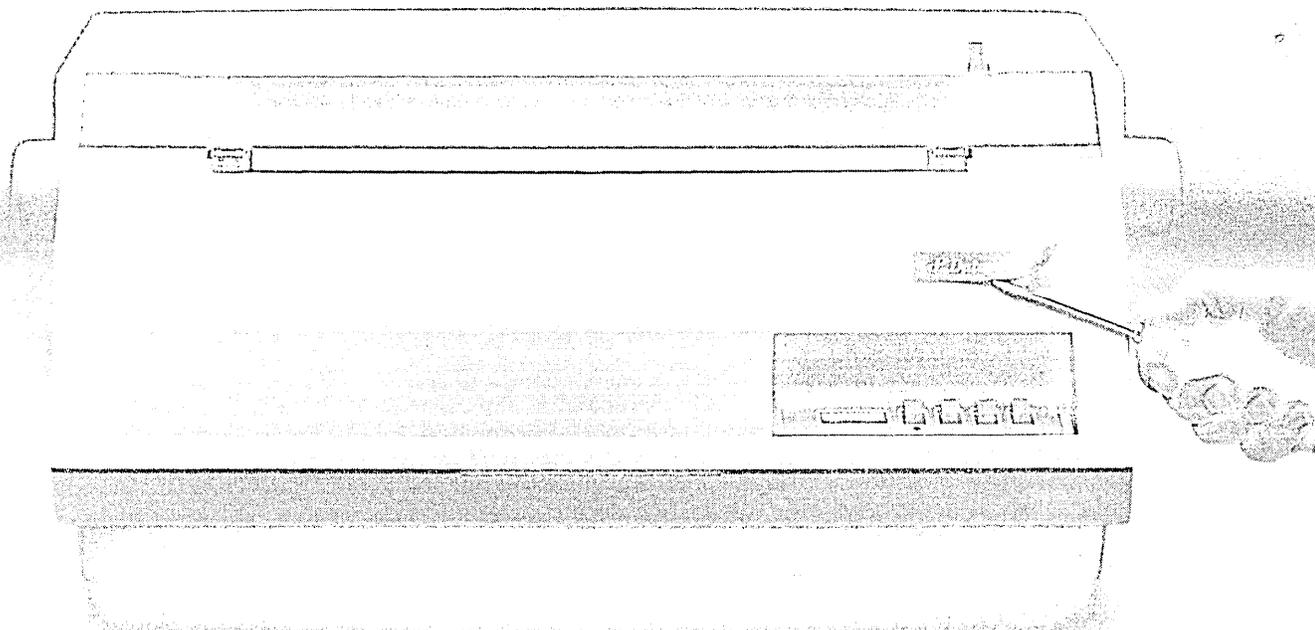
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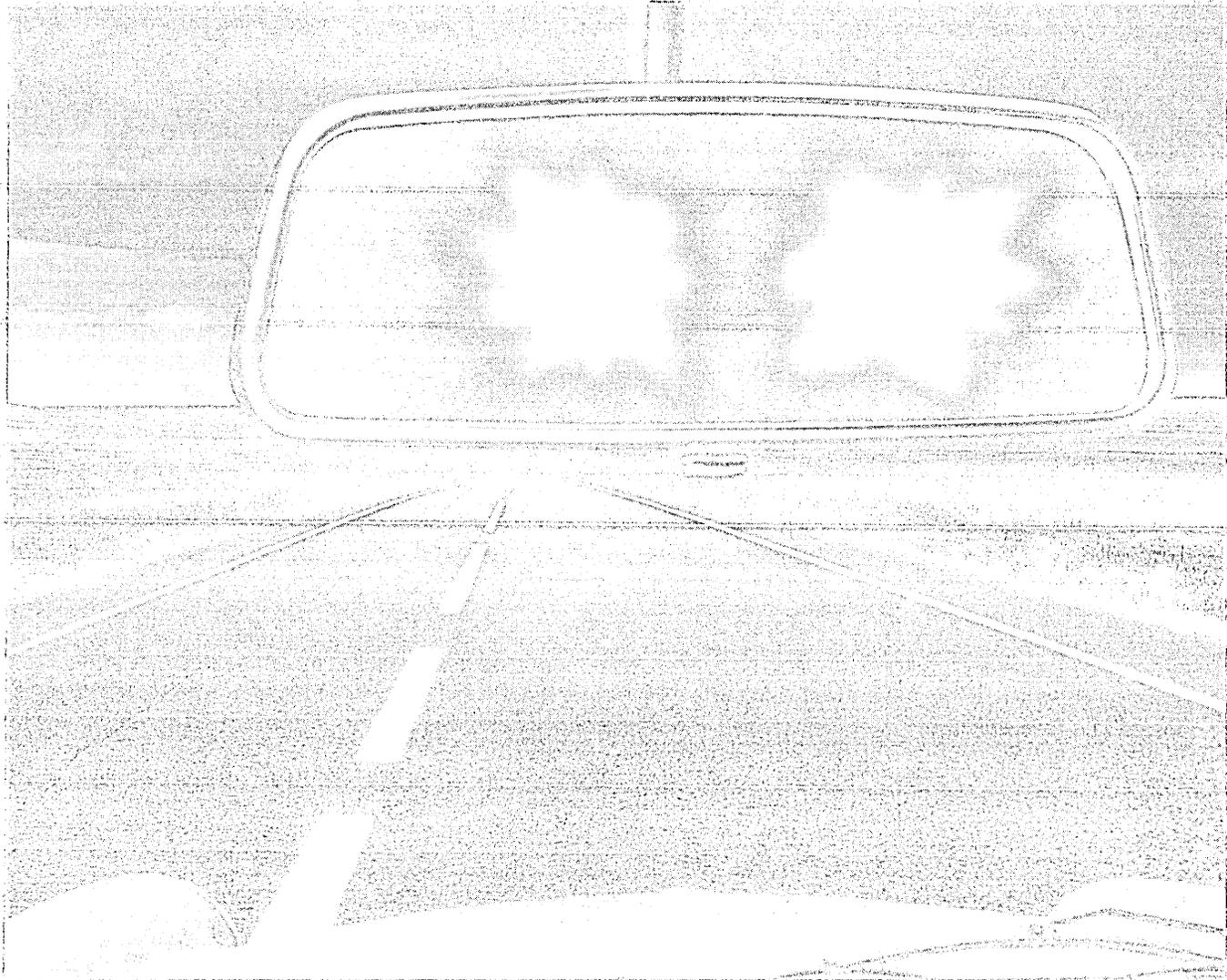
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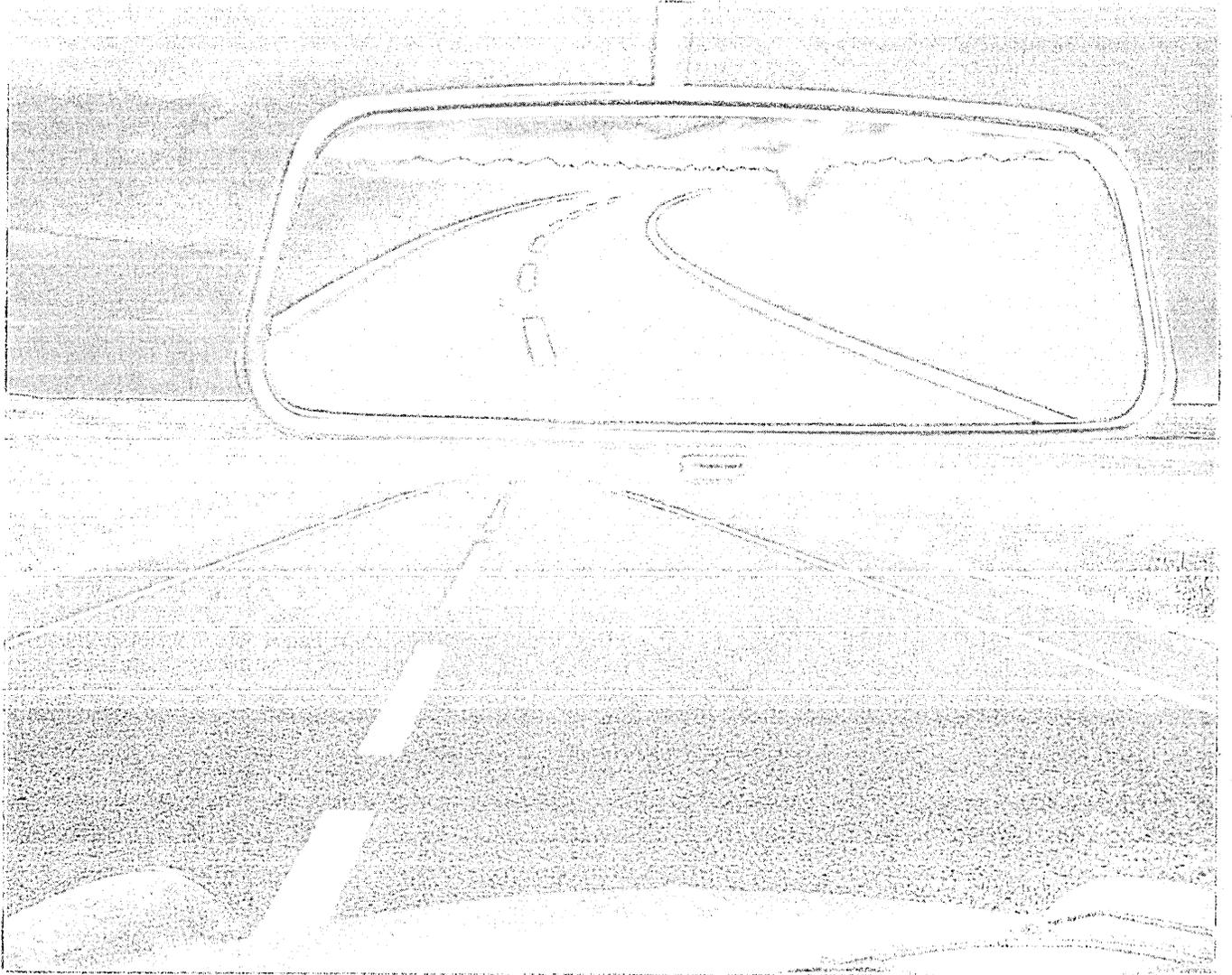
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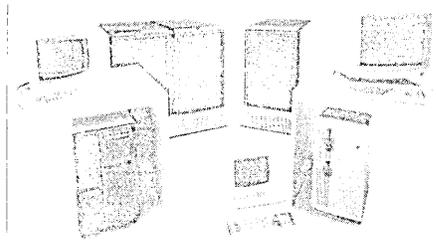
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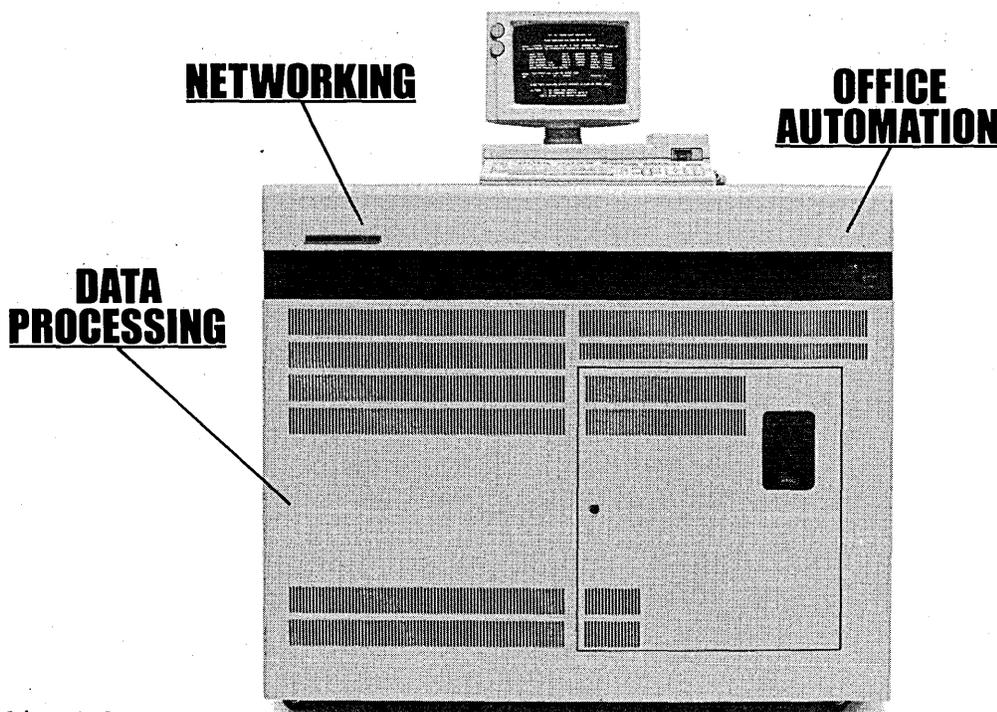
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LETTERS

SWEET TALK

Frank Sweet's article on "Keyfield Design" (Oct. 1, p. 119) left me uncertain that he had made his point. This is the first time I have heard anyone proposing a dataless key, so the article got my immediate attention. Both examples Sweet used to demonstrate the potential problems of using data-embedded keys seemed to be problems more of inadequate initial design than of support for his concept.

If the keyfield is dataless, it seems to me it becomes meaningless except to the computer. The key becomes more a record index number than a key. The designer is still left with the need to access records using some knowable data. If a separate sort file of ordered keys must be maintained in order to access the data record key, haven't we just shifted the problem from the data file to the sort file?

ARNOLD R. MADEIRA
Cranston, Rhode Island

I have been in the database function as a DBA and DA for about 10 years. In going through my file of Articles Worth Keeping about Database, I noticed that most of them were by one Frank Sweet. His writing approaches seemingly complex situations, clarifies them, and proposes solid methods for dealing with them. He has the ability to clear away the technological smoke and reveal reasonable approaches to making the database environment a distinct possibility. Keep up the good work, Frank.

JOSEPH E. O'DELL
Whirlpool Corp.
Benton Harbor, Michigan

IS THIS PERFECTLY CLEAR?

The Look Ahead of Sept. 15 (p. 13) reported incorrectly that Southern California Edison had been ordered by the California Public Utilities Commission to include literature from a group called the Utilities Consumer Action Network (UCAN) in Edison electric bills.

The commission did not require Southern California Edison to include UCAN literature in its bills. That order applied to another California utility, San Diego Gas & Electric.

Southern California Edison, however, is a party to the filing before the U.S. Supreme Court protesting the commission's order. The protest was filed by San Francisco-based Pacific Gas and Electric.

REBECCA A. SORDELET
Corporate Communications
Southern California Edison
Rosemead, California

SCIENCE OR ENGINEERING?

Curt Hartog's attempt ("Of Commerce and Academe," p. 68) to answer the question posed on your Sept. 1 cover—"Is Computer Science Practical?"—should have been preceded by an attempt to address the question, "Is Computer Science Science?"

The undergraduate courses I have seen were almost pure engineering: the use of science and mathematics for the design, construction, and utilization of data processing tools, both hard and soft.

EDWARD C. FREILING
Science Software Services
Fredericksburg, Virginia

HEADACHE

Your Oct. 1 issue included a letter (p. 15) from Gil E. Gordon in support of telecommuting. It is an interesting idea and a real headache from the standpoint of data security. Perhaps DATAMATION can address this subject in future issues.

As a working parent who has taken several years off to raise a child, I can see the lure of telecommuting as well as the potential conflicts. Those considering such a situation would be advised to consider the demands presented when one is in the position of performing parenting and another job simultaneously.

The idea of telecommuting has

traditionally geared itself toward women and the handicapped. The potential for economic disparity and a piecemeal mentality is bound to present itself. Furthermore, these people will be situated away from the corporate ladder and out of the mainstream.

Presuming a willing telecommuting work force, given the above-mentioned environment, we still have the problem of hardware and data security. From an auditing standpoint, telecommuting is problematic to say the least. The idea of confidential databases leaving the office is not popular in security-minded circles. It may well be an idea whose time has come, but its implementation will certainly require a thoughtful approach.

D. ADAMS-KADEN
Edp Auditor
Long Island Savings Bank
Huntington, New York

NOT SO SMART

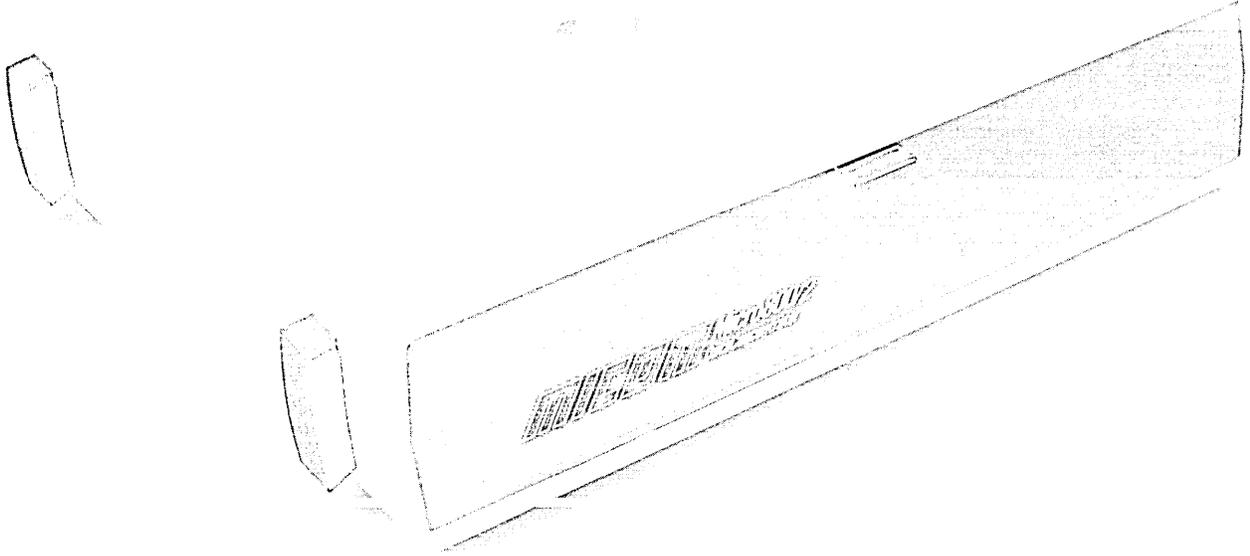
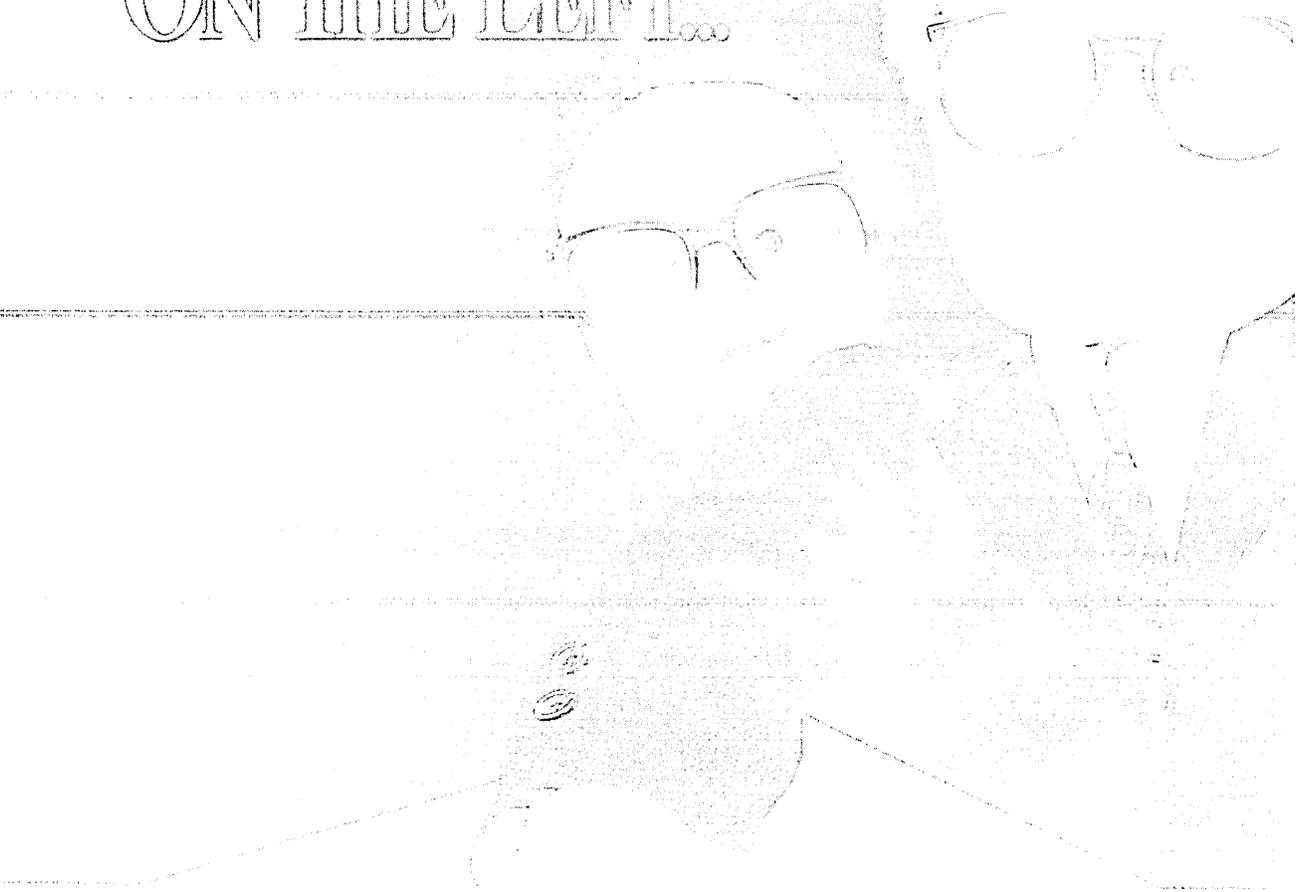
In "Are Smart Buildings a Dumb Idea?" (Oct. 1, p. 101), you cite a Booz, Allen & Hamilton forecast of a \$10 billion shared tenant services (STS) market by 1990. While we are indeed optimistic about the potential for STS, we are not *that* optimistic.

We have projected that the addressable market (i.e., customers who could use STS) will be \$10 billion by 1990. Many of these customers, however, may not have STS available in their buildings or will opt for competitive suppliers and services.

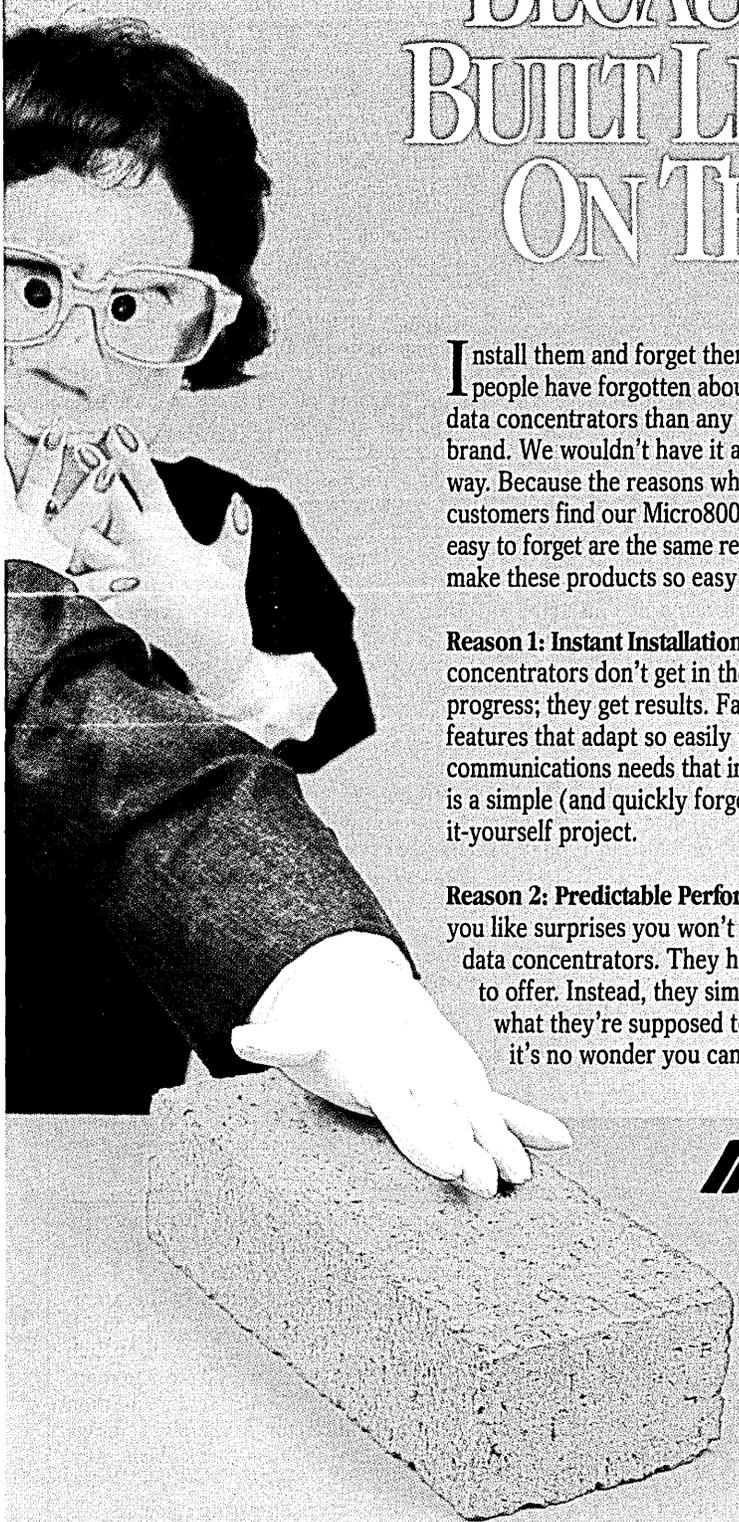
We believe that the actual STS market size will depend on many factors that are today unpredictable, the most important of which may be how effective STS operators are in getting their "service message" across to tenants.

JOAN TRUDE
Senior Associate
Booz, Allen & Hamilton Inc.
New York, New York

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INFOCUS

DASD: TOO MUCH AIN'T ENOUGH

On-line data storage keeps getting cheaper, but it's also getting harder to manage.

by David Stamps

It's a well-chronicled fact that the cost of on-line data storage is steadily dropping. As direct access storage devices (DASD) get ever larger, the cost per megabyte stored gets ever smaller. Now down to \$20 per megabyte, by the end of the decade, analysts predict, it could dip below \$10 per megabyte.

But for some customers, cheaper disk drives may be turning out to be too much of a good thing. An explosion of applications calling for on-line disk storage has pushed the use of DASD ever higher, until it is often the largest hardware expense in an MIS budget.

"Even though the cost of storage per megabyte is going down, we still end up spending more and more money on DASD because of the expanding needs of our users," says Lynn Darsh, manager of storage subsystems for Chemical Bank, New York.

Chemical Bank has just under 1,000 IBM 3380 disk drives and its DASD growth is surging along at about 60% compounded yearly, slightly above the industry average. That growth in DASD volume prompted the bank to evolve its storage management position into what Darsh terms "a key planning position," in order to help keep some control over DASD.

Other users measure the ever-growing use of DASD not just in dollar cost but also in physical space, and they too are concerned by what they see.

"We'll be rolling in quad-density disk drives as soon as they become available, and we'll still be blowing the walls out of our data center," says Michael Nearman, manager of technical support services for United Airlines.

"If our disk storage keeps growing at the rate it is now, we'll be seeing the curvature of the earth over the tops of our desks," says Nearman. "There needs to be a change in the way DASD is managed."

Managing DASD. That is the challenge the big shops are facing. Mounting numbers of disk drives and rapidly rising dollar investments in DASD acreage are

prompting many of them to undertake special storage management projects.

"We're paying about the same for DASD today as we pay for mainframes," says Steve Sheinheit, who earlier this year completed a four-month study of DASD use at Manufacturers Hanover Trust, New York.

Companies that go to the trouble to measure their DASD usage, as did Manufacturers Hanover, soon discover another component to be factored into the DASD management equation. To the growing numbers and escalating dollars worth of disk hardware must be added a declining level of DASD efficiency.

"As devices get larger, there is a tendency, we found, to leave large blocks of space unused," reports Sheinheit. "It's true that as disk devices get larger, the more the cost of storage per megabyte drops, but it's also true that with larger storage devices, there is a noticeable tendency to be less efficient.

"Our realized cost improvement in DASD over the past five years is 13%," he says, "but our efficiency rating for DASD use is only about what GUIDE and other groups cite as industry average."

And that industry average is not impressively high. According to a survey completed in April of this year by GUIDE, the user group of IBM's commercial customers, allocated storage on 3380 disk drives is at 62%, down from 66% on 3350s five years ago. Considering that on average only between 65% and 70% of allocated storage is actually used, the average utilization for DASD is only about 42%, GUIDE reports.

Managing DASD is not an easy job these days. First of all, the available automated software tools are not what they could be. While there are some useful

"We'll be rolling in quad-density disk drives as soon as they become available, and we'll still be blowing the walls out of our data center."

packages, most users agree that there are few if any comprehensive DASD management systems.

IBM's own Data Facility/Hierarchical Storage Manager (DF/HSM) is considered by many to be only a first step toward some future, overall storage management system. Some users question IBM's motivation for developing storage management software—particularly now, when it has the market for high-performance disk drives almost to itself.

"If we rely on IBM and their future direction with HSM, it will end up costing us more than we can afford," says United's Nearman. "IBM, because they sell the resource, lacks the incentive to manage it.

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CIRCLE 11 ON READER CARD

IN FOCUS

They aren't going to sell us the software that lets us get by with one box where today we need 20. We'll look at any option—mass storage subsystems, a workable optical disk, whatever," he continues. "It looks like we're going to have to be the systems integrators ourselves on this one."

Lacking software with which to manage DASD, companies must make do with human beings. But how large should a DASD management staff be? The discrepant answers to that question show how imprecise a science DASD management is.

As recently as a few months ago, IBM marketing staff were telling users in presentations on DASD management that

"As disk devices get larger, the more the cost of storage per MB drops. It's also true that with larger storage devices, there is a tendency to be less efficient."

the optimum staffing ratio was something like one employee for every 10 gigabytes. That figure perplexed users, whose storage management staffs, if they exist at all, are generally spread much thinner than one per 10.

Kurt Engelbert, manager of technical support for RCA, calculates his DASD management staffing at about one person per 32 gigabytes. Nearman estimates that for some of its data files United is getting by with no more than one person per 100 gigabytes.

"I heard their pitch several times, but to tell you the truth, I can't relate to it," says Tony Ywoskus, manager of technical services for John Hancock Mutual Life Insurance Co. in Boston. "By their reasoning, we should have 62 people handling our DASD. We have more like eight people dedicated to DASD management. If I added up bits of people throughout the organization, I could come up with maybe 15," he says.

"I guess what IBM is saying is that every dataset that's put into a production environment has to be looked after, that you should be managing on a dataset level not a volume level," Ywoskus adds. "There may be some benefit to that, but frankly I don't see it."

What IBM is now saying is that the proper ratio of staff to DASD is impossible to nail down, but that it might be more like one person per 32 or 35 gigabytes, depending on whether a user counts only those people directly supporting DASD, not tape, and if a customer's definition of support staff does not include end users and programmers.

"IBM continues to be concerned about the people-intensive nature of data storage," a company spokesman says.

"Our long-term goal is to reduce the ratio of people required for data management."

For now, the question of how many people to employ in the pursuit of ever-proliferating DASD management may be academic. With the cost of DASD hardware still dropping, many MIS managers cling to the traditional view that hardware is cheaper than people.

"The tendency has been to throw out more spindles and not worry about bodies," says William Luebke, director of RCA's corporate data center in Cherry Hill, N.J. "Don't worry about efficiency when the hardware is so damn cheap."

Even if a data center manager wanted to make an honest effort at improving DASD efficiency, it is generally believed—perhaps rightly so—that a person can spend many hours trying to make DASD efficient and still come away with only a nominal gain. That perception is likely to scare people away from the task, suggests Mike Chuba, an analyst with the Gartner Group in Stamford, Conn.

"Would you ask your boss for two extra people so you could boost your efficiency from 50% up to 60%?" asks Chuba. "Why even call attention to that kind of inefficiency? It makes more sense to keep quiet and install more hardware."

The traditional view, however, may be starting to change. "Sure, disk storage is getting cheaper," says RCA's Luebke. "But if everyone is using twice as much disk space as he needs—well, the cost of a 3380 these days is such that it might be time to look at the trade-off of hiring some more people to manage DASD."

For most companies, the first step toward managing DASD should be to measure its use. "We believe in the old adage, 'If you're not measuring it, you can't manage it,'" says Manufacturers' Sheinheit.

Unfortunately, measuring DASD usage is not a straightforward undertaking. Manufacturers Hanover spent four months interviewing staff and taking different measurements of DASD use at one of its six data centers. It measured DASD size and utilization, analyzed staffing costs, compared capacity and cost for different applications, broke down the figures for database and nondatabase applications, active vs. nonactive datasets, etc.

Sheinheit had not expected to spend four months pulling together the data required to profile DASD usage at the data center. Part of the problem, he explains, is that the bank had to develop some of its own software. Much measurement and performance data could be pulled together using DASD usage software borrowed from IBM, and statistical

analysis routines. But the DASD usage software didn't handle VSAM data, for example, so Sheinheit's staff had to develop software to analyze it.

The objective of Manufacturers' DASD study, explains Sheinheit, was to develop a methodology for DASD capacity planning to be used eventually at all of the bank's data centers. In 1986 it will issue its report and guidelines as a corporate-wide approach for improving DASD planning and efficiency.

"There's no doubt that there is room for improvement," says Sheinheit. Just by enforcing rules to clean out dead files and remove old files from DASD to tape, the bank recovered 10% of its DASD space at the data center that served as the pilot.

"We can probably get that same sort of yield just cleaning up the other centers too," Sheinheit explains, "but that's not really the point of the project. We want to improve the efficiency of the data that's used and not simply clean out the old data."

The approach taken by Chemical Bank to improve its DASD usage is a two-year-old (and still going) project to switch from volume-based to pooled DASD storage. The bank has also created a centralized planning function "to apply principles of storage management across the board at the various data centers," notes Lynn Darsh. "DASD is growing so fast that without some central management you end up with old data, wasted space, lost money."

"What we had before," she says, "was a large number of volumes, many of which had mixed data. Frequently, the

"The tendency has been to throw out more spindles and not worry about bodies. Don't worry about efficiency when the hardware is so damn cheap."

mix was neither logical nor desirable. You'd end up with production data and test data on the same volume."

Moreover, she adds, many managers hoarded space on volumes. Often they would request more space than they really required. Space on volumes was often traded back and forth among managers in private deals. "In other words," says Darsh, "there was no central control."

Now, as part of the controlled pool approach, Darsh says, files are monitored to make sure that the proper amount of space has been allocated. Certain kinds of files don't require a formal request for space. Seventy cylinders of test data, for example, don't need approval. But the space is monitored. If the data aren't used within 45 days, they get compressed and then rolled off onto tape.



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CIRCLE 12 ON READER CARD

IN FOCUS

Tony Ywoskus of John Hancock, which has over 625 gigabytes of on-line data at two computer centers, agrees that enforcement of data storage rules can yield vast improvements in DASD storage.

"You need to have good blocking factors, some set of naming conventions, and you migrate the stuff that is not used

"We want to improve the efficiency of the data that's used and not simply clean out the old data."

frequently to tape. Just doing those three things can lead to enormous savings."

John Hancock has had a storage management group for a number of years, says Ywoskus. Since last year, the emphasis has been on incorporating new software products into storage management. These include IBM's DF/HSM, DMS from Software Laboratories in Dublin, Ohio, and PDS MAN from Goal Systems of Columbus, Ohio.

Ywoskus admits that software tools today do not provide all the features users need. HSM, for instance, could provide better reporting, and he would like to see it manage data on other than a volume basis. It would be very useful, he adds, if

it could move databases.

Still, some of the new software tools, including HSM, can yield impressive results when used in conjunction with principles of DASD management, claims Ywoskus. "In one site alone, we cleaned up the equivalent of 80 volumes of 3350s," he says.

But attempts to tackle the DASD management problem are not going smoothly or quickly for all organizations. Four years ago, Bruce Bernard perceived a critical crunch coming in DASD storage at New England Telephone Co., Boston.

"There were really several problems," recalls Bernard. "There was uncontrolled growth, inappropriate use of disk media, files that were difficult to configure and maintain."

Bernard, who was working in one of the three data centers at that time, suggested to management that if they didn't start working on a solution right away, the problem could soon be a full order of magnitude greater.

The company has taken some important steps toward solving its storage problems. It has formed a four-person DASD management team and started a pilot to identify and eliminate private data files that squander storage space.

"But it has been a long haul," says Bernard, now manager of capacity planning. It took until late 1983 to name a DASD manager, and then another two years to appoint the four-person staff.

The real problem with DASD, as Bernard sees it, is one of management and user perception, and he believes that no real headway may be made until both management and applications developers can be convinced to change the way they regard DASD.

"As a project gets funded," says Bernard, "it is funded with an eye toward new DASD. In other words, if a project is worth doing, it's worth spending money on new DASD. But when you add new

"Users have been given the perception from the press that DASD is cheap, so there is no impetus to do good projections."

storage, it just compounds the problems at the data center.

"Users have been given the perception from the press that DASD is cheap, so there is no impetus to do good projections. Until there is a new way of looking at DASD resources by developers, the data center is going to keep getting deluged



with new on-line applications."

Marc Butlein, a Gartner Group analyst who coauthored a report on DASD pricing and usage in September, agrees that part of the problem with DASD is the perception in the user community that DASD is cheap. Butlein has some doubts about the ability of DASD managers to change the patterns of users' habits. "It's

"IBM continues to be concerned about the people-intensive nature of data storage. Our goal is to reduce the ratio of people required for data management."

like asking a traffic cop to control the consumption of gasoline," he says.

If companies are serious about controlling the growth of DASD, the traffic cop approach is a poor one, says Butlein. A better method would be to use pricing as a control and establish an effective chargeback system.

An effective chargeback system, says Butlein, is one that forces users to self-manage the DASD resource. Geared toward that objective, the scheme need not be tied to the cost of DASD hardware.

But users, including some who have spent more than a little time strug-

gling with DASD management issues, express some reservations about using chargebacks to control DASD. Nor is it universally accepted that DASD growth, as unbridled as it seems these days, even needs to be slowed down.

An important part of the change in DASD management at Chemical Bank has been to place more emphasis on chargebacks.

"The idea of having people pay for what they use is reasonable," says Lynn Darsh. "A chargeback system does focus on what it costs to store data on-line, something that I'm not sure all users are aware of," she says. "Chargeback can be a way of quantifying the trade-offs between on-line storage and some other kind of storage, but it shouldn't be a means of curbing DASD growth per se."

"Chargeback systems are always difficult and probably not fair," says Sheinheit of Manufacturers, where the details of DASD charges are left to the discretion of individual data centers.

"Some users get charged for more performance than they get, some for less. Over time, we may be able to change users' behavior, migrate them to other kinds of media. Eventually we'd like to move toward more direct kinds of charge-

backs—per track, per transaction, or whatever—to make the system more fair." In the meantime, he says, "you have users trying to cope with a rapidly changing technology. It isn't clear that we can get to a one-for-one chargeback system.

"I don't disagree with the concept. It's just that chargeback is only one of many pieces of DASD management."

Sheinheit too is unwilling to say that DASD usage needs to be curbed. DASD growth in some areas, even if 100%, may be positive, if it's an area where it supports a profitable product.

"Our goal for now is just to be able to measure DASD usage accurately. By giving data centers the tools to measure DASD, you might assume that they'll have the means to stem growth, but that's not necessarily the goal. It may be that DASD will grow even faster, but more effectively." ©

David Stamps is a Minneapolis-based free-lance writer.

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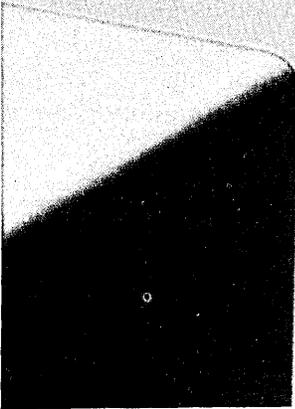
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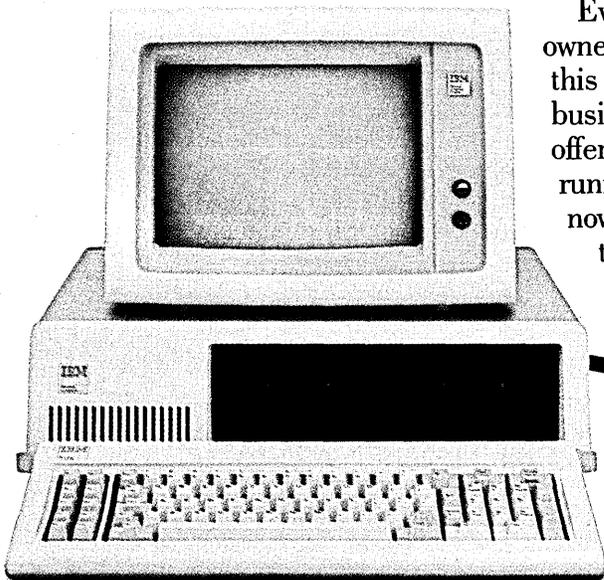
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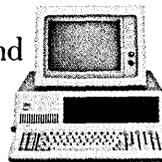
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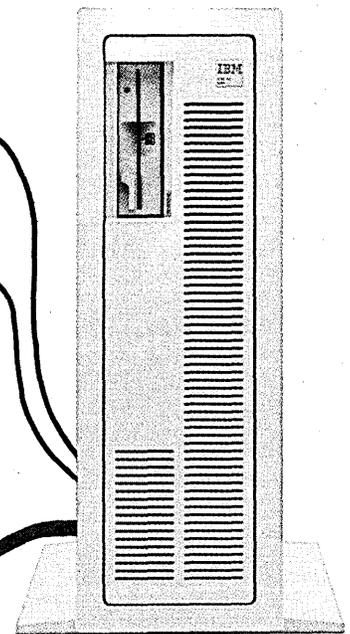
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NEWS IN PERSPECTIVE

MIDRANGE SYSTEMS

OUT OF GAS

Users see shortcomings in the System/36, opening up possibilities for DEC, DG, and Wang.

by Ralph Emmett Carlyle

Users are openly accusing IBM of promising more than it has delivered in the burgeoning office automation market.

A growing number of what users say are failures and false starts in the office have generated complaints that the computer giant is still "selling futures," not real solutions. Their ire is now being vented on the System/36, which IBM describes as its office and departmental system. Users describe its architecture as "grossly underpowered" and not well suited for sophisticated departmental processing. Users do say that the 36 is suitable for small business data processing.

After what it calls its honeymoon period of getting to know the System/36, Volkswagen America's corporate headquarters at Warren, Mich., has stopped short of placing an \$8 million order for 40 of the computers. "The machine is little more than a file server, and we need something that, in addition, will handle spreadsheets, graphics, time management, electronic mail, and the like," says Warren Kress, manager of Volkswagen's Information Center, and the person entrusted with the task of evaluating departmental solutions.

Kress says the decision was taken with IBM's blessing, after the mainframer conceded that the System/36 couldn't meet Volkswagen's departmental computing requirements. Volkswagen is, however, going ahead with its plan to install some 600 System/36s at dealerships throughout the country. "It's a fine small business system or standalone dp computer for field offices," says Kress. "It's simply not a departmental processor."

Elsewhere the story is similar. "The 36 is okay for simple applications, but our demands are heavier and our transactions more varied," says a vp of MIS at a large East Coast insurance group, which chose the Wang vs system instead. "It's not the engine for us. IBM is promising more than it can deliver."

Users, guaranteed the protective cloak of anonymity, are quick to list the System/36's more obvious deficiencies: 16-bit architecture, no DBMS, no obvious

growth path. They allege others that are less obvious: batch-oriented disk handling, poor utilities and end-user interface, poor integration between the 36 and PC operating systems, and low functionality from Displaywrite/36—even to the point of missing basic word processing modes such as repagination.

IBM declined to address each allegation specifically, but did dispute, through a spokesman, users' claims that the S/36 is not a suitable departmental processor. "We're constantly evaluating additional requirements for the System/36, and, as appropriate, we have and will continue to strengthen the S/36's role as IBM's strategic departmental system." The spokesman added that there is no indication of a downturn in orders for the machine.

IBM's protestations, however, do not change users' views of the S/36's role. "The System/36 wasn't designed for the office or department. It was built by IBM's Rochester, Minn., division as a replacement for the System/34 small business system," says Tom Teresi, chairman of the System/34 and 36 division of the IBM user group, COMMON. "The machine was never designed as a mainstream [i.e., corporate] product, but IBM saw an opportunity to sell it as such."

Teresi says that when you load office applications onto the System/36, you never know what response time to expect. "The users have all told me that they'd rather use Displaywrite III on a PC than Displaywrite/36," he says.

Even IBM's System/36 vars are now saying IBM is "misleading" its customers. "It's not an office system, whatever IBM says. As a small business or standalone dp box it's fine—and we sell tons of them," says Douglas Altenburn,

"It's not the engine for us. IBM is promising more than it can deliver."

chairman of Endata, Nashville. "But as a corporate office system it's been oversold by IBM and overbought by users. I think they're beginning to recognize that."

One former System/36 var, now with Wang, describes the 36's architecture as I/O- and disk-constrained. "There seems little future in it," says Robert Curran, vp at Software Decisions Inc., Independence, Ohio. "A newer, faster 36 with more memory wouldn't change that."

Vars and independent software companies have been speculating that a much bigger System/36—perhaps a System/37—is in the cards for next year. "The System/36 has run out of gas, and IBM must hold its market under increasing pressure from the mini makers," says Michael Malloy, marketing director at Fusion, a Mill Valley, Calif., company



ILLUSTRATION BY RAFAL OLBINSKI

that writes software for the so-called 3X group of machines built by Rochester: the System/34, 36, and 38.

Most of the speculation has centered around a new machine with a 24-bit architecture, a doubling of the cpu power to 0.5MIPS, and a growth in main memory and auxiliary storage to four megabytes and two gigabytes, respectively.

Fusion's Malloy expects (or at least hopes for) more. "We're looking for more similarities with the System/38, including support for RPG III and its control language, CL. We also expect a similar logical file structure to the 38," he says. He adds that these moves would help position sites for a speedier and less painful migration to the System/38, should users choose that path.

As revealed by DATAMATION (see "Bringing It All Home," June 15, p. 54), IBM has been preselling one future (circa 1987) system, code-named Fort Knox, that will resolve all its midrange incompatibilities in one easy step. Resident on the machine, the story goes, will be software emulators for the System/36, 38, and the 4300. Talk also concerns a

RISC-based processor that can be slotted into all IBM's diverse midrange systems to produce a common hardware bond.

Many corporations laugh at talk of such easy and painless solutions. "If only it were that simple," they say of the latest "IBM future" doing the rounds. Major customers, such as Mobil, are not prepared to put their business on hold while they wait for "phantoms" of the future. Mobil is known to be actively testing the office automation solutions of the leading mini makers. Interest in IBM's System/36 has waned, say insiders, and Digital Equipment Corp. is considered the front-runner for a three-year, \$10 million to \$20 million OA deal.

Only two years ago, DEC's All-in-1 software was jokingly referred to by customers as All-in-10 because of its alleged lack of integration. IBM and Wang held 60% of the OA business between them. Today, some estimate, DEC has almost one third of the total market for integrated OA software, and Data General has come from nowhere to take a 25% share.

The mini makers concede that IBM has won the pc war, and that SNA,

through its Document Interchange Architecture (DIA) and implementation for the office (DISOSS), provides the software framework for future OA systems. Until recently, the mini makers, with the possible exception of Data General, fought both trends and lost hands down. Now, users say, they are taking a new tack by supporting the IBM PC and SNA/DIA/DISOSS, and a more favorable competitive environment has opened up for them.

By allowing the IBM PC to communicate both locally and remotely with their minicomputers and by providing for the transfer of files between their minis and IBM mainframes, DEC, DG, and Wang have positioned their products as departmental controllers. Now they are attacking IBM's known weakness, midrange systems, and not its strengths.

"We're very interested in DEC's solution," says Volkswagen's Kress. "But we're holding back at IBM's request—at least until year-end. IBM says it is studying our needs more carefully and will respond by the new year." He adds, "We're all anxious to know what IBM's new departmental system will be." ©

NEWS IN PERSPECTIVE

OPERATING SYSTEMS

MULTI-USER DOS?

What if Microsoft announces a multi-user DOS and nobody cares?

by Irene Fuerst

Rumors abound that Microsoft, the Bellevue, Wash.-based company that created the MS/DOS personal computer operating system—better known to IBM PC users as PC/DOS—is cooking up a multi-user version of the same.

Microsoft vigorously denies it, saying MS/DOS is a single-user solution; Xenix, a Unix derivative, is the company's multi-user solution.

Fueling rumors is a statement by IBM Entry Systems Division president William Lowe: in a speech last October at Boston's Hammer Forum, he said that IBM was committed to a multi-user version of PC/DOS. (IBM relies upon Microsoft for DOS development.) A Microsoft spokesman suggested asking IBM for clarification, but the IBM spokesman to whom DATAMATION spoke refused to explain what Lowe meant, saying, "We're just going to go with his comments."

Microcomputer managers say ho hum. Multi-user micros, MS/DOS-based or not, haven't stirred much interest among corporate pc users. "Most of our users are running spreadsheets," explains Cliff Hodges, supervisor of Chevron Corp.'s personal computer services center in San Ramon, Calif. "They don't want to do any more than that."

"A lot of the work people do is relatively modest analytic work or preparation for presentations," says Dr. Thomas Buckholtz, office technology project coordinator for San Francisco's Pacific Gas and Electric. "That type of work is much better done on the desktop."

Microsoft's multi-user Xenix has been available for the AT since spring, but with an installed base of almost 340,000, only 10,000 to 15,000 copies have been sold—less than 3%. Perhaps that's because, as user Hodges puts it, "It didn't solve any problems for us."

Hodges says the AT was brought out with more than one user in mind, and while he agrees there are some places where that capability might be useful, he says, "We haven't been too interested."

Buckholtz says he is interested in finding capabilities that will allow people

to share information. "It is clear we do want some form of connectivity," he says. He is experimenting with networks and considering a departmental computer.

Currently, desktop computing is "many, many times cheaper" than installing and using shared systems, says Buckholtz. Even if a pc could be easily converted to a multi-user system, "the cost of service tends to go up," he says.

There is a demand for multi-user micros, but the market for them is currently only a fraction of the MS/DOS market. Figures provided by International Data Corp. (IDC) of Framingham, Mass., show that about 231,000 supermicros—defined as two- to 16-user systems—worth about \$2.6 billion were shipped in 1985. Users bought about 3 million standard pcs worth about \$9.9 billion in the same year; about 90% were DOS compatible.

"I think there's a lot of demand for multi-user operating systems, but in very, very specialized markets," says Jim Kinlan, director of technical marketing for Lotus Development Corp. in Cambridge, Mass. The most popular nonproprietary OS is Unix, including Xenix, which is finding a niche among scientists and engineers.

"Multi-user systems are important in businesses that don't have computers yet and are kind of waiting for multi-user solutions in their price range," says IDC analyst Steve Bosley. "Most businesses right now are attracted to a local area network solution because they have a lot of pcs installed." Local area networks have rudimentary file- or record-level locking, though, limiting their usefulness.

Microsoft is said to be readying MS/DOS 4.0, a version that takes full advantage of the AT's 16 megabytes of memory by running in the 286 chip's native mode. The chip's segmented memory should mean that DOS 4.0 will also be multitasking, so a user could do some word processing, for example, while a lengthy spreadsheet recalculates. Observers predict 4.0 will be announced in early 1986.

The existing version of MS/DOS for the AT, DOS 3.1, is restricted by a 640K memory barrier, a relic of the older Intel 8088/8086 architecture on which the PC and PC XT were based. Those micros are too limited to support more than one user.

With some I/O changes, a multitasking system could conceivably be converted into a multi-user system. Brian Jeffery, of the Palo Alto-based International Technology Group, speculates that IBM might take Microsoft's multitasking, single-user MS/DOS 4.0 and turn it into a multitasking, multi-user PC/DOS 4.0.

The successor to the 286 chip, In-

tel's 80386, is even more suited to power a multi-user system. Intel announced the 386 in October; systems built around it may be available as early as the second half of 1986. The chip's on-board memory management, 4 gigabytes of real memory, and 64 trillion bytes, or terabytes, of virtual address space make it attractive as a host for multi-user software.

Many observers think the MS/DOS progression will be single-user, single-tasking; single-user, multitasking; and multi-user, multitasking. That would make the operating system for the 386—perhaps MS/DOS 5.0—the most likely candidate for multi-user MS/DOS.

Microsoft also has Xenix to worry about. Unveiling a multi-user MS/DOS "hasn't been where their bread is buttered," says Brian Boyle, director of research at San Francisco's Novon Research Group. "Microsoft has about 50% of the base of Unix users. Why cannibalize that by making a multi-user DOS?"

If MS/DOS goes multi-user, the primary market for the new operating system looks to be small businesses—a fractured market served by a myriad of value added resellers, many of whom write their own software. For mainstream software publishers, the effort of reworking their software may not be worth the effort. Only if they are assured of reaching the mainstream corporate user—a user who, so far, is satisfied with single-user micros. ©

STRATEGY

FACELIFT FOR SPERRY

Marketing takes center stage as the company moves its headquarters and reorganizes into six market sectors.

by Karen Gullo

Sperry Corp. is shaking the dust out of the rugs and wrapping up 1985 with new corporate appointments, products, and a corporate headquarters.

The company recently named Joseph Kroger, president of its Blue Bell, Pa.-based information systems group (ISG), as president and chief operating officer, a post that had been vacant for two years. And rather than replace Kroger, Sperry restructured the information systems unit into six segments—commercial marketing, government marketing, prod-

NEWS IN PERSPECTIVE

ucts and technology, integrated business systems, and customer services—each headed by new corporate vice presidents. Corporate headquarters will move from New York to Blue Bell.

The measures are part of Sperry's efforts to reorganize itself from a diversified manufacturer to a strictly computer and electronic systems company. This strategy comes in the wake of the company's \$330 million sale two months ago of its New Holland farm equipment operation to Ford Motor Co., for which Sperry took a \$230.6 million net loss in the second quarter ended Sept. 30.

"We're trying to mold the whole company into operating units that are electronic in nature and computer by style," says Jan Brundin, vice president of product strategy and management. "We're looking at ourselves as a more unified company." Kroger was not available for comment.

The move is "very analogous to an IBM reorganization," says Michael Geran, analyst at E.F. Hutton. "They've just shuffled the players [in ISG]. Basically it's the same key people running the unit, they've just been moved around and given better titles. They are all part of Kroger's

The success of the company's first round of strategic moves—namely the decision to embrace Unix—is debatable at best.

team." Geran estimates Sperry's third quarter revenues for the fiscal year 1986 (restated after the sale of New Holland) to be \$1.47 billion, up from \$1.26 billion the previous year. Earnings are also expected to be up, to \$70 million from the previous year's \$61.3 million. R&D expenditures will total \$405 million for fiscal '86, up from \$340 million in '85.

The company set out on a new course one year ago when it announced its decision to support Unix on its product line and to seek oem relationships for new products. James Aldrich, Sperry senior vp for corporate planning, says that while a lot of attention has been paid to the fact that Sperry over the last year has changed its product line to become more market sensitive, even more important are the changes the company is making in its marketing efforts as reflected in the restructuring of ISG. "We're finding out that we have to do just as much surgery on our marketing side," says Aldrich.

"We are concentrating on developing a roster of extremely competent vars," says Aldrich. But the company is going to be choosy about whom it does business with, he adds. "We do not see Sperry as a retail dealer-type organization, but as a marketer to experienced distributors and vars. Frankly, we're not in a

big rush. We want to do this right."

So far, the success of the company's first round of strategic moves—namely the decision to embrace Unix—is debatable at best. Few users have ported the SX/1100 operating systems; Sperry estimated a year ago that by now as many as half of the 1100 installed base, about 3,000 sites, would have migrated to SX/1100, but so far orders for the system are "very low," according to Brundin, perhaps in the area of 50. Most users contacted by DATAMATION say Sperry's sup-

port of Unix may be a good idea, but it clearly hasn't attracted the kind of attention from the installed base that Sperry seems to have expected.

At a meeting of AUUA Inc., a Sperry user group, this fall, users were "thoroughly indoctrinated with Sperry's move to Unix," says Jim Puthuff, director of dp for the city government of Sacramento, Calif. "It seems clear that not a lot of users are ready to make the switch. While the company is pushing the system, there doesn't appear to be a need for it."

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```
IDENTIFICATIONS
MODULE: Mininame
AUTHOR: bcs
DATE: 8/29/84
/* program that adds first name to a file
GLOBALS
FIXED LENGTH 1 ans
FIXED LENGTH 15 fname
END GLOBALS
MAIN PROGRAM
BEGIN
CLEAR SCREEN
USE "NAMES"
VIEW BY "ID_FNAME" ASCENDING
STORE "?" TO ans
AT 23,01 SAY "Add a record ?
Enter Y or N "
WAIT TO ans
WHILE UPPERCASE(ans) EQ "Y"
CLEAR GETS
AT 06,01 SAY "Please enter first
name"
AT 06,20 GET fname
READ 1
STORE fname TO record_name
APPEND RECORD
AT 12,10 SAY "Welcome to
cENGLISH " & fname
AT 14,10 SAY "Press any key to
continue. "
WAIT
STORE " " TO fname
STORE "?" TO ans
AT 23,01 SAY "Add another record
Enter Y or N "
WAIT TO ans
CLEAR ROW 1 THRU 24
END WHILE
AT 12,10 SAY "That's all for now !"
UNUSE "NAMES"
END PROGRAM
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NEWS IN PERSPECTIVE

Users continue to be wary about whether Unix will become a standard. Says Paul Friesen, MIS manager at Quill Corp., a direct-mail office-supply firm and Sperry user in Lincolnshire, Ill.: "We don't see an advantage to using SX/1100—there's still a question as to whether Unix will be generally accepted. We have a big investment in a large base of applications running under the current system." Many users are concerned about the security of Unix in general, and Sperry concedes that further efforts need to be made on the part of AT&T to make Unix a more secure operating system.

Another problem is a lack of applications software. Jim Gilbreath, head of computer science and simulation at the U.S. Naval Ocean Systems Center in San Diego, where SX/1100 is running on an experimental basis, says Unix application software "isn't a very rich field yet. It's getting better, but there are some applications that you want that just aren't there."

Gilbreath believes, however, that Sperry's support of Unix, is "a step in the right direction," and he is not alone. Many users support the company's Unix strategy.

"Sperry made the right decision," says Lyle Hartman, president of Information Consultants Inc., Hockessin, Del., and former president of AUUA. "The jury is still out on the system in general, but because it runs on top of Sperry's current operating system, users can continue to use that and still take advantage of the good software written for Unix."

According to Sperry's public pronouncements, the migration of users to SX/1100 is going along as planned, but company officials privately concede that the move is going slower than expected. "Our strategy [for the 1100] is pinned to the success of Unix as a standard," Brundin says. "It may take a few years, but we think its going to happen." The company seems to be depending on its government business, which Aldrich says comprises 40% of Sperry's revenues, to buy its Unix strategy.

"The Unix move relates to two things," says Geran at E.F. Hutton. "First, to greater access over time to third-party software, and second, Unix has become a prerequisite in some government bids, and Sperry has a pretty good government base. But with respect to most commercial mainframe customers, the migration to Unix has not been very aggressive."

Jan Brundin says he's not surprised that so few MIS managers interviewed by DATAMATION expressed an interest in SX/1100. "We believe the movement toward Unix is going to come up through the small systems, from the

micro and departmental systems world, and not from the mainframe level down. So you won't find a lot of users porting the systems to their 1100s yet."

Lyle Schrum, vice president of data processing at Hawkeye-Security Insurance Co., Des Moines, corroborates Brundin's observation. "We don't need Unix on our hosts and we don't plan to use it," he says. "We do want it on our micros and minis. I'm more intrigued by that prospect."

Unix aside, the company has

rolled out a number of new micro products in recent months and announced additions to the 1100 mainframe series. In September, Sperry began shipping the PC/IT personal computer, its Mitsubishi-built entry into the PC AT arena. The company also announced SperryLink PC software for Sperry and IBM micros that enables SperryLink to function on micros. PC/On-Line, a menu-driven software package that links MS/DOS-based micros with the company's 1100 mainframes, has also been announced.

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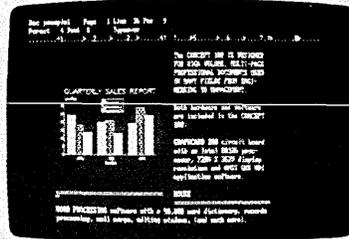
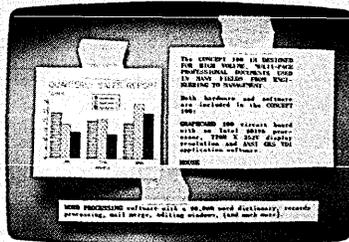
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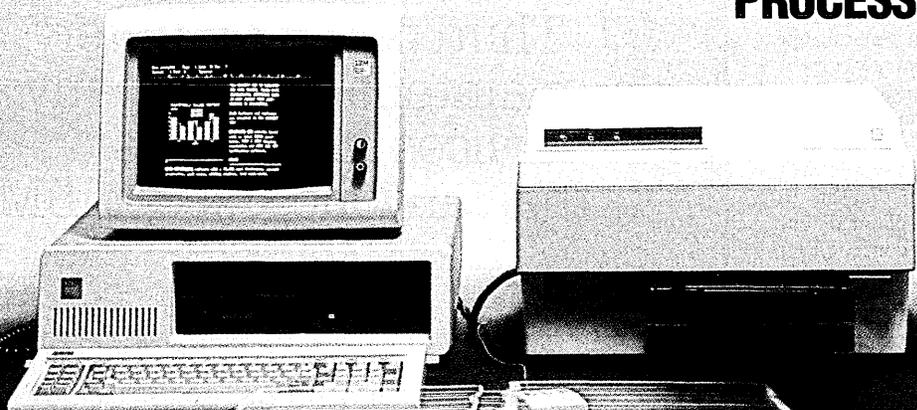
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NEWS IN PERSPECTIVE

Sperry expects to introduce a dozen peripheral products by Christmas, including five-gigabyte disks and a few printers. The company recently canceled development of a desktop 1MIPS 1100 machine code-named Orion. Instead, the company will bring to market sometime next year a multiprocessor, code-named Swift and ranging from 1MIPS to 4MIPS, that Brundin says will cover the same customer base as Orion. In addition to the cancellation of Orion, Sperry also ended an oem deal with Encore for the Wellesley, Mass.-based company's Multimax computer after repeated delivery delays.

Sperry says it expects to release two more additions to the 1100 line—Liberty, ranging from 2MIPS to 10MIPS, and Saturn, with a capacity of up to 18MIPS—in 1986 and 1987, respectively.

By the end of the decade, Sperry expects to release a follow-on product for the 1100/90, ranging from 24MIPS to 150MIPS. The machine, code-named Mercury, will be Sperry's "biggest hummer, our flagship machine," says Brundin.

In a speech to members of USE Inc., another Sperry user group, in October, Joseph Kroger alluded to other new product areas. He predicts that one third of Sperry's revenues in five years will come from a new roster of products under development, including digitized PBXs, image-based office systems, a fault tolerant microprocessor system, and software development tools, including artificial intelligence-based expert systems. Kroger also predicted that Sperry will aggressively pursue the telecommunications market, offering large-scale integrated ISDN networks. ©

FACTORY AUTOMATION

THE FORCE THAT IS MAP

Despite some nagging technical details, General Motors' clout has seen to it that the manufacturing automation protocol juggernaut is real.

by Willie Schatz

"The worst thing anybody can think is that we're finished with MAP," says Mike Kaminski, manufacturing automation protocol program manager for General Motors. If current or potential GM suppliers make that mistake, they're going to have to do some serious penance later on.

"We're only 65% done," he continues, "and we've got a very full plate for next year. But unless there's a catastrophic event, it's going to be extremely difficult not to have success with it."

Kaminski echoed the overriding sentiment at last month's AutoFact conference in Detroit, where factory automation suppliers gather annually to show their wares.

"This probably signals the start of the MAP kickoff," says Gail Loper, director of product marketing for Honeywell

Information Systems' manufacturing systems division. "GM is certainly the right company to back it. They brought IBM to the trough for the first time, and that's good for the industry."

The cause of Loper's enthusiasm was a 21-vendor demonstration showing off an IEEE 802.4 MAP network communicating with an IEEE 802.3 network—the backbone of Boeing's Technology and Office Protocol (TOP) network. The networks were also linked via an X.25 public packet switched network from Detroit's

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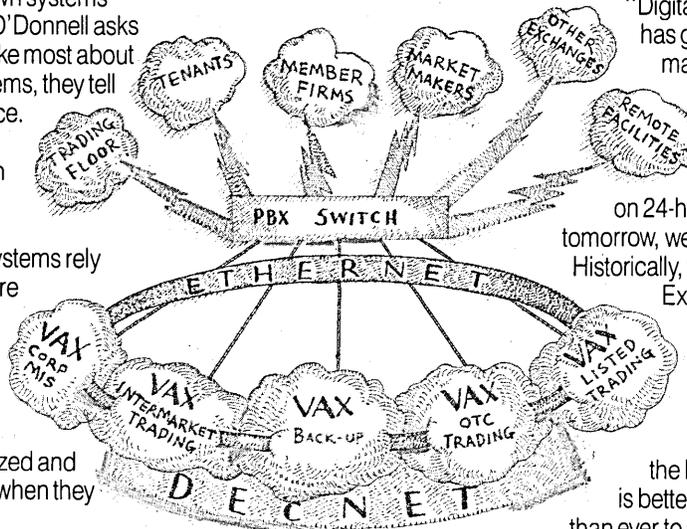
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NEWS IN PERSPECTIVE

Cobo Hall to a remote IEEE 802.4 5Mbps local network at the GM Technical Center in Warren, Mich.

Perhaps almost as memorable were the seemingly strange bedfellows the demonstration brought together. Not only did IBM, Digital Equipment Corp., Hewlett-Packard, Honeywell, AT&T, and NCR share their technology, they actually sat next to each other on a stage extolling the virtues of MAP.

Behind the scene, though, it wasn't all smiles and handshakes. Two of the panel members almost lost their seats, according to a source involved in getting the demonstration together. It seems that one powerful computer maker and a key programmable controller manufacturer "had to be hit over the head with a baseball bat" to conform to the demonstration schedule. Such is the power of GM's purse.

"AutoFact is going to be the equivalent for MAP that the IBM PC was for the personal computer," contends Joe Schoendorf, president of Industrial Networking Inc. [INI]. Factory automation suppliers will all stop their proprietary work and run to MAP."

Schoenfeld hopes they set land speed records. A combination of General Electric's money and Ungermann-Bass's technology, INI is 100% MAP. Boards, cables, installation, support. That's a great basket in which to put all one's eggs. But if MAP dies, INI goes with it.

"Am I worried that factory automation is going to stop?" Schoenfeld asks. "If MAP doesn't work, these companies will make it work. They've got too much invested not to have it work.

"The alternatives are to get a new standard, which no one will ever agree on, or go back to the proprietary standard, which the world won't let anybody do."

That doesn't mean that all technical problems with MAP are solved. Several MAP and TOP issues remain to be sorted out. Not the least of these is network management.

Another issue is interoperability, which is at least an order of magnitude more complex than compatibility. Machines A and B can be compatible, but that doesn't mean they're interoperable. And there can be conformance to the International Standards Organization (ISO) standards, upon which MAP is based, but that also doesn't guarantee interoperability.

Eventually, MAP is going to be on cards that users can plug into the backplane of their computers or on chips that are already inside the machine. Layers 3, 4, 5, and 7 of the 802.4 standard—network, transport, session, and application—will be on a chip. That will make a

vendor's product differentiation difficult.

"The only specific advantage you can gain with MAP is that you might build it a little cheaper than someone else," Honeywell's Loper explains. "The essential functionality must be common in order to communicate between systems.

"You won't have every factory putting in MAP the same way. A manufacturer has to tailor the system to fit the functionality of the factory. Each factory is different. It's that tailoring aspect that's important."

That's just how GM sees it. It has 15 plants, none of which are clones, on MAP implementation schedules. Its truck and bus plants in Fort Wayne, Ind., Pontiac, Mich., and Oshawa, Ont., will be totally MAP configured next year. So will its Saginaw Steering Gear "factory of the future." All GM plants are expected to be on-line by 1988.

That will cut by half the current \$6,500 cost to connect a robot to a broadband network. It should save one third the software costs to make the present

"GM is certainly the right company to back it. They brought IBM to the trough for the first time, and that's good for the industry."

proprietary systems go. In a few years, communications technology should trim connection costs even further. Since half of systems costs are communication-related, GM stands to save significantly. Don't expect to see that savings on automobile sticker prices, however. That's another story.

"How a manufacturer gets competitive is by the choice of manufacturing equipment he buys," Loper says. "You no longer have to worry about the communications protocol, because that's fixed. Now you can buy products based on functionality. It's the choice of things you put on the network that becomes critical."

So where does this leave GM's competitors? Or any other company in a field that isn't leaping on the MAP bandwagon?

"Being in the lead helps us for awhile," concedes Robert Eaton, GM's vice president of the Advanced Engineering Staff. "Ford is right behind us, though. But that's not true in Japan or Europe. We'll get a year or two on them, we hope."

"GM whipped up American industry to fight for worldwide competitiveness," says Ralph Waite, vice president and general manager of Milwaukee-based Allen-Bradley. "That's why GM is going to win. The critical issue is GM deciding to do something about the problem." ©

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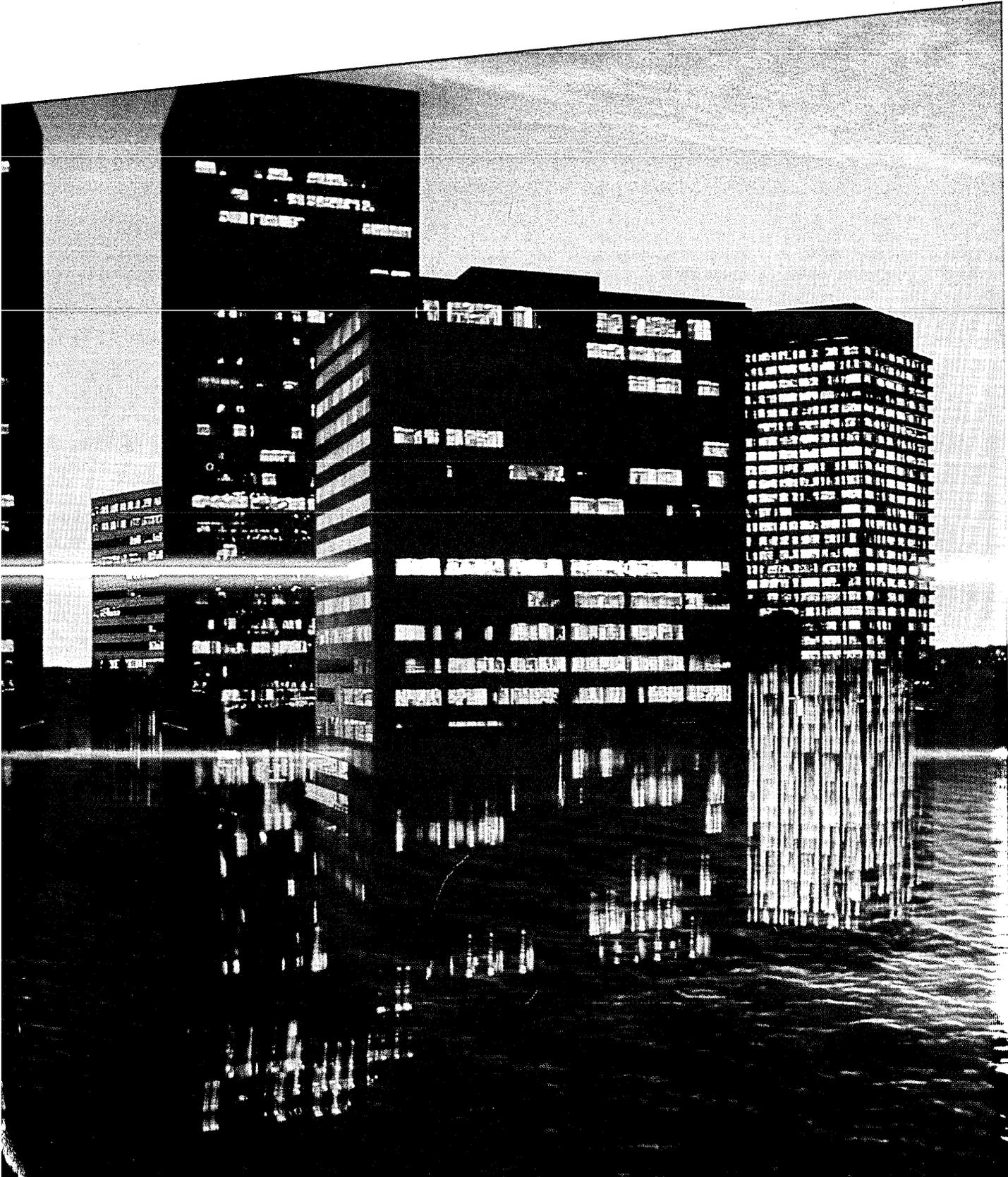
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BENCHMARKS

CDC TO SELL UNIT: Attempting to stymie continuing losses, Control Data says it plans to sell most of its computer business products group and sell or close its international data services business. Xidex Corp., a Mountain View, Calif., maker of data storage products, intends to purchase the business products group, which makes floppy disks, tapes, and other storage products, for \$55 million to \$75 million, CDC says. The operation employs about 2,000 and includes three plants in Omaha, Neb., Wales, and Australia. In addition, Cincinnati Bell Inc. intends to buy a segment of business from Control Data's United Information Services Co. Cincinnati Bell will purchase for an undisclosed sum a computerized service that tracks calling patterns of telecommunications users. Additional plant closings and further layoffs are on the agenda, according to CDC officials. Over 7,000 employees have been laid off this year in the peripheral products group, and CDC says further reductions are likely. Robert Price, CDC president, told security analysts in New York last month that peripheral group revenues will drop by \$700 million by the end of 1986.

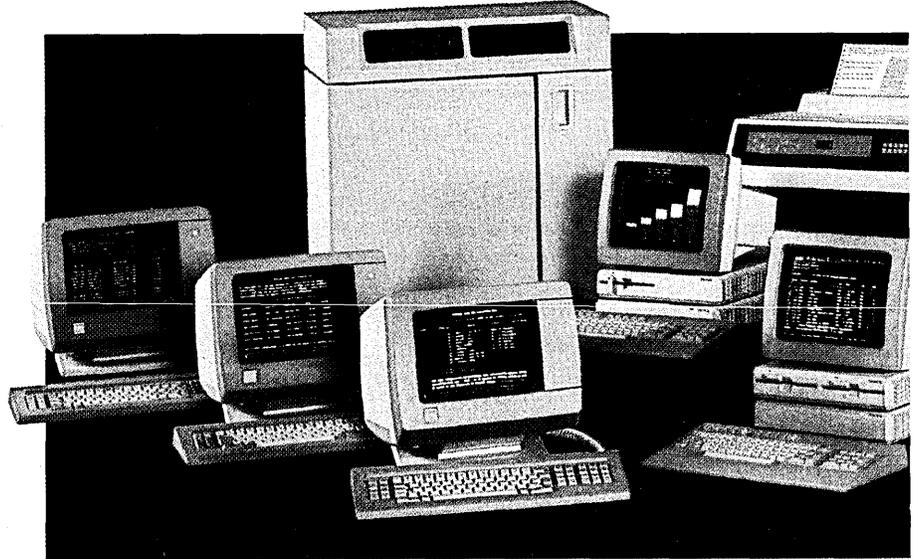
ADVERSE RULING: Tandon Corp., Chatsworth, Calif., was hit with a stunning setback just when it seemed as though happy days had returned. The maker of double-sided floppies lost the main round in its patent infringement case against Mitsubishi Electric Co. after International Trade Commission judge Sidney Harris ruled in Washington, D.C., that major competitor Mitsubishi had not ripped off Tandon's patented technology (see "Floppy Fortunes Flounder," Nov. 1, p. 60). Earlier, Tandon had named Mitsubishi, along with Sony Corp. and Teac Corp., as alleged patent violators. Sony and Teac made undisclosed settlements, but Mitsubishi chose to fight. James Hamilton, a lawyer for Tandon, says his client will probably ask the full ITC to examine the Harris ruling. Tandon's civil lawsuit against Mitsubishi in Los Angeles will still go forward, says Hamilton.

DÉTENTE VIA PHONE: The first full-time computer teleconference channel between the U.S. and the Soviet Union went on-line in November. Joel Schatz, director of U.S.-Soviet special projects for the Ark Foundation of San Francisco, dialed up the Soviets using a Macintosh computer during a banquet held in Berkeley, Calif. Unfortunately, no one answered because it was a national holiday in the Soviet Union, but during the winter high school students and their teachers in Moscow and San Francisco will be able to converse. The U.S. Commerce Department applies the same rules

to the computerized conversations as to telephone conversations and other communications. According to Schatz, the government says it is alright for private individuals to make their own arrangements to communicate. Eventually, he says, all a user will have to do to join a teleconference is pay a fee.

PARTNERSHIPS: Hitachi's European outlets, Germany's BASF and Italy's Olivetti, are signing up partners in an effort to increase sales of the Japanese com-

pany's machines. Germany's Nixdorf is taking four models of Hitachi's 4300-level systems from BASF in an effort to provide an upgrade path for users running out of power. Olivetti, meanwhile, has been selling the Hitachi boxes to Italian users for the past six years, but its attempts to sell outside Italy were not successful. Now the company is looking for agents in different European countries and has already signed a British software company called Fee to sell the machines in the U.K. and Australia. Fee is taking the



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whole line of systems from the 4300-level up to the new Sierra lookalikes.

NEW CLOTHES: Perkin-Elmer Corp. has spun out its Data Systems Group, Holmdel, N.J., into a separate company called Concurrent Computer Corp. The new company, which will initially be 99% owned by P-E and 1% by Concurrent management, was formed to reverse an image of low visibility in the computer market held by Data Systems, says PE ceo Horace G. McDonell. The formation of a

new company with a new name—the name Concurrent refers to parallel or multiprocessing, as incorporated in the company's 3200MPS line of superminis—will remedy this visibility problem and enable the company to compete more effectively, P-E officials believe. P-E says it intends to take the company public at some future date, although P-E intends to retain an equity position in Concurrent "greater than 80%" after an offering is made. Concurrent is actually the third incarnation of this computer organization.

First formed as Interdata Inc. in 1966, the company was acquired in 1974 by P-E and renamed the Data Systems Group. Heading Concurrent as president and ceo is James K. Sims, who was senior vp and head of the group since 1983.

ACORN'S RISC CHIP: Acorn, the British home computer manufacturer backed by Italy's Olivetti, has entered the reduced instruction set computer (RISC) game with a 32-bit processor chip developed at its headquarters in Cambridge, England. First versions of the chip, which has been under development for two years, are claimed to operate at a rate of 3MIPS and the company is aiming to sell it for high-performance systems in real-time or AI applications. Acorn intends to use the RISC architecture in its own future products, but the company declines to say what they will be. The troubled British manufacturer, bailed out earlier this year by Olivetti, recently entered the scientific and engineering market with a series of low-priced workstations. The chip could be destined for follow-up products, analysts believe. In the meantime, Acorn has produced an evaluation system for software developers consisting of its Acorn RISC Machine (ARM) mounted in a BBC microcomputer, the firm's hobby market machine. Acorn has already produced a simple concurrent compiler with a multiwindow text editor for the processor. BASIC, Modula 2, and Lisp are among the languages available for the chip, with C, Pascal, and FORTRAN to follow. Olivetti is also watching the U.K. company's RISC developments with interest, and once the performance is proven it may adopt the chip for its own product line, parts of which are marketed in the U.S. by its transatlantic partner AT&T.



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CIRCLE 2 ON READER CARD

PEDDLE'S TANDON PC: Ex-Commodore and Victor Technologies maven Chuck Peddle is riding the micro market once more, this time for the West German headquarters of Tandon Computer, a direct sales operation linked to disk drive maker Tandon Corp. Tandon has a small stake in the European company and is using it to test market its own IBM-look-alike pcs, the XT-compatible PCX and the AT-compatible PCA. Previously, Tandon pcs were only sold oem—mostly to Tandy in the U.S. While Peddle accepts that the U.S. is the biggest market, he believes Europe is a much easier nut to crack with a new pc since the marketing effort can be focused on a country-by-country basis. Initial sales will be in Britain, West Germany, and the Netherlands and with France, Italy, and the Scandinavian countries later on. If all goes well the company may start selling the machines direct to end users in the U.S. too. ©

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Here's how other companies strategically use VERIFY, InterTest, and DataVantage to increase productivity.

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*Northern Natural Gas:
Maintaining software quality
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"New applications development methodologies and hardware make it increasingly difficult to maintain quality. That's why we need VERIFY." So says John Latenser, Senior Systems Analyst at Northern Natural Gas, a leader in the transportation of natural gas products. VERIFY helps the Omaha company develop more reliable systems faster. "With VERIFY, we reduce our testing time by 25 to 50 percent," he said. "That gives us a definite competitive edge."

"I think it's fortunate that On-Line Software International came out with VERIFY, because it is the solution we had been looking for," Latenser continued. By way of an example, he cited an on-line system that required five successive revisions. "From the documentation standpoint alone, VERIFY shaved a whole day off the revision process. Quality and reliability were enhanced," he said.

InterTest
*ADT Security Systems:
User-friendly testing produces
more accurate systems.*

Programmer productivity goes up appreciably with InterTest, according to Kathleen Wolfson, Senior Systems Analyst at ADT Security Systems, New York. "We get systems out quicker than we would have otherwise," she stated. "They're much more

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thoroughly tested, and much more accurate, which is very important to me."

"If ever there was a package that was user-friendly, InterTest has got to be the best at that," Wolfson continued. "The biggest benefit to us is, you can have people who are not the world's greatest experts learn from their mistakes, and they'll be able to turn something around very quickly."

"There are other testing packages, but InterTest is one of the few packages on the market that I just can't imagine running a CICS shop without," she observed.

DataVantage *GTE Communication Systems:* *Easy testing of complex IMS* *recursive relationships.*

GTE's first use of DataVantage was at its North Lake, Illinois facility for manufacturing large central office switching systems. "This was a particularly demanding application because of the IMS recursive relationships involved," Senior Data Base Analyst Brian Bowers explained. "DataVantage has proved to be a most valuable data base subset management tool for us."

Running an IBM 3084™ under IMS, GTE Communication Systems uses DataVantage to generate accurate subsets of data bases. "We have found it to be a completely functional tool that is also easy to use," he said.

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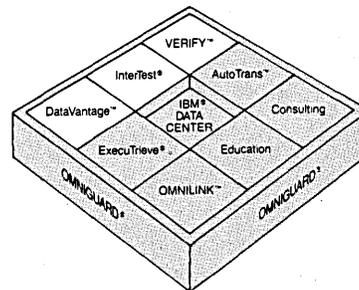
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WORLD WATCH

TOKYO - Northern Telecom has the inside track in chasing down a coveted contract from Nippon Telegraph & Telephone (NTT) for central office digital switches. NTT, which is also eyeing proposals from Rolm, Digital Switch, and AT&T, is under the gun to buy national wares. So, look for NTT some time this month to dish out a procurement pie sliced several ways to appease both the local and foreign factions.

LONDON - Officials from the Pentagon and United Technologies didn't exactly receive a royal welcome during their recent stay in the land of royalty. Scouting for participants in various "Star Wars" projects, the bigwigs got a big snub at some of the major U.K. research centers. Imperial College researchers working on fifth generation technologies even sent a strongly worded letter to Prime Minister Margaret Thatcher shunning any British involvement in the controversial military scheme.

SYDNEY - The Australian government has given local computer maker Labtam International the okay light to ink a technology agreement with the Soviet Union. Under the pact, Labtam will initially supply the Soviets with eight 16-bit micros that will go into scientific labs and education centers. The company is currently working on a project with the Academy of Science in China to develop a Unix-based 32-bit machine for foreign markets.

HELSINKI - Nokia Data is on the prowl again after its deal with Mohawk Data Sciences went kaput. Nokia, which lost out in its bid for MDS's European subsidiaries, is looking for a company that has a strong marketing and support operation in Europe. Staffan Simberg, director of international operations at Nokia, confirms the talks but won't talk more.

NEW DELHI - Control Data and France's Bull are fighting it out to get a passage to India for their mainframe technology. The technology transfer deal, worth over \$10 million, would allow the government-owned electronics company ECIL to make mainframes locally. While Bull is bullish over its prospects, CDC is worried the Feds will block its bid because of ECIL's involvement in the nation's nuclear sector.

STOCKHOLM - It seems as if Uncle Sam is putting the squeeze on Sweden. Anxious to stem the flow of high-tech goods to the Eastern Bloc, U.S. agents have started visiting certain Swedish companies as often as twice a day to make sure they are sticking to the new regulations the Reagan administration put into effect last July.

MUNICH - Watch for portable pc maker Grid Systems to announce an alliance with West German aerospace firm Messerschmitt-Bulkow-Blohm. The linkup should help Grid lock in military and government customers.

TOKYO - Bureaucrats at Japan's Ministry of Posts & Telecommunications are tuning into bizarre forces for unconventional communications channels. The MPT has set up a consultative committee to study psychic power and gravity waves as future communications media. Committee members include such luminaries as NEC Corp. president Tadahiro Sekimoto and other bright lights in academic and industry circles.

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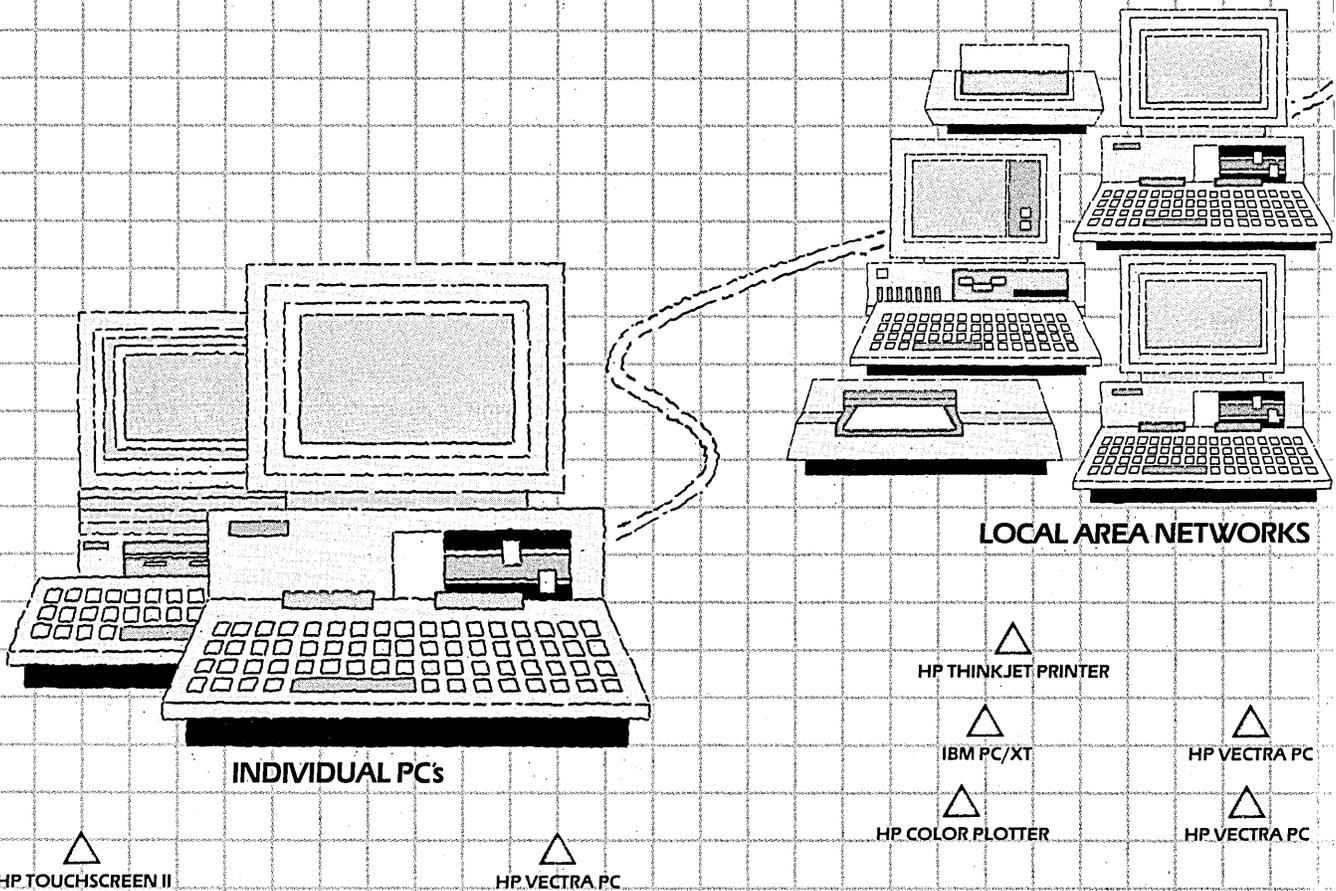
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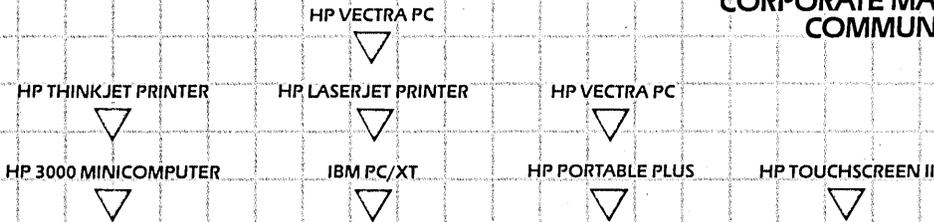
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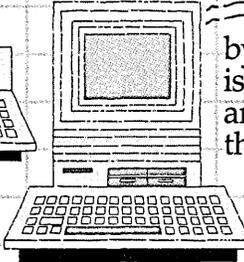
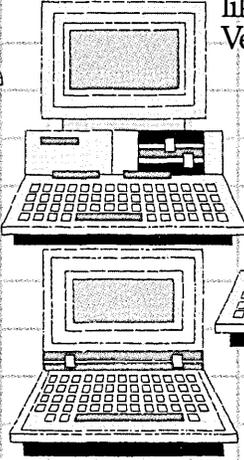
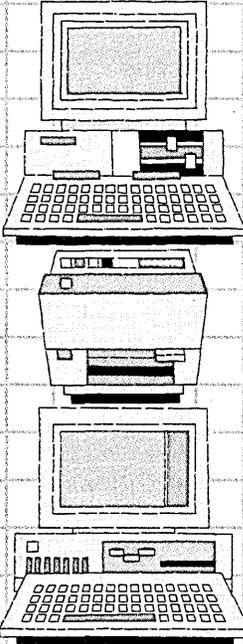
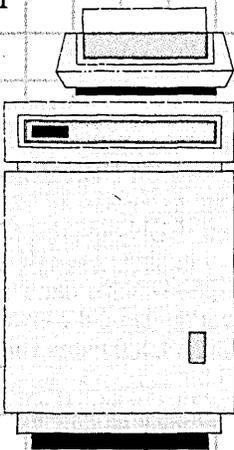
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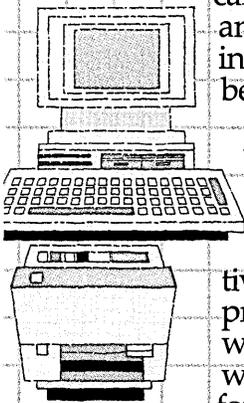


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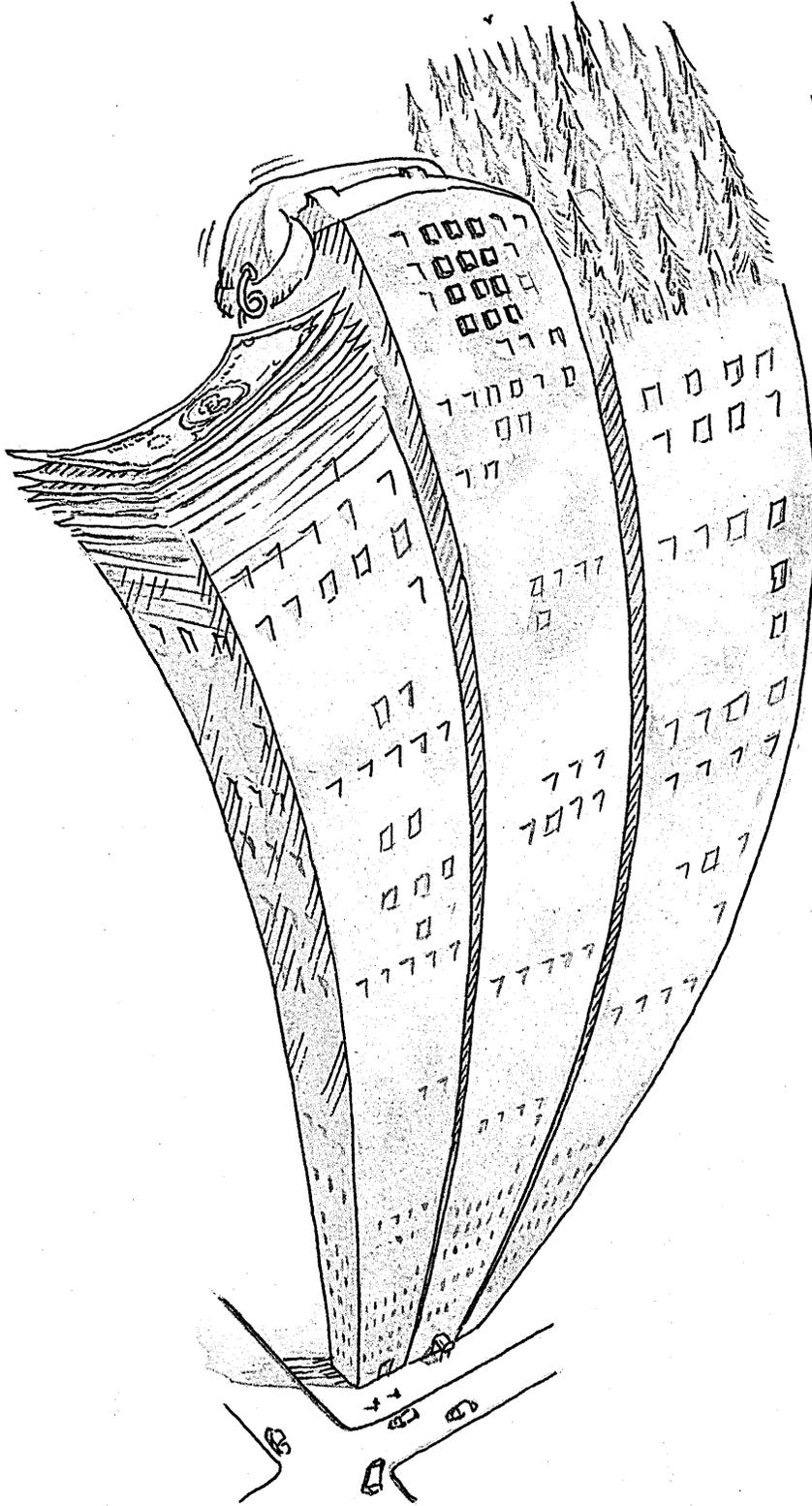
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Good tools and models aren't enough to prevent bottlenecks and oversupply. Planners need political savvy and a knowledge of the corporate budget.

THE MATURATION OF CAPACITY PLANNING

by H. Pat Artis

During the past decade, a rapid increase in on-line applications has motivated most corporations to start capacity planning programs. These programs have two main objectives: to anticipate hardware needs and to control costs as the corporation's workload grows. Despite significant spending on personnel, training, and tools, however, few corporations have achieved these goals.

What explains these disappointments? The premise of this article is that the key to a successful capacity planning program is not a particular set of tools or techniques, but the ability of the capacity planner to collect and distribute information to the corporation's decision makers. Too often, capacity planners confuse the accuracy of their algorithms with their overall effectiveness; they seem to feel that refining methodologies is more important than establishing channels of communication with other corporate groups.

It is the author's contention that the typical capacity planning program evolves through five stages, and that most of today's programs are still in the early phases of that evolution. The five stages are defined as follows:

1. Vendor capacity planning: services are provided as part of the vendor's marketing effort.
2. Special studies: individuals in the data processing organization are periodically assigned to conduct capacity studies.
3. Technician: a specialized staff function is developed to address the technical issues.
4. Organizational development: capacity planners transfer their focus from tools to end-user requirements, financial considerations, reporting, and communications.
5. Mature: corporate decision mak-

ers perceive the capacity planning results as essential to their decision-making process.

In Fig. 1, these stages are compared in terms of reporting level, planning, documentation, budget considerations, relationship to end-user requirements, continuity, and types of tools employed. By defining the general framework of this evolution and describing the events that move an organization from one stage to the next, this article will provide capacity planners and corporate decision makers with a basis for evaluating and increasing the effectiveness of their capacity planning programs.

1. *Stage one: vendor capacity planning.* A corporation's first step in capacity planning is the sizing of its first computer system, or the first system using a technology radically different from that of systems used previously. In this stage, the corporation usually depends on the vendor to provide system sizing (i.e., the first capacity plan) as a part of the marketing effort. The goals of the corporation and the vendor representative often coincide in this first plan. The customer wants a system that meets his needs, and the vendor wants to propose an adequate system with a price/performance ratio that beats the competitors.

To be successful, the capacity planner must be able to convey his plans and justifications to corporate decision makers. Vendors acting as capacity planners have a significant advantage because they have easy access to these people. Typically, the vendor works with the director of data processing to prepare and present the proposal to corporate management.

The principal product of any capacity planning study is a document presenting plans and justifications to corporate decision makers. The value of a capacity plan is a direct function of the reader's ability to act based on its contents. In general, capac-

ity planning programs do not suffer from a lack of information. What they suffer from is a failure to convey that information, in an understandable form, to the people who have to act upon it. During the first stage, the vendor's hardware proposal becomes the capacity planning document that communicates the plans and justifications to the corporate decision makers.

The objective of any capacity planning program is to select and justify the procurement of hardware to meet anticipated needs. Since hardware expenditures are substantial, the planners must take into account the corporate budget cycle. Proposals are worthless to management if they are presented out of sync with the budget planning cycle. In this stage, the vendor's proposal defines the hardware acquisition line in the corporate budget and is carefully timed so that it can be incorporated in the desired budget cycle.

PLANNERS, END USERS INTERACT

In addition to the requirement for communication through the management chain, capacity planners must also interact with end users to better understand their future requirements. Initially, vendors do not include end-user requirements in their capacity planning studies because they lack familiarity with the corporation's business functions. With each successive planning cycle, however, the vendor will attempt to develop more extensive end-user contacts so as to be better able to justify upgrades.

Another key consideration is the continuity of effort offered by the capacity planning program. Perhaps the greatest strength of the vendors in the capacity planning function is the continuity they provide to the process. In effect, the vendor's marketing plan defines a hidden agenda from which future plans will evolve.

The first stage ends when the objectives of the corporation and vendors diverge.

FIG. 1

THE FIVE STAGES OF CAPACITY PLANNING

STAGES

CHARACTERISTICS	STAGES				
	VENDOR	SPECIAL STUDIES	TECHNICIAN	ORGANIZATIONAL DEVELOPMENT	MATURE
Reporting level	Corporate decision-makers and director of data processing	Director of data processing	First-level technical supervisor	Manager of technical services	Manager of technical services
Written plans	Marketing proposals	Five-year plans	Detailed technical documents	A series of plans and justifications distributed to all levels of management	Continued distribution of plans to all levels of management
Relation to the corporate budget	Plan synchronizes with budget cycle and defines the hardware line items	Plan synchronizes with budget cycle and defines the hardware line items	None	Plans produced to serve the budget cycle	Involvement in both current and future budget planning
End-user Considerations	Little or none	Initial discussions	Ineffective surveys or none	Understanding of user requirements and business activities	Detailed user understanding and consulting
Continuity	Long-term vendor marketing plan	Planning treated as one-time studies	Ongoing technical effort, poor high-level results	Contracts are managed and long-range strategies are developed	Continued management of long-term agreements
Tools	Rules of thumb and vendor marketing aids	Ad hoc or vendor marketing aids	Extensive tool development and acquisition	Continued refinement	Continued refinement

The final factor that we will use to evaluate capacity planning programs is the tools employed. Although an installation's first system is often sized using broad guidelines, brief benchmark studies, or rules of thumb, the vendor representative often has a number of marketing aids he can apply to analyze client data. Using the results from such studies, the vendor can further justify his capacity planning recommendations.

The duration of the first stage of capacity planning can range from a few months to many years. The first stage ends when the corporation recognizes that its objectives and those of the vendor have diverged. Over time, the vendor becomes more intent on maximizing account revenues while the corporation seeks to maximize the benefit of its investment and control data processing costs. When this happens, the vendor's role in the planning process is reclassified from that of primary influence to just another source of input in

the decision-making process.

Although every installation experiences the first stage, not many find themselves in it today; most shops went through it in the late 1960s or early 1970s.

Stage two: special studies. When the data processing organization assumes responsibility for capacity planning, the most common approach is to define it as a periodic responsibility, best dealt with by a task force or an individual assigned to a special study. These specially designated capacity planners usually have little or no experience in planning and are unlikely to view it as a potential career position. In this stage, the object of the process is to select and justify an upgrade from the current hardware configuration. It is interesting to note that it is difficult to perceive the project as successful if the study simply endorses the status quo configuration. Hence, an upgrade is the almost inevitable result of each planning process.

A capacity planner typically works

with the director of data processing to prepare a detailed written plan and justification for the proposed upgrade. This document often takes the form of a five-year capacity plan. Although these plans are usually forgotten after the short-term upgrade has taken place, the term five-year plan is used to cast a more strategic glow on what is clearly a tactical effort. Together, the director of data processing and the capacity planner present the document to the corporate decision makers.

In this stage, there is generally a one-to-one correspondence between the proposed system upgrade and the potential hardware line items in the corporate budget. Moreover, these planning cycles are timed to produce recommendations coinciding with the definition of the corporate budget. There is a clear understanding by the dp director and the capacity planner that no proposal, no matter how valid, can be realized unless it is integrated into the corporate budget process.

One benefit of the second stage is that the capacity planners start consulting both with the business planners and with end users. Although the vendor may have sought to develop such ties, the capacity planner is more successful because of his organizational knowledge and political contacts.

Unfortunately, this stage also has a number of negative aspects. Principal among them is a lack of continuity resulting from the special project approach. Capacity planning does not yet merit continued staffing, and it is unlikely that an individual will be assigned to the task more than once. Because capacity planning in this stage is a high-visibility special project, it is often assigned to rising stars who will have long since been promoted by the time of the next planning cycle.

The greatest obstacle faced by these planners is their lack of detailed knowledge about capacity planning tools or methodologies. They often have to rely on ad hoc data reduction tools or vendor support to analyze their measurement data. As a result, their studies often are based on one or two simple metrics such as cpu utilization or DASD spindles.

SIGNALING THE THIRD STAGE

The special studies stage of capacity planning generally continues through multiple hardware planning and acquisition cycles, usually until a significant capacity shortfall occurs. Corporate management then reacts by reclassifying capacity planning as a detailed technical function that must be addressed by a specialized staff. This single decision signals the transition to the third organizational stage of capacity planning.

Today, probably 25% to 30% of all installations are still in the second stage. The plans developed during this stage usually succeed in that they result in the installation of a particular configuration. The lack of continuity, however, can produce disjointed financial agreements that will lead to future problems.

Stage three: technician. The third stage of capacity planning is dominated by technicians and their tools. During this stage, a technical staff establishes a methodology that will allow the corporation to avoid the shortfalls that ended the prior stages. This is the most expensive stage of capacity planning; it is characterized by high levels of spending for recruiting and educating staff and for procuring and developing specialized software tools.

When capacity planning becomes part of a specialized organizational unit, staff members typically report to a first-level

technical supervisor in the data processing organization. This isolates them, and increases their dependence on written communications. Since the planners focus on tools and methodologies, rather than on developing business justifications or understanding end-user requirements, their reports don't tell decision makers what they need to know. Often, technical management encourages this emphasis on methodologies by taking a particular interest in the tools being used.

Isolated from the decision-making process, the capacity planners often have little or no involvement in the development of the corporate budget. Their budget concerns have more to do with tool procurement than hardware acquisition. Many sound recommendations may go unimplemented because the planners present them out of phase with the budget cycle.

The technicians don't communicate much with end users; they tend to have few political ties and little understanding of the organization. When communications are attempted, they usually take the form of periodic user surveys that solicit estimates of future requirements. Unfortunately, the units in which these estimates are requested (i.e., cpu seconds) fit the tools and have little meaning to end users. The users respond with superficial estimates, and the survey becomes a waste of time.

Despite the presence of a dedicated staff, the third stage suffers from a lack of continuity. Since the capacity planners are divorced from budget issues, they are unable to address the long-term financial aspects of hardware acquisition. Often, when such issues are addressed, they are dealt with by data center management as part of the supervisory functions that they provide the capacity planners. While this approach works in some cases, the most common result is poor control of long-term financial planning.

At its height, the third stage is characterized by serious contradictions. On the one hand, corporate managers worry that they aren't receiving appropriate information, despite significant expenditures for staff and tools. On the other hand, the capacity planners are confused as to why corporate decision makers are ignoring the sound technical arguments they have provided.

Many installations remain in this third stage for years; the vast majority of shops are in it right now. Because the corporate decision makers have important unfulfilled expectations, a confrontation will eventually occur. Alternatively, the technicians, frustrated at having their recommendations ignored, may resign, thus wasting

the money the corporation has invested in their training. However it occurs, the confrontation will either mark the end of the corporation's formal capacity planning, or it will lead to the creation of a forum where the real needs of corporate management are made known to the capacity planners.

ATTENTION ON USERS' NEEDS

Stage four: organizational development. In this stage, the planners have finally redirected their attention from tools to the needs of end users. They have recognized that their primary responsibility is to provide results that can be easily interpreted by corporate management.

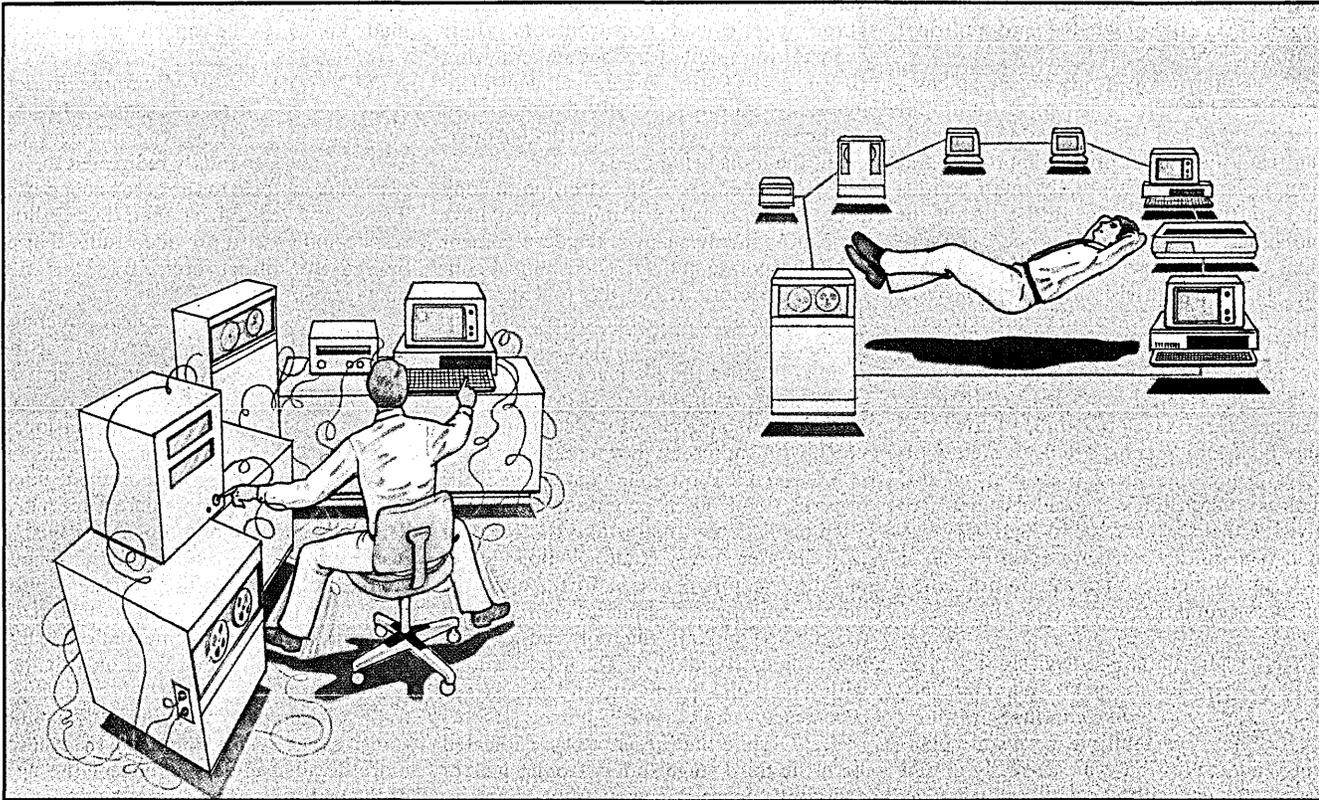
Once capacity planners understand their role as a staff support function, their specific reporting level is no longer a primary concern. Regardless of the reporting level, they focus on the information requirements of the entire corporate management structure rather than on the technical curiosity of their immediate supervisors. Their documentation emphasizes business justifications instead of abstractions like resource utilization. Moreover, their efforts are now synchronized with the budget cycle so that their recommendations can be integrated with the corporation's financial planning.

To prepare these business justifications, capacity planners must develop a more detailed understanding of the needs of the end users. They usually do this with interviews, which also foster political and organizational ties. Once these ties have been developed, the planners can apply more-detailed forecasting techniques (such as business element-based forecasting) that require a detailed understanding of the end users' requirements.

Since budget-related issues are now among their responsibilities, the planners' attention can be directed to the understanding and management of financial agreements. They develop a clear understanding of the leases, rental agreements, and depreciation schedules of the hardware, often for the first time. With this information they can develop strategies to synchronize overlapping agreements and simplify future transitions to new hardware technologies. During the third stage, the technicians developed extensive skills in the management of data. Once they realize that the financial agreements represent important data in the planning process, they can use these skills to bring continuity to the hardware planning process.

During the fourth stage, tool development and selection may continue, but tools no longer have the highest priority.

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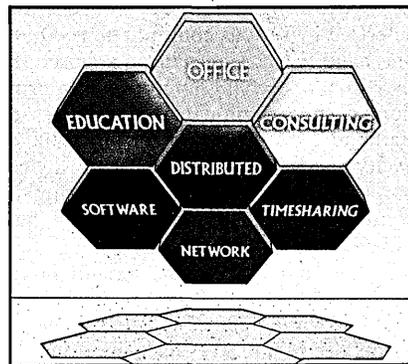
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The transition from vendor dependency to maturity is not a simple process.

Typically, the new tools allow the capacity planners to incorporate the information they have obtained from the end users. In addition, the planners' concerns expand during this stage to issues such as floor space, power, and cooling, which are not contained in the computer log file data on which they have previously concentrated.

The planners are now producing a continuing series of planning documents for corporate decision makers. Rather than being standalone documents, they provide both a long-term strategy for the installation and detailed tactical plans for the current budget cycle. With each new planning cycle, the capacity planners increase their budgetary and communication skills, along with their knowledge of the business and the requirements of the end users.

The fourth stage ends when the corporate decision makers come to view the capacity planning as a reliable and essential input to their decision-making process. Today, only a small fraction of installations can be said to be in the fourth stage.

PLANNERS REFINE SKILLS *Stage five: mature.* The confidence senior management now feels in the capacity planners signals the existence of a mature program, one that is trusted to collect and distribute information to decision makers at all levels of the corporation. In other words, the fifth stage is entered when capacity planners can meet the expectations of the corporate decision makers they support. During this stage, capacity planners continue to refine skills they developed during the fourth stage.

The transition from vendor dependency to maturity is not a simple process. It is interesting to note that many of the key characteristics come full cycle during the five stages. For example, the level of continuity represented by the plan begins with the long-term marketing objectives developed by the vendor. During the interim stages, continuity issues are ignored by both the individuals assigned to special studies and the technicians. In the later stages of development, attention is once again focused on long-term considerations.

Capacity planning can provide the corporation with an effective means for reducing costs and ensuring that adequate resources are available. Unfortunately, most capacity planning programs today are trapped in the third stage, characterized by increasing management expectations and technical frustrations. The way out of this trap is to recognize the structural characteristics that limit the effectiveness of capacity planning programs in their early stages. ©

H. Pat Artis is senior technical adviser at Morino Associates in Vienna, Va. He has written and lectured internationally on workload characterization, capacity planning, and I/O configuration management. In 1984 he received the A.A. Michelson award from the Computer Measurement Group.

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Improved Ergonomics For Improved Productivity

Take the 102-key ASCII-style keyboard, for example. Its low profile, gentle contour and typewriter touch make for faster keying with fewer errors. The keyboard has programmable function and editing keys so it can be custom-tailored to meet your application needs.

Then, for comfortable viewing, there's the tilt and swivel of the 12" display. And the sharp, clear 8 x 16 character matrix for easy reading. Plus cursor, character and field attributes (blink, reverse video, underscore, dual intensity, etc.). And scrolling. And partitioning. And lots more.

The IBM 3163 with Plug-in Cartridge

And, as if that weren't enough, we're also announcing

B A a \$ m G * @ # Q

The sharp 8 x 16 character matrix helps make for easier reading and fewer operator errors.

a second new ASCII display station with even higher function—the IBM 3163.

Outwardly, these two new displays look alike. But the 3163, in addition to its built-in emulation of the IBM 3101 Model 881, also offers the ability to emulate the DEC VT 52 and VT 100* by means of a unique plug-in cartridge.

And while you'll like the power and flexibility of the 3161, for your high-function applications the 3163 goes even further. For example, a 7,680-character buffer and up to three windows enable you to view and modify portions of different host data bases. The 3163 lets you redefine and even recap the keys.

On both displays the setup is menu-guided and written in plain English, so it can be done easily and quickly. The point is, both are designed to improve your user productivity.

Very Attractive Prices

The price per terminal is \$695 for the 3161 and \$1,095 for the 3163. Quantity discounts are available. What's more,

IBM maintenance offerings start as low as \$35 per year per terminal for

customer carry-in repair.

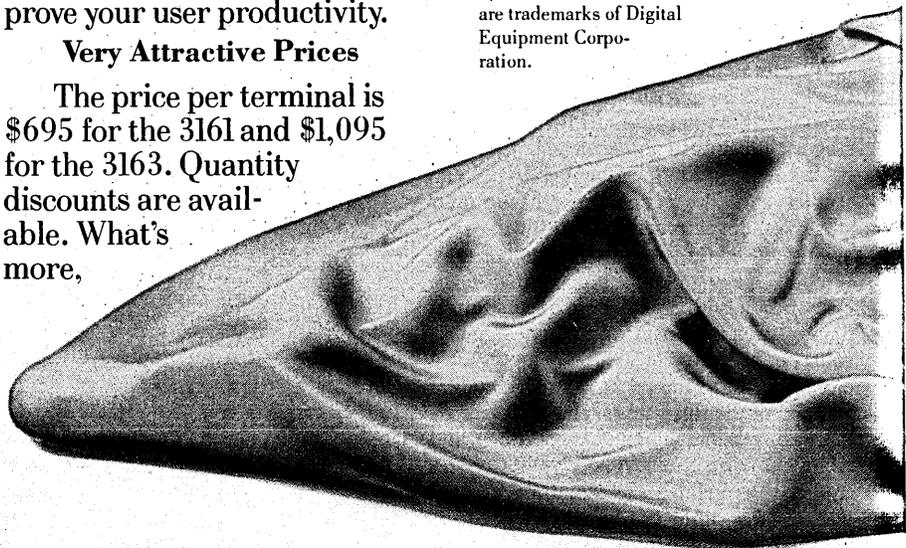
Now there's a new family of ASCII displays with the quality, service and support IBM is famous for. Both displays are available through IBM Authorized Distributors and IBM marketing representatives.

FEATURES	3161	3163
Lines x Characters	25 x 80	25 x 80
Double-sized chars	No	Yes
Line drawing chars	24	24
Vertical scroll	Jump	Jump/Smooth
Definable function keys	24	24
Windowing	No	Yes
Partitioning	Horiz	Vert/Horiz

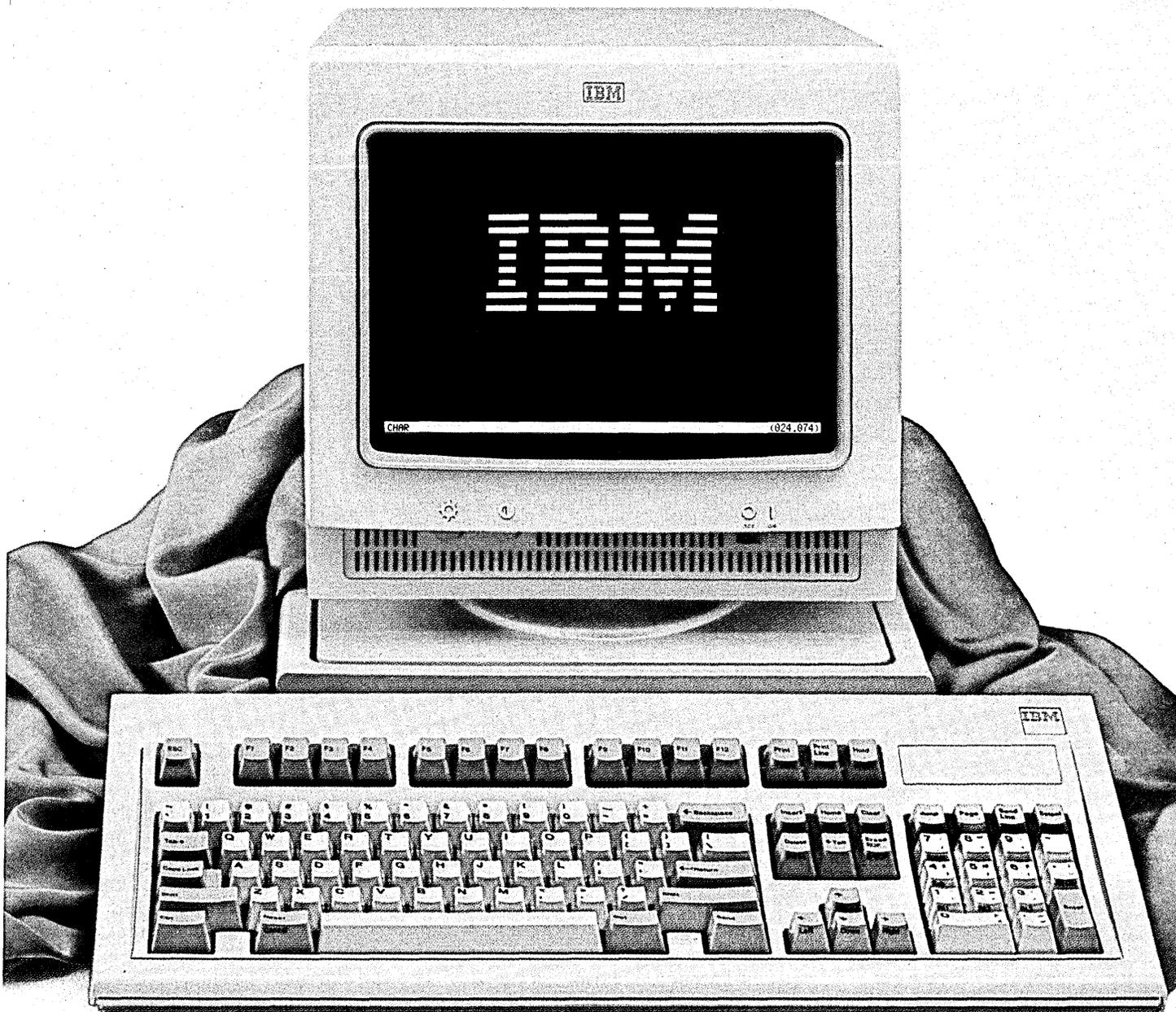
Call 1 800 IBM-2468, Ext. LE/82 for the name of an Authorized Distributor near you.



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different ASCII displays in one.



The IBM 3161 ASCII Display Station

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smoothly and consistently, copy after clean, crisp, trouble-free copy. As well as through your low- and medium-volume copiers and offset duplicators—a fact your purchasing people will like because they know volume buying keeps costs and inventories down.

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Fast, dependable Hammermill Fore 9000 DP. The paper that can keep your high-speed system running at high speed.

Ask your Hammermill supplier for samples and a sample book.



Santa's MIS department was a shambles—and that made everybody miserable.

HOW THE SOFTWARE WORKBENCH SAVED CHRISTMAS

by Richard Harrison, as told to Nicholas Zvegintzov

How the software workbench saved Christmas is one of my children's favorite stories. It is a good illustration of how the Federal Software Management Support Center brings software management expertise to federal agencies and to contractors working with federal agencies. In addition, all the principals involved are mythological, and therefore we do not have to change their names.

It was the night after Christmas, and all through the government not an agency was stirring, not even the Internal Revenue Service. I will not specify the year, but I will give you this hint: it was the year everything seemed to go wrong. In many areas of the country there were no reindeer droppings on roofs and no bulging stockings. Children received only back order slips and useful objects selected by their parents, such as mittens, piano lessons, vitamins, and notebook dividers. The children were angry, and finally their anger reached Washington.

Late in the evening of Dec. 26, I received an official call to proceed immediately to the Zero Milestone on the Ellipse, between the White House and the Washington Monument. It was a bitter night, and the snow squeaked beneath my shoes. The lights were off in the Federal Triangle. The trees around the Ellipse seemed to crowd in so that I stood not in the heart of the city but in a small clearing on the edge of the forest. Next to the Zero Milestone stood a small cabin I had never noticed before. Its logs were firmly chinked with whitewashed clay, its roof was clad with cedar shakes, and the pungent smoke of burning pine logs wafted from its fieldstone chimney. A long sled was parked in the front yard, and in the stables at the back I glimpsed tiny reindeer. Since nobody else was in sight, I banged on the cabin door.

The man who opened the door was one of the tallest, thinnest people I have



The customers want to correspond with Santa via electronic mail.

ever seen. He wore a tailcoat of ancient cut, a star-spangled vest, and woolen stovepipe trousers. I recognized him at once as the person we Feds all work for. "Good evening, sir," I said.

"Call me Sam," he said. "Come in out of the cold. I have someone here who needs our help."

Beyond the narrow hallway was a low, curtained doorway. Sam held the curtain aside and we stepped into the living room of the cabin. At the far end of the room was a fireplace in which logs blazed and hissed. Beside the fire, in a leather armchair, sat a man as short and fat as Sam was tall and thin. His cheeks were like roses, his nose like a cherry, but as he turned to greet us, he looked far from merry.

"Ho, ho, ho," he said mournfully. "I sure hope you can help us."

Sam sat down on the opposite side of the fireplace, and motioned me to sit in a chair between them. I took out my yellow pad. "Just give me the facts," I said.

GNURDS PROCESS THE DATA

"When small was beautiful," said Santa, "Christmas was simple. I ran the business with elves, who made toys, and trolls, who delivered them, and Santa's little helpers, who picked up requests and determined whether children were good or bad. In the early 1970s, with the help of gnruds—gnomes specially adapted to data processing—I took a big step, and computerized.

"Our system was organized into three subsystems. The Customer System supports the customer profile, distinguishing good children from bad, and performing the pre-Christmas, one-year-older rollover when recipients graduate from Cabbage Patch dolls to Madonna see-through T-shirts. The Manufacturing System maintains a database of toys in progress. The Shipping System schedules and routes deliveries, and maintains the reindeer resources database. Here, I'll show you." Santa borrowed my pad and sketched a diagram of his MIS department in the 1970s (see Fig. 1). He explained that each functional system had its own programmers, programs, and data. To link these areas, he said, the programmers and their managers exchanged written and verbal messages, much as in the days before computerization.

"Now, my MIS director is a fellow named Doc," said Santa. "Doc went to college, and he learned a thing or two. 'Information is information,' he says. 'It does not matter whether it is names of children, inventories of toys, or rooftop routes. Information that is already in the system should

stay in the system. It can be transformed and transmitted to other activities in the system automatically. What works already should be made to work harder.' Doc decided to turn Santa Enterprises into the most integrated and computerized manufacturing and delivery business at the North Pole, and he planned to do so by vigorously managing the information resources already present."

Santa gave some of the details. The ages and relative goodness of the children, he said, can be converted into manufacturing instructions (so many space voyage videos vs. so many huggables). The locations of the children can be transformed into picking and loading instructions in the reindeer warehouse. And the customers themselves are becoming more computerized. They want to correspond with Santa via electronic mail and, in particular, they want to switch from being bad (their normal state) to being good (their special Christmas state) as late as possible before midnight of Christmas Eve. Therefore Doc proposed to equip Santa's little helpers with handheld terminals that could transmit via satellite.

Santa borrowed my pad again to sketch a picture of his MIS department in the 1980s (see Fig. 2). Production gnruds continue to run the existing systems to car-

ry on the existing business, he said, but now teams of development gnruds are simultaneously working to link and integrate the existing systems.

"These projects," said Santa, "are far from being the success that my MIS director promised."

"Isn't that always the way?" I said sympathetically.

"That's not the worst," said Sam. He lowered his voice to a whisper. "One of my federal judges has proposed breaking up Santa Enterprises and distributing the work to 366 BOCs (Birthday Operating Companies)."

"Instead of integration," said Santa, almost in tears, "I shall have disintegration." He had a broad face and a round little belly; it shook when he sobbed, like a bowl full of jelly.

A mournful expression came over Sam's face. He reached over and clasped Santa's hand. "I know we can help you," he said. He refilled our stoneware flagons with New World grog—hot chocolate and corn whiskey—and they both turned to me.

"What does your staff tell you is the problem?" I asked.

"It's not just one problem, and it's nothing big," said Santa. "That's why it's so hard to deal with. A sequence of software glitches and intercreature misunder-

FIG. 1

SANTA'S MIS DEPARTMENT IN THE 1970S

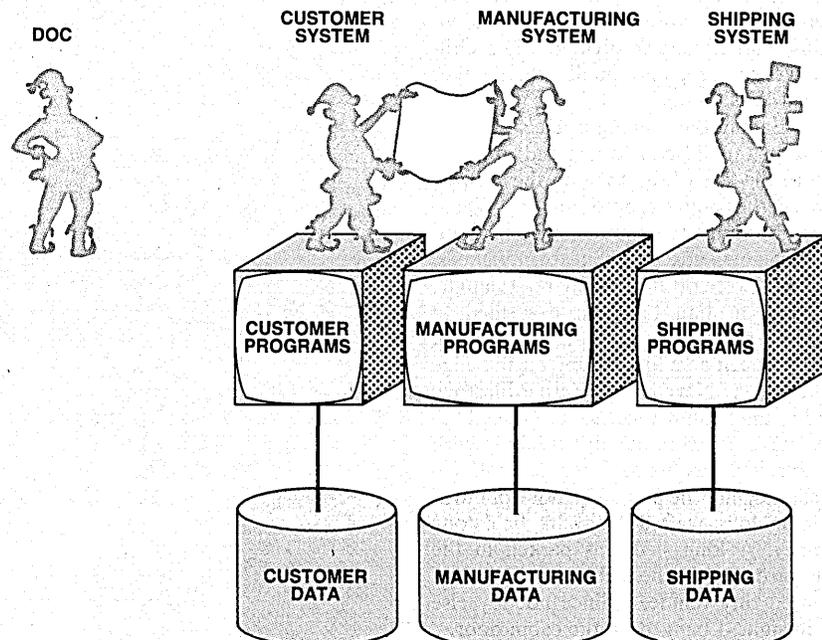
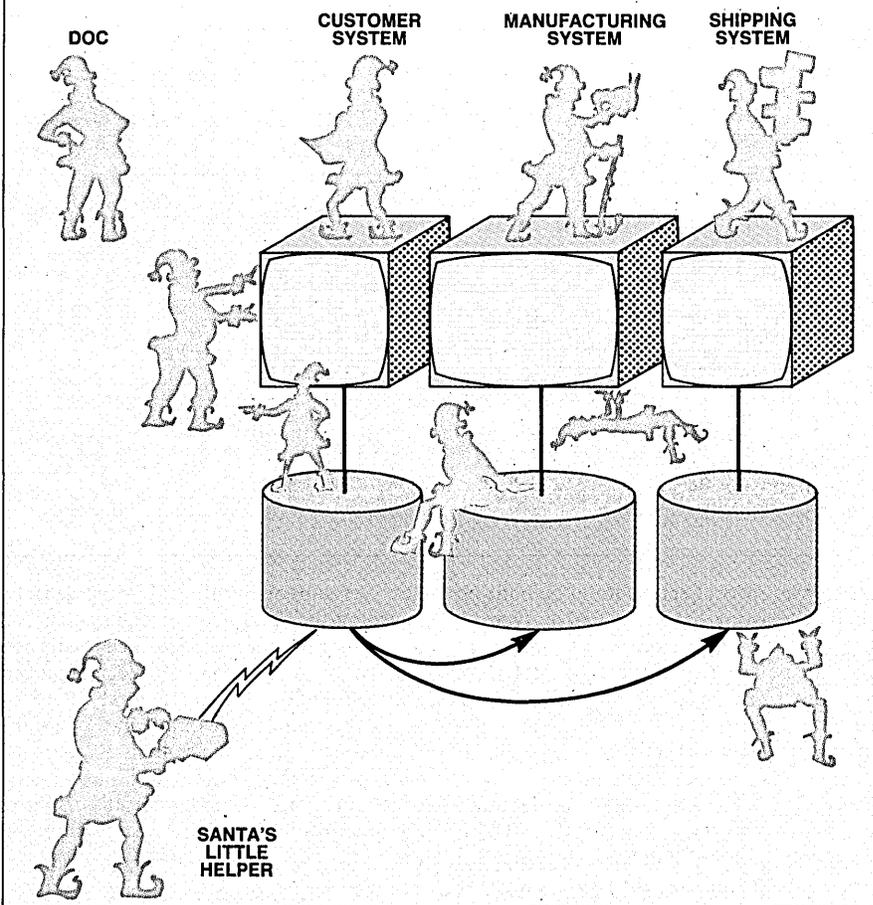


FIG. 2

SANTA'S MIS DEPARTMENT IN THE 1980S



standings, each small and recoverable in itself, has cumulated to create an unrecoverable disaster."

Santa's software management problems fell into three categories.

- Programmers did not coordinate their changes, so that two programmers would make conflicting changes in the same file, or the system would come up with the old version of one function and the new version of another.
- The project phases had been miscoordinated. Santa's little helpers could not be trained to use their new terminals until the software came up with a live demo version, and when it did, there was too little time to train the helpers before the Christmas deadline. The project managers had not detected the slippage until the crunch was on them.
- Complex sequences of programming tasks had not been accomplished correctly. Programmers assigned to find all the data links between the customer file and the manufacturing file had missed some, or failed to validate their work, or not recorded the answers correctly.

"I just can't understand how we could fail so badly," said Santa. "Gnurds are specialized for data processing. They

have an extra left hand for the function keys, and extra eyes for reading multiple windows. They worked hard. They worked smart. But their best efforts just weren't good enough."

"However many hands and eyes you have," I said, "the complexity of a data processing task can get beyond you. It's the same in data processing as in the manufacturing task. Take your elves, for example. Does each one sit on a stool making tools one by one?"

"They used to," said Santa. "Toys were simple once. A thing like that tin whistle in Sam's vest pocket we used to make individually. But something like that vcr over there takes an assembly line and specialized tools."

A WORKBENCH FOR SANTA

"Then that's the key," I said. "The more complex the job, the more setup you need. For a real complex job, like your new programming projects, you need a real complex workbench."

"All the gnurds have terminals already," said Santa. "They have full screen editing, menu-driven job control language, and interactive execution. I don't know what other workbench they would need."

"But a workbench isn't just terminals and editors and menus; it's what you make with them," I said. "And the problems you had with these projects weren't problems of programming; they were problems of organization."

"You had all the pieces that you needed, but you couldn't find them, and if you found them you couldn't reach them, and if you reached them you bumped into each other picking them up, and when you picked them up you didn't know where to put them," I added.

"In short," said Santa, "we need a workbench. But what is a workbench for software?"

I bulleted on my yellow pad some basic criteria for a software workbench.

- A software workbench is a control framework for the tools, standards, procedures, or other resources used in software creation, modification, and management.
- A software workbench is not just a single software tool, it is something to mount software tools upon.
- A software workbench should be usable by personnel with different levels of technical skill, or at least adapted to the level of skill of its intended users.
- A software workbench should be usable on a wide range of problems currently faced by software personnel, not just on the problems of creating new systems.

"Those specifications are all fine and dandy," said Santa, "but I don't believe there's anyone in the universe who can deliver them. Remember that I have everything from magic to myth to call upon, and I haven't been able to find anything."

He explained that when Doc first realized they were in trouble, he sent out a message via spiderweb mail to all the fantasy kingdoms where software help is to be found—Fairyland, Dreamland, and Valhalla—for a solution to their software problem. Responses poured into Doc's igloo until his floor was piled with robin eggs, bottles, and gossamer cocoons. But after he opened up the packages and read all the proposals, he was disappointed.

The princes of Fairyland promised to sell Santa magic machines that could generate anything in the world. The price: Santa's staff would have to learn to speak one of the languages of Fairyland. A language of Fairyland, said each Fairy vendor, is a language of the future. Unfortunately, each of the Fairy languages is different. And once you speak one Fairy language you must speak that one forever. "The price is too high," said Doc, and put aside the proposals from Fairyland.

The vendors of Dreamland said:

The vendors of Dreamland said, "We have all the resources to make your dreams come true. Offer us enough gold pieces."

"We have all the resources to make your dreams come true. Just tell us what you want, offer us enough gold pieces, and then some, and we will do the work." "You're dreaming," said Doc, and put aside the proposals from Dreamland.

Valhalla is the realm where the defense of good against evil is forged. Each of the blacksmiths of Valhalla said: "We have workbenches unsurpassed in all the universe which we use in forging our mighty weapons. Unfortunately, our technology is proprietary and is only used in our house, so we cannot sell it to you. But, by the way, if you find out anything, please let us know." "They're improvising and jury-rigging just as we are," said Doc, and put aside the proposals from Valhalla.

When I heard this story, I had to laugh. "It sounds to me that things are just about the same with you as they are in the real world. We don't call our vendor groups Fairyland, Dreamland, or Valhalla, but they tend to give us the same type of answers. That doesn't mean you can't use them. You just have to know how."

Santa looked a little happier. With a wink of his eye and a twist of his head, he asked: "Does that mean I have nothing to dread?"

SAM HAD THE SAME PROBLEMS

"Well, it certainly means you're not alone," said Sam. "I've had the same problems running my business. We have invested billions of dollars in developing and maintaining our software inventories, and we also lose track. It becomes hard to tell on any given day just what is in the inventory and how well it is working. That's what we asked the Federal Software Management Support Center to look into."

I began to sketch on my pad some of the principles we had learned in our search for workbenches to control the software inventory.

Our first principle recognized that resources must be conserved:

- Preference will be given to systems that already exist. We have neither the time nor the money to build from scratch.

Our second principle recognized the strategy of divide and conquer:

- One software workbench is not enough; there are as many software workbenches as there are different software activities.

To prevent this principle from carrying us off in incompatible or irreversible directions, we added two more principles:

- A software workbench should be built on an open architecture so that new tools and tools from different sources can be added incrementally.

FIG. 3

SOME WORKBENCH VENDORS

VENDOR	SYSTEM NAME
Softool Corp. 340 South Kellogg Ave. Goleta, CA 93117 (805) 683-5777	CCC—Change and Configuration Control
Motorola Four-Phase Systems 10700 North De Anza Blvd. Cupertino, CA 95014 (408) 255-0900	Maestro Plus+
Rand Information Systems Inc. 1201 Harbor Bay Parkway Alameda, CA 94501 (415) 769-9000	Rand Development Center

- A software workbench should be built on standard existing hardware and software.

When we looked at the problem from the perspective of these principles, we went out to research existing open frameworks oriented toward the solution of significant but bounded software management problems. I explained to Santa that California is a place something like the fabulous realms of Fairyland, Dreamland, and Valhalla, and I showed him the list in Fig. 3. I explained that in the real world there are many ways in which specialized workbenches have been built to support specialized views of the software process.

One view, stressing configuration management, recognizes that the content of a software system is in its inventory of files. Those files comprise the source code, documentation, and data that together represent the relationship of a computerized system to its users and builders. Configuration management arose as a military discipline whereby defense managers could keep track of the immense inventory of parts that make up a battleship or an infantry division, and could therefore resupply or re-equip with the right parts and materials at the right time. Configuration management can also be applied to the inventory of symbols in a software system. The configuration management workbench links and integrates the files of a software organization.

An example of a configuration management workbench is CCC, the Change and Configuration Control system from Softool Corp. CCC, according to Softool, enables programmers to coordinate their changes so that two programmers cannot make conflicting changes in the same file and also so that the system cannot come up with the old version of one function and the

new version of another. It does this by guarding the documents in the system and by enforcing rules that govern their use. The rules are set by the project manager, and could prescribe, for example, that

- two programmers cannot check out the same source file at the same time, and
- if a programmer checks in a new version of a source file, then the object version of all systems of which it is a part will be re-created.

GUARDS, REPORTS, CHANGES

CCC remembers the changes made to the files that it guards and can report changes or re-create past versions. CCC runs on many kinds of hardware, including IBM mainframes and DEC VAXs, plus Apollo, Data General, Honeywell, Hewlett-Packard, and Sun.

A second way to implement the workbench idea is with a project management approach. The project management workbench links and integrates the personnel of a software organization. An example is Maestro Plus, a feature of the Maestro front-end programming environment. Maestro was designed by Software GmbH, a West German software house, and is hosted on hardware from, and marketed in the U.S. by, Motorola Four-Phase Systems.

Maestro Plus is a facility for the manager to establish the milestones of a project, communicate them to the staff, and receive feedback on their accomplishment. Maestro Plus models the progress of a software project as a sequence of text creations. A project manager can tailor a project skeleton to reflect a preferred methodology or an arbitrary sequence of activities, for example:

- A development project must progress by creating a series of documents representing

code, test materials, user documentation.

- A conversion project must modify a designated set of source files, recompile them, and run them against modified data.

The project manager establishes the skeleton of activities, and may budget manpower requirements and calendar time for them. As the programmer accomplishes each subtask, effort expended and time of conclusion are updated in the skeleton. Exception warnings of effort over budget or schedule slippage are transmitted to the manager via electronic mail.

A third way to implement the workbench idea is by linking and integrating the tools that a programmer works with into a tool workbench. RDC, the Rand Development Center, from Rand Information Systems Inc., is an application of IBM's ISPF (Interactive System Productivity Facility), which is a language for creating a menu-based controller for interactive processes. RDC uses ISPF to frame, control, and support customized tool environments, for example:

- A conversion workbench, including tools for converting source code and data files, for performing pre- and post-conversion tests, and for comparing the results.
- A documentation workbench, including tools for collecting information from users and programmers, and for editing and formatting text and examples.

According to Rand, RDC provides facilities that enable a software manager to create workbenches with specified sets of tools, and to assign a programmer to a specialized tool workbench appropriate for the current project. The RDC was first created to be a standard development environment for Tennessee Gas Transmission, a subsidiary of Tenneco.

3 WAYS TO EXTEND STRENGTHS

These three software workbenches illustrate three ways to extend the organizational strengths and technical know-how of the software team and to institutionalize the knowledge of the software group. In fact, they provide a defense against three ways in which (as Santa's programmers had discovered) improvised, ad hoc methods—methods often kept only in the heads of the practitioners—can break down under increased complexity.

The configuration management workbench builds beyond the stage at which programmers individually remember where the project files are and borrow them from each other. The project management workbench builds beyond the stage when a manager and a programmer communicate on project schedules informally.

The tool workbench builds beyond the stage at which programmers work only with the tools they have brought into the shop themselves.

A FINAL GIFT FOR SANTA

I had one more gift for Santa: a bundle of vendor literature. As I handed it to him, I offered him another of our principles: use the vendors, don't let them use you.

Following our own principles, I said, the Federal Software Management Support Center has initiated its own Programmer's Workbench Demonstration Project to research the practical potential for implementing such packages in large-scale federal dp facilities. Since our mandate is in software conversion and software renewal, we looked for an infrastructure designed for software tool integration and management—the framework of a software tool workbench. We selected as a starting point the RDC, the Rand Development Center already described.

To date, we have activated some 14 different tool sets, including our own cost estimation and inventory collection systems, plus a test coverage monitor, source and file comparators, a translator, a data standardization device, a reformatter, and a restructuring engine. These tools had been combined into a number of different tool sets to support programmers and managers performing different phases of conversion and improvement.

Moreover, since there had been great interest within the dp community in advancing a practical software workbench demonstration, we have not had to buy or develop any of the software components we used to assemble the workbenches. Rand Information Systems Inc. donated the RDC; Conversions Inc., Raleigh, N.C., its Transit conversion package; and Language Technology Inc., Salem, Mass., its Recoder restructuring engine.

As a result of this strategy, I told Santa, we advanced still another principle: the more tools you successfully integrate, the more vendors will be eager to add theirs, and the more options you will have to choose among.

It was getting close to dawn. Sam raised a corner of the blind and looked out the window. The sliver of a new moon was rising just ahead of the winter sun. The backglow of the snowy earth cast a pallor on the moon's dark face. It was time for Santa to depart; he does not travel by day.

Santa stood up and pulled his fur-trimmed crimson robe about him. I do not know how I could have thought him mournful, as I had when I first stepped in

that room. He was chubby and plump, a right jolly old elf, and I laughed when I saw him in spite of myself.

"I feel so much better," he said. "Is there anything else I should know about software workbenches?"

"Only this," I said. "Take the first step; otherwise you will never start at all."

Sam escorted us out into his humble front yard. Santa's troll grooms had harnessed the reindeer, and they stood before the gate, nostrils steaming. Santa sprang to his sleigh, to his team gave a whistle, and away they all flew like the down of a thistle. I watched them fly out of sight over the trees beyond the White House, and behind me I heard Santa's tune echoed by "Yankee Doodle" played on a tin whistle.

When I turned to say good-bye to our host, there was no more log cabin beside the Zero Milestone. At the White House fence a couple of policemen watched me and mumbled into their walkie-talkies. At the curb was a cab whose driver said: "You the party to pick up at Sam's?"

Did Santa's gnurds install software workbenches? I don't know for sure, but I think so. Programmers did not stumble over each other, information was not lost, schedules were not slipped, and thus Santa's software workbench saved Christmas.

Certainly my children tell me Christmas is getting better and better. And the only part of the system that never ran as specified was the database to distinguish good children from bad. There are good and bad designs, good and bad programs, good and bad data, but, as far as Santa is concerned, all children are good children.©

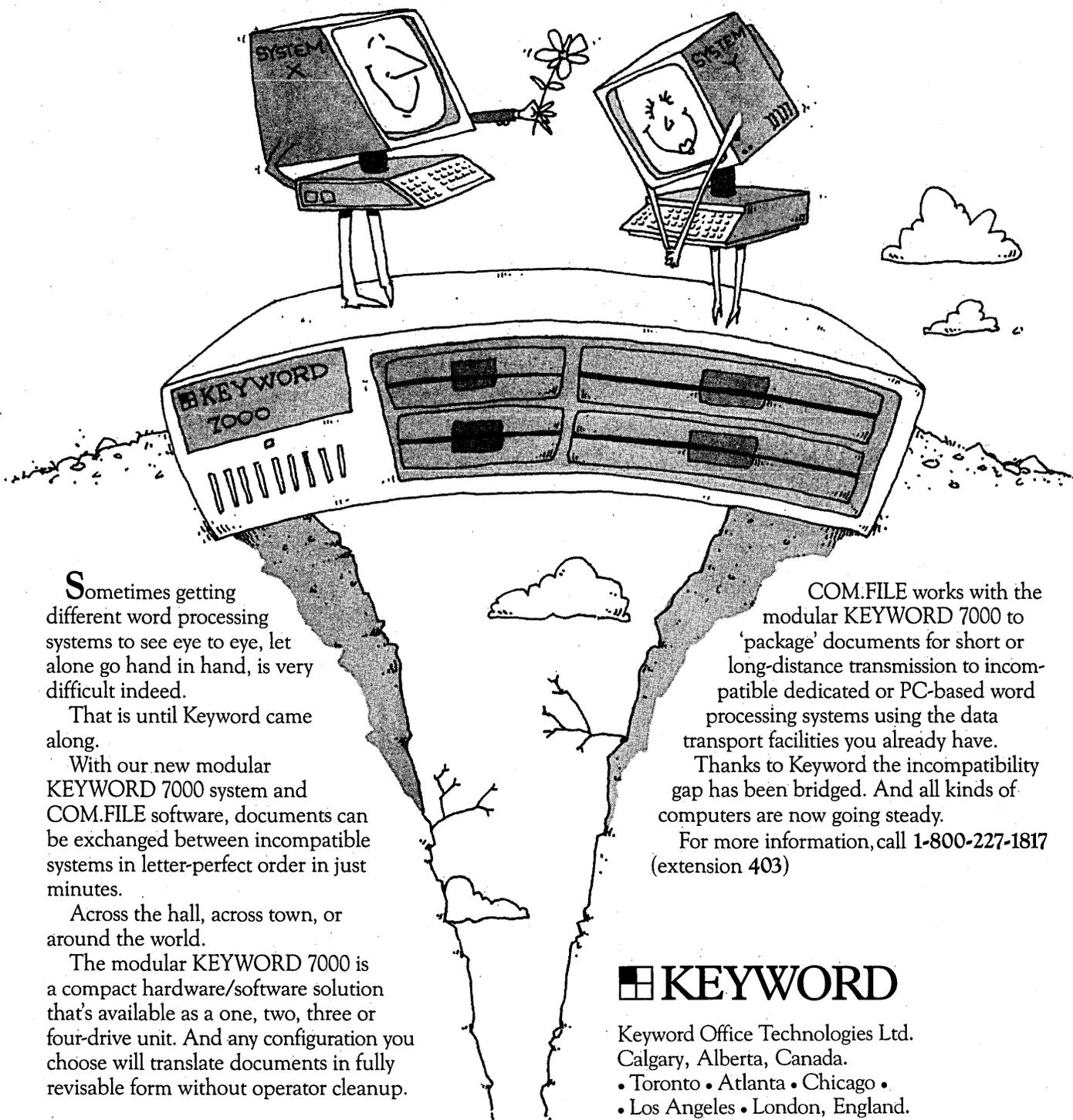
Richard G. Harrison is director of the Federal Software Management Support Center in the General Services Administration's Office of Software Development and Information Technology (OIT), in Falls Church, Va. OIT supports federal agencies with software technology, office information systems, and information resource management planning.

Nicholas Zvegintzov is editor of *Software Maintenance News*, Staten Island, N.Y., which reports monthly on the enhancement, adaptation, and correction of software, and the technical support of software users.

Both authors are recognized supporters of the software renewal process and deal with software professionals who are looking for advances in performance that can be achieved with existing personnel, and advances in technology that can be installed alongside existing systems.

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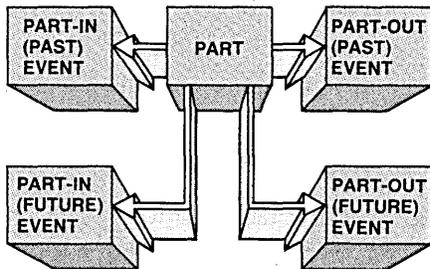
CIRCLE 27 ON READER CARD

THE TEMPLATE

by Frank Sweet

Future-event records tend to be quite volatile. Their short lives and high flowrate often call for a cookie-cutter entity to help stamp them out in assembly-line fashion.

We've been designing a maintenance equipment spare parts inventory system called MESPIS. Its goal is to report when we must reorder spare parts, based on their stock balance being too low. So far, our database looks like this:



Part, the hub of our design, contains ID-number, description, and on-hand-stock-qty for each spare part. The two past-event records document every occasion when the part's on-hand balance was updated. The two future events predict arrivals of ordered parts and planned usage. Now, we'll examine the template, or cookie-cutter, pattern.

Compute the volatility of our part-out future event. Say 10 maintenance work orders are done each month. They are planned 30 days in advance, and each requires about 100 different kinds of spare parts. Once the parts are actually consumed, their future-event records vanish, replaced by past events. Hence, some 1,000 new future part-out records are born every month, each with a life span of about one month. This 1,000-record population has a

volatility of 100% per month. Work it out, and you'll see that if maintenance work orders were scheduled three months in advance, the volatility would be only 33% per month. In other words, future-event volatility is inversely proportional to the user's planning horizon; the less farseeing the forecast, the higher the volatility.

Contrast this with past events. They appear when parts are consumed and last for however long we need their audit trail. For example, keeping records in a system for six months results in a 17% monthly volatility. Past-event volatility is inversely proportional to the user's need for history; the more history needed, the lower the volatility.

Since hindsight is sharper than prophecy, any application's future is less certain than its past. Consequently, future-event records are, by far, the most volatile entities in a database. They are produced in a steady stream, live out their short lives, and vanish.

Precisely because they emerge in a steady stream, loading them with data can be tiresome. A model or template record helps. This pattern tells us that when we have a highly volatile entity, we should plan how we'll produce its fields. One way is to find a record wherein we can house standard default values for the fields.

Consider lead time. We saw last issue that our future part-in record carries a date telling when the event (part's arrival) is anticipated. Notice that this information has value even beyond the scope of our system. With it, for instance, we could produce a report comparing the expected arrival dates of those framis bearings we spoke of with their planned consumption dates. True, such an expediter's report is beyond the scope of our development con-

tract, but it's nice to know we could respond quickly to such a request if called upon.

The problem is, where does the information come from? We could ask the user to enter it manually each time. This is more work for our unfortunate friend in purchasing. In addition to bombarding her with reorder warnings, we ask her to guess the date each part will arrive. How would she go about it? Framis bearings take four weeks, fernst gaskets take six, and light bulbs come in overnight. Knowing the nature of the part, she would add its typical lead time to today's date, giving a likely arrival date. Such lead time characterizes the part itself. It is a template datum because it helps compute a field (arrival date) in the volatile part-in future event. Hence, we should add estimated-lead time to the record layout of part-item. Similarly, we should inspect all fields in future-event records: how will each be produced? Would a template help?

Notice that we design the template to help the user, not replace him. The computed date is simply a first guess, offered as a suggestion. Final responsibility for accuracy remains with the user and we must enable him to manually overlay the computer's estimate with his own.

A productive-skepticism warning: users do not always see a template's usefulness as clearly as they do its threat. A template's goal is to handle the routine that makes up 80% of any activity, enabling users to override exceptions. But some confuse importance with ease of automation. With data such as lead time or price, users have been known to refuse template defaults and insist on having it done by hand: "Delivery-date is too important to be entrusted to the computer." Only time and

A productive-skepticism warning: users do not always see a template's usefulness as clearly as they do its threat.

familiarity can alleviate fear. In this situation, our wisest course is to include templates in the design but temporarily leave them out of the processing. Thus, a typical sequence of change requests reads:

January (system newly installed): "Delivery dates must be entered by hand. They are too important to be left to the computer."

April: "We need a list of standard lead times we can refer to (while manually computing and entering all those delivery dates)."

July: "The resupply report should automatically compute each order's estimated delivery date. But this must not go directly into the database. Instead, we shall transcribe the dates from report to database, correcting each as needed."

October: "Computed delivery dates should go automatically into the database. A separate Executive Review Report must be provided, however. It should list each day's computed delivery dates so we can carefully review them and correct those in error."

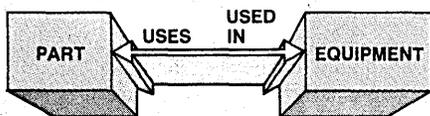
January: "Executive Review Report? Never heard of it. Oh yes, now I remember—that's the one Joe binds and files. Nobody knows what it's for."

THE SELF-RELATED RECORD

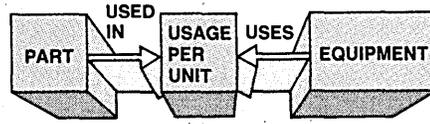
In previous issues we addressed two of the three goals in the scope statement for a maintenance equipment spare parts inventory system. We've determined that the hub of our database is a part-item record with one occurrence for each different kind of part we stock. The record holds the part's ID number, description, on-hand quantity, reorder point, and delivery lead time.

Now, in part 13, we examine the third goal, that is, to "identify, for each part, those pieces of equipment in which it is used." The statement also implies the converse: to identify, for each piece of equipment, the spare parts it uses.

One approach is to add an equipment box, that is, a file containing a record for each piece of equipment.



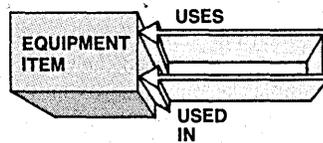
The arrow is two-headed because, while any part (e.g., lubricant) could be used in many different kinds of equipment, a given piece of equipment could require many different types of parts. Recall that a two-headed arrow warns of a missing intersection entity. Replacing it with the intersection, we have:



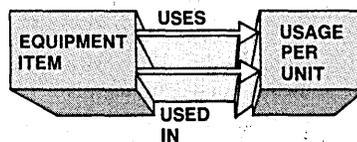
This approach is satisfactory and might do the job. Its main flaw lies in the need to discriminate between a spare part and a piece of equipment. Terminology, it turns out, often depends on context, and something that's called a spare part one moment might be termed a piece of equipment the next.

Looking at an automobile, we might consider the entire engine assembly a spare part. But if we consider the engine as equipment, its ignition cabling group (i.e., coil, distributor, wires) might be termed a spare. And, while a faulty ignition system (equipment) is being repaired, a single spark plug cable (spare part) could be replaced.

If such context-dependent terminology were the case in our application, then treating part-item and equipment as two different entities would be a mistake. A less redundant solution is to have just one entity and call it equipment/item as a compromise.



The situation regarding this two-headed arrow is precisely the same as in the prior one. It means we need an intersection entity. What makes it confusing is that the same record lies at both ends of the arrow. But, though the relationships are harder to visualize, the same rules apply. The resulting pattern is so widely used that it has a name: bill of material.



NUMBERS, KEYFIELDS, ETC.

It is dangerously easy to think a conceptual database is designed when, in fact, major issues are still unresolved. The topics keyfields, numbers, and real things comprise a form of checklist we find useful in deciding whether we are really finished. They are not new. We have mentioned all three before and in part 14 we review our prior discussions.

Keyfields—unique, unambiguous, unchanging, and dataless. Every entity should have a keyfield—an identifier that will tell a person or program which occur-

rence is at hand. Keyfields should be:

- Unique. Each real-world object or event should be represented by only one occurrence of its entity. Don't have two item records for the same part.
- Unambiguous. Each occurrence of an entity should model only one real-world object or event. Don't mix light bulbs and gaskets in a single time record.
- Unchanging. Once they are assigned, an entity occurrence's keyfields should remain unchanged.
- Dataless. Keyfields identify. Data fields describe entity attributes. Don't mix the two functions.

Numbers—population and volatility. An easily avoided error in database design is to neglect numerical analysis. To an intern, it may seem that the experienced surgeon takes risks. To an apprentice, the seasoned engineer may appear to guess at pressure vessel stress. Similarly, to novice database designers, veterans can seem to shortcut numerical analysis of the data. In all three cases, appearances are deceptive.

A database designer working on his or her tenth materials management system might give the illusion of being unaware that the bill of material is a complete template for supply requisitions, or that maintenance work-order volatility is between 50% and 100%. But, like the swan's effortless glide, it is an illusion that conceals frantic paddling beneath the surface. Before signing off a conceptual design, we must know every entity's population and volatility. Until we do, our design is unfinished.

Real things—objects and events. Application systems analysis usually begins by studying the existing system, automated or not. This is the easiest way to find out what it's all about. But our database design would be less than professional if it simply modeled the existing system. Our goal, after all, is to model underlying physical reality.

Every box in our design should represent an identifiable entity in the real world. Nonvolatile boxes simulate objects (or intersection data about pairs of objects). Volatile boxes model events or happenings that actually take place. No box should simply model a record in another data processing system, automated or manual.

Concluding a conceptual database design, we ask ourselves three questions:

- Does every box have a unique, unambiguous, unchanging dataless keyfield?
 - Can we produce reasonable population and volatility estimates for every box?
 - Does every box represent either a real-world object or a real-world event?
- Yes? Then we're done. ©

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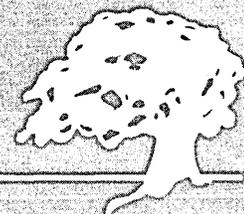
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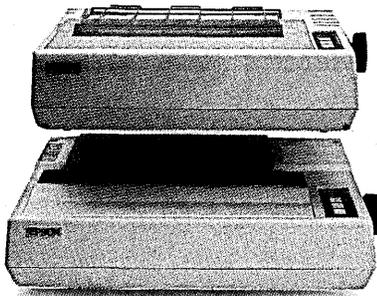
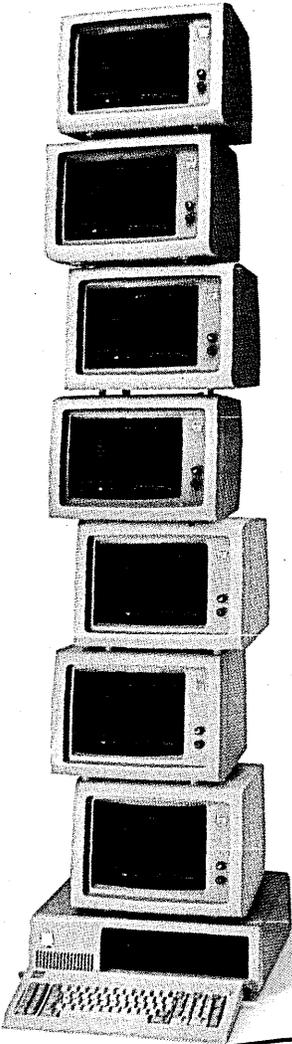


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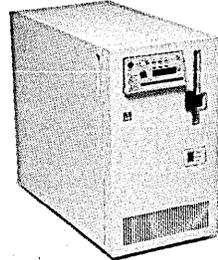
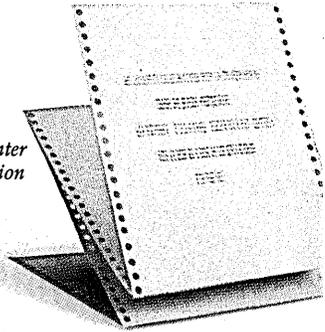
CIRCLE 23 ON READER CARD

Multiple Host Sessions—Up To 7 Combinations of Displays and Printers—Simultaneously (Available Only On AST-5251/11 Plus)

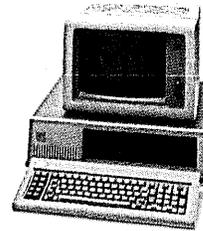


Multiple Printer Sessions, Including 5256, 5224 and 5225 Emulation On PC-attached Printer

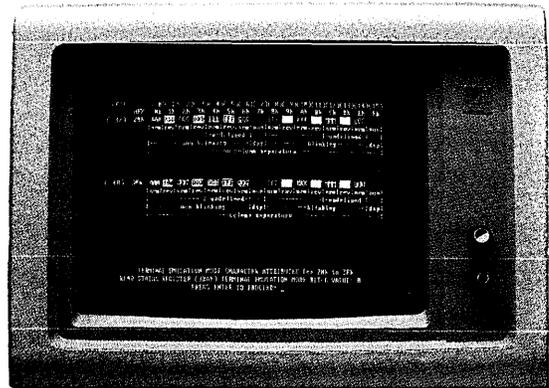
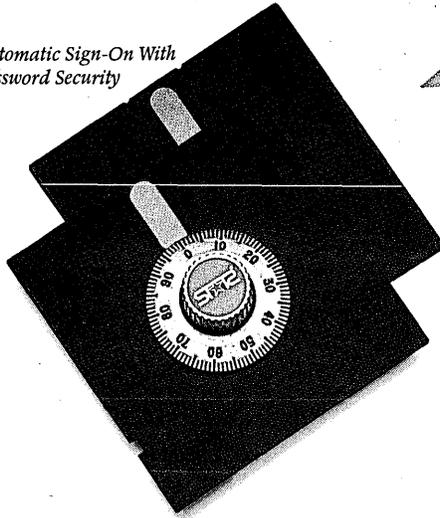
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network gateway connections we've established worldwide, that we've already made a substantial commitment to helping people realize their fundamental visions of the "smart office."

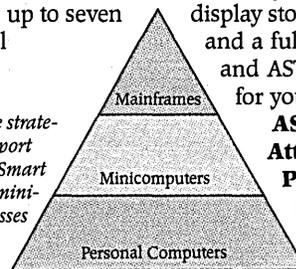
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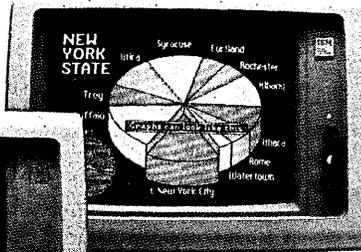
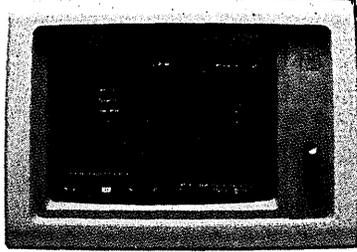
Our file transfer system means you can move host data to and from your favorite PC application software files, like Lotus 1-2-3®, WordStar® and dBASE.™ For easy integration of PC and host applications, we've included our Applications Program Interface (API).

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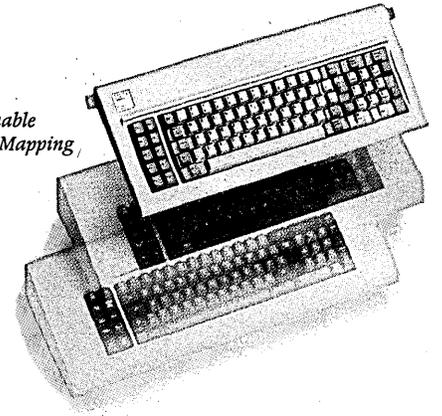
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monochrome display look just like an IBM Model 11 display.

And it gives you high-resolution Hercules[™] compatible bit-mapped graphics, high quality text and a parallel port.

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Our color capabilities are completely compatible with your PC software favorites like Framework[™], Symphony[™], Lotus 1-2-3[®], Business Graphics Systems[™] and DESQview[™]. There's also a parallel port to make printer and plotter connection easy and convenient.

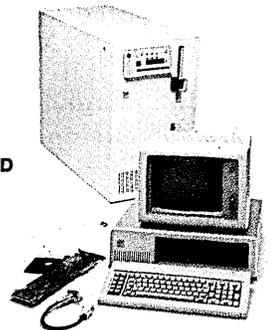
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Which means, with our 3278/79 card, you've got more memory left for application programs. And less tied up with housekeeping functions.

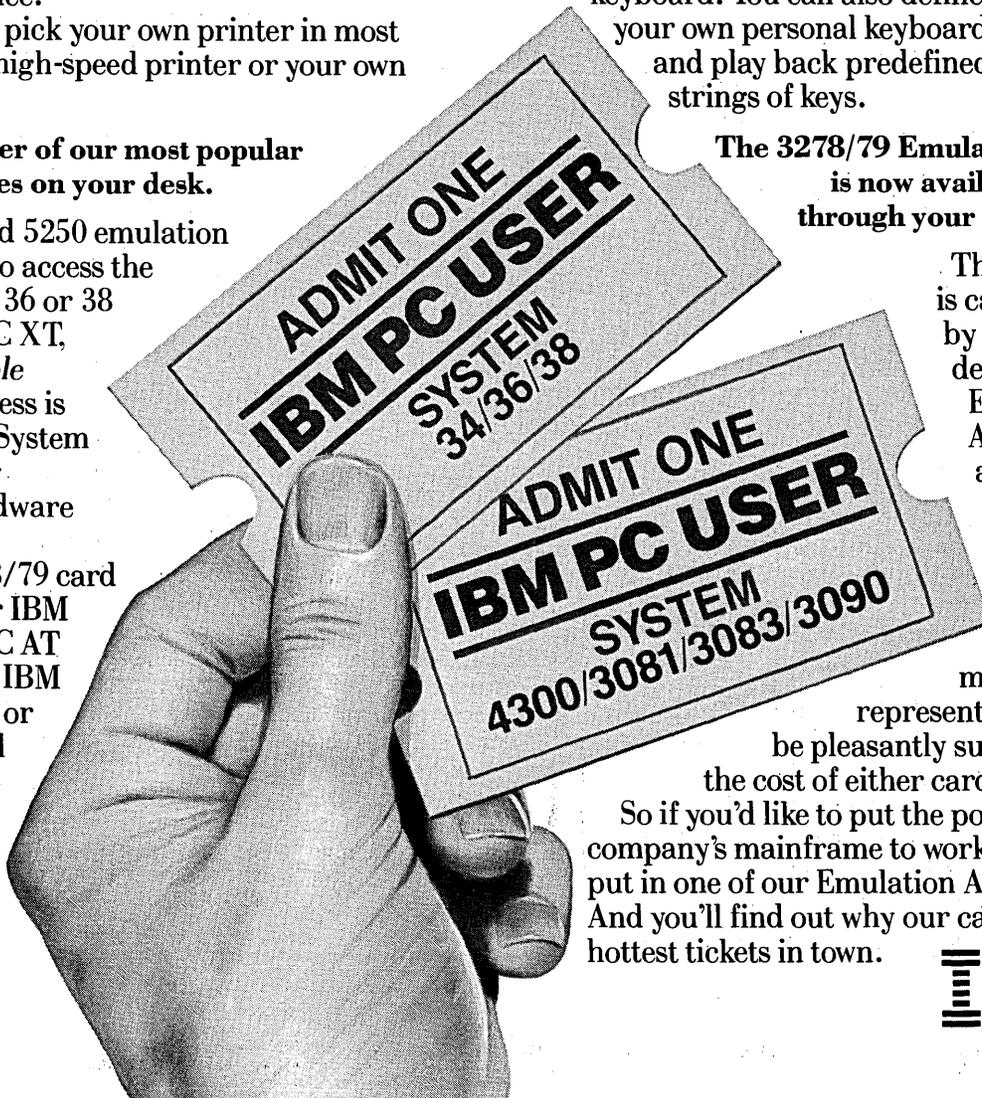
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HARDWARE

OFF-LINE

Sometimes our industry terminology is confusing: for example, in the realm of personal computers we have desktop, laptop, and kneetop models; we have luggables, portables, perhaps even haulables and draggables. The latter designations seem to apply without regard to whether your're five feet, two inches tall and weigh 100 pounds or you're "Refrigerator" Perry, the 307-pound defensive lineman for the Chicago Bears who would probably class a 4300 as a totable.

Now we have subsets. In a research report by Market Intelligence Research Co., Palo Alto, portables have been broken down into three categories: briefcase-sized, handheld, and suitcase models. (No mention, thank goodness, of models that fit into your shaving kit, or stuffables that nestle nicely in your Lands End duffle bag.)

Turns out these three sizes are vying furiously for the marketplace. The briefcase versions were on a par with the handhelds and suitcase models during 1984, but by 1988, the report states, the briefcase-sized portables will have swept the field.

"Briefcase-sized portables represent the wave of the future for the personal computer industry," MIRC predicts, and forecasts a market segment that will increase at a 75% growth rate over the next five years to \$11.3 billion in sales, "leaving the handhelds and suitcase models far behind."

But there are subsets to the subsets. "The briefcase class is composed of two sub-

groups: the low-end, or kneetop, computer as characterized by the Radio Shack 100, and the high-end, full-function units like the Grid Compass and the Hewlett-Packard 100 Portable."

We just received for evaluation a Tandy 600 portable, Radio Shack's latest offering. It fits into a briefcase. It has lots of features, including 32K RAM upgradable to 224K, built-in 3½-inch 360K floppy disk drive, 80-character-by-16-line flip-up LCD display, internal 300baud modem, built-in word processor, calendar, filing system, telecommunications, and spreadsheet. You can hold it on your knee, or put it on your lap, or haul it around in your briefcase if you're so inclined. It weighs about 11 pounds; the price is \$1,599.

And then there's the Thorn EMI Liberator, a 3¼-pound portable text processor that is the size of an A4 sheet of paper and just 35mm thick. (It's being marketed only in Europe now; U.S. plans are vague.) In its press release, the Middlesex, England, firm refers to the unit as a kneetop computer, and then muddies the waters by stating, "It fits easily inside a briefcase leaving plenty of room for other items."

It comes in two models: one with 40K of memory, the other with 64K. Additional memory can be provided using an optional plug-in 24KB cartridge. And then there's a portable disk drive, a modem, an acoustic coupler, and a range of printers. Are those the other items that fit in your briefcase? The price in Europe is about £740.

MAINFRAME COMPUTER

The A10 system is a general purpose mainframe computer available in two models, the single processor A10F and the dual processor A10H; the F model is field



upgradable to an H model. Also available is the A10FXH, an upgrade package that permits users of the vendor's A9F and A9FX systems to upgrade to A10H systems.

The A10H's dual processors can be used together as one system or partitioned into two single systems operating as independent A10Fs to meet dynamically changing workloads. Both models feature 256K DRAM memory technology with memory capable of being expanded from 12MB to 96MB in 12MB increments. Circuit technology is emitter coupled logic (ECL).

The A10 operates with the complete range of the vendor's A series software, including the InterPro software series and Logic and Information Network Compiler II (LINC II), a fourth generation application program and system generator. A full line of software designed for various business applications, including manufacturing and distribution, education, health care, government, and finance, runs on the system. The A10H is available immediately; prices for 24MB base systems begin at \$962,000. The A10F will be available in the second quarter of 1986 with prices for 12MB base systems beginning at \$580,000. The A10FXH is scheduled for release in the third quarter of 1986 and is priced at \$650,000.

HARDWARE

Also available is a new operating system called Master Control Program/Advanced System (MCP/AS), the follow-up to the vendor's Master Control Program (MCP). In addition to the A10, MCP/AS also supports the A3, A9, and A15 systems, and can address more than 24 billion bytes of main memory. A Series users of software release 3.5 will be able to upgrade without program recompilation. BURROUGHS CORP., Detroit.

FOR DATA CIRCLE 301 ON READER CARD

SYSTEMS FAMILY

The 8850 processor, a file server that is part of the vendor's Starship product architecture, functions as a standalone system or as part of an RMS or ARC local area network. In a standalone RMS system, the 8850 processes large batch jobs, runs a variety of high-level languages such as COBOL and RPGPlus, and supports terminals, printers, and communications links. In an ARC network, the product acts as a file server, controlling file manipulation and batch processing. In addition, the system manages the vendor's multi-user business processing system, Datashare, allowing up to 24 users to simultaneously execute a variety of application programs. The system includes a 16-bit cpu, up to 4MB of system memory, and interface modules that can support up to 24 terminals and/or printers. Basic configuration, including 512K memory, is priced at \$16,500.

The 9348/49 disk drives provide up to 2 billion bytes of on-line storage for the 8850. The 9348 unit consists of a 67MB disk drive with a removable 9-inch cartridge for backup or data transport from system to system. The 9349 features a 9-inch fixed disk drive that offers 266MB of data storage. Pricing is \$14,500 for the 9348 and \$22,500 for the 9349.

An aid for electronic mail, Mail Gateway Facility integrates the vendor's DOS and RMS operating systems by facilitating transparent interchange of information between the vendor's RMS-based

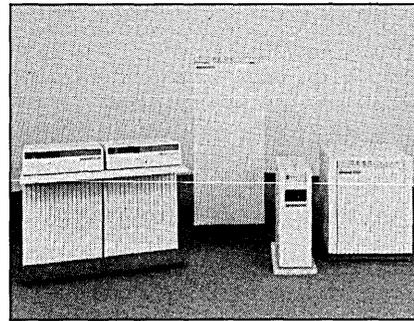
electronic mail system, Vista-Mail, and other systems. License fee is \$500; related software costs are additional.

The 9336 Disk/Tape Subsystem combines fixed hard disk and interchangeable tape media. Designed for use in standalone systems and as local storage in RMS/DOS ARC networks, the 9336 provides 65MB of fixed disk storage and a 65MB streaming tape drive. Price is \$14,500. DATAPOINT CORP., San Antonio.

FOR DATA CIRCLE 302 ON READER CARD

UNIX-BASED COMPUTERS

The Xelos family of computers uses operating systems derived from Unix System V, release 2. The XF/200, a supermicro with an MC68000 processor and 256K



RAM, features four ports, memory of 1MB to 3MB, disk capacity of 51MB, 320KB floppy disk storage, and graphics controller. Price is \$10,150. The XF/210 is an enhanced version of the XF/200, providing six ports, up to 4MB of memory, and 51MB to 75MB of hard disk storage. Price is \$10,500.

The XF/400 is a supermini that runs the Xelos OS. Along with a variety of applications tools, standard and optional office automation packages (RM/COBOL, UNIBOL), and graphics software are offered. The XF/400 has eight to 16 ports, 51MB to 170MB of Winchester storage, 2MB to 4MB of memory. Price is \$21,995.

The XF/600 system expands from 16 to 64 ports, has directly addressable

main memory up to 16MB and a 1KB direct-mapped cache memory. Fixed and removable disk subsystems range from 51MB to 2.4GB. Also provided are battery backup for automatic memory retention and a floating point processor. At a minimum configuration of 16 ports and 2MB of memory, the price is \$27,000 without disk and tape. The XF/610 is an enhanced version of the XF/600 with the added feature of an intelligent I/O handler (DIOS). Standard configuration includes 32 ports and 4MB of memory and is priced at \$45,000 (excluding disk and tape). PERKIN-ELMER, Oceanport, N.J.

FOR DATA CIRCLE 303 ON READER CARD

SECURITY SIMPLIFIED

The Block, according to the vendor, is a coded hardware device providing software protection that requires a nominal amount of statements to be embedded in an author's application program. When an author's program is executed, an interface port on the computer is interrogated periodically to determine if the unit is present. If the response is positive, the program performs as expected; if not, program control is redirected as specified by the author. Both parallel (IBM PC/Centronics) and serial (RS232) versions are transparent to the system. Backup copies can be made, programs can be transferred to hard disk, and all other normal operations can be performed when the unit is present. No specific algorithm is needed; the degree of security for interrogating



the Block is limited only by the ingenuity of the software developer. A fully compiled language is recommended for maximum protection against deciphering. Individual codes are assigned to each customer. Units can be cascaded to allow more than one application program to operate independently. Price of an individual unit is between \$24 and \$39. SOFTWARE SECURITY INC., Stamford, Conn.

FOR DATA CIRCLE 308 ON READER CARD

—John L. Kirkley

HARDWARE SPOTLIGHT

PC INTERCONNECT

The Alliance personal computer interconnect system links up to 20 IBM PCs to share peripherals such as printers, modems, or disks. The system is based on a programmable, intelligent cluster controller that connects PCs via RS232 interfaces at 115Kbps. Star configurations will support two to 20 PCs and peripherals; standard network configurations support four, eight, 12, 16, or 20 PCs. The cluster controller incorporates a multiplex network managed by an Hitachi 64180 microprocessor, using the vendor's proprietary software resident in PROM in the cluster controller and in the user's PC. An

optional 480K buffer is available for the controller to perform print spooling and electronic mail functions.

In addition to the system software, the product consists of a utility program for administering the network and an interface package that allows each microcomputer to access the network. The network software also provides automatic file locking. Pricing for the system is approximately \$100 per node. The eight-port model is priced at \$895, with a \$349 charge for each additional four-port module. MATRIX COMMUNICATIONS, Marblehead, Mass.

FOR DATA CIRCLE 300 ON READER CARD

SOFTWARE AND SERVICES

UPDATES

For a while it was touch and go: vast hordes of users, smuggling micros into the corporation to circumvent an often unresponsive dp department, were causing data integrity problems for the company and political problems for MIS.

Now, several years later, reason and order have prevailed, and most corporations have established comprehensive personal computer policies. MIS is firmly back in charge--the revolution is over.

But, to quote that old Eagles' song, "Every form of refuge has its price," and for MIS, the price of control means dealing with a growing user population that wants training, troubleshooting, and hand-holding... and they want it now. To a dp department that's already several years behind on its applications backlog, the old days of user anarchy might look pretty good.

Compounding the problem, according to Atlanta-based Micro Support Resource Corp. (MSR), corporate America must train 2.7 new users every year for each personal computer installed to keep pace with turnover (promotions, transfers, terminations, etc.). MSR also cites surveys that indicate that as many as 61% of corporate personal computer users have received no training on their hardware or software.

What to do? As you might expect, MSR has an answer. The company claims to be the first third-party support organization that is truly national in scope. Its main thrust is to provide day-to-day support services for business users of micro-com-

puters: detecting, preventing, and resolving operational problems.

Troubleshooting is conducted via toll-free telephone at the MSR Corporate Support Center in Atlanta. Experts are backed up by a computer system called MAX (Magic Answer Extractor), which is programmed with the answers to thousands of questions about pc software. When a user calls in, a support representative takes information from the caller and asks questions prompted by MAX until the problem is resolved. MSR president Deborah Fain estimates that MAX can cope with about 80% of the questions users are likely to pose. If you do stump the system, MSR researchers will come up with the answer, let you know, and add the new information to MAX's knowledge base.

A companion software system called MACI (Magic Access to Customer Information) keeps track of the questions each company asks MAX. From those data, MSR can identify problem areas that might be better dealt with by a formal on-site training program. Right now, MSR trains on 12 different software products, either at the customer's site, other local facilities, or at MSR-operated support facilities in major cities.

The company also designs and writes documentation, including manuals for sales training, user training, and operational and technical reference. The prices of MSR's services vary with the number of software packages in use at the customer's site. A single-user contract for support of Lotus 1-2-3 is \$104.

NETWORK MANAGEMENT

PNMS III is a fourth generation network management system for the IBM 370, 30XX, or 43XX systems using MVS/VTAM and for several mini and supermicro computers using Unix. The system permits users to record, track, and resolve problems that occur in a network. It is implemented with Peregrine Four, the vendor's applications environment software, and includes a relational database manager, a format manager, and a report writer. Files, screen formats, and relationships between files can be tailored to user requirements, and the database allows users to display a record or query-by-example (QBE) list and add, update, and delete information. All components allow ABE or command-line-query access to any data in the system. Fields may be flagged as key-search fields using a b-tree search method. Price ranges from \$5,000 to \$35,000. PEREGRINE SYSTEMS INC., Irvine, Calif.

FOR DATA CIRCLE 326 ON READER CARD

NETWORKING, ISO STYLE

DSA6 Release 3.1 executes under the vendor's GCOS 6 MOD 400 operating system and implements DSA on the DPS 6 product line. It includes transport and remote file facilities, remote batch facility, application interface, network administration and network control facilities. The network control facility allows the designation of a single DPS 6 to function as the control center from which can be administered the total network of DPS 6 systems. The product also supports two-level transaction processing, electronic mail, and terminal presentation facilities, which allow asynchronous terminals to support character mode and forms mode applications as determined by the user's sign-on procedure. The software implements the ISO standards and CCITT recommendations for HDLC and X.25.

The DSA/SNA Gateway provides access to IBM host applications from terminals and printers connected to a DPS 6 or DATANET 8. The gateway allows a DPS 6 to support the attachment of IBM BSC

SOFTWARE AND SERVICES

cluster controllers with their 327X terminals and 328X printers as well as enabling pc's equipped with emulators of the vendor's terminals to access IBM host applications as 3270 terminals. Using the gateway, a given DPS 6 terminal user can communicate with any other Honeywell system, and immediately thereafter access SNA mainframes or vice versa. Multiple-terminal users can access Honeywell and IBM systems simultaneously. Connections to IBM hosts can be made from anywhere in the DSA network. The modules are DSA/SNA gateway interface facility and IBM 3270 terminal facility. The software runs on all DPS 6 systems and, with the exception of the DSA/SNA Gateway, also runs on the microSystem 6/10. DSA6 bundled initial and annual primary license fees start at \$2,190 and \$1,000 respectively; the initial license fee is \$875 for the microSystem 6/10. Priced separately, the starting initial and annual license fees, respectively, range from \$270 to \$935 and from \$85 to \$575. DSA/SNA Gateway components are priced separately. DSA6 transport facility and SNA6 transport facilities are prerequisites and carry starting initial and annual license fees that, respectively, range from \$590 to \$935 and from \$230 to \$575. DSA/SNA Gateway license fees depend on the DPS 6 configuration. Initial and annual license fees are: gateway presentation facility, \$480 and \$255; gateway interface facility, \$855 and \$450; IBM 3270 terminal facility, \$165 and \$96. HONEYWELL INC., Waltham, Mass.

FOR DATA CIRCLE 327 ON READER CARD

CICS COMMAND-LEVEL COBOL

CICS/CMS Release 1 provides the ability to edit interactively, translate, compile or assemble, and initially test CICS command-level COBOL, PL/1, and assembler application programs in a VM/CMS system. The product is a single-user system that operates in the CMS environments of an IBM host running Virtual Machine/System Product (VM/SP) with or without the High Performance Option (VM/SP HPO) and, after downloading from the host, an IBM PC AT/370 or an XT or AT with a 370 option kit running VM/PC.

Using the CMS environment, CICS/CMS allows the developer to implement an uninterrupted CICS application while using one workstation. From program entry to completed unit test, the programmer can remain in the CMS environment and can concentrate serially on a single unit of work. The COBOL, PL/1, and assembler translators execute directly under CMS and their output is written on a local CMS minidisk accessible to the user, allowing errors to be corrected immediately. Other features include full command-level CICS application programming interface (API) for translate and compile; extensive CICS/VS functions for unit testing; file support under CMS, which simulates VSAM functions; access to host CICS/VS data during unit testing; dialog support and debugging aids; simple CICS resource definition and customization; and load-and-go installation. Basic monthly charge is \$835 for the host and \$750 DSLO; the monthly PC license option

is \$50. The one-time charge is \$15,000 basic and \$13,500 DSLO; the PC option is \$900. IBM Corp., White Plains, N.Y.

FOR DATA CIRCLE 328 ON READER CARD

BEYOND SPREADSHEETS?

Javelin is a business analysis and reporting software tool that the vendor claims could make the spreadsheet obsolete. The software contains a central information base surrounded by 10 views, each corresponding to a method conceptualizing business problems. In addition to the standard rows and columns, data may be viewed in such formats as tables, graphs, notes, or formulas. The formulas used to create the models are written in plain business language. JAVELIN SOFTWARE CORP., Cambridge, Mass.

FOR DATA CIRCLE 329 ON READER CARD

TWO TOOLS FOR PCS

SAS/FSP is a full-screen interactive data entry, editing and letter-writing tool for personal computers. Written in C, version 6 of the software supports the IBM PC, XT, AT, and compatible machines under PC/DOS. The software permits multiple user access to the same information system and includes ready-to-use procedures for customizing data entry screens, producing personalized letters, and displaying observations in an SAS dataset. The software is compatible with the SAS System for mainframe, mini, and microcomputer environments. First-year fee for customers with one to 50 workstations is \$2,000; renewal rates are lower.

SAS/AF, also written in C, is an interactive facility for on-line applications development. Menus and fill-in-the blank screens can be created for users at any experience level. The first-year annual fee for customers with one to 50 workstations is \$1,500 with lower renewal rates. SAS INSTITUTE, Cary, N.C.

FOR DATA CIRCLE 330 ON READER CARD

MULTILINGUAL LINK

IRMALink FT/TSO and FT/CMS are high-speed file transfer programs that transfer data between IRMA-equipped PCs and IBM's MVS/TSO and VM/CMS environments, respectively. Version 2.1 supports 3270 keyboards in Danish, Belgian, Swedish, French, English, German/Austrian, and Finnish. Configuration for a particular country is a one-time, one-step process performed by the user. Version 2.1 host code supports file transfer in these combinations: a PC with IRMA; a PC with IRMAcom; and a PC with IRMA and Symphony Link. Price is \$125 on a multi-user, multihost, multisite basis. DIGITAL COMMUNICATIONS ASSOCIATES INC., Alpharetta, Ga.

FOR DATA CIRCLE 331 ON READER CARD

—John L. Kirkley

SOFTWARE SPOTLIGHT

LU 6.2 FOR IBM PCS

AdaptSNA LU 6.2 is a communications package for IBM PCs that implements IBM's new Logical Unit Type (LU 6.2) protocol. It runs on the PC, AT, XT, or compatibles and allows the PC to communicate and transfer files as an LU 6.2 device in an IBM SNA/SDLC network.

It can be used for both PC-to-mainframe and/or PC-to-PC communications applications. It's a complete software/hardware package featuring an integrated high-speed modem and SDLC interface hardware on a single plug-in board, or a software-only product.

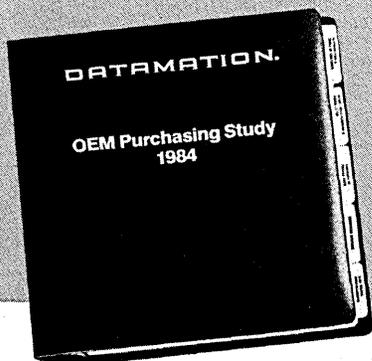
The LU 6.2 protocol, also called Advanced Program-to-Program Communications (APPC) by IBM, is a relatively recent enhancement to SNA that allows programs running in a variety of computers to communicate with each other on a peer-to-peer basis, rather than the traditional master/slave SNA relationship (see Updates, Nov. 1, p. 147). IBM has not yet released APPC capabilities for its PC products, although they are available on various systems like the System 36 and 38, the

Displaywriter, and the 5520 office system.

The AdaptSNA LU 6.2 package provides the user with a number of IBM-defined APPC functions. These functions are in turn used by a PC/DOS applications program to communicate and exchange information with other programs running on a mainframe or another PC. For example, the allocate function establishes a conversation with another partner, which is analogous to opening a file on a local application. Similarly, the LU 6.2 function called send data is used to transmit data to the partner, analogous to a write operation for local file application. When purchased as a software-only product at \$795, an IBM SDLC communications board and a synchronous modem are required. The hardware/software package is \$1,590 and includes the software, the vendor's AdaptModem, a plug-in communications board with high-speed synchronous modem, and an SDLC interface adapter. NETWORK SOFTWARE ASSOCIATES INC., Laguna Hill, Calif.

FOR DATA CIRCLE 325 ON READER CARD

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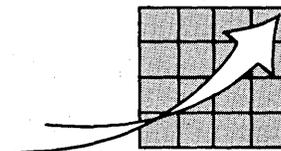


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READERS' FORUM

THE THICK MAN

I had already told her she looked familiar, just in the course of making some witty conversation, but when she turned around from the window I realized she really was familiar.

"Boom-Boom Simpson!" I cried, opening my arms.

She playfully raised a chair over her head.

"Just business, Sam . . ."

I ducked behind my desk.

"Strictly business, Ms. Simpson," I said soothingly.

"You know how I am on a case."

She snorted acknowledgement, and I risked a peek over the desktop. Was it my imagination, or did she raise the chair a little higher?

"I know well enough," she muttered, casually dropping the chair out the window.

Well, I knew Boom-Boom Simpson, too. I remembered the night we met, the restaurant she chose, the safety pin in the cheek of the waitress. Everything. How we talked over the alfalfa sprouts and tofu, washing things down with cabbage juice. How I paid the tab, added it to my business expenses, and how the IRS audited me and I had lost all my receipts somewhere. How I followed her that night up her stairway, and how she had picked me up and threw me back down her stairway.

It was the same night she hired me to check out what she thought was a payoff deal at the insurance company she worked for: somebody had bought some application software that was older than my blue suit—and my blue suit dates back to when portable meant a computer you could move without a special permit from the highway department.

But it turned out that the guy who authorized buying the Universal Rating Manager (URM) package wasn't getting a kick-back. He just figured that the Release 26 of DOS required by URM couldn't be so different from MVS/XA that it would trouble those sharp kids in MIS. He was promoted to senior vice president, and the ops manager was encouraged to move on. Just now, Ms. Simpson didn't seem to have any warm memories about our times together.

I made a placatory gesture. When both her shoes were clean, I stood up and said, "I'm just a private eye with one chair to his name, sister."

Knowing how Boom-Boom felt about URM, I was a little surprised to hear she was now working for the very outfit that had sold it to her former employer—a Southern-based company called the Good Ol' Software House. It seems a scout from GOSH had seen her work and lured her away from People's Insurance by offering twice the salary. She was the first person GOSH had ever found who understood how the URM worked.

"You wouldn't believe how much they're paying me, Sam. You'd think they'd never seen a COBOL programmer with insurance background before."

As my eyes fell upon her purse, I stood up and agreed to take the case.

She gave me one of her funny looks. I studied it for a moment, then handed it back.

"You want me to tell you what the case is, Sam, or do you just want to blunder out into the street, get a few feet, then slap yourself in the head and say 'What a jerk! I never asked her what the problem was!'"

I pushed a hat on my head and headed for the door.

"I don't tell you how to run your business, Doll."

After a few minutes Boom-Boom caught up with me, just as I had raised a hand to hit myself in the head. I normally hire out dirty work like that, but it was my head, and it was a matter of pride to me that I should hit it myself.

"Wait, Sam, let me explain," she cried.

I lowered my hand, slowly. Just to give her something to think about.

We walked to the corner tavern and ordered a Scotch.

"GOSH was sued by the Feds for doing a demo with someone else's hardware," she told me. "GOSH eventually oemed the hardware, and it all worked fine with their software, and the Federal Department of Less-Than-Encouraging Life Signs and Levied Contributions to the Government liked the bundle so much they doubled their order in the first year."

"So what's the problem?" I asked. Then, to prove I had been keeping up with her I added quickly, "Why is GOSH getting sued, I mean?"

"The Commission for Watching Out That Enough Money Is Left for Defense claims that GOSH cheated the FDLTELSLGC by demonstrating stuff that didn't exist yet."

"But mm-hhm-mmn does that all the time," I mumbled carefully so as not to get sued myself.

"Everybody does it," she shrugged hopelessly.

"Some better than others," I countered wittily.

As her ice cubes landed in my lap, I realized how lucky I was to be wearing my blue suit.

"So you want me to ask around about GOSH? Find out if they're clean?"

"That's right, Sam. I don't want to work for crooks." She shattered her glass for emphasis. "I've got my self-respect."

I stared into my drink. Yeah, that's all I seemed to meet anymore—women with self-respect. I paid the tab and we left.

I told Boom-Boom to wait in my office. She told me what I could do with my domineering attitude. I told her what I could do with my domineering attitude. She said she doubted it. I offered to demonstrate. She folded me up and put me in my bottom desk drawer.

All that took a while, but finally I set out to see Eustace Pfeiffer, the famed stock analyst—well, maybe not so famous—well, he's not an analyst, either. But believe me, you won't find another barber who knows Wall Street as well as Eustace Pfeiffer.

You've got to play smart with Pfeiffer; let on that you

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READERS' FORUM

need information, and he'll rob the shirt off your back. And I'd lost enough of my possessions for one day.

"Just a trim, Eustace. Leave a bit just over the collar. Easy on the nose hairs. You think the Feds have a case against Good Ol' Software?"

Pfeiffer looked at me slyly in the mirror. "You're working on something, Sam."

"Maybe," I danced around the issue. But it didn't fully fool Pfeiffer.

"I think maybe you are. And I think you want some information."

I couldn't outfox this guy. I handed him my shirt.

"GOSH," he said, "I think they're on the level."

"Golly," I said, "You think who's on the level?"

"GOSH." He clipped a few hairs off and brushed them into my ear. "Word on the Street is that the Feds know they haven't got a case, and they want to settle out of court. They keep on pushing up the court date."

"But GOSH won't settle?"

"You got it." He shaved a trough across my head.

"Leave me a little length on the top, would you?"

"Too late." He kept cutting.

"It looks to me like GOSH has a little corporate pride. It looks like they aren't going to admit they did something wrong, when what they did is pretty standard practice in the industry. And the FDLTELSLCG got as good a system as anybody is offering. Government contractors are easy targets right now for congressmen who want to make names for themselves. It's refreshing to see a business stand up for its rights."

"Then you're pretty sure GOSH is going to beat the pants off the Feds in court."

He turned off his clippers and admired his work in the mirror. "Three-fifty," he answered coyly. "Unless there's something to this story that GOSH hasn't let anyone know."

Maybe, I thought as I tramped back to my office, my lack of success with Boom-Boom was due to the fact I had always been the bearer of bad news.

Not this time. This time I could tell her her employer was honest, and they were going to be vindicated in court. The price of their stock would go back up, and the orders for new systems would come rushing in. She could look forward to many happy years at GOSH, and be proud to be a part of the organization.

I threw open the door to my office.

"Ms. Simpson," I started.

"Shut up, Sam."

Boom-Boom was watching a tv news program intently.

The newscaster had our undivided attention now.

"The CWOTEMILD and GOSH have settled their suit out of court, GOSH chief executive officer Byron Marnish announced this afternoon. The CWOTEMILD required GOSH to sign a statement to the effect that it will never make witnesses in federal cases disappear under mysterious circumstances. The statement in no way implies that GOSH has ever made witnesses in federal cases disappear under mysterious circumstances, however. Ceo Marnish said the settlement was 'a great victory for GOSH, and we look forward to getting back to business as usual.' Chief prosecutor Wilson Quarterly talked to the press outside the courtroom, and characterized the settlement as 'a landmark in American jurisprudence.'"

Boom-Boom switched off the television and blew daintily into her handkerchief. "I think maybe you could use a good dinner to get your mind off things," I said kindly.

"Just dinner, Sam? No strings attached?"

"Great idea. Wear something strapless."

I raised an arm in defense, too late.

My intuition told me I'd be shopping for furniture soon.

—Bruce C. Kula

Indian Rocks Beach, Florida

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2

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3

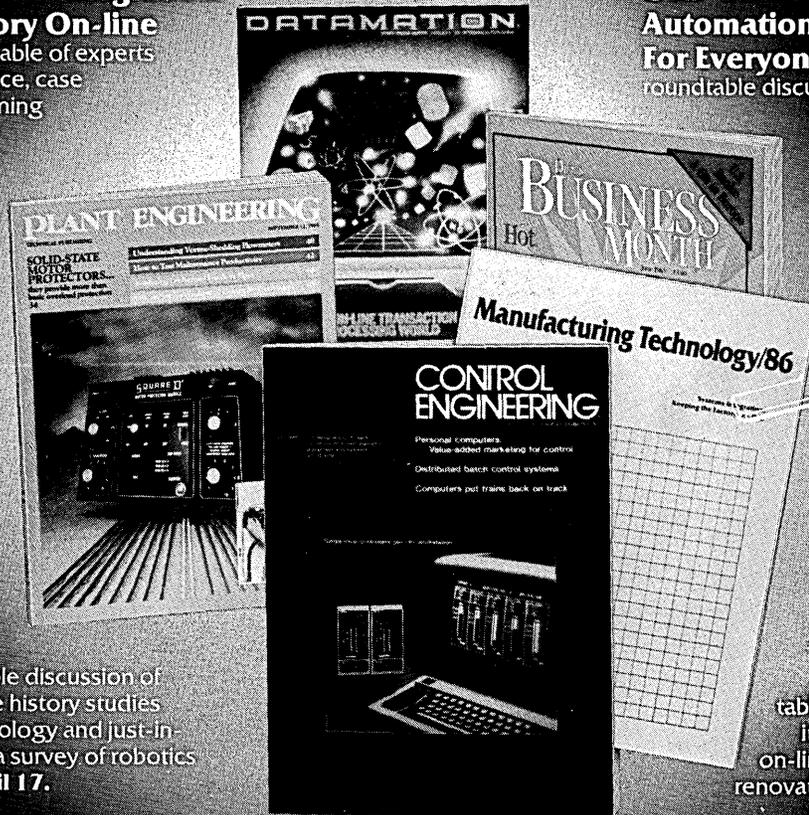
SEPTEMBER Negotiation: Automation Contracts Are Not For Everyone

September reports a roundtable discussion on contracts, provides case histories on product design for automated production and multi-vendor networks, and a survey of MRP II software. **Closes July 17.**

4

DECEMBER The Factory and Its Components: High-Tech Quality Control

December offers a roundtable on automation and quality control, case histories on on-line systems and building vs. renovation, and an industry survey of data acquisition devices. **Closes October 17.**



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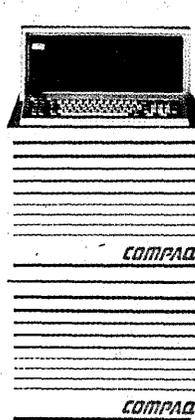
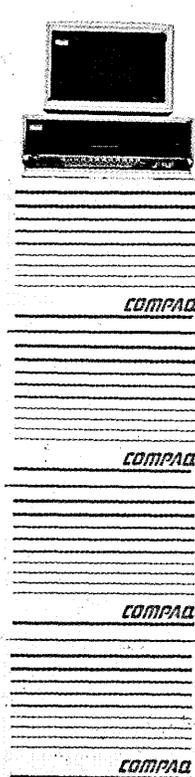
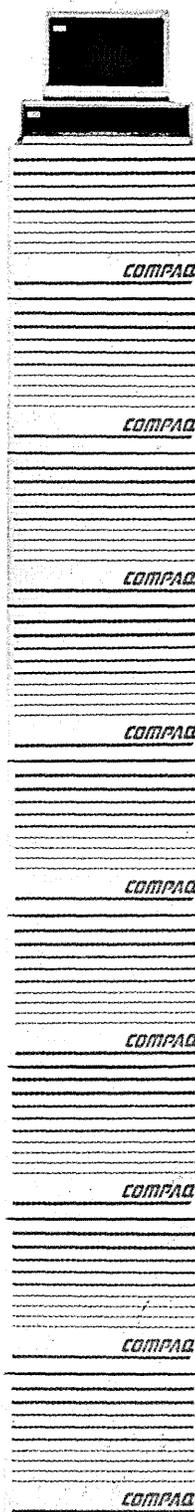
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