

**EXCLUSIVE REPORT**  
Why Top IS Execs Are Jumping Ship, p. 21

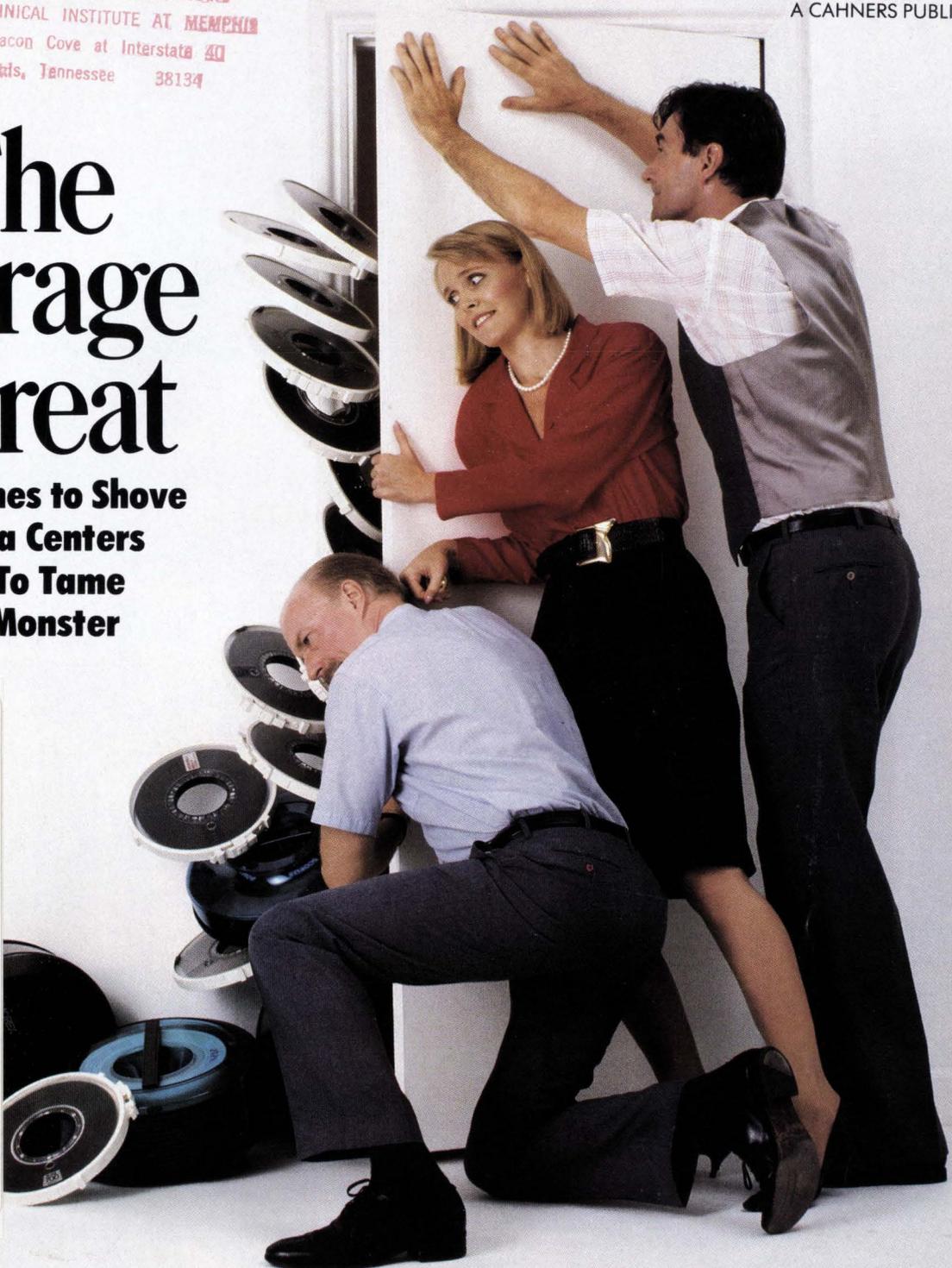
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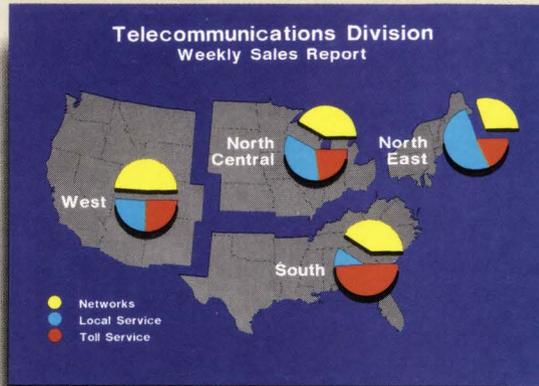
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- **UPSs Flourish as LAN Protectors**
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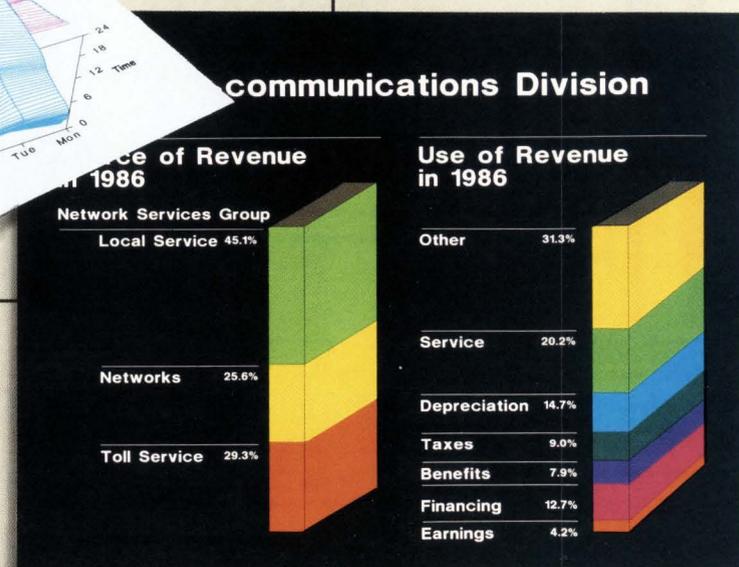
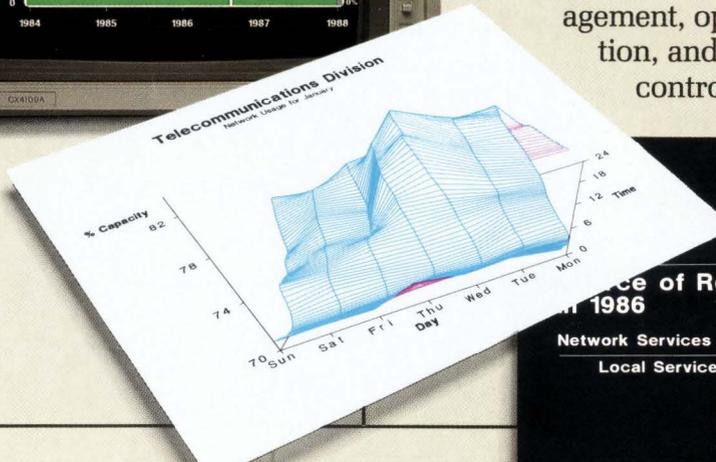
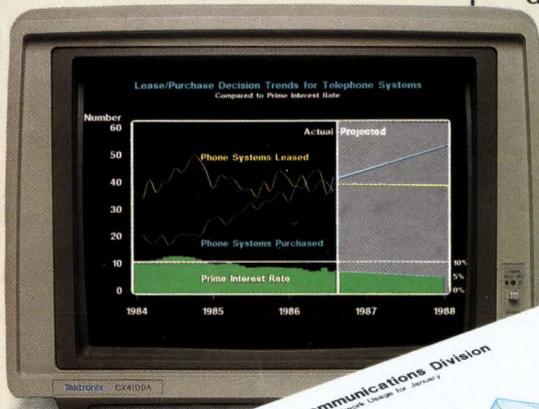
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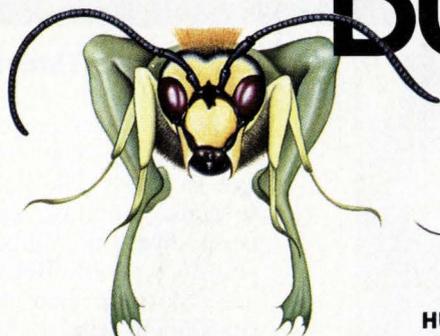


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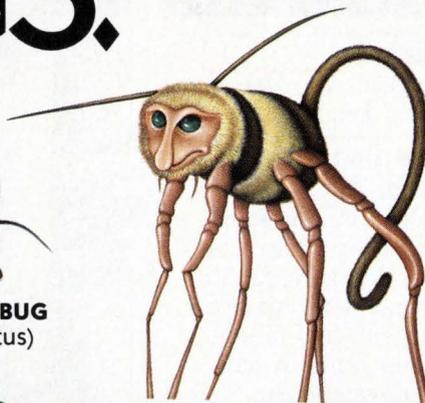
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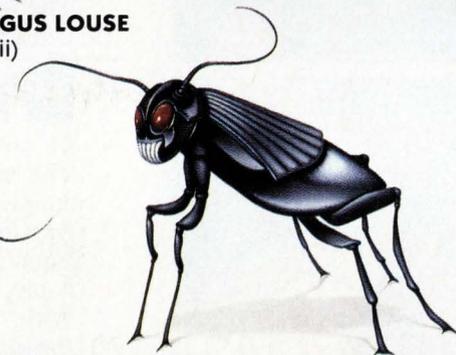
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# DATAMAT

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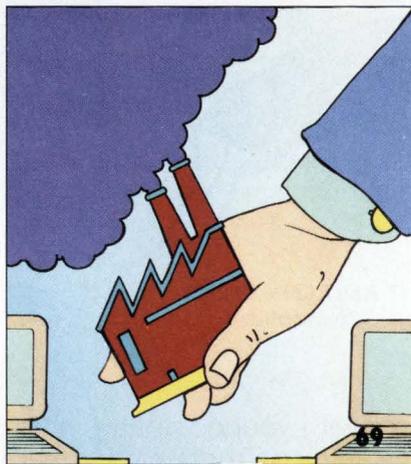
Many IBM users are dealing with a new villain: the storage monster. The inability to manage storage efficiently is chomping up IS budgets and floor space. But users are digging in, and IBM is responding with its solution: system-managed storage. With:

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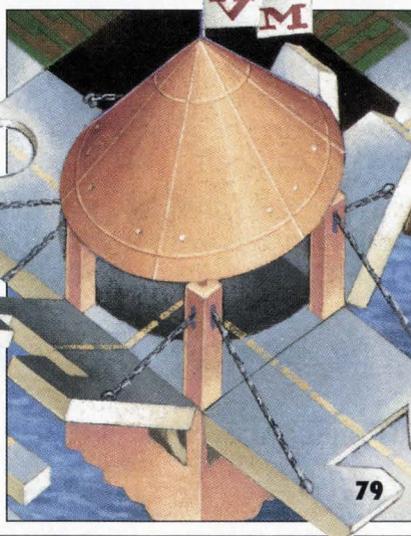
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Cover photograph by  
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The Evolution of  
ARPANET  
Has Silverlake Cleared  
the Confusion?

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## Editorial

### A Crisis in IS Management

Now is the summer of discontent for many leading IS execs. Tired of fighting corporate cost-cutters who see information technology investments as mere expense items in a business world newly infatuated with decentralization, such notables of the IS management domain as Kavin Moody, Woody Hobbs, and Michael Simmons are leaving their top technology posts at Fortune 1000 companies in search of new employers whose vision goes beyond quarterly earnings statements (see "A Rash of Top-Level Departures Erupts at IS Shops Across Nation," p. 21).

Many other IS execs who have remained with their companies soon may be approaching the departure gate as well; they're clearly frustrated with the lack of development work they are able to initiate because their staffs are too busy with conversion work created by mergers and acquisitions (see "IS Development Is Being Pinched as Mergers Continue," p. 23).

What we're seeing, and you're no doubt experiencing, are marital problems unforeseen by those matchmakers who pushed the union of business strategy and information technology: IS grooms being rebuffed by business brides that have had a sudden change of heart on how they want to manage their affairs. The result? Long-term strategic IS plans dependent on centralized thinking and standardization have given way to short-term business plans focused on the needs of decentralized business units.

"Whichever way the pendulum swings," says MIT's James Herson, "IS is the scapegoat, the victim, because it's generally viewed by corporate heads as an expense, not an asset." American Standard's vp of IS, Gary Biddle, believes IS pros also suffer self-inflicted wounds: "We've done a poor job selling ourselves."

Corporate management must resist temptation to slash IS budgets just for the sake of greater profits. So, too, must IS execs come to understand the motives behind decentralization and to devise info technology plans to make it work. Systems and software are, in fact, what enable organizations to transform themselves from command-and-control, department-and-division organizations into the flat info-based entities they need to become, observes management guru Peter F. Drucker in a recent *Harvard Business Review* article.

Perhaps such mutual efforts on the part of ceos and their technology chiefs can keep a Moody, Hobbs, or Simmons within the corporate ranks. Business can ill afford to lose such IS talent.



A handwritten signature in cursive that reads "Tim Mead".

TIM MEAD  
EDITOR-IN-CHIEF

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# Letters

## In Defense of Data PABXs

I would like to respond to a News in Perspective article entitled "The Demand for Data PBXs Cools as Users Look for Speed" (May 1, p. 26). I spoke with Brad Schultz while he was writing the article and I feel that I was misquoted: the article gives a distorted view of today's data switch marketplace.

The three data PBX users that were quoted in this article state that they are very happy with their systems and have no firm plans to replace them. It is not that they are reluctant to let go because the data PBX is old technology, but more that the data PBX is a cost-effective solution for their communications needs.

The data PBX users quoted stated that at some point in the future, presumably three to five years out, they would consider replacing their data PBXs if the data PBX did not increase in speed, and they required higher speed throughput.

Data PBXs over the years have continued to enhance and upgrade their features and functionality, and this will continue, with higher speed throughput allowing the data PBX to remain a viable solution for the long haul.

The part following my name in your article was taken out of context. I do not agree that data PBXs are asynchronous port contention and selection devices, but that they are in fact the backbone for many large complex data communications networks that have the ability to do port contention and selection.

I also disagree with IDC's statement in your article that data PBXs are better described as port contention and selection devices. This may have been true at one time and in some of today's very low-end products. However, the majority of the higher-end data PBX products in today's marketplace parallel many of the functions of a LAN costing three times as much.

Data PBXs have evolved greatly since the early days of the port selector/contender and will continue to do, keeping up with today's technology and providing a cost-effective solution.

JOHN F. MAZZAFERRO  
Product Line Manager  
Micom Systems Inc.  
Simi Valley, Calif.

## Interchange

I'm surprised that your feature story, "Open Systems: What Price Freedom?" (June 1, p. 54) is slanted toward operating systems and communications net-

works only. "Open" to an application implies the importation and exportation of data in a nontranslatable fashion (i.e., interchange standards).

Though communications leveling was brought to us by communications techies, the openness suggested by this leveling is not solely their dominion.

CLYDE MINER  
McDonnell Douglas Corp.  
St. Louis

## Unix Wishes

I have been following the expansion of Unix-based systems from engineering and scientific workstations into business systems. At one time, I was not sure that this move would be successful. However, Unix does seem to be making slow but steady progress in gaining acceptance in the business community.

My firm recently became a convert to Unix by acquiring a central reservations system for our hotel business that runs on a Hewlett-Packard HP-9000 Unix-based minicomputer. Because of the question of growth, I had wondered about the long-term practicality of this choice. Should our business grow beyond the capabilities of the minicomputer, we would be faced with the cost of replacing hardware and software at the same time. However, should the development of Unix for mainframes become widespread, as reported in "Mainframers Develop Unix Ports as User Interest Grows" (May 1, p. 21), then our company could transfer our software to a Unix mainframe should the need arise.

Therefore, I wish to encourage these mainframe vendors to continue their efforts. I feel that the future growth of Unix in the business arena will be improved by having a more complete growth path that extends through business-oriented mainframe systems.

DAVID RAY FULLER  
Calmark Hospitality Systems  
San Diego

## Correction

The table "A Comparison of Storage Media" (News in Perspective, May 15, p. 41) should have listed the following figures for on-line storage costs per megabyte: 20 cents for Creo's 12-inch optical tape; \$3 for the 5/4-inch rigid optical disk; \$10 for the high-end 5/4-inch Winchester magnetic disk; and \$6 for the low-end Winchester. Readers desiring copies of the corrected chart should contact Marsha J. Fisher at (212) 463-6527.



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**John H. Duell, Director  
US Patent Office, 1899**

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# Look Ahead

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## **CHEVRON WON'T BE FAULTED**

SAN RAMON, CALIF. -- Don't be surprised to see moving vans in front of Chevron computer sites over the next couple of months. The big oil company has reexamined its computer operations and has decided to shrink to two major U.S. data centers (plus one smaller one) from three. The total IS head count should shrink by approximately 169 positions (from 2,300 now), all through attrition. Cost savings and facility issues are behind the change; Chevron felt uncomfortable having two big facilities located on the same earthquake fault line. Thus, Chevron's Concord, Calif., facility will lose eight of its 10 IBM 3081s to other sites. San Ramon and Houston sites will be expanded and a small La Habra, Calif., facility will be left pretty much as is. In addition, Chevron is creating a centralized network division to run its massive data networks, replacing its current approach of shared responsibility.

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## **DIGITAL PAPER GAINING MOMENTUM**

NEW YORK -- User and vendor interest in the flexible optical storage medium (and its corresponding tape and disk drive) developed by ICI Electronics of Great Britain appears to be mounting. Lawrence Livermore Laboratories and a still unidentified supercomputer maker each say it is interested in Creo Products Inc.'s optical tape drive (see "Digital Paper Promises Cost, Storage Gains for Optical Media," May 15, p. 32). Doug Weir, a computer scientist at Livermore, tells DATA-MATION that Livermore is intent on studying the Creo optical tape as a possible medium for its oodles of archival data. "We would like to be able to put it in as small a space as possible, instead of having several buildings in various locations dedicated only to storage," Weir says. He adds that Livermore would switch from the mag tape it uses for archival storage only after determining whether Creo's product met all of the Labs' reliability requirements.

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## **BETTER ROLE FOR USERS IN X/OPEN**

SAN FRANCISCO -- At least one open standards promoting body is responding to the call to include users and user groups in its decision-making on a more formal basis. X/Open, the consortium of U.S. and European vendors, is planning to create a new, associate member category that would allow users to participate in the definition of the X/Open Unix-based applications environment without having to fork over the big money that vendors such as Hewlett-Packard, ICL, and AT&T do as full members. X/Open already has a user advisory council, but its members don't vote on the technical elements of the X/Open applications environment.

# Look Ahead

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## **IBM MIGRATION TOOLS FROM GERMAN FIRM**

PFORZHEIM, WEST GERMANY -- Look for a fourth-quarter release from Software Services (SWS) of reverse engineering products for migration of IBM's IMS/DB or DL/1-DOS and Hierarchical DBMS programs and data to DB2 or SQL/DS. The company plans to begin client presentations of the migration products in August. IBM began marketing SWS's VSAM to DB2 or SQL/DS product through a nonexclusive marketing agreement last May, but whether or not IBM will pick up the company's new migration products as well hasn't been determined. SWS has marketing agreements with Cap Gemini in France for DOS/VSE to MVS and COBOL to COBOL II products.

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## **SPECTRUM'S DBMS PLANS MOVING SLOWLY**

CUPERTINO, CALIF. -- Hewlett-Packard Co.'s database strategy for its Spectrum HP 3000 Series 900 RISC systems is still evolving, though not as quickly as customers probably would like. The company is working on what it terms a fully distributed database based on its HP SQL product. First out of the gate by the year's end will be distributed access to read and update across HP SQL. In 1989, heterogeneous read and access of non-HP SQL databases will be available. At a future, undetermined date, there will be a fully distributed database split across systems. Whether this capability actually will be packaged with Allbase, the ever changing database announced for Spectrum, has not yet been determined. Of course, Allbase isn't what it was originally planned to be, either. HP now says Allbase is shipping, but instead of consisting of a new component called HP Image, it has been packaged with the older upgraded Turbo Image database. If that isn't enough, Oracle Corp.'s database for Spectrum is between 35 and 40 days off schedule, but should be ready this fall.

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## **EXPERT TOOLS FOR VM USERS**

PALO ALTO -- Thanks to a joint development effort between giant Shell Oil and tiny Neuron Data, IBM mainframe users soon will get a crack at the same easy-to-use, low-priced expert systems tools that have proven popular for pcs. Shell and Neuron Data have migrated Neuron Data's Nexpert tools to IBM's VM operating system and they are expected to make the port commercially available next month. The product will compete with other new expert systems tools from vendors such as AICorp.

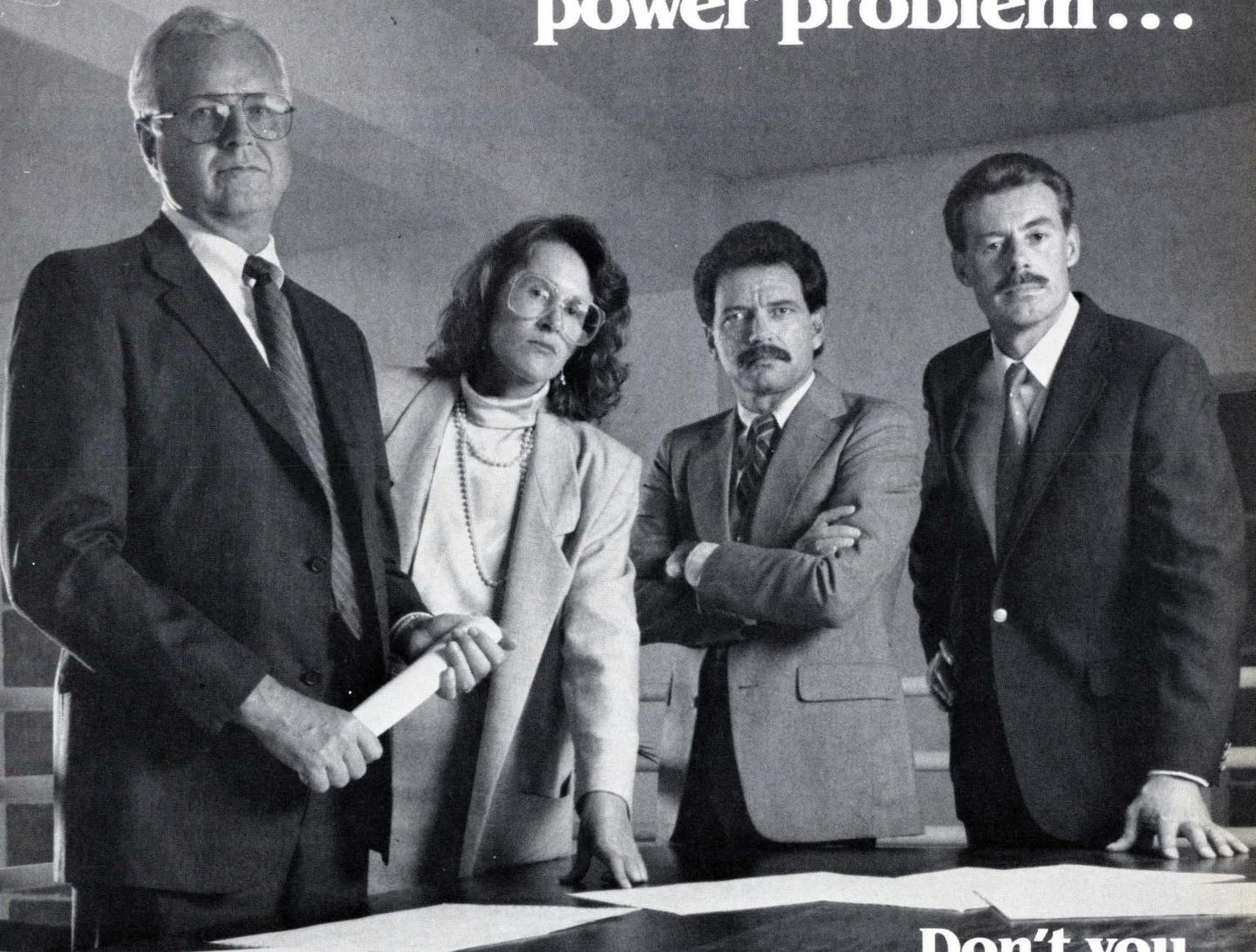
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## **NOT SO BULLISH ON THE NAME HONEYWELL?**

MINNEAPOLIS -- An impending transfer of majority ownership in Honeywell Bull Inc. to France's Groupe Bull spells further changes for the U.S.-based computer

(continued on p. 14)

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# Look Ahead

maker. It's no surprise that Groupe Bull, which is expected to increase its Honeywell Bull stake to 65% by Jan. 1, 1989, is arguing for a larger share of the nameplate. A spokeswoman confirms the reappraisal, adding that no decision on a change has been reached. The name Honeywell Bull will remain at least through the year's end, when Honeywell will reduce its stake in the company to 19.9%.

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## U.K. GOV'T DRAWING UP AI METHODOLOGY

LONDON -- Wondering about the best way to come to grips with expert systems? U.K. users may have to continue wondering for another two years until a new initiative by the British government's technology agency, the CCTA, produces results. The agency, which recommends purchasing criteria and standards within U.K. government departments, is drawing on the experience of the country's expert systems experts to formulate a national methodology for applying the technology. Called Project Gemini, it involves U.K. computer services companies SD-Scicon and Logica, management consultants Ernst and Whinney, ICL, and U.K. expert systems house KBSC Ltd. The result will be a methodology, with support tools, by the end of 1990.

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## BROADER OFFERINGS

MILAN -- European users should watch for a series of new products from Honeywell Bull over the next few months following an agreement between Groupe Bull and the Honeywell Bull subsidiaries in Italy and the U.K. to form the European Solution Center in Brussels. This is part of a corporate effort to broaden the group's European market product offerings. The companies will be exchanging selected products with the aim of targeting national offerings to international markets. Michele Cimino, general manager of Honeywell Bull Italia's marketing division, will have responsibility for the new center.

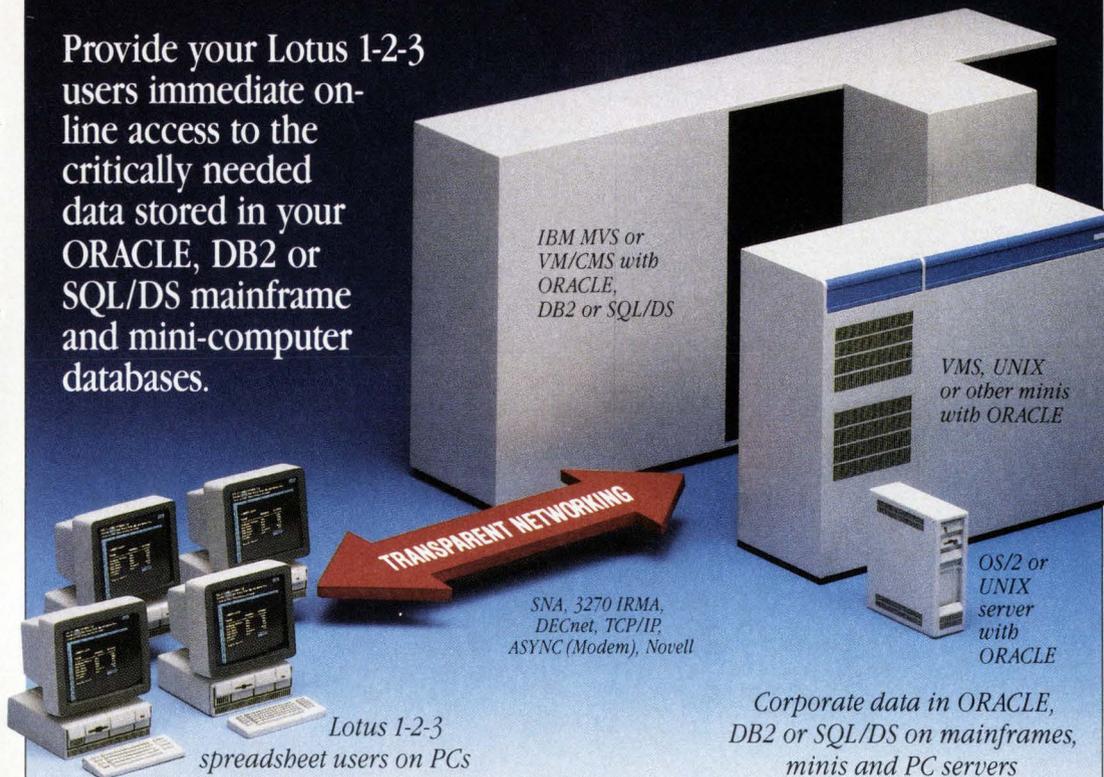
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## RUMORS AND RAW RANDOM DATA

Aggressive Australasian computer services group, the Paxus Corp., plans to move its whole Financial Systems division over the next few months from Sydney to London in a bid to capitalize on its growing strength in the European insurance market. The move is also part of the company's preparation for a listing on the London Stock Exchange. Paxus, with worldwide revenues of \$130 million last year, expects Europe to provide 28% of its sales in 1988 . . . U.K. mainframer ICL, meanwhile, is heading in the opposite direction and will set up an OSI networking joint venture in Australia over the next few months with local data communications supplier Datacraft of Melbourne.

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| Tucson                   | Aug 4                  |
| CA Costa Mesa            | Jul 7, Aug 2, Sep 1    |
| Los Angeles              | Jul 21, Aug 16, Sep 15 |
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| Ontario                  | Aug 18                 |
| Sacramento               | Aug 4, Sep 22          |
| San Diego                | Jul 12, Aug 9, Sep 8   |
| San Francisco            | Jul 19, Aug 16, Sep 14 |
| San Jose                 | Jul 26, Aug 18, Sep 20 |
| CO Denver                | Jul 27, Sep 22         |
| Colorado Springs         | Jul 7                  |
| CT Farmington            | Jul 20                 |
| New Haven                | Jul 20                 |
| Stamford                 | Aug 4                  |
| DC Washington            | Jul 22, Aug 19, Sep 16 |
| FL Ft. Lauderdale        | Jul 14                 |
| Orlando                  | Sep 14                 |
| Tampa                    | Jul 12                 |
| GA Atlanta               | Jul 5, Sep 7           |
| HI Honolulu              | Sep 13                 |
| IA Des Moines            | Jul 12, Sep 13         |
| IL Chicago               | Jul 20, Aug 16, Sep 15 |
| Springfield              | Jul 6, Sep 14          |
| IN Indianapolis          | Jul 13, Aug 24         |
| KS Wichita               | Sep 13                 |
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| Burlington               | Aug 12                 |
| Worcester                | Aug 9                  |
| MD Bethesda (Commercial) | Sep 21                 |
| MI Detroit               | Jul 12, Aug 9, Sep 13  |
| Grand Rapids             | Jul 13                 |
| MN Minneapolis           | Jul 19, Aug 24, Sep 27 |
| MO Kansas City           | Aug 4, Sep 14          |
| St. Louis                | Jul 21, Aug 11, Sep 6  |
| NC Raleigh               | Sep 15                 |
| NE Omaha                 | Jul 12                 |
| NH Concord               | Sep 20                 |
| Merrimack                | Jul 7                  |
| NJ Iselin                | Jul 14, Aug 18, Sep 15 |
| Princeton                | Jul 12, Aug 15, Sep 15 |
| NM Albuquerque           | Sep 29                 |
| NV Las Vegas             | Jul 27, Sep 22         |
| NY Albany                | Sep 20                 |
| Buffalo                  | Aug 10                 |
| Long Island              | Aug 17, Sep 20         |
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| OH Akron                 | Aug 20                 |
| Cincinnati               | Jul 13, Sep 15         |
| Cleveland                | Jul 20                 |
| Columbus                 | Jul 12, Sep 22         |
| OK Oklahoma City         | Sep 13                 |
| Tulsa                    | Jul 14                 |
| OR Portland              | Sep 8                  |
| PA Harrisburg            | Sep 26                 |
| Philadelphia             | Jul 19, Sep 19         |
| Pittsburgh               | Jul 26                 |
| Valley Forge             | Aug 16, Sep 8          |
| RI Providence            | Sep 22                 |
| SC Greenville            | Aug 17                 |
| TN Memphis               | Sep 14                 |
| Nashville                | Jul 27                 |
| TX Amarillo              | Sep 20                 |
| Austin                   | Aug 18                 |
| Dallas                   | Jul 12, Aug 9, Sep 7   |
| Houston                  | Jul 21, Aug 11, Sep 8  |
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| UT Salt Lake City        | Aug 9, Sep 20          |
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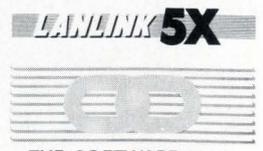
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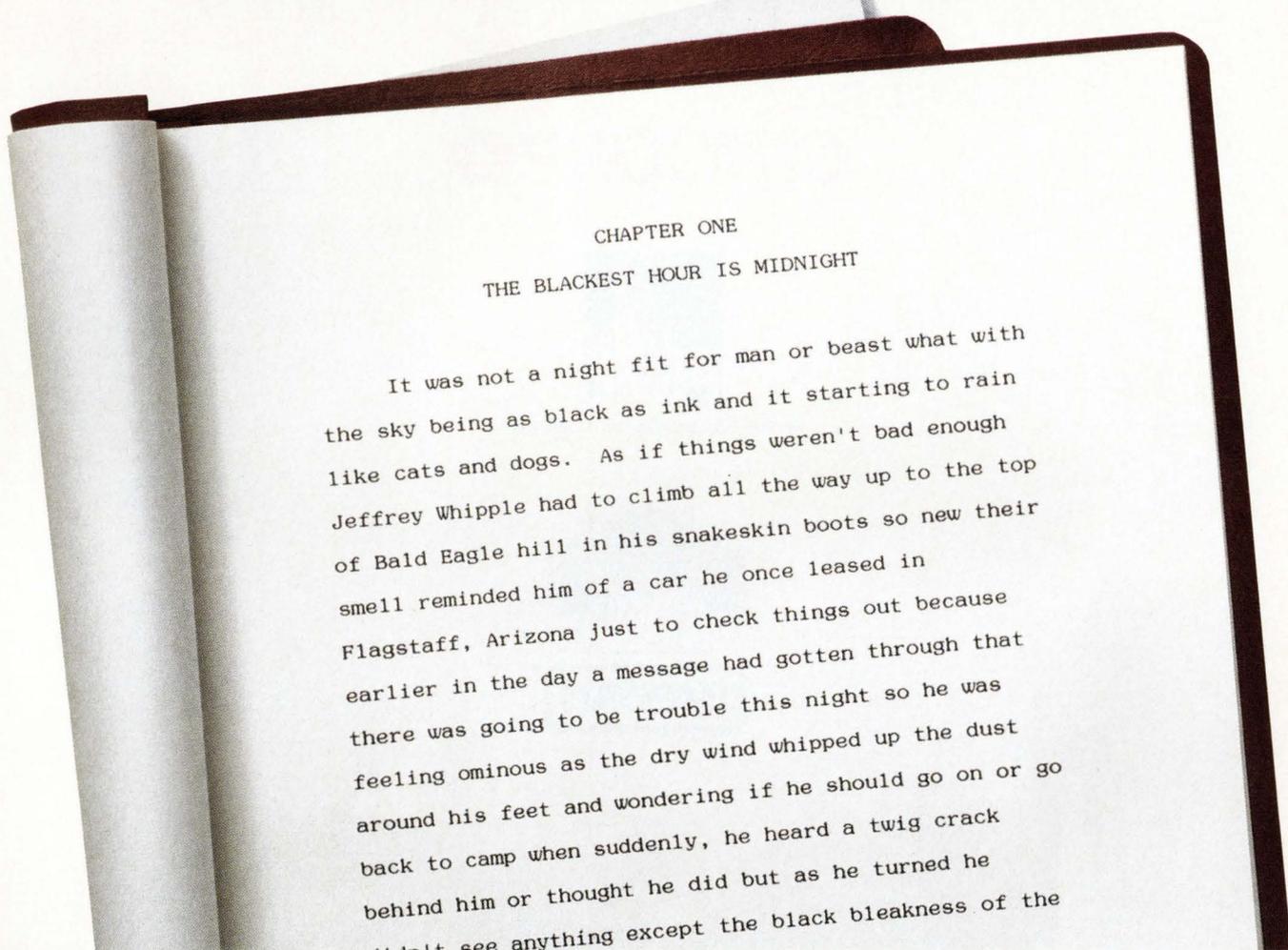
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# News in Perspective

## TURMOIL IN IS

### A Rash of Top-Level Departures Erupts at IS Shops Across Nation

As the lean and mean economic climate and decentralization transform IS, the role of leading IS executives is changing—to the chagrin of many.

BY JEFF MOAD AND RALPH EMMETT CARLYLE

There's a new constant in the the computer rooms of America: fear. Centralized IS organizations are being dismantled and their budgets cut on an unprecedented scale. Rampant decentralization and merger mania are forcing top IS executives across the nation into early retirement or midlife crises at the peak of their working careers. With their organizations under attack and few non-IS alternatives within their own companies, many IS executives are looking for a way out.

In the last few weeks, top IS executives at Gillette, American Express, Charles Schwab, and Fidelity Investments have resigned. Others at companies such as American Standard are candidates to make similar moves.

At Gillette and Fidelity, a general business downturn and IS decentralization were two of the underlying trends that led to the departures of Kavin Moody and Michael Simmons. Woodson Hobbs' sense of a lack of control led to his recent departure from Schwab. The departure of Kailash Khanna, vice president of corporate systems and technology, from American Express was reportedly

due to the IS decentralization program under way at the company. Meanwhile, IS veteran Gary Biddle, who has spent 31 years at American Standard, finds his feelings of insecurity growing each day as the effects of a takeover become increasingly real.

#### IS Is Considered an Expense

Macroeconomic or industry specific trends are not the only reasons for turmoil in

with his boss, Simmons, formerly president of Boston-based Fidelity Investment's systems subsidiary, is unemployed as of this month and hoping to land on his feet at a more—to use his words—enlightened company. Simmons describes his former boss this way: "Like many business leaders, he thinks that chopping up the company is the answer to everything."

Simmons says that big

not a case of either/or: you must have both approaches for controlled autonomy. Companies are demassifying with no unifying IS vision to guide them."

Edward C. Johnson III, chairman and ceo of Fidelity's parent, FMR Corp., Boston, didn't accept his characterization as a committed decentralist. "I am fully aware that many companies have fallen victim to hasty and ill-conceived IS decentralization," he says. "My feeling is we need an IS organization that has both centralized and decentralized elements: a hybrid."

He says that he and Simmons differed on the fine points of how such a hybrid could be achieved: "There were merits on both sides of the argument; it wasn't black or white."

#### Outside Pressure

One of the gray areas is pressure from outside. "Even just the hint of an acquisition can decimate an IS organization," says Robert Forney, director of information systems at Akron, Ohio-based Gencore. This maker of everything from bullets to tennis balls is no stranger to corporate raiders and predators. Its defensive posture has included the dismantling of a mainframe-based decentralized organization and the creation of a number of semiautonomous businesses using minicomputers. "The traditional remoteness of centralized IS groups makes them a focus for tension during



SCHWAB'S HOBBS: Too often, CIOs are seen as the overhead side of the business.

the IS executive suite. Poorly controlled IS budgets, corporate management's view of IS as an expense—not an asset—and the maturation of the IS executive function itself all play a role.

After a yearlong clash

corporations are dividing into two camps: centralists and decentralists. "Neither of them will give ground, and neither of them is right," says Simmons, who resigned, he says, because his boss couldn't see beyond decentralization. "It's

not a case of either/or: you must have both approaches for controlled autonomy. Companies are demassifying with no unifying IS vision to guide them."

#### EXCLUSIVE REPORT

ALSO: Mergers Pinch IS Development, page 23.

Rate of Salary Increase Dips, page 32.

takeover talks. Many technicians can't endure the anxiety and [they] leave," he says.

The aftermath of such high-stakes corporate games can leave IS chiefs exhausted and disillusioned. A recent example is Moody, Gillette's former corporate director of MIS, who got into IS management by accident and now prefers the risks of forming his own IS company.

As more IS authority is decentralized, the role of the CIO is changing from one with operating control to what Moody calls an "orchestra leader." The new CIO needs the skills of a communicator and a consultant, says Moody. While Moody was not uncomfortable in that sort of role, "I decided I didn't want to retire as the MIS director of the Gillette Company or any other company."

### Frustration Is Felt by IS

Moody and others say they have been frustrated because they are still subject to being thought of as cost centers. Although their IS executive titles have brought them greater status, they often find their votes don't count for much when the board of directors decides to break up the IS department or to slash spending.

"In the '60s and '70s, all we wanted to do was to get out from under reporting to the cfo," says Woodson Hobbs, recently resigned executive vp for IS at Charles Schwab, the San Francisco discount stock brokerage. "Then, in the '80s, the CIO was created, and we started reporting to the chairman. We even got on the management committees. But more and more we're realizing we're stuck with a large set of problems and that we still don't have much control. Too often, we are still seen as the overhead side of the business," says Hobbs.

According to Richard

Koeller, MIS vp at Cleveland-based TRW, top IS execs are finding out the hard way that at upper management levels, "might makes right." The ceos and top operating officers who want to "restructure companies like monopoly games," according to Koeller, have the might and the CIOs are powerless to stop them.

Meanwhile, the focus on IS at many companies and the creation of the CIO have elevated the top IS executives to a new, more visible level within their companies. Ceos expect more—some would say too much—from them. "Some of them want God to run MIS, and he's not available," Hobbs says.

That visibility also means more accountability. Chuck Gibson, senior vp at the Index Group, calls it "the visible glitch factor." Gibson recently did a study of CIO turnover in the wake of some of the recent, high-profile departures. "In some sense the top IS function may be maturing," he finds. "It's changing from one in which power is based on influence rather than control."

That influence extends to decisions on standards and architectures rather than buying equipment or managing large central staffs. For many technology-oriented IS executives, it's not an easy transition, Gibson says.

Nor is the IS executive role maturing so rapidly that it is viewed within most companies as just another top management position. That's a problem because most top IS executives aren't given the option to advance their careers by moving into other top operating functions in

their companies. "Especially at manufacturing companies, the career path for IS is IS," says Moody.

American Standard's Biddle, unlike Moody and Hobbs, will not be forming his own company if he is forced out of the New York-based manufacturer following its recent acquisition. He's not in a hurry to go anywhere else, but he's bracing himself should the ax fall, as he puts it. He first heard American was the subject of a hostile takeover in January. Since that time, this 49-year-old "workaholic," like so many of his

peers, has been forced into inactivity, putting his life "on hold" while his fate is decided. The new owner, which is an investment bank, is taking American private.

The biggest fear Biddle has is that his new bosses will try to recoup some of the money spent doing so by slashing existing long-term information technology programs.

Biddle and his staff have been burning the midnight oil to discover and document evidence that this and previous IS spending has been "strategic" and vital to the well-being of the manufacturer. "This is the dilemma we all face," he says of his profession. "IS investments are concerned with such intangibles as quality and service—parameters that are difficult to quantify.

"The only thing I know for sure," says Biddle, "is that if we [the IS group] are perceived as an expense, we'll be cut."

Though many IS professionals blame what they refer to as "shortsighted" business managers for their current predicament, Biddle is not one of them: "We've done a

poor job of selling ourselves."

Some IS executives—Biddle included—have courted the business side of the house and with their input and support have developed new frameworks and models to help focus information technology spending and relate it to the bottom line.

But, in stark contrast, a new DATAMATION/Coopers & Lybrand survey of 400 top IS executives and organizations across the country reveals that almost 20% of respondents have never developed either an information systems or architectural plan (DATAMATION will publish a full analysis of the study next issue).

### Living In a "Fool's Paradise"

"We've all been living in a fool's paradise," says Biddle of the IS profession. "And now it's time to face reality."

Some CIOs are being forced to face reality all too abruptly. A recent study by Touche Ross & Co., New York, shows that, although more CIOs—34%—are now reporting directly to their chief executive, they are more vulnerable to being fired. Fully a third of CIOs say they replaced IS executives who had been fired.

Furthermore, it's not just bodies that are being replaced. Many feel something valuable is being lost as experienced IS executives quit or are fired.

"In the '60s," says TRW's Koeller, "many people who were in their 20s saw that IS was becoming important, and they worked hard to get where they are today. Many of them were fearless and courageous people. But these are the same people today who are laying down their swords and leaving the field because they're tired and facing a very difficult situation. You'll find very few people who will volunteer to serve at the Alamo." ■

**"HINT OF AN ACQUISITION CAN DECIMATE AN IS CONCERN."**

## TURMOIL IN IS

# IS Development Is Being Pinched as Mergers Continue

New systems development takes a backseat to the bottom line as mergers and takeovers persist at banks and retail chains, but the situation is seen as temporary.

BY GARY McWILLIAMS

Mergers, acquisitions, and leveraged buy-outs are taking a toll on systems development.

Consultants and systems developers say that new development in U.S. retailing and banking—two sectors that are especially wracked by takeovers—is playing a secondary role to fending off suitors and to conversion activities.

In the Boston area alone, leveraged buy-outs and takeovers have led to systems deferrals and cancellations at Allied Stores Corp., Filene's Basement Stores Inc., and Supermarkets General's Purity Supreme Division.

### Allied Project Runs Aground

In probably the single largest example, Allied Stores recently discontinued an estimated \$30 million IS centralization program following the purchase of Federated Department Stores Inc. by Allied's parent, Campeau Corp., Toronto (see Look Ahead, June 1, p. 9). Federated's Atlanta data center will pick up Allied's operations.

Systems development at banks is also feeling the merger pinch. Bill Livesey, a Boston-based banking systems consultant with DMR Group Inc., says, "A lot of the banks' dp staff are working exclusively on conversions."

Large-scale development is being placed on hold as banks sort through newly acquired systems, Livesey says. "We've seen a merger result in two or three different versions of the same sys-

tem. The question arises, which of these will be the corporate solution?"

As serious as such deferrals may sound, the impact may be temporary. In other cases, the breakup of larger chains through leveraged buy-outs may actually be creating systems work. Plans to spin out Filene's Basement Stores Inc. to a management group has prompted consideration of its own systems center. At present, the company operates off the systems of its former parent, Cincinnati-based Federated.

C. John Cunningham, a former Federated IS executive and now a senior consultant with Arthur D. Little Inc., based in Cambridge, Mass., says that few major developments typically follow an acquisition or buy-out. "Most IS operations are left alone for a year or two after a merger," Cunningham contends. "There is so much to do in the way of rearranging marketing, business planning, and staffing that unless they are an utter disaster, the systems won't get high priority."

The sorting out process that comes later often results

in a swapping of systems, Cunningham says. That's certainly true at Shawmut National Corp., Boston. Shawmut bank operations in Massachusetts will share the fruits of a deposit system de-

Connecticut banks, says Alfred S. Dominick, a senior vp at Shawmut Bank. "We didn't have a deposit project in mind, but we're delighted we can put [CNB's] to use," Dominick notes.

### Deposit System Put On Hold

At the Bank of New England Corp., a major Northeast bank holding company that has acquired operations in Connecticut, Maine, Massachusetts, and Rhode Island, similar reviews put plans for a new deposit system on hold. "It was a project of such size

that, where attention was turned to getting conversions done, we decided to delay it a bit," says Kathryn Nichols, a Bank of New England vp for Massachusetts banking systems. Two major projects were reevaluated and will be expanded to incorporate the newer operations, she adds.

In neither case did the reviews prompt any new development, although both will continue some ongoing projects and expand them to acquired banks.

On the bright side, Nichols says experience gained during the conversions should prove useful when the bank resumes the delayed deposit system. "When conversions end, we will have an

extremely knowledgeable group on deposit systems," she notes.

The swapping at both Shawmut and the Bank of New England brings new systems to a much larger number



MILES BOUTELLE: A casualty of Allied's takeover by Campeau.

development begun at Connecticut National Bank (CNB), Hartford.

Begun before the merger of the two operations, the CNB system will be expanded to include Massachusetts and

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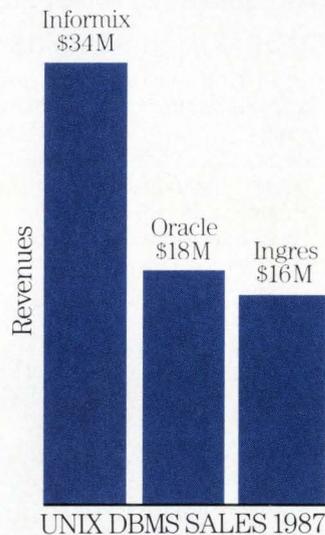
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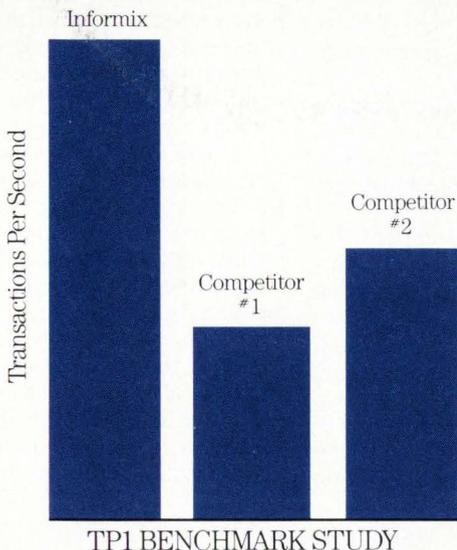
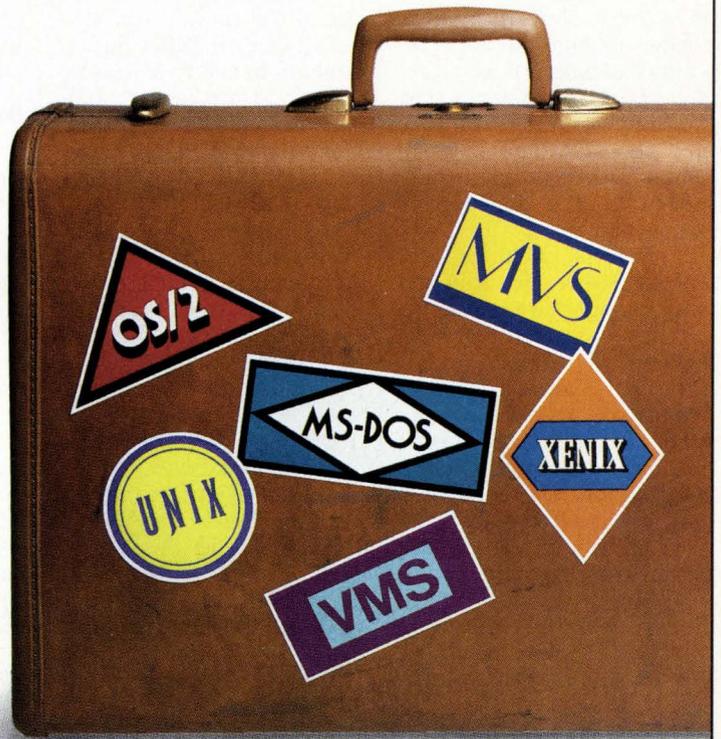


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of institutions, yet, in absolute terms, they do not translate into increased systems development.

"The end result usually is some kind of a consolidation," says Joseph Judenberg, director of professional services at Logica Data Architects Inc.'s New York office. "After a while, the issue becomes economies of scale, and people then want to start merging systems. It's rare you see someone creating wholly new systems solely because of a merger or acquisition."

Few IS executives at companies involved in ownership changes are willing to talk about the impact of mergers on new development. Stop and Shop Cos., Braintree, Mass., which recently sought refuge from a hostile takeover attempt through a \$1.2 billion leveraged buy-out, declined to discuss its systems activities following a business restructuring.

Similarly, IS executives at Zayre Corp., Framingham,

Mass., and Purity Supreme, Billerica, Mass., declined to discuss the impact of takeover defenses on their systems development.

"Right now," says Albert Silver, a retail systems consultant with DMR Group, "corporations don't want to spend the money [on systems]. They'd rather bolster the bottom line to be less attractive as a takeover candidate. I can tell you, it has certainly delayed the decision-making involved in getting projects started."

Moreover, the takeovers and restructurings are dampening IS productivity—even if only temporarily. "A company looking for cash isn't willing to undertake the funding of any major systems," observes an IS executive who was laid off following one such takeover. "What takeovers do is cause the people there a great deal of concern about what they will be doing. No one wants to work on maintenance. They go to work and the most important

thing is the next rumor."

While programmers and other technical specialists who lose their jobs in restructurings and cutbacks usually are able to pick up new employment quickly, the same can't be said for higher-level IS managers (see "A Rash of Top-Level Departures Erupts at IS Shops Across Nation," p. 21).

## Headhunters Coming up Empty

Miles Boutelle is a senior IS executive who lost his job following Allied Stores Inc.'s purchase by Campeau Corp. In the four months since Boutelle lost his position, the former director of data communications reports he has been on two job interviews.

"I've got 10 headhunters from all over working for me," says Boutelle, who has 19 years' experience in IS. "Almost to a person, they say senior-level jobs are few and far between." Three other Allied IS vice presidents lost their jobs when Boutelle did.

"To my knowledge, none of us has landed anything," he says.

Industry executives confirm the situation. Thomas A. Jeffery, MIS vp at Lechmere Sales Inc., a Woburn, Mass.-based retailer, says he's seen an increase in IS executives' résumés in recent months. "Almost invariably, they are from very senior guys. I've

## SYSTEMS DEVELOPMENT IS ALSO FEELING THE PINCH.

not seen a real increase in résumés from technical people or programmers."

What will happen as the takeovers and leveraged buy-outs continue? Boutelle, who hopes to return to IS, sees more of the same.

Boutelle feels that "overall, it will probably lead to fewer positions and less systems activity than if everyone was running their own systems and competing with one another. Whether it's good or bad, I don't know."

Jack D. Seibald, a vp and retailing industry analyst at Salomon Bros., New York, says the present impact of takeovers on systems activity no doubt will be only a memory in a year or two.

"As takeover artists go beyond the stage of initially cutting all expenses, the realization will settle in that these systems are needed in order to be profitable. It's a short-term situation now," Seibald says. "There's likely to be fairly good growth in demand for technology over the next several years for the retail industry." ■

## Aftermath of a Takeover at Chevron

While it may be of little consolation to those undergoing mergers today, there are people who've been through the process and survived. Their message is not encouraging.

"It doesn't take that many more people to run a company twice the size," says William Houghton, general manager for Chevron Corp.'s communications technology department in San Ramon, Calif.

Houghton should know. He was in the trenches in 1984 when the all-time biggest merger was announced: the \$13.3 billion marriage of Chevron (formerly Standard Oil Co. of California) and Gulf Oil Co. When the merger went into effect the following year, the decision was made to close all of Gulf's data centers. As a result, layoffs did occur and equipment was eliminated.

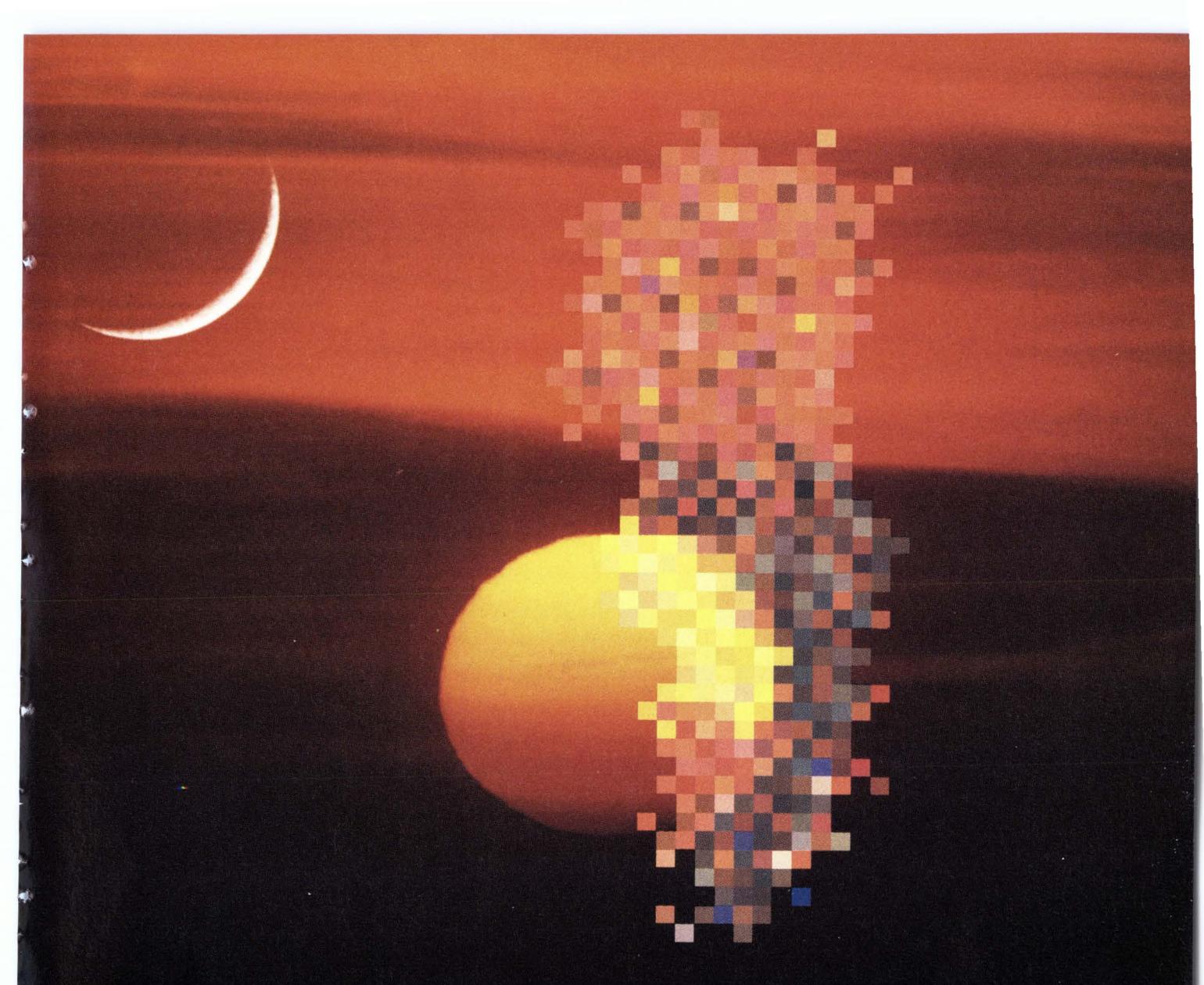
One reason was that the two companies were very similar. "In data processing we were not that different at all. Both were very strongly consolidated," according to Houghton. For example, Chevron figures that its operations workload increased by 40% but no additional people were brought on board.

For those employees who were kept on, the first year was one not of progress but of conversion. "A lot of tasks were deferred," admits Houghton. "You do have to take scarce applications resources and put them into conversion. We had to take all of Gulf's business applications and figure out where they were going."

One major conversion effort involved merging Gulf's credit card operation into Chevron's. Today, three years later, almost all conversion efforts are complete. The one exception is an application for gas royalty payments. "That's a bear," Houghton says.

A lot of the work involved communications. Network changes were a daily occurrence. "We chewed up a lot of [time] in 1985," adds Houghton. "In 1985, the focus was having the networks talk together. It wasn't until the next year that we began to optimize operations."

BY SUSAN KERR



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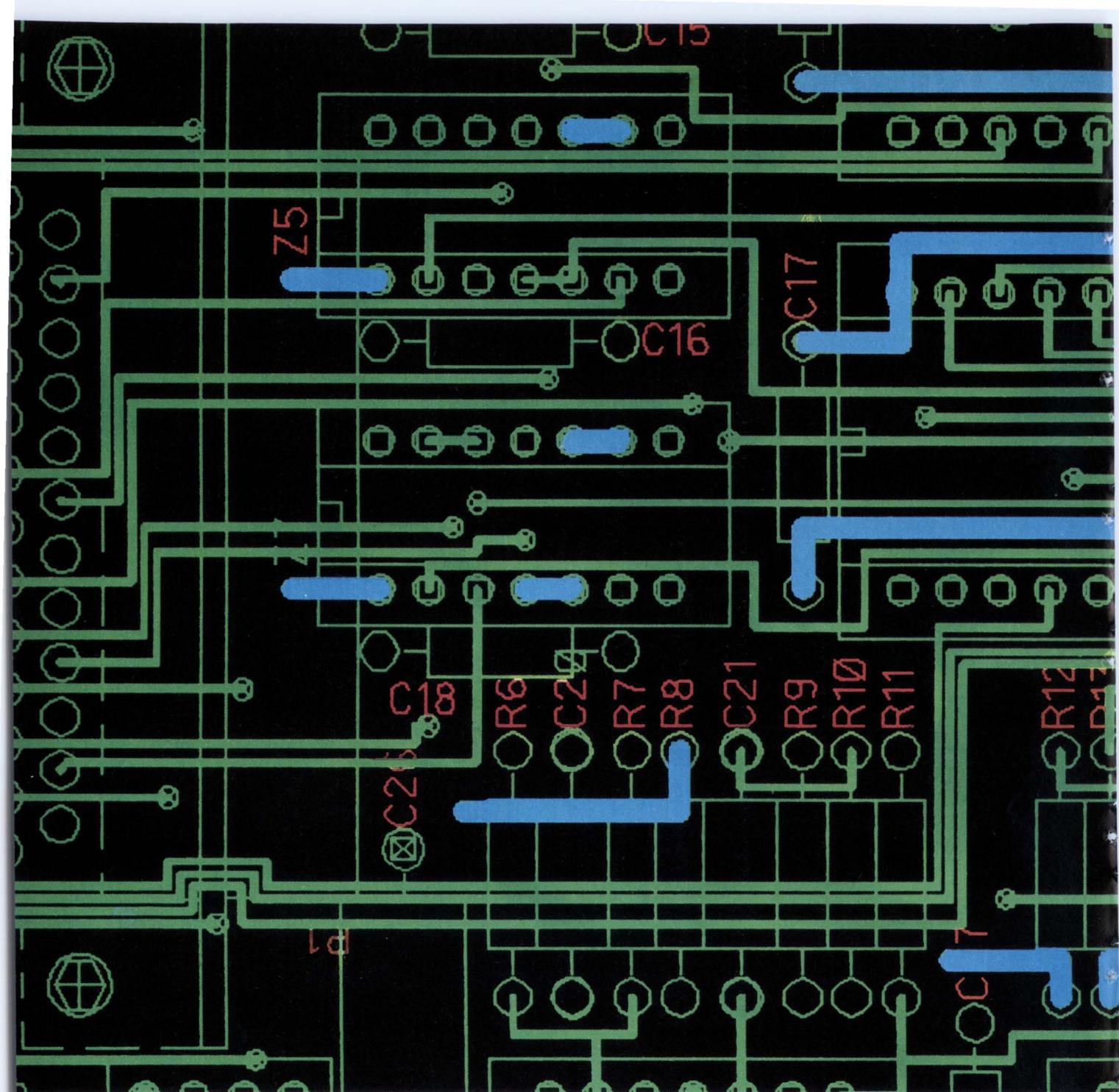
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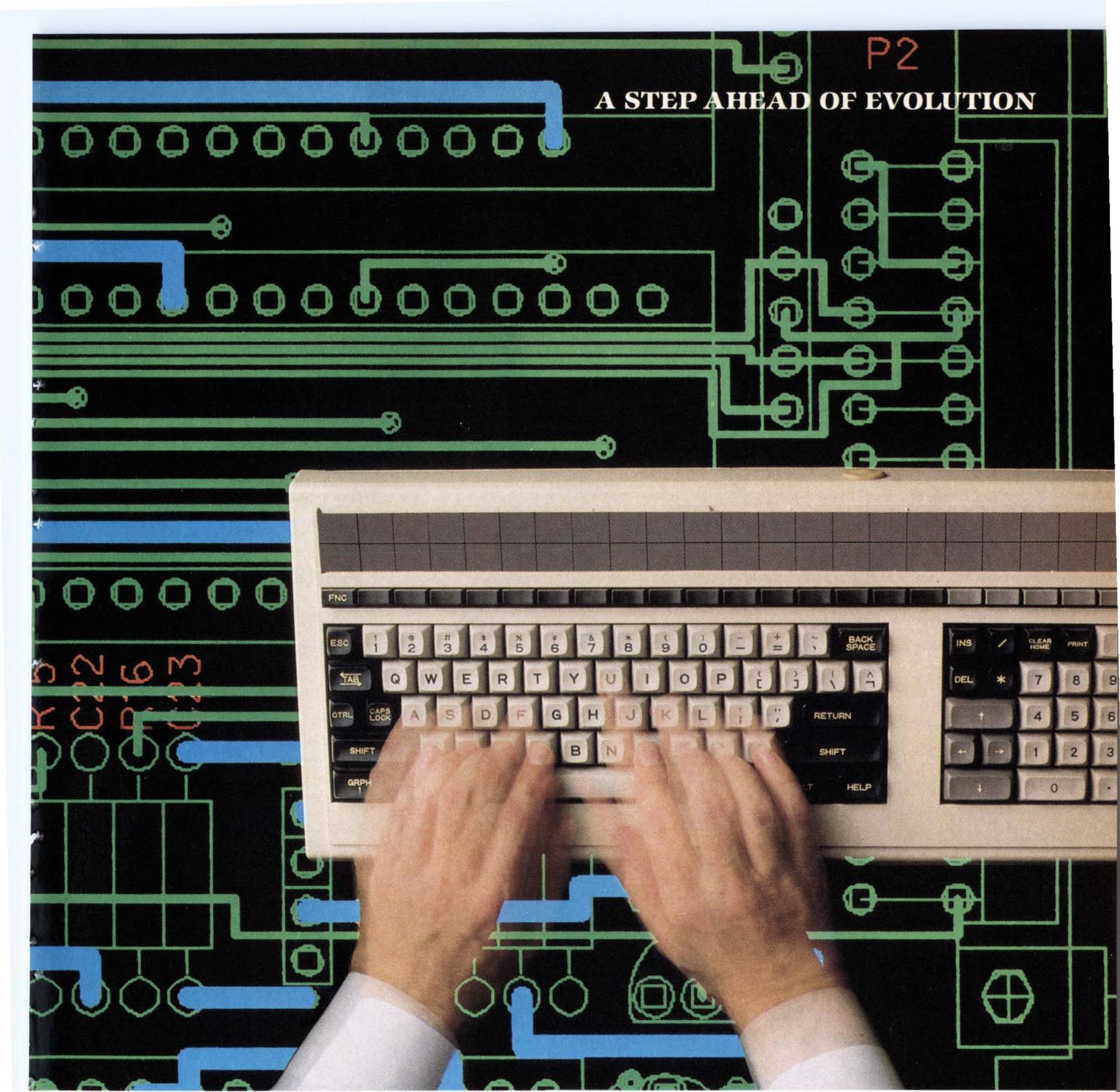
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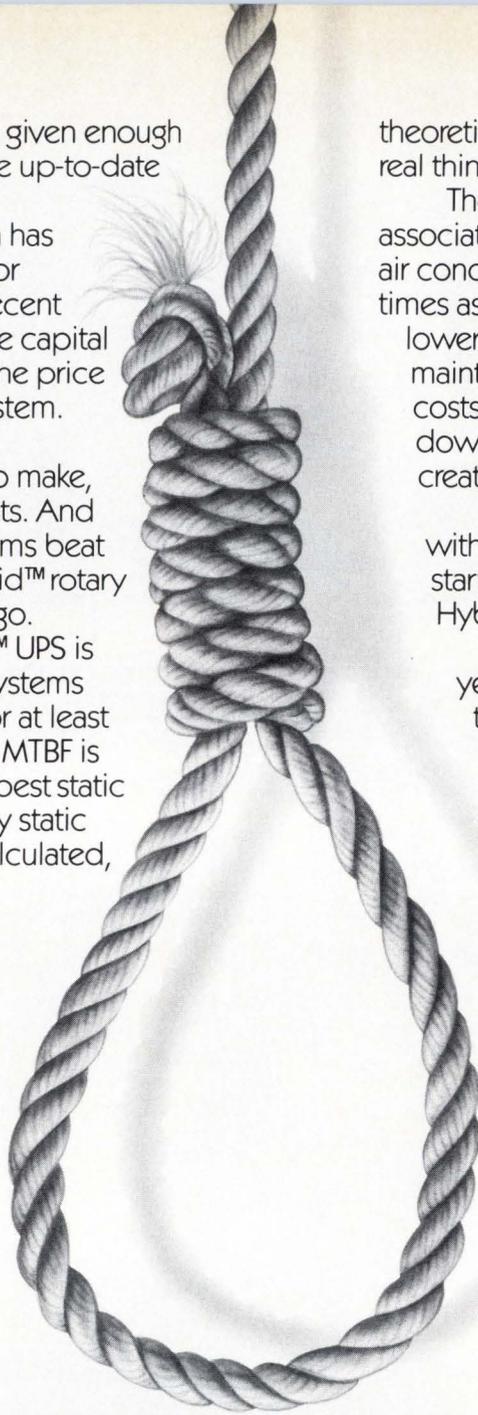
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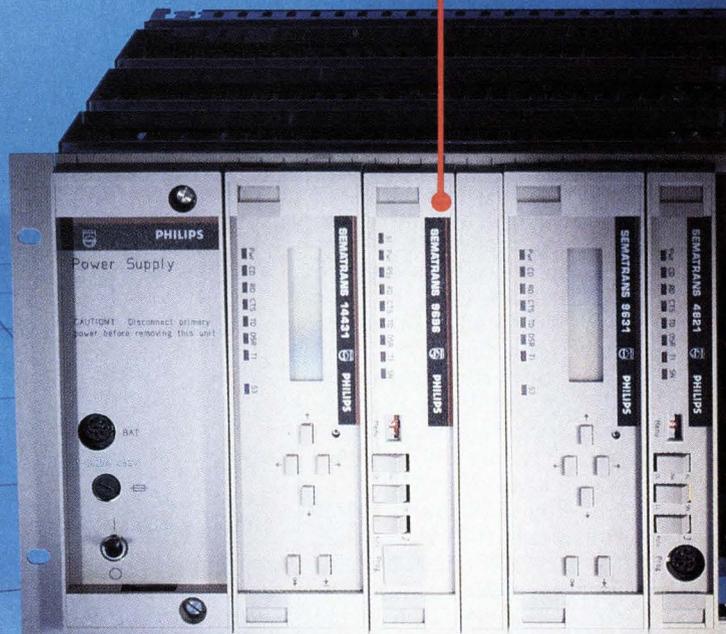
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## TURMOIL IN IS

# Rate of Salary Increases for IS Execs Is on a Downward Spiral

A recent survey shows that those in the financial services sector could be especially disappointed with their raises this year, but bonuses could compensate.

BY MARY K. FLYNN

Information systems executives expecting an 8% raise this year may be disappointed, especially if they work for financial services companies. A recent survey suggests that they may take home only a 3.6% increase; one Wall Street chief information officer goes as far as to predict they'll get no increase at all. On the other hand, those lucky enough to work for a company that comes out on top of the market may find some compensation from their year-end bonuses.

### Raises Were 7.9% in 1987

It was Black Monday that pushed the already declining yearly increase for IS pros at financial services companies into a nosedive. The average salary increase for the top IS positions dropped to that 3.6% level this year from 7.9% of base pay in 1987, according to the 1988 Salary Survey of Information Management/Data Processing Executive Positions, conducted by Edward Perlin Associates Inc., New York.

Roger O'Connor, staff consultant for Perlin, tells DATAMATION that the sharp decrease indicated by the survey is a direct result of the "changed economic conditions since October."

The impact of the crash has been felt in the financial community more than in any other segment of the economy, says O'Connor, whose study annually polls 1,000 IS executives at 34 companies. Most of the companies are fi-

nancial services firms, such as American Express Co., Chase Manhattan Bank, Metropolitan Life Insurance, and Shearson Lehman Hutton.

The Perlin numbers paint a bleaker picture than DATAMATION's own research, which spans all the industries represented by its readership. Compare the 3.6% increase of the Perlin study with the 5.9% average in-

creases at all," he says. Anderson, who is a participant in the Perlin survey, declined to give details on salaries at New York-based Pru-Bache.

### Post-Crash Readjustments

Traditionally, financial services companies plan their payroll budgets in September. Last year, many of them "readjusted their salary planning models" after October,

according to the Perlin surveys (see "Declining Yearly Salary Increases for IS Executives").

DATAMATION salary surveys for the last four years confirm the trend indicated by the Perlin surveys. In 1984, participants in DATAMATION's survey projected a 7.8% increase. In 1985, they predicted 7.1%. In 1986, the projected increase fell to 6%, and last year it was 5.9%.

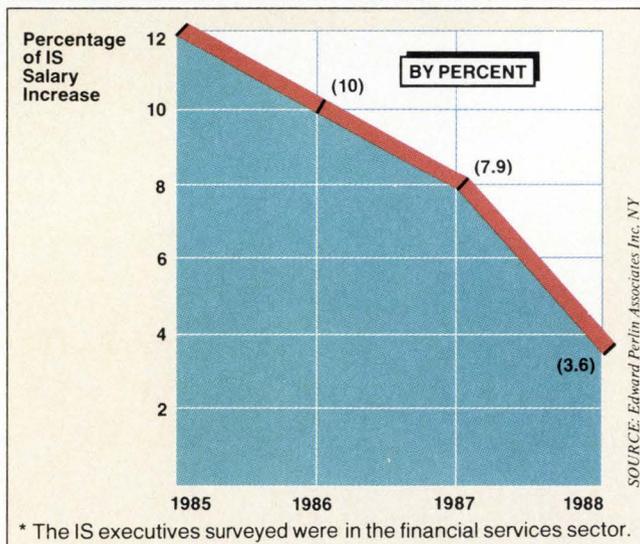
### Less Competitive Salaries?

This year's decreased raises for IS pros in the financial community may result in salaries that are less competitive with the rest of the industry, says O'Connor. "The ripple effect hasn't been felt in other types of companies, like communications, dp services, insurance, and entertainment." But O'Connor says he does not expect to see an exodus of IS execs from financial services firms into other industries.

Elizabeth Woods of the Woods Group, a New York recruiting firm specializing in data processing professionals, agrees. Although she has "seen a lot of movement at the vp level from one financial services company to another since October," she adds that she has "not seen people moving out to anything like manufacturing. Certain financial services companies have surfaced as stronger, and they've profited from the staffing losses of other companies."

A heightened level of job hopping on Wall Street was suggested by an IS job fair sponsored by eight financial services firms last February (see "Superbowl Tuesday: An IS Job Fair on Wall Street," March 15, p. 48). An unprecedented vertical-market recruitment event for the financial community, the fair was designed to lure IS pros from competing companies within the financial district.

## Declining Yearly Salary Increases for IS Executives\*



crease projected for 1988 by participants in DATAMATION's 1987 Salary Survey, which was conducted before the crash (see "What Are You Worth?," Oct. 1, 1987, p. 78).

W.H. Anderson, CIO for Prudential-Bache, believes raises for most IS execs on Wall Street won't come anywhere near 3.6%. "I've spoken to many companies that do not intend to give any in-

creases at all," he says. Anderson, who is a participant in the Perlin survey, declined to give details on salaries at New York-based Pru-Bache.

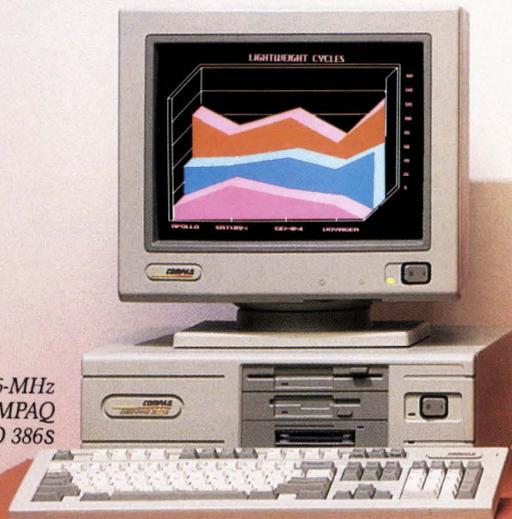
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## GOVERNMENT SYSTEMS

# Controversy Comes Early To Two Proposed Treasury Bids

### Potential bidders question the RFPs for two megacontracts from the government's strongest Unix advocate, and the closing date is postponed.

BY WILLIE SCHATZ AND MARY JO FOLEY

For a while, it seemed there was a possibility that the U.S. Treasury Department's DMAC II (Departmental Microcomputer Acquisition Contract II) would escape the clutches of the nefarious government procurement cycle. The request for proposal (RFP) would close on time, the award would be made on schedule, and that would be that.

Then folks realized that the Treasury was talking adult sums here, possibly as much as \$2 billion for DMAC II and the soon-to-be-released TMAC II (Treasury Minicomputer Acquisition Contract II). So, potential bidders began to tell the Treasury what they thought of DMAC II.

They haven't stopped yet.

#### Scope Called an Error

"By far the most grievous of errors in this solicitation is the scope of the contract," wrote Terry Miller, president of Government Sales Consultants Inc., Great Falls, Va., to Stuart Toleman, a Treasury contracting specialist. Miller wrote Toleman the letter because a company asked him to look over the proposal—Solicitation A-88-07 on your program—in case the firm decided to bid. "I also did it because it was the right thing to do," Miller says.

According to Miller, the indefinite quantities and indefinite delivery dates in the RFP "set a phenomenal range of \$50,000 to \$400 million as the contract value. In consideration that most of the microcomputers are based on the powerful 80386 architecture, as are those cited in the forthcoming RFP for the TMAC requirements, I believe the

ranch on that date, either.

"We've gotten an average amount of questions for a contract this size," says Treasury's Toleman. "The proper thing to do is to submit group answers to all the questions. That's what we're going to do. If we have to change any specifications based on the questions, and we can't make them by July 29, we'll extend it again."

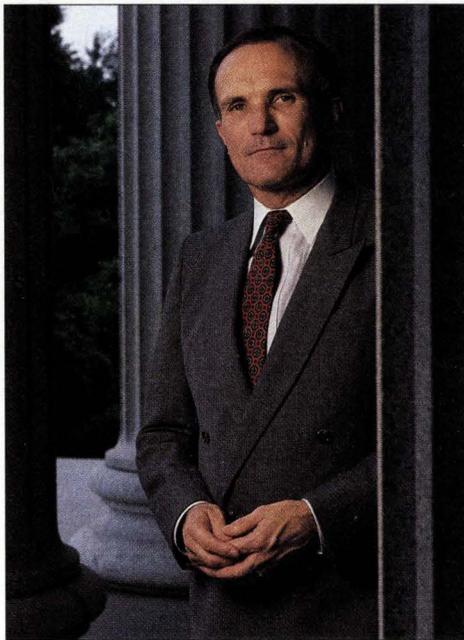
That would make it the same old procurement song for DMAC II, which is a follow-on to the Treasury's three-year-old DMAC I micro procurement. DMAC II is actually expected to be worth anywhere between \$130 million and \$400 million, and will encompass hardware, software, and federal systems integration services.

#### One-Vendor Solution?

TMAC is a contract for \$1.8 billion worth of Unix minicomputers, software, and related services. The TMAC RFP should hit the streets this summer, and the contract should be awarded by the end of 1988 or the beginning of 1989.

Miller's scenario has the Treasury's favored vendor—IBM, in case you hadn't guessed—winning the DMAC contract and then shutting down TMAC by offering a board that turns a one-person DMAC machine into a standing-room-only TMAC machine.

"Despite the intent of



TREASURY'S COOPER: Seeking commonality.

DMAC and TMAC specifications overlap, and there is a real possibility that items on the DMAC solicitation will be procured in lieu of those purchased off the TMAC contract."

The Treasury has responded by kissing off the RFP's original June 13 closing date and extending it to July 29. But don't go betting the

O'Connor believes that those "people who have survived the repositioning are happy to have jobs. They're not about to leave." O'Connor predicts that the turnover rate in dp, which he says has been at about 17% for the last year or two, probably will go down shortly. (For some real-life turnover stories, see "A Rash of Top-Level Departures Erupts at IS Shops Across Nation," p. 21.)

Pru-Bache's Anderson doesn't think the economic climate will have any effect on

## BLAME IT ON THE CRASH.

the turnover rate. "For the past four years," he says, "there's been more turnover in Wall Street dp than in professional basketball coaching, but this environment won't accelerate that process." Turnover, says Anderson, is a direct result of whether or not "end-user senior management [ceo or cfo] is happy with the job performed."

#### Bonuses May Compensate

Anderson offers a pot of gold at the end of this rainbow for Wall Street IS pros who, he says, "have never been busier than they are right now." For some IS execs, year-end bonuses may compensate for the lack of raises.

"The higher up on Wall Street in dp you go," Anderson explains, "the more dependent you are on bonuses based on profits of companies. If the firm you're working for is doing well, and you're looking at a 20% to 30% bonus, then it doesn't matter if your salary increase is 6%, 3%, or 0%." ■

the DMAC requirement for single users as opposed to the TMAC requirement for multiusers," Miller's letter says, "the potential multiuser features of OS/2 and Unix in our DMAC specifications would allow multiuser conversion at little cost."

### Is IBM In the Money?

Miller also contends that the CPU requirements make IBM a lock. These include a minimum of eight expansion slots, three of which must meet 32-bit specifications, and the capability to change system configurations without the use of DIP switches or jumper blocks.

"The first of those specifications strongly indicates IBM's Micro Channel, PS/2 Model 80," Miller's letter says. The second specifica-

tion severely limits the number of competitors who can respond to the requirement."

Nevertheless, everybody who's anybody figures to be in DMAC, TMAC, or both. The money's not bad, and the publicity won't hurt the winner either.

"Basically, our orientation is toward microcomputers and workstations," says Roger Cooper, deputy assistant secretary for information systems for the Treasury.

Although the Treasury is allowing its users a considerable amount of latitude in choosing the specific microcomputer hardware and software they employ under the DMAC II contract, Cooper expects MS/DOS running under Unix to be one of the main operating environments. As a result of this, DMAC and TMAC

systems are likely to be fairly compatible.

DMAC II, which is expected to last five years, "will be a very similar contract to the one we've got now [DMAC I]," Cooper says. PS/2s, especially the Intel 80386-based models running MS/DOS, OS/2, and/or some type of Unix, are sure to figure prominently, he claims. "But we're also talking about bringing in some more [Motorola] 68000 machines, primarily the Apple product line, and laptops, especially for the IRS." As was true with DMAC I, "we'll probably be entertaining a situation where we won't define the architecture. Somebody could even bid a RISC machine," Cooper adds. "It will have something for everybody."

Exactly as DMAC I did. The Treasury purchased every known general office software package, including, but certainly not limited to, PC/DOS 3.2, OS/2 version 1, Xenix, Multimate Advantage II, WordPerfect 4.2, Microsoft Word 3, Lotus 1-2-3, RBase 5000, and dBase III Plus.

### A Philosophy of Autonomy

"We're more interested in getting good maintenance arrangements than in dictating that they [vendors] have to bid PS/2s, VGA graphics, or whatever," Cooper says. "We leave those decisions to the [11 Treasury] bureaus. That way, you don't get into turf battles with them, where they think they should be doing A, but you think they should be doing B. We're trying to provide some value-added for them and give them a little bit of guidance as to what we think is important. The idea is to get as much commonality as possible without hassling folks."

The Treasury's overall IS strategy is built around a philosophy of individual autonomy. The Treasury's bu-

reaus—which include Alcohol, Tobacco and Firearms, the U.S. Customs Service, the Bureau of Engraving and Printing, the IRS, and the U.S. Mint, among others—can and do request proposals for some of their own IS contracts. Customs recently called for bids on a \$50 million Unix contract, and the IRS is slated to release an RFP for its Integrated Collection System by the end of the year. But the Treasury's central IS department, the organization to which Cooper belongs, also provides for shared telecommunications, standards adherence, and some consolidated IS buys—such as DMAC and TMAC.

One area in which the Treasury distinguishes itself from other agencies is in its strong advocacy of Unix and its experience with the operating system. Although other agencies are talking a lot about Unix and/or Posix (the standard proposed by IEEE), and nearly three quarters of all current computer RFPs specifically require Unix, the Treasury department is one of the very few civilian agencies that can claim a sizable installed Unix base.

"Right now, we're going through a period of transition in the government, regarding how much money we want to spend on which operating systems," Cooper says. "A lot of people are just waiting. There's OS/2, Apple, and MS/DOS [running under Unix or alone]. You can make really good cases for all three," he says.

What sets the Treasury apart more than anything is its answer. As Cooper says, "We're providing the vehicles and letting the users decide." But it won't be that easy. This is the government, after all. ■

*Mary Jo Foley is a freelance business and technology writer based in Washington, D.C.*

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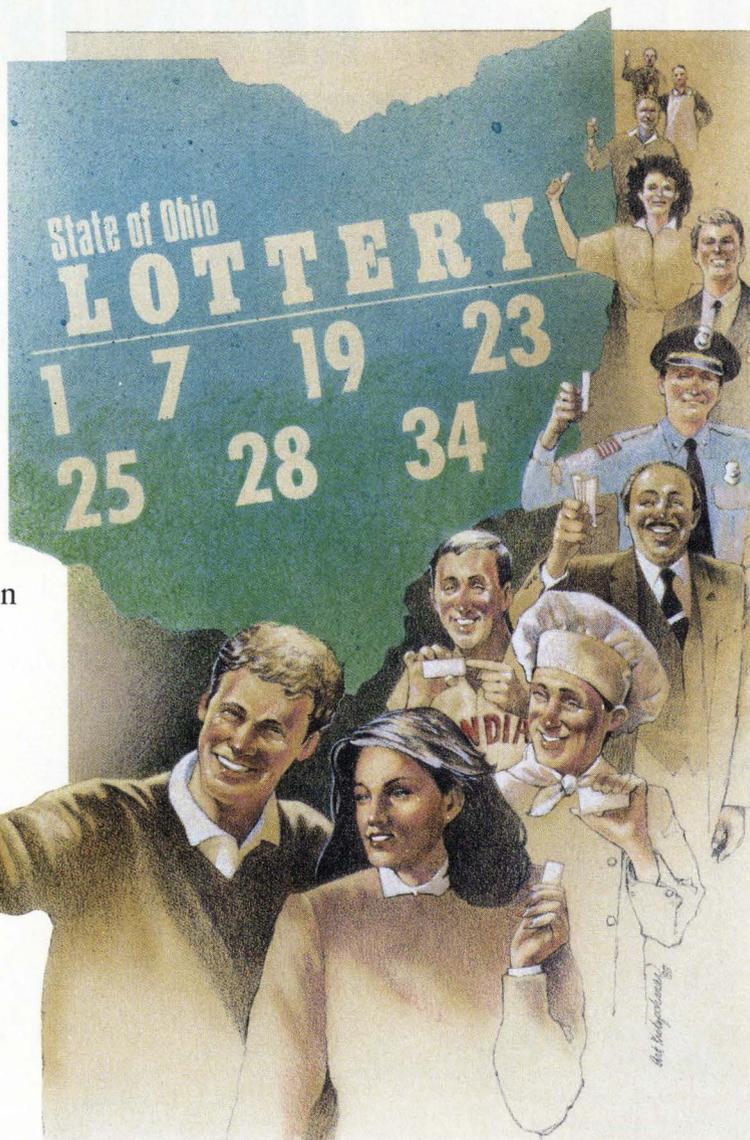
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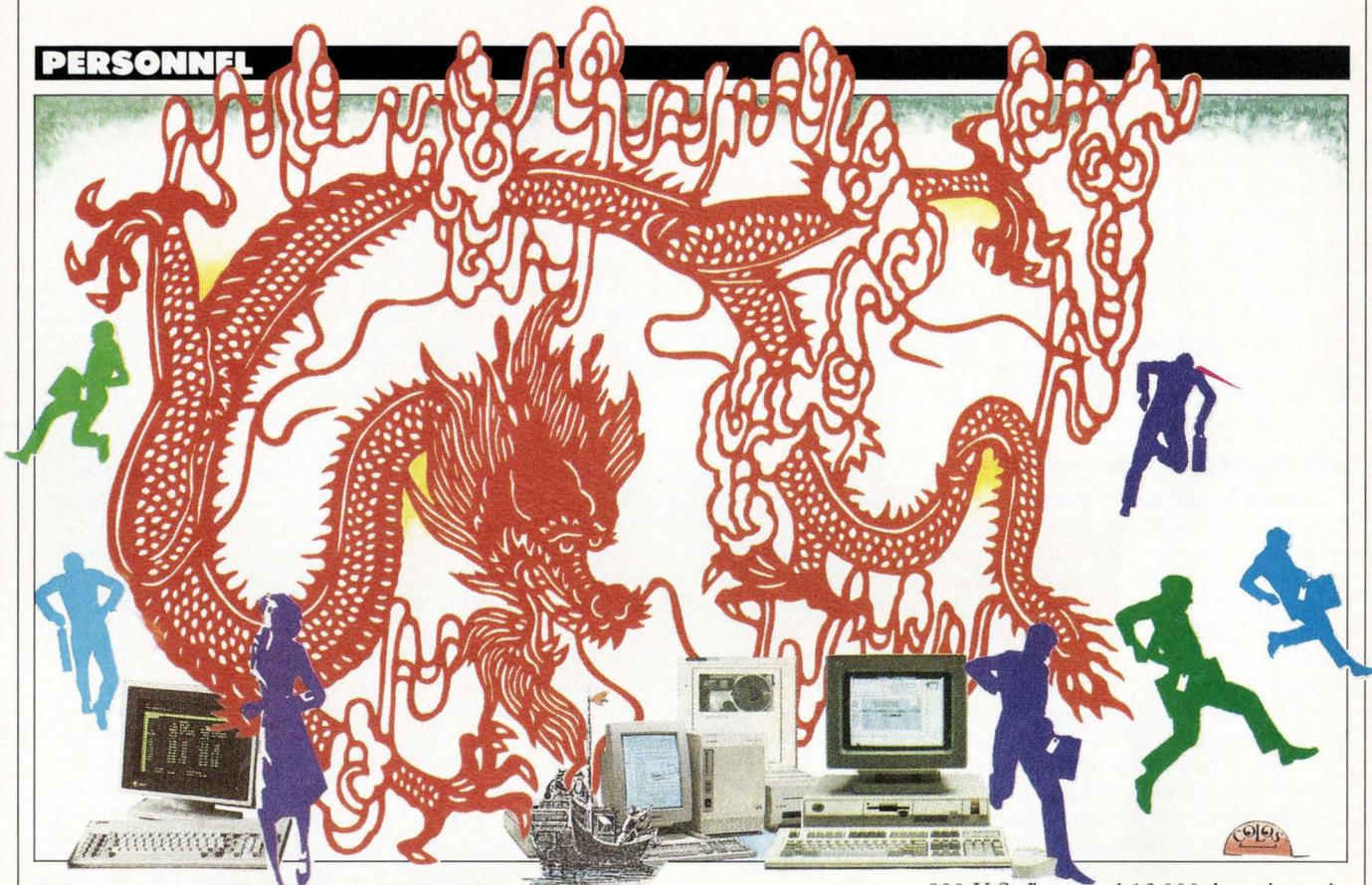
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# Behind the News

## PERSONNEL



## Hong Kong IS Pros Escape the 1997 Jitters

The exodus of skilled IS pros to other countries before Beijing takes control of Hong Kong has created a significant brain drain.

BY TOM McHALE

When Hong Kong's press corps heard that Governor Sir David Wilson had something to say on April 20, thoughts turned immediately to the colony's deepening refugee crisis.

With more than 12,000 Vietnamese already in prison-like camps and a fresh wave of boat people fleeing famine to Hong Kong's outlying islands, compassion was wearing a bit thin.

While a stiffly proper Sir David had harsh words for Hanoi, the governor unexpectedly took up another, perhaps more threatening, refugee problem: Hong Kong's own outflow of refugees fleeing China's 1997 takeover, a brain drain of educated, successful professionals.

"We have to face the fact that there

is a problem," Sir David told the press in deadpan understatement. "Even though the numbers have not gone up enormously, there are more people from the key middle management sector leaving Hong Kong," he conceded.

Ever-present queues of would-be emigrants at U.S., Canadian, and Australian government offices, and newspapers swollen to the size of the *New York Times* by help-wanted ads make it difficult to ignore that Hong Kong Chinese are on the move more than ever before.

### Service and Support Standards Decline

The numbers may not be enormous by Sir David's reckoning, but the drain already is changing the way firms' IS departments do business in what has long been the corporate capital of the booming Southeast Asian region, including the

800 U.S. firms and 16,000 Americans in the colony.

Compounding the staff problems facing IS managers are declining standards of service and support from vendors that are even more battered by employee turnover. Vendor IS staffs are said to be job-hopping at a faster rate because of the proliferation of Asian regional headquarters in Hong Kong for foreign computer companies.

By mid-1987 it was already clear that a dangerously high number of experienced IS staffers were joining the ranks of Hong Kong's "yompies"—young, outwardly mobile professionals.

"The impact of emigration was driven home to me in a 1987 year-end survey of Hong Kong's 40 largest dp sites," explains Reid Rasmussen, general manager of Hong Kong-based researchers ResearchAsia. "I asked dp managers to list the three most pressing issues facing them in 1988 but really only got one answer—emigration."

"The diagnosis is bleak," says Price Waterhouse consultant Richard Willsted. "Hong Kong is suffering from a severe shortage of people with relevant IT experience and understanding in both general management and IT management."

# Behind the News

Rasmussen says that corporate IS is responding to the staff problem in various ways, including overhiring, paying higher salaries, making staff fault tolerant by ensuring that no individual's job is unique, hiring outside of Hong Kong, and setting up contract terms to ensure that an employee will serve the full term: for example, 25% of a full package is withheld until completion of a two-year contract. He adds that it's still too early to tell if any of these reactive measures will have a significant effect.

## Confidence In China Is the Chief Factor

But it is the level of confidence in the future under China that will determine the outcome of the staff problem, not reactive measures, says John Strickland, general manager, services, at the venerated Hong Kong and Shanghai Bank.

According to Strickland, much depends on how Hong Kong settles and ultimately views the Basic Law—the mini-constitution that will provide the framework for governing Hong Kong as a special administrative region of the People's Republic of China after 1997. The first draft of the Basic Law was published in April.

"If people see confrontation and rancorous debate on the Basic Law, that will only serve to accelerate the rate of emigration," says Strickland. "If people see that Hong Kong has no influence on the Basic Law, that is bad. But if it becomes apparent that Beijing will take positive steps to consider Hong Kong concerns, that would be a good thing."

Getting a handle on just how many are leaving is no easy matter. Even government statistics are just an estimate based on net figures of the total inflow and outflow of residents recorded by the Immigration Department each year. Mike Rowse, principal assistant secretary of the government's Administrative Services and Information Branch, the man appointed in May to head a task force on emigration, says, "We really have no way of knowing who is emigrating."

The task force was established in response to a disclosure that 27,000 citizens emigrated in 1987, a 100% jump over the 13,000 emigrating in 1986. Emigration in the early 1980s, leading up to the Sino-British Agreement in 1984, averaged 20,000 annually, but dropped to a low of 11,500 in 1985 as Hong Kong and Beijing enjoyed a brief honeymoon.

## Hong Kong IS Salaries May Top World Market

One of the more striking side effects of the brain drain on Hong Kong's information systems sector—for both users and vendors—is that it may hold the dubious distinction of paying the world's highest salaries, according to Jeff Evans, the managing director of IS headhunters, Tech-Xecutive Society. Evans is British, and has been a resident of Hong Kong for 17 years.

Particularly for middle management and development positions, Hong Kong job contracts could be bonanzas, and they are no longer limited to Chinese IS professionals. Americans, Canadians, Australians, or almost anyone with the right skills and an eye for travel in the Far East can land a lucrative stint in freewheeling Hong Kong.

It's a sellers' market now for skilled people, say industry watchers. "We're already at American salary levels—the world's highest—in some categories," says Evans. "And salaries should continue to rise for the next few years." Evans points out that on the vendor side, sales and marketing salaries have doubled in three years and are often on a par with U.S. levels in terms of pretax packages. A company will hire a salesman averaging \$750,000 worth of software sales annually for approximately \$50,000, and "that's by no means a high salary in this market," says Evans.

With a low income tax (averaging 17%) and a variety of legal means of reducing even that amount, the salaries become even more tempting, Evans says.

While experienced sales and marketing people in Hong Kong earn salaries comparable to their U.S. counterparts, a typical package could be 15% higher than is offered in Australia and as much as 20% to 25% higher than what an IS worker of comparable experience in Great Britain could expect, Evans explains.

On top of that, he says, think of the bonus of sunny Hong Kong's tropical climate on the South China coast to a manager staring out the window at freezing rain in Britain.

Now, however, there's no end in sight to the increases. Canada issued 22,000 immigrant visas in Hong Kong last year, double the number in 1986, according to Canadian government sources. Those visas can be used any time within the next five years. Australia expects to have issued as many as 7,200 visas in the fiscal year that ended June 30, 1988, says Janet Shekavs, Australia's regional immigration director, "and that number could climb higher," she says.

Canada and Australia draw IS professionals largely because they provide immigrant visas quickly to foreigners who have job skills that their economies demand. Immigration to the U.S., on the other hand, is still granted primarily to those who can claim kinship with someone there. U.S. officials issued 7,400 immigrant visas in Hong Kong last year.

As for IS professionals in particular, ResearchAsia's Rasmussen estimates that most large installations are seeing annual staff turnover of 15% to 20%, but he cautions that some departments may be badly hit and others untouched for no apparent reason.

The losses are coming at a time when staff needs are climbing from 10% to 20% per year. According to Rasmus-

sen, Hong Kong's installed base of minicomputers in 1988 will be triple that of 1984. "At least half, probably closer to 70%" of mini users in Hong Kong use applications software developed in-house, which translates into exploding staff requirements.

A confidential 1987 survey of some 3,295 IS staff and their salaries obtained by DATAMATION puts the situation in some perspective. The report on 64 installations, prepared by the Hong Kong Management Association, says that staff turnover was 22% in systems development and 21% in operations staff. Of those, it said that 139 systems development people and 10 of the operations staff—or about 4.5%—emigrated.

But the HKMA survey's statistics lie at just the tip of the iceberg, according to some industry consultants. Considering that there are well over 2,000 mainframe and minicomputer sites in Hong Kong, the HKMA's sample was just too small to get the full picture.

## Rate of Staff Loss Triples

"The situation has already reached crisis proportions," says Jeff Evans, managing director of Hong Kong-based IS headhunters Tech-Xecutive Society.



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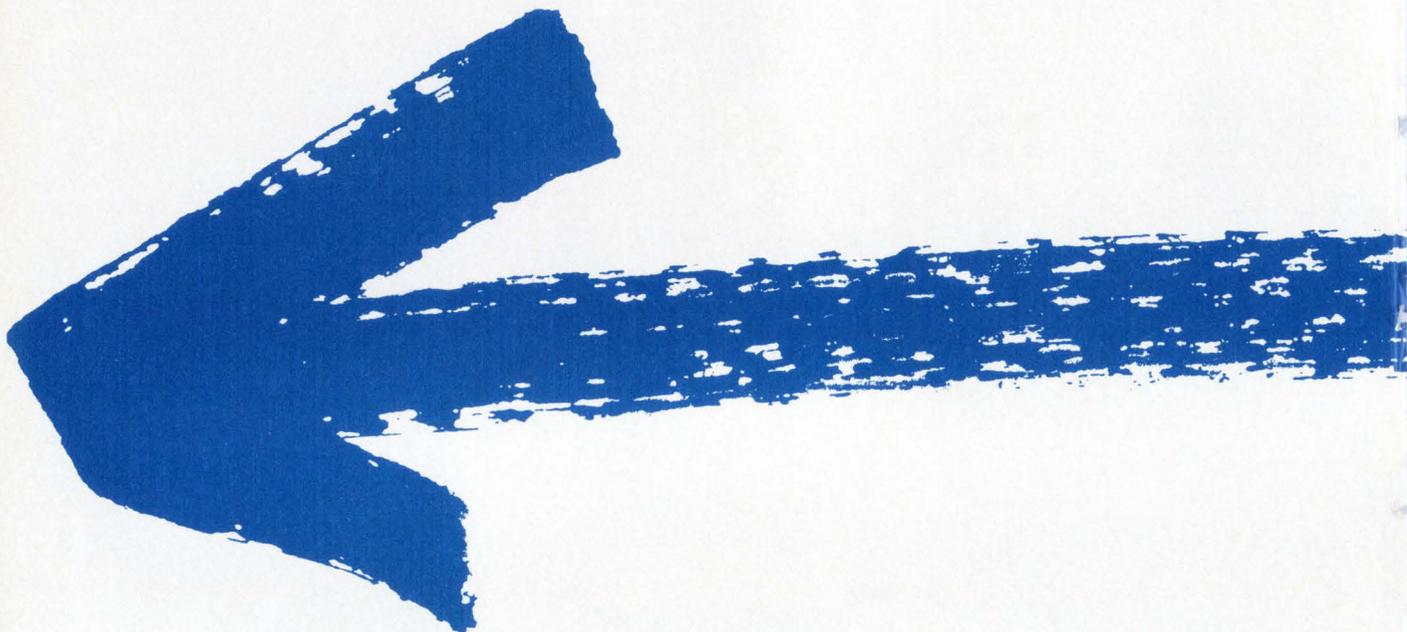
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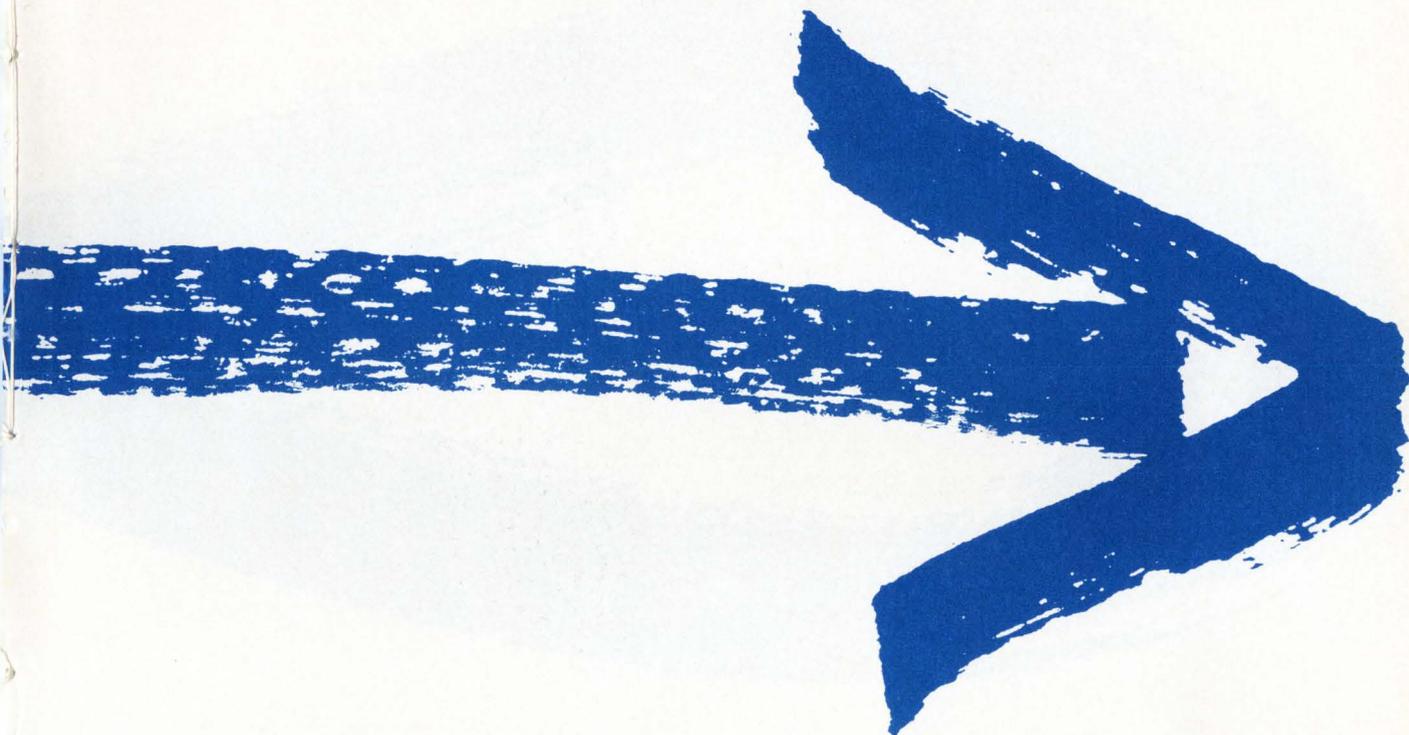


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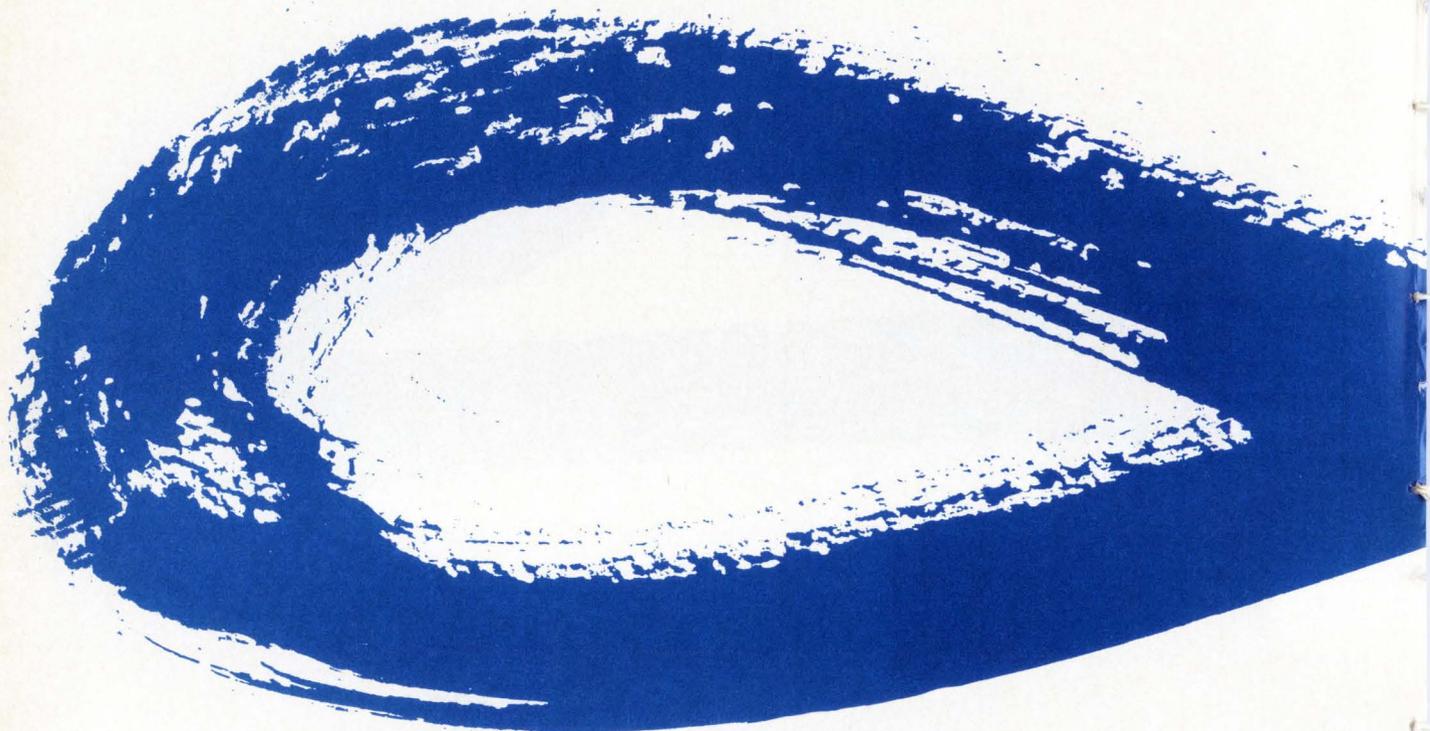
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**IBM** The Bigger Picture

## Behind the News

"My estimate is that the total staff lost in 1987 was more than the previous three years put together," says the 17-year Hong Kong resident matter-of-factly. Evans estimates that about 1,200 experienced IS staffers bade farewell to Hong Kong last year.

The loss of that many people in one year is significant when taken against the total pool of IS people in Hong Kong. Consultants guess that that number is anywhere between 8,000 and 16,000, depending on the definition of IS professional. Once vendors' staffs are added, the number jumps to between 20,000 and 25,000.

It's the loss of seasoned staff that hurts the most, says Evans. "The people emigrating are typically people with six to 10 years of experience; the people with skills to handle a project but who have not yet priced themselves out of the market."

Willsted categorizes emigration as the "killer on top of all other strains" facing IS in Hong Kong. He estimates that in the last three years, emigration has perhaps halved the number of people with more than five years of relevant experience.

Vendors may be hurting the most, says ResearchAsia's Rasmussen. IBM, with Hong Kong, Southeast Asian, and China operations all based in Hong Kong, is said to have lost almost 100 employees in 1987. While officials at IBM will neither confirm nor deny the loss, they say that emigration is an ongoing concern. Big Blue's troubles grabbed attention earlier in 1988 when the firm ran a series of full-page newspaper advertisements seeking qualified staff, a break with its tradition of hiring only recent graduates.

Willsted says that Hong Kong IS operations will encounter a variety of problems in the coming year, such as IS managers taking development shortcuts through inexperience to solve staff losses, resulting in worse system failures; individual projects being poorly designed, running late, and over budget; rapid rises in salaries; premature promotions; and extreme difficulty in recruiting good people from overseas.

Increased emigration has opened up lots of vacancies, fueling a job-hopping mentality within Hong Kong that some IS managers say now qualifies as their biggest headache. "During the past two years my IS staff grew to over 400 from 260 and in the last 18 months we've had a turnover of 250 people," says Glen

Rasmussen, former managing director of Computasia and Reid Rasmussen's father. Computasia is an arm of Hong Kong Telecommunications, the colony's telephone company.

### Many Job-hoppers Within Hong Kong

For the last six months, says the elder Rasmussen, who resigned from the firm in April to return to consulting, most of the staff turnover was job-hopping for better pay within Hong Kong. He says that previously it was emigration that claimed the lion's share of those leaving.

The staff turnover problem and all its unpleasant side effects have become business as usual for Hong Kong's IS executives, says Glen Rasmussen, who sees no likelihood of the problem going away soon.

### IBM IS SAID TO HAVE LOST ALMOST 100 EMPLOYEES IN 1987.

Tech-Xecutive's Evans says the problem will solve itself by the early 1990s, as Canada and Australia catch up with their IS needs and close the doors to those job categories, because no other country can take Hong Kong residents in such numbers. "I don't think this is a crisis that will bring Hong Kong to a grinding halt," he says. "Skills are available elsewhere in the world and Hong Kong will have to bring people in."

Some in the industry predict confidently that Hong Kong, at least in some job categories, will soon pay the world's highest salaries (see "Hong Kong IS Salaries May Top World Market"). Many managerial and systems development posts are already offering compensation packages equal to or higher than comparable positions in Great Britain, Australia, Canada, and even the U.S.

Increasingly, managers report trying to solve the staffing problem by recruiting Hong Kong Chinese who have emigrated and have a new foreign passport. Tech-Xecutive is digging for staff in Australia, Malaysia, and Singapore, Ev-

ans says. "What you're seeing now are a lot of recruiting efforts in Australia," says Glen Rasmussen. The continent is a revolving door for emigrants, he says. "The Chinese community is tight and you can find and contact the people with the skills there. We sent [recruiting] people to Australia on several occasions to get Hong Kong people we knew through IBM, HK Telco, or Cable and Wireless connections and bring them back for us. On our first trip to Sydney we interviewed 15; 12 came back."

Emigrants will come back from Australia for two reasons, explains the veteran IS manager. First, the Australian system is flexible: you only need two years residence to gain citizenship, he says. Second, it's not uncommon to hear of accounts of racial prejudice. "It's more difficult to get people to come back from Canada, where the residence requirements are longer," Glen Rasmussen says.

But it's not always easy today, apparently. "We've already done some trawling in Australia and Canada to get back staff who emigrated, but there's been little success," says Hong Kong and Shanghai Bank's Strickland, one of the colony's senior IS executives.

One solution for Computasia and a growing number of other companies is to subcontract development work outside of Hong Kong. Glen Rasmussen says that he subcontracted development work in the Philippines and explored the possibility with the Immigration Department of bringing in staff from Taiwan, Thailand, and the Philippines.

The elder Rasmussen's advice to U.S. companies and others considering a setup in Hong Kong? "Bring in key control people and subcontract work—perhaps now in the Philippines—but maybe five years down the road in China. Bring in project managers, systems analysts and they can oversee the design while systems development work can go elsewhere."

Despite the fact that he feels things will get worse before they get better, Reid Rasmussen remains bullish on Hong Kong's future. "Hong Kong is the geographic center of Asia and thus the logical site for corporate headquarters. The environment for expatriate staff is good and the lure of the China market in the future is still strong." ■

*Tom McHale is a freelance writer based in Hong Kong.*

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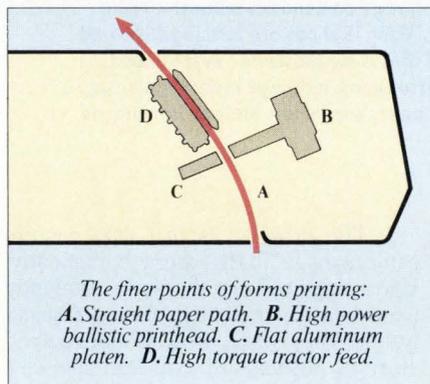
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# The Storage Threat

**IS managers may think of large systems storage demands as a beast running amok, but help is on the way. Forward-thinking IS shops are forming dedicated storage management control squads, and IBM is emphasizing "system-managed storage." But SMS has its own repercussions: a change in the relationship between end users and data storage managers and in how storage is managed.**

BY JEFF MOAD

**I**t's big and getting bigger. It's insatiable, laying waste to IS budgets and gobbling up floor space like there's no tomorrow. You can't run; it's already here. Many have tried to hold it down, but they've found that it's out of control.

It's the Storage Threat.

In the last few years, the growth in mainframe storage at IBM and compatible user sites has outpaced even the rapid increases in mainframe processing power, growth driven by the surge in end-user developed applications, the requirements of large relational databases, and the performance demands of new on-line, transaction-oriented applications.

## Efficient Management Is Elusive

Since 1978, according to IBM estimates, MIPS and accompanying storage have grown at an exponential rate (see chart, p. 60). Market analyst Dataquest Inc. estimates that last year alone, U.S. users bought almost four times as much IBM disk storage—117,000 gigabytes—as they had through the entire product lifespan of the IBM 3350 disk drive between 1975 and 1982.

The problem is that data centers can't manage all that storage efficiently. Users want to keep the most frequently used data where it can be accessed quickly, and they want to avoid unexpected storage bottlenecks that can increase systems response times. However, they also want to pack as much data as is practical onto their expensive disk drives.

## IBM Data Transfer Rate Stays Put

At least until recently, IBM hadn't done much to help. Although processing power and the demand for storage has been growing rapidly, the rate at which IBM allows users to transfer data from the storage subsystem to the cpu—3MB per second—hasn't changed in several years. IBM has equipped its disk controllers with cache memory, but that is an expensive solution and one that requires lots of hands-on management. Likewise, many of the software-based storage monitoring, migration, and analysis tools offered by IBM and others are difficult to use and usually require lots of high-priced systems programming personnel.

As a result, storage managers have been faced with a trade-off dilemma: either hire lots of programmers and use lots of software tools in an attempt to

bring the storage monster under control or simply throw hardware and more dollars at the problem. Some users have chosen the latter course, buying more disk drives than they need, then loading them only partially with data in the hope of improving device and overall systems performance. Today, IBM estimates that its customers use, on average, only about 45% of the disk space they have paid for.

With storage demands and costs growing faster than ever, many users are ready to draw the line. That means using more storage management software tools and hiring more systems programmers to use them. Three years ago, Monsanto Corp. in St. Louis embarked on an aggressive program to improve disk utilization and efficiency and to cut costs. As a result, disk utilization at Monsanto is at about 75%. The firm has not bought any new disk drives since March 1987.

This approach does cost money. Monsanto has a staff of 12 people focused on storage performance and management. Although such users complain that the storage management software tools they are offered are still too hard to use, they feel they have at least slowed the storage hardware acquisition cycle without reducing their ability to respond to new applications. Recent reports indicate they are not alone.

## Survey Says: Disk Drive Demand Down

The 1988 DATAMATION/Cowen & Co. survey of large systems users revealed that, although pressure to increase disk purchases is still there, 61.4% of IBM large systems users said they plan to add more disk drives this year, compared with 72.3% in 1986.

According to Nick Allen, a storage analyst with the Gartner Group Inc., Stamford, Conn., IBM is starting to realize such a trend could be bad for business. "IBM knows that every dollar a user spends on a person or on floor space is a dollar not spent with IBM," Allen says.

IBM is finally beginning to implement what could be a comprehensive solution to many storage management problems—both IBM's and its customers'. IBM calls it system-managed storage (SMS). It's an idea that has been around for several years, but it moved one step closer to realization this spring when IBM announced the Data Facility Storage Management Subsystem (DFSMS) along with its Enterprise Systems Architecture/370 (ESA/370) extensions to the MVS operating system.

DFSMS could change the way large us-



## Push Comes To Shove As Data Centers Try To Tame The Monster

ers manage storage, making the process more automated, more efficient, and more responsive to changing storage technologies. But that's not all SMS would change.

SMS would significantly alter relationships between end users in departments and other business units and data center storage managers by centralizing many of the storage decisions users now make. SMS also could change the relationship between IBM and its competitors in the storage management business, giving IBM more room to maneuver technologies and making it hard for third-party hardware and software vendors to keep up.

SMS changes the way storage is managed by presenting applications developers with a functional, logical view of disk storage instead of what is now largely a physical view of storage. Today, MVS applications developers must write, along with their applications, a job control lan-

guage (JCL) program that not only says how much disk storage will be reserved for the application but where and how the data will be stored, so the applications developer has to know a lot about storage hardware.

More important, it means that each application is tied, via the JCL, to some physical aspect of the storage subsystem. When IS managers want to move datasets or convert to new storage hardware, they often have to make changes to the JCL. That means manual intervention, time, and money. This often leads users to postpone conversions to new disk hardware.

SMS proposes to change that by divorcing applications developers from the physical elements of the storage subsystem. SMS creates three logical categories under which data are defined for storage purposes. Users describe data according to dataset type, record length, access method, availability, and backup require-

ments. The principal software component of SMS—a major new release of IBM's MVS/DFP storage management subsystem—then uses those class definitions to determine where a dataset should be stored, where and when it should be migrated to a different device, and what data should be deleted or backed up, among other things. Those jobs are carried out by new releases of existing products, such as IBM's DFHSM, DFSS, RACF, and DFSORT products.

What that means is, under SMS, the rules are made and enforced centrally, at the data center. End users just describe their data and leave the management—the allocation, the backup, the migration—to IS. SMS, says IBM, allows storage to be managed centrally in an automated, more consistent fashion that will save users both programmer time and disk space. IBM says the initial phases of SMS will allow users to improve disk utilization by an average of 20%. "We're saying, 'Wait, you don't have to make that trade-off [between programmers or hardware],' " says Lynn W. Yates, the director of systems support products at IBM's Santa Teresa Laboratory, which is responsible for SMS development.

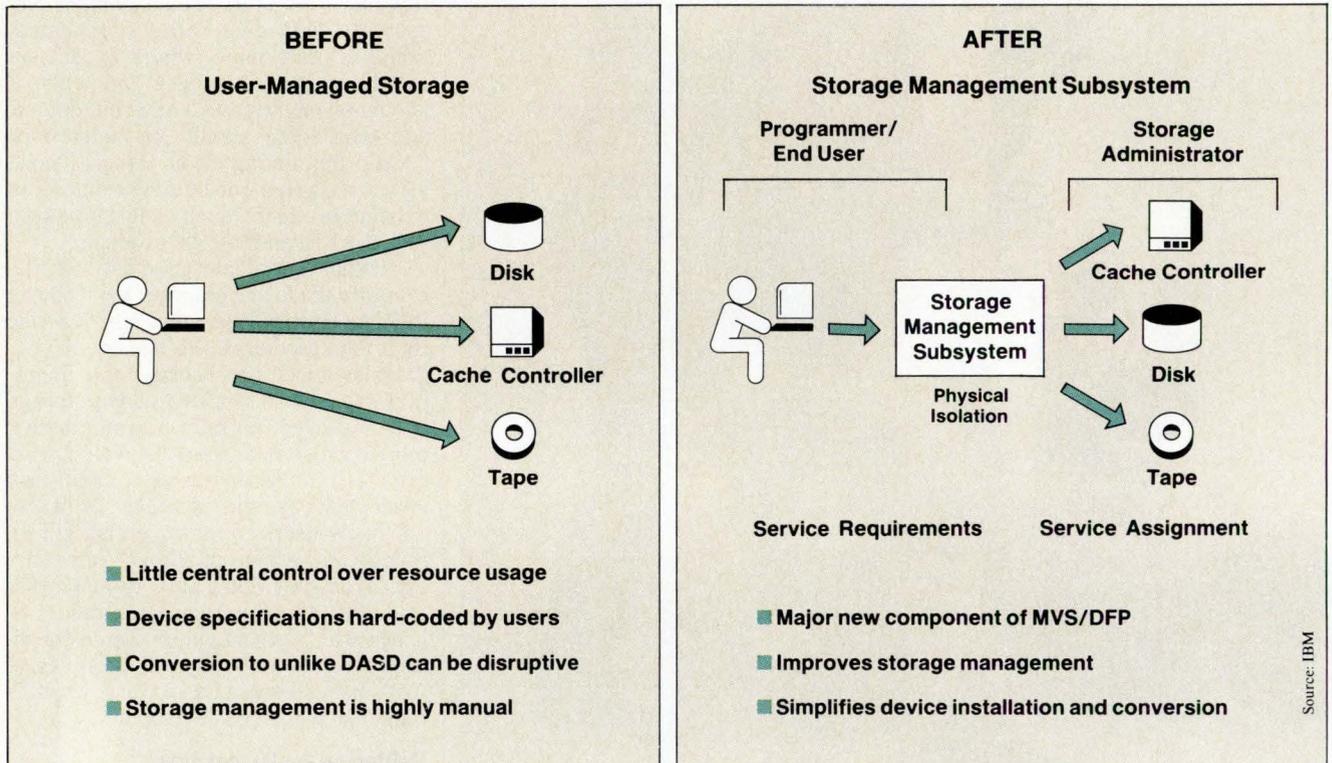
### Tightening the Budget Reins

That sounds good to IS executives such as Gary Hendel, a vice president at Gold Dome Federal Savings in Buffalo, N.Y. Hendel, who is also manager of systems software, has seen disk storage balloon by 50% per year for the past four years as Gold Dome acquired several smaller local banks.

Hendel blames the company's booming storage demand as much on the habits of Gold Dome's 400 end users as on the bank's acquisition policy. End users, says Hendel, "often start allocating datasets without thinking about what it costs or whether the resources are there. And they never want to delete anything. They say, 'I might need that in two years.'" With SMS, Hendel says, "I'll be able to say to users, 'Follow a couple of rules for me, and I'll make sure you can do your job.'"

Of course, it won't be quite as easy as all that. There will be significant technical challenges for users implementing SMS once the new version 3 of MVS/DFP ships in December. Just as imposing will be the organizational and political problems in companies in which SMS will be perceived by end users as a loss of autonomy. "Control of data and storage can be a political issue within a company," says W. Gary Parker, manager for storage

## Storage Management: Before and After



Source: IBM

management at Sterling Software. "People who manage storage must be sure they are doing so in a way that doesn't anger users or get in the way of them doing their job."

At most companies, storage management groups must get voluntary cooperation from end users before attempting major reforms along the lines of SMS. At Aetna, Hartford, Conn., for example, a storage management group has been at work for two years implementing a set of internal SMS-like reforms that are designed to cut into the company's annual 30% DASD growth rate.

To date, however, Aetna users' response to the changes has been mixed. The changes involve switching to a catalogued access method, new naming techniques, and DASD pooling. Only 8% of Aetna's data on DASD has been affected by the storage management reforms. "It's been kind of like telling users, 'We'd like to clean up your office for you while you're working,'" says Aetna storage management manager William Caruso. "It's been hard to convince people at first."

Caruso and other storage managers feel that IBM's newly unveiled SMS approach will lend credibility to what they have been trying to do inside their com-

panies. "Finally, the idea of storage management is gaining momentum," says Caruso.

### IBM's Advance Work on SMS

Even before announcing SMS in February, IBM had been trying hard to get users to make organizational changes that would lay the foundations for SMS. IBM has published a guide—called the Storage Management Library—which strongly advocates that users form dedicated storage administration groups, centralize storage management, and implement techniques such as volume pooling, using esoteric names in labeling datasets, and managing data at the dataset rather than at the volume level.

Some large users have followed IBM's lead and seem ready to incorporate SMS. One is the Northwest telco U.S. West, which began an aggressive storage management effort two years ago, based on IBM's suggestions, in an attempt to reduce its 50% annual DASD growth rate. U.S. West formed a storage management unit, centralized management of most—though not all—of its 1,000GB of disk storage, and went to volume pooling of data. The company even wrote some internal code to cut down on JCL changes. The result has been an im-

provement in disk utilization from 50% to 62% at its Bellevue, Wash., and Portland, Ore., data centers.

It hasn't always been easy for U.S. West to sell the new storage management to its end users. According to one such user, Joan Gangl, a member of the company's applications support group technical staff, "When they first went to pooling and HSM, a lot of people didn't like it. HSM was a bad word for a while." Users feared losing control over data or being told they couldn't have the storage space they needed. Gangl says her group has had to do more to justify its space requests under the new, centralized storage management system. But HSM has helped some users backup their data. Now, says Gangl, "People are getting used to it. We realize it needs to be done. This is a bottom-line company, and we are all in charge of controlling expenses. Before, we wasted a lot of space."

In an effort to get the necessary user participation, U.S. West's storage management group went so far as to offer a \$250 savings bond to the end user who helped recapture the most disk space. That program resulted in the company saving some \$2 million worth of disk space.

Ed Godsey, a technical staff mem-

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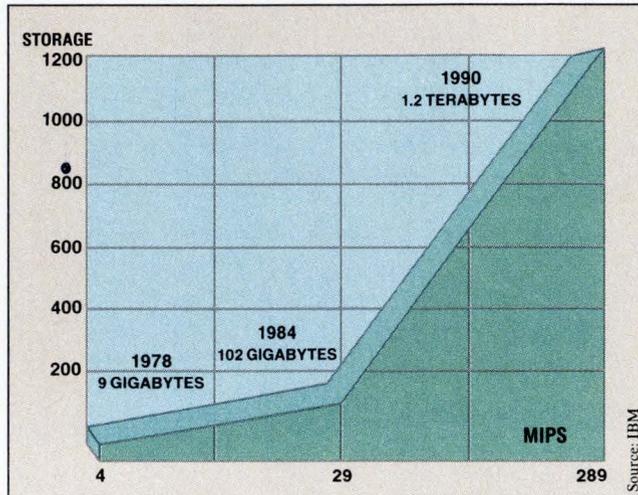
## The Storage Threat

ber, says such results have helped U.S. West's storage management group get what he calls a "mandate from upper management" to continue their storage management efforts. IBM's SMS direction will help, too. "We've got to get our clients to think in terms of 'How critical is this dataset? Does it need backup? And what sort of performance does it need?' They need to forget about the JCL. We're getting some help from our vendor in this, and we hope to get more," Godsey says.

Some observers point out that, by centralizing storage management and storage decision-making, IBM seems to be contradicting its own concurrent push for distributed, cooperative processing. Cooperative processing is supposed to give end users and business units more control, but SMS seems to take away much of that control, at least as it pertains to managing storage resources.

That apparent contradiction is nothing new, however. Cooperative processing, as defined by IBM and its Systems Application Architecture, will still rely

### The Rapid Growth of Storage



primarily on the mainframe host for such key management services as network management, in addition to storage management. And, according to some storage managers, there's good reason to centralize. "We are more knowledgeable about managing data than our customers," says Monsanto's Koogler.

Some users, while aware of the obvious advantages of storage management, aren't completely in accord with

IBM's ideas about centralization. Many large users are wary of submitting their most critical data to a highly centralized, automated system. They fear a loss of control and a loss of flexibility in managing the data upon which their businesses are based. Other users are worried that centralizing storage management will place an unwanted limit on new applications development.

That's been a concern at the Minneapolis-based IDS financial services subsidiary of American Express. IDS has grown rapidly since it was acquired by American Express in 1984. Because of that fast growth, says IDS manager of performance management

Philip Klitsche, "We haven't been able to limit end user use of space. There's been a fear that that would limit growth and new programs."

The result of IDS's reluctance to centralize storage management has been a tripling of DASD storage at the company over the four years and a DASD utilization figure that is at about the industry average—45%. IDS also has become a big user of cache memory, although Klitsche

## How Monsanto Took Control of the Monster

When Robert Koogler took over storage management at Monsanto Corp. three years ago, the company was adding disk storage rapidly, working toward a goal of providing its users with response times below three seconds, and improving its disk space utilization rate, which hovered around the industry average of 45%.

Today, Monsanto's storage management operation is recognized as among the most effective in the industry. Under Koogler, the company has improved its utilization rate to between 70% and 75% and provided subsecond response times for all of its systems. Perhaps even more impressive is the fact that Monsanto has not had to buy any new disk storage devices since March 1987.

How did Monsanto do it? By committing to an aggressive, rigid storage management program that emphasizes investment in storage management software tools and the people to use them, as well as a willingness to work closely with end users to understand how their business needs determine their storage requirements.

Koogler began with a broad, seven-point storage strategy, which called for optimizing storage utilization rates and implementing technical changes only when they enhanced utilization. Then he drew up what he describes as a "fairly rigid" set of standards and guidelines for managing Monsanto's storage. Among other things, it outlawed users' private datapacks and specified that all datasets conform to naming standards, and it required that all datasets in excess of 75MB

be sent to tape. In addition, Monsanto specified that all datasets not used within seven days be migrated daily to slower devices. The daily migration to tape of datasets not used in 120 days and the release of used space for sequential datasets was also required.

The Monsanto manager admits it wasn't easy to sell end users on some of the rules at first, particularly the prohibition on private packs. But, he says, "when you go out to customers and explain what you're doing and why, they understand that it's in their best interest."

Other tools are used by Koogler to get end users' cooperation. One is a piece of software now under development, based on the SAS statistical package, which will lay out for users what impact certain storage management techniques will have and how much specific applications cost the company and users in storage and dollars.

Koogler employs most of the commercially available storage management software tools, but, on the whole, they are still too difficult to use. He sees IBM's system-managed storage as a way around that problem. Eventually, says Koogler, SMS will return to end users much of the control over storage as the jobs of centralized storage are automated by SMS. In the meantime, storage managers have a big job to do educating end users about security and backup. "It would be extremely poor judgment for us to wait and then say to them, 'SMS has arrived. You are now responsible for managing your data.'"

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## Other Vendors' Approaches to Storage Management

As IBM moves toward system-managed storage, other vendors are not standing still. Most say they have plans to bring automated, system-managed storage to their environments. So far, however, IBM's approach to SMS seems to be the most ambitious and comprehensive, perhaps because the storage problems facing IBM and its users are the most severe.

Digital Equipment Corp. avoids many of the storage problems facing IBM users, for example, by locating at the disk controller level much of the intelligence used to manage storage. DEC's Hierarchical Storage Controller helps manage data backup, monitors free space allocation, and allows applications developers to view storage at the logical level, according to DEC.

The company claims that that allows its customers to utilize 70% of their disk drive space, on average. Currently, DEC is in the process of testing new facilities to support backups of stored data at remote sites and upgrading its RDB database management system to allow database files to be broken up and placed on multiple devices more easily and transparently.

Unisys, too, claims its users aren't quite as hard-pressed to manage storage as IBM's customers. That's because Unisys, on its largest A-Series mainframes, already makes it easier for applications developers to allocate data by supporting a

fixed block disk storage architecture, so programmers can avoid specifying certain physical storage attributes. Also unlike IBM, Unisys supports caching in main memory and a data transfer rate that recently was improved to 10MB per second from 3MB, using the IPI ANSI standard controller interface. As a result, Unisys, like DEC, claims its users require fewer systems programmers to manage their systems than do IBM users. Unisys corporate program management manager Charles L. McIntyre says Unisys is just beginning to study implementing an automated, hierarchical system-managed storage approach.

Similarly, Tandem Computers Inc. is moving toward automated, system-managed storage. While IBM primarily is focused on cutting storage-related costs for its users, Tandem wants to improve its systems' uptime by eliminating operators.

According to Tandem operating system group product manager Judy Robbins, the company has determined that 42% of the downtime on its systems is attributable to operator errors or reconfigurations. Tandem plans to eliminate those errors by automating storage management via an umbrella architecture it calls Distributed Systems Management. Tandem says DSM will automate management of networks as well as storage.

calls it an expensive solution. "We've grown so fast we can't wheel anymore boxes in here until we get a handle on it," he says.

IDS is beginning to look more closely at adopting the kind of new file naming and volume pooling techniques recommended by IBM as a first step to SMS. Klitsche says, however, that he still has his doubts. While SMS is a good long-term goal, he says, volume pooling techniques too often fail to take performance into account, and products such as IBM's DFP are still too hard to use.

Another user with doubts about centralizing storage management is insurance giant Metropolitan Life in New York. Until about three years ago, all Met Life data were controlled and managed by the company's individual business units. Three years ago, Met Life began to look at centralizing storage management as a way to modify DASD growth. But, says Met Life technical manager Stephen Schlazer, management was comfortable with the centralization of only about 40% of its storage management under IBM's DFHSM product.

"We decided centralization under HSM wasn't suitable for our critical datasets because they need to be available all the time to on-line applications," says Schlazer. "HSM lends itself to deleting or migrating data down the storage hierarchy once a day in the evening, but at this point it doesn't have the flexibility or in-

teractive characteristics that we need."

Observers say IBM will have to continue to improve DFHSM if it is going to make SMS a success. HSM is responsible for migrating data between faster and slower storage devices depending on how often the data is used. HSM was developed for IBM's now-defunct 3850 mass storage device, and originally it was a batch-oriented facility. Gradually, IBM



**IBM HAS BEEN TRYING TO GET USERS TO PREPARE FOR SMS.**

has improved HSM's interactive capabilities, but many users remain suspicious of HSM.

### SMS Facing Technical Barriers

There are other technical barriers to IBM fully implementing SMS and to users adopting it. IBM acknowledges that SMS will take 10 years to roll out completely, and what has been announced so far is only about halfway there. Ultimately, says IBM's Yates, SMS will automate the storage management process com-

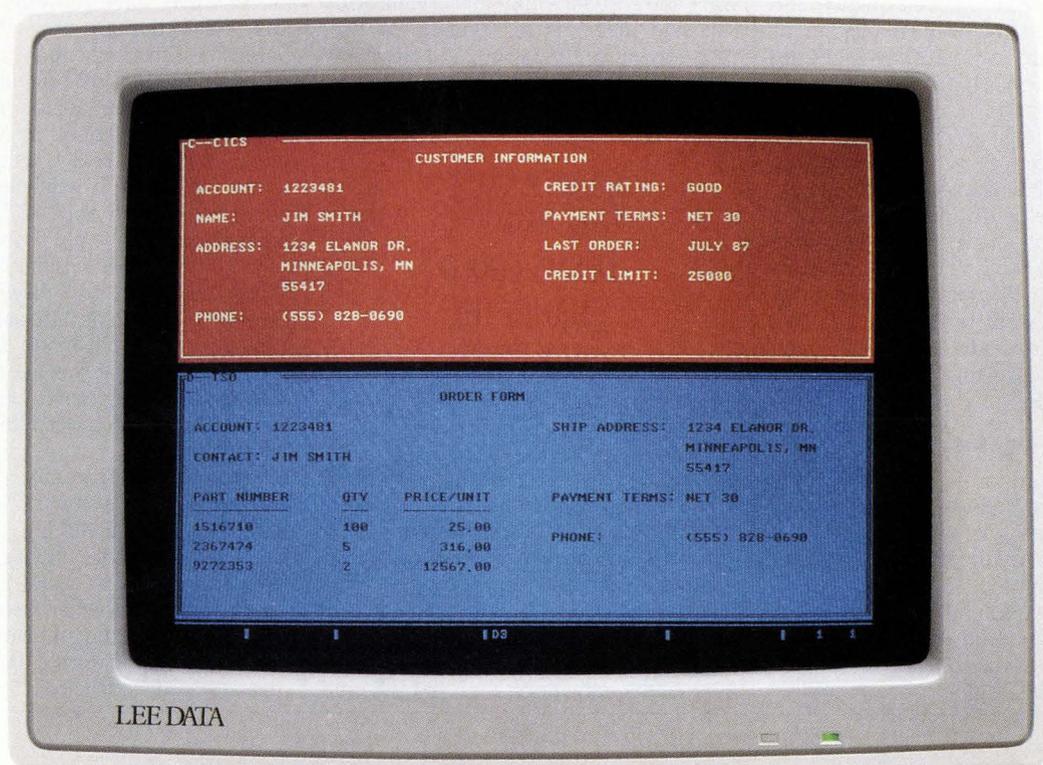
pletely, eliminating the need for storage administrators and managing the migration of data throughout the storage hierarchy, from central high-speed buffer at the top through central storage, expanded storage, cache, DASD, and tape. SMS will be able to do all that on the fly in a way that is transparent to users, IBM promises.

SMS hasn't even begun to address issues such as managing the vast amounts of data located on pcs and workstations. Nor has IBM made any promises about supporting SMS in other environments, such as VM or DOS/VSE. IBM has said only that it is aware that SMS in the VM environment is a "known requirement."

Just to get to its immediate SMS goals, Yates says, IBM has 700 programmers at work on the project. Five hundred of them are at IBM's Santa Teresa lab. Yates says it will be another five years before all is in place.

Although most users say IBM has the right idea, some question whether IBM will have SMS in place by the early 1990s and whether users will be ready to adopt it. Even progressive storage managers, such as Monsanto's Koogler, have their doubts. Koogler is troubled by the problems IBM recently has had writing microcode for its new 3990 Model 3 controller, problems that have delayed initial availability of the product by up to six months. "It's disturbing when you think how many other things are dependent on

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IBM writing microcode," says Koogler.

Monsanto has followed many of the IBM-recommended storage management techniques, and the results have been excellent (see "How Monsanto Took Control of the Monster," p. 60).

Nevertheless, even Koogler isn't ready to sign up for SMS right away. One reason is that Monsanto doesn't use expanded storage on its 3090 150 and 3081 mainframes, and much of SMS's benefit in the future will flow from exploiting expanded storage. For another thing, most SMS users will want to upgrade to IBM's new MVS/ESA operating system, something Monsanto doesn't have any immediate plans to do.

#### SMS In an MVS-only Environment

Other users note that exploiting SMS will require them to upgrade to new data access methods, such as ICF VSAM, and to upgrade to new hardware, such as the 3090E and 4381E. "There's a lot of work to do to exploit all that, and I'm one who is in pretty good shape already because of some of the things I've done on my own," says Koogler.

Observers note that all that hardware and software upgrading required by SMS will mean extra revenue for IBM, probably more than enough to offset any SMS-caused drop-off in disk drive sales, so there may, in fact, be no free lunch.

### DFSMS COULD CHANGE THE WAY USERS MANAGE STORAGE.

IBM has said that SMS will run only in the MVS/ESA and MVS/XA environments. After DFP version 3 becomes available at the end of the year, future enhancements will run under ESA only. In addition, SMS will run on high-end E Model hardware only. Further, it will support only the new 3990 controllers, the 3380 J, K, and

CJ2 disk drives, and the 3480 tape drive.

SMS may have the effect of moving lots of data that are now sitting on tape onto DASD, further enhancing SMS-related business for IBM. According to Michael Beadsmoore, senior vice president at IBM storage competitor Masstor Systems, "SMS is not really designed to apply to the tape area. It will relegate tape to being for backup only, and lots of data now on tape will be put onto disk."

Adds Gartner's Allen, "I'm sure this [SMS] took years to sell within IBM because it was seen as a threat to the DASD business. But what made it palatable in the end was that it was seen as a plan to sell more MIPS, more semiconductor memory, and to remove inhibitors for future growth."

SMS may also give IBM a leg up on its hardware and software competition. Some users already are shying away from using storage management tools from third-party vendors because they see those tools as separate from SMS. For example, although Gold Dome's Hendl calls Sterling Software's DMS/OS storage management software "a very good



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## The Storage Threat

product," he says he won't use it because "it's not part of SMS. I see IBM moving to put a comprehensive product together, and that's where we're going."

Third-party vendors, such as Sterling and Computer Associates, have been forced to promise that their products will be part of SMS, even though IBM hasn't yet shipped the product, and they have not yet seen the SMS interfaces to which they will have to write. "I see us being fully integrated with SMS. But first we'll have to see all the interfaces," says Sterling's Parker.

### Potential Problems for Pcms

Meanwhile, plug-compatible hardware vendors may also find themselves at a competitive disadvantage. For one thing, with SMS and ESA, IBM is putting emphasis on expanded storage as a high-performance layer in the storage hierarchy in place of the solid-state disk products that have been sold successfully by vendors such as Storage Technology Corp., National Advanced Systems, and Amdahl Corp.

More important, SMS could give IBM

increased freedom to integrate new storage hardware technologies into its product line since SMS divorces applications from the physical aspects of the storage devices. That could make users more willing to migrate to those new technologies sooner.

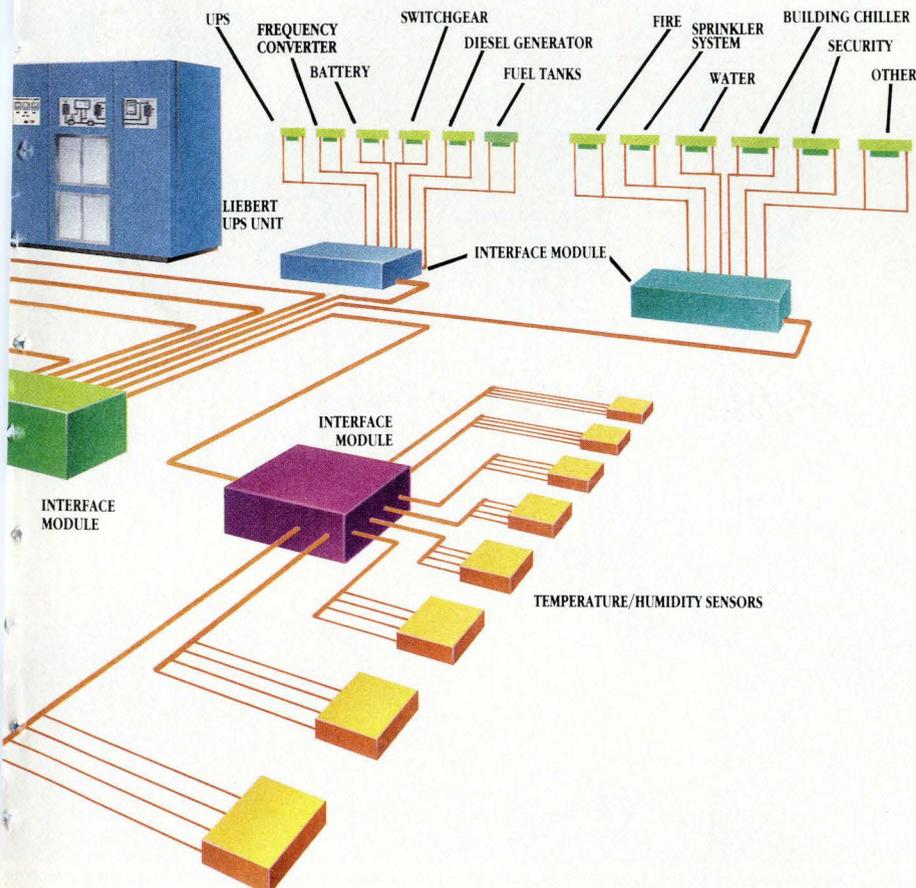
Some pcm vendors can be heard

**SOME DON'T  
AGREE WITH  
IBM'S IDEAS.**

crying FUD. "At this point, SMS is an IBM marketing tactic," maintains NAS peripheral products marketing director Minh Le. "IBM is operating in an environment where their hardware products are inferior and their software, such as HSM, is under attack. All they have is the promise of future products."

Le says SMS is being oversold. Before it begins to make sense, he says, you need expanded storage that can be shared between processors and semiconductor storage that costs a fraction of today's \$1,500 per MB. "We may see those things, but it won't be soon," he says. Many users agree with Le about SMS being oversold in the absence of any available usable product. Monsanto's Koogler says, "There's a real danger that some people will start saying, 'Let's not focus too much on storage management ourselves right now because there's this white knight called SMS coming down the road, and it's going to save us.' That would be a big mistake."

Instead, companies must continue to invest in the storage management tools and techniques available now. Ultimately, that means working at understanding the businesses of end users and their storage requirements. "The key still has to come down to human interaction," says Index Group's Nedzel. "No system, no matter how automated, will be able to tell you where the next new application will be required." ■



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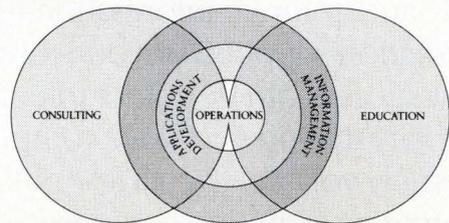
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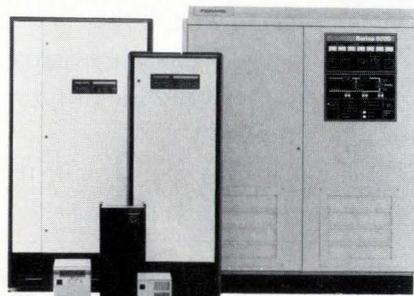
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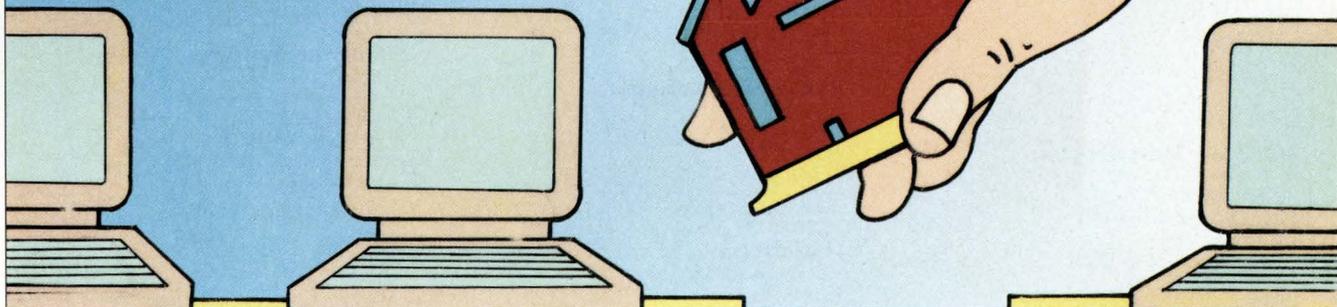


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# UPSs Flourish as LAN Protectors



**Until the use of local area networks began to mushroom, the uninterruptible power supply and its kin, the standby power system, did not figure prominently in the micro systems that IS shops were installing. Today, as mission-critical LANs place increasingly important data at greater risk of loss than traditional, mainframe-centered systems, firms find they cannot afford to forego some power backup system.**

BY MARK MEHLER

The uninterruptible power supply, UPS, which protects computers and telecommunications equipment against blackouts, brownouts, voltage transients, and related power problems, always has been a fixture in mainframe and minicomputer user sites. In the early days of the microcomputer explosion, however, the idea of incorporating a \$3,000 or \$4,000 backup power system into a desktop computer didn't sit well with cost-conscious end users.

"When personal computers first came out, people were doing simple word processing or databases and didn't feel the need to spend half again the price of the system for a UPS," recalls Doug Smith, western regional sales manager for San Diego-based Elgar Corp., a supplier of low-power protection systems.

#### **LANs Give UPS a New Lease on Life**

Along came the next information systems revolution, in the form of more sophisticated LANs, and suddenly the UPS is in fashion again. The UPS market renaissance is well exemplified by a recent \$622 million contract that the U.S. Air Force Logistics Center awarded Exide Electronics, Raleigh, N.C., for UPS systems to support its mission-critical computer and network operations.

"Put simply, LANs are storing information in volatile RAM and only occasionally send the data to a hard disk [directory]. Any power loss can be catastrophic," explains Neil Rasmussen, vice president of engineering and cofounder of American Power Conversion Corp., Peacedale, R.I., another supplier of low-power systems for microcomputer applications.

In addition to the greater susceptibility of the LAN to data loss, the data are more important when being shared on the network by people numbering anywhere between eight and 800.

At Du Pont's Textile Fibers Department in Wilmington, Del., for example, network administration field representative W.G. Bowen says the 30-second to two-hour power outages that occur approximately twice a year are reason enough to protect his 800-person LAN with a full on-line UPS from Clary Corp., San Gabriel, Calif. Du Pont chose the on-line UPS instead of the standby power systems (SPS) or off-line units, which often are used for LAN protection.

"Basically, we needed the 24 minutes of on-line backup power," Bowen says. "We're running five or six file servers, and the Clary is a powerful little unit. Also, some of the standby systems we looked at switched to backup power when it wasn't necessary."

Illustration by Irvan Banyai

## UPSs Flourish as LAN Protectors

### Providers of Powerful Systems

#### **American Power Conversion Corp.**

350 Columbia St.  
Peacedale, RI 02883  
(401) 789-5735  
Type of unit: SPS  
SPS KVA Range: 330VA-1.2KVA  
CIRCLE 100

#### **Applied Research & Technology**

5770 Powers Ferry Rd. NW  
The Pavilion, Suite 201  
Atlanta, GA 30327-4390  
(404) 951-9556  
Type of unit: On-line DC parallel backup unit.  
UPS KVA Range: Equivalent to 1.5KVA-2KVA  
CIRCLE 101

#### **AT&T Power Protection Systems**

650 Liberty Ave.  
Union, NJ 07083  
(800) 372-2447  
Type of unit: UPS  
UPS KVA Range: 1KVA-10KVA  
CIRCLE 102

#### **Best Power Technology Inc.**

P.O. Box 280  
Necedah, WI 54646  
(608) 655-7200; (800) 356-5794  
Type of unit: UPS  
UPS KVA Range: 250VA-15KVA  
CIRCLE 103

#### **Clary Corp.**

320 W. Clary Ave.  
San Gabriel, CA 91776  
(818) 287-6111  
Type of unit: UPS  
UPS KVA Range: 360VA-37.5KVA  
CIRCLE 104

#### **Computer Accessories Corp.**

6610 Nancy Ridge Dr.  
San Diego, CA 92121  
(619) 457-5500; (800) 582-2580  
Type of unit: SPS  
SPS KVA Range: 400VA-1KVA  
CIRCLE 105

#### **Computer Power Inc.**

124 W. Main St.  
High Bridge, NJ 08829  
(201) 638-8000; (800) 526-5088  
Type of unit: SPS and UPS  
SPS KVA Range: 400VA-1.5KVA  
UPS KVA Range: 1KVA-400KVA  
CIRCLE 106

#### **Cuesta Systems**

3440 Roberto Ct.  
San Luis Obispo, CA 93401  
(805) 541-4160  
Type of unit: SPS  
Wattage Range: 90W-400W  
CIRCLE 107

#### **Elgar Corp.**

9250 Brown Deer Rd.  
San Diego, CA 92121  
(619) 450-0085; (800) 854-2213  
Type of unit: SPS and UPS  
SPS KVA Range: 400VA-1.6KVA  
UPS KVA Range: 1KVA-50KVA  
CIRCLE 108

#### **Emerson Computer Power**

3300 S. Standard St.  
Santa Ana, CA 92702  
(714) 545-5581; (800) 222-5877

Type of unit: SPS and UPS  
SPS KVA Range: 200VA-1.5KVA  
UPS KVA Range: 360VA-750KVA  
CIRCLE 109

#### **Exide Electronics Corp.**

3201 Spring Forest Rd.  
Raleigh, NC 27604  
(919) 872-3020; (800) 554-3448  
Type of unit: UPS  
UPS KVA Range: 1.5KVA and up.  
CIRCLE 110

#### **General Power Systems**

1045 S. East St.  
Anaheim, CA 92815  
(714) 956-9321  
Type of unit: SPS and UPS  
SPS KVA Range: 500VA-2KVA  
UPS KVA Range: 500VA-62.5KVA  
CIRCLE 111

#### **HDR Power Systems Inc.**

600 Oakland Park Ave.  
Columbus, OH 43214  
(614) 262-6832  
Type of unit: UPS  
UPS KVA Range: 2.5KVA-100KVA  
CIRCLE 112

#### **Imunelec Inc.**

5000 Highlands Pkwy.  
Suite 150  
Smyrna, GA 30082  
(404) 434-3493  
Type of unit: UPS  
UPS KVA Range: 1KVA-30KVA  
CIRCLE 113

#### **Isoreg Corp.**

410 Great Rd.  
Littleton, MA 01460  
(617) 486-9483  
Type of unit: UPS  
UPS KVA Range: 500VA-62.5KVA  
CIRCLE 114

#### **KW Controls**

South Plank Rd.  
Middletown, NY 10940  
(914) 355-6741  
Type of unit: UPS and SPS  
UPS KVA Range: 10KVA-1,000KVA  
SPS Wattage Range: 20KW-1,500KW  
CIRCLE 115

#### **Liebert Corp.**

1050 Dearborn Dr.  
Columbus, OH 43229  
(614) 888-0246; (800) 637-7238  
Type of unit: UPS  
UPS KVA Range: 360VA-750KVA  
CIRCLE 116

#### **LorTec Power Systems**

145 Keep Ct.  
Elyria, OH 44035  
(216) 327-5050  
Type of unit: SPS and UPS  
SPS KVA Range: 300VA-1.2KVA  
UPS KVA Range: 2KVA-160KVA  
CIRCLE 117

#### **Meirick Inc.**

87 Hawn Dr.  
Box 298  
Frisco, CO 80443  
(303) 668-3251  
Type of unit: SPS

Wattage Range: 350W-1,400W  
CIRCLE 118

#### **Panamax**

150 Mitchell Blvd.  
San Rafael, CA 94903  
(415) 499-3900; (800) 472-5555  
Type of unit: SPS  
SPS KVA Range: 450VA-1.2KVA  
CIRCLE 119

#### **PTI Industries**

269 Mount Herman Rd.  
Scotts Valley, CA 95066  
(408) 438-0946  
Type of unit: SPS and UPS  
SPS Wattage Range: 200W-1,500W  
UPS KVA Range: 400VA-700VA  
CIRCLE 120

#### **Safe Power Systems**

528 W. 21 St.  
Tempe, AZ 85282  
(602) 894-6864  
Type of unit: SPS and UPS  
SPS KVA Range: 250VA-1.2KVA  
UPS KVA Range: 425VA  
CIRCLE 121

#### **SL Waber**

300 Harvard Ave.  
Westville, NJ 08093  
(609) 456-5400; (800) 634-1485  
Type of unit: SPS  
SPS KVA Range: 300VA-600VA  
CIRCLE 122

#### **Sola**

1717 Busse Rd.  
Elk Grove Village, IL 60007  
(312) 439-2800  
Type of unit: SPS and UPS  
SPS KVA Range: 330VA-1.5KVA  
UPS KVA Range: 400VA-10KVA  
CIRCLE 123

#### **Topaz Inc.**

9192 Topaz Way  
San Diego, CA 92123  
(619) 279-0831  
Type of unit: SPS and UPS  
SPS KVA Range: 400VA-2.5KVA  
UPS KVA Range: 5KVA-10KVA  
CIRCLE 124

#### **Toshiba/Houston International Corp.**

13131 W. Little York Rd.  
Houston, TX 77041  
(713) 466-0277  
Type of unit: UPS  
UPS KVA Range: 500VA-50KVA  
CIRCLE 125

#### **Tripp Lite**

500 N. Orleans St.  
Chicago, IL 60610  
(312) 329-1777  
Type of unit: SPS  
SPS KVA Range: 200VA-2KVA  
CIRCLE 126

#### **Unison Technologies**

23456 Madero Way  
Mission Viejo, CA 92691  
(714) 855-8700; (800) 345-9299  
Type of unit: UPS  
UPS KVA Range: 600VA-800VA  
CIRCLE 127

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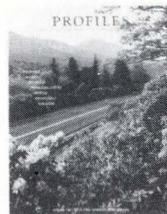
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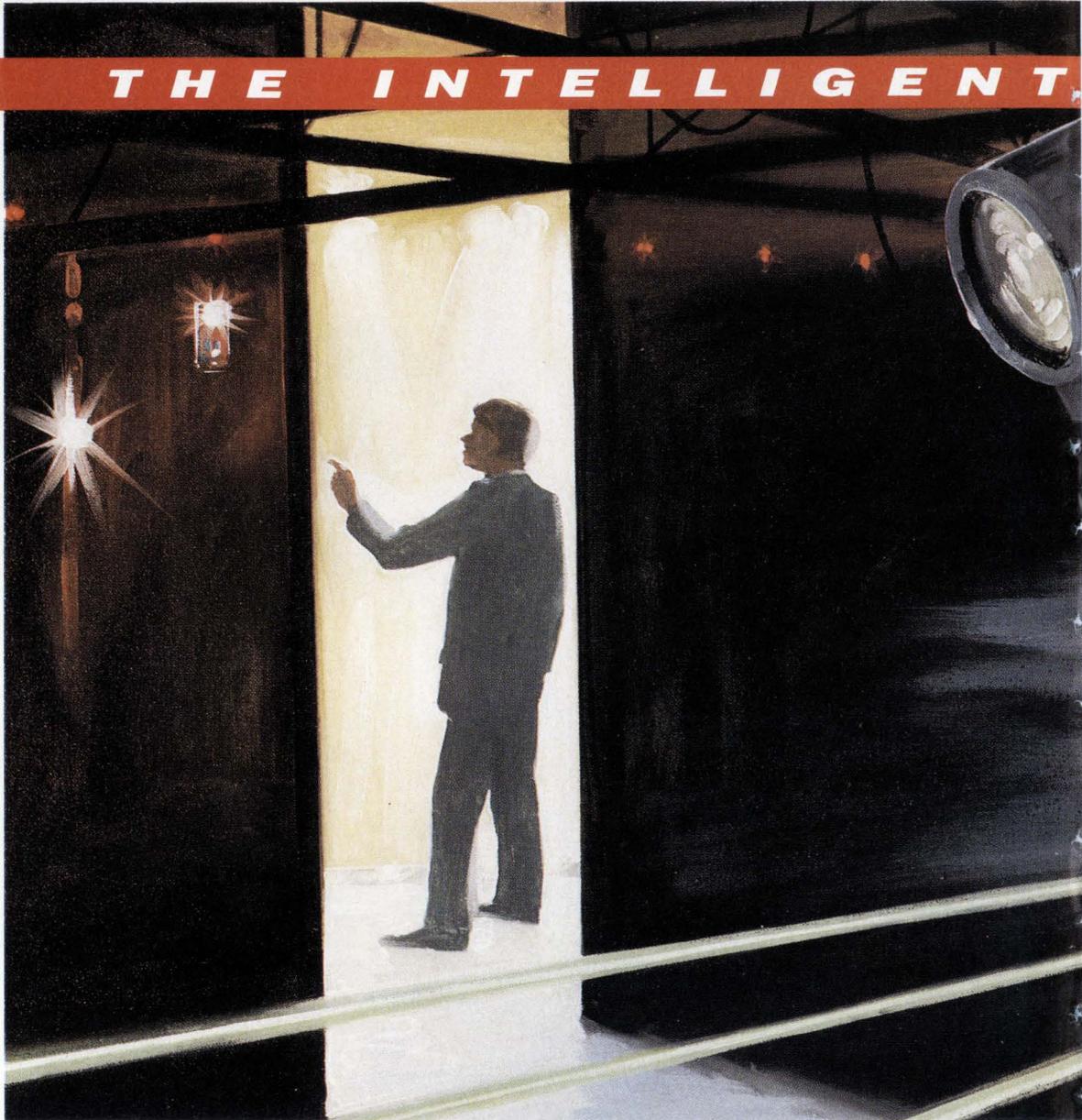
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## UPSs Flourish as LAN Protectors

The majority of the small, light, inexpensive SPS units, designed to support file servers or pcs, cannot be characterized theoretically as true UPSSs. With these, the inverter, which is normally off, begins drawing from a battery when it detects a problem. The switchover causes an output loss, or "glitch," of perhaps four milliseconds to 10 milliseconds.

A so-called hybrid system, meanwhile, seeks to eliminate the glitch through the use of a ferro-resonant transformer, which has capacitance, or stored energy, "bled out" onto the load line during a power failure. In the full-line, or on-line UPS, the inverter powers the load continuously, which eliminates any switching and offers extended brownout protection by virtue of its not being reliant on battery power.

### Awareness Is a Boon to Growth

Venture Development Corp., the Natick, Mass.-based market research firm, sees the lion's share of the growth in the emerging LAN UPS market occurring in off-line systems. Dan Kennedy, a project director at Venture Development, pegs 1986 U.S. sales of low-power (0KVA-1KVA) off-line systems at \$76.3 million and projects dollar consumption of \$139.4 million in 1988 and \$253.4 million in 1991. Sales of 0KVA-1KVA on-line UPSSs are seen as rising only to \$62 million this year and \$94 million in 1991 from \$43.1 million in 1986.

"A great deal of the expected growth in the 0KVA-1KVA segment is a result of increasing awareness on the part of end users that power-related problems can cause you to lose data that can never be replaced," says Kennedy. "Our numbers also suggest that there's a consensus that full-line UPS is not absolutely required in network applications."

"People have definitely gotten away from the idea that off-line systems don't do the job," argues Paul Royalty, marketing manager of Topaz Inc., one of the six leading suppliers, according to Venture Development, of SPSS (along with American Power, Elgar, PTI Industries, Safe and Sola Electric; see "Providers of Powerful Systems"). Royalty notes that, with switching speeds down as low as between one millisecond and four milliseconds and up to between 20 milliseconds and 40 milliseconds of "ride-through" protection inherent in the computer's own internal switching power supply, the transfer is invisible to the user.

"I would say 80% to 90% of pc-

based [applications] don't require on-line UPS," seconds Doug Smith of Elgar, which markets a full line of standby, hybrid, and full-line systems.

Smith concedes, however, that where line voltages are chronically low—in certain rural areas of the United States as well as in many of the nations in the third world—a standby system that offers only a limited operating time below 100 volts may not be enough to get the job done.

Moreover, some insist that standby and hybrid UPSS can be "fooled" by brownouts, sensing them as a total blackout and switching onto the battery. This results in premature battery drain and system shutdown.

American Power's Rasmussen sees this tendency as a bigger danger in Florida, Texas, and other areas that are becoming increasingly industrialized and are subject to persistent thunderstorms



**THE MOST  
GROWTH WILL  
BE IN SPS.**

or unusual weather activity. "In Florida, we're talking about up to 100 days a year of audible thunderstorms. On perhaps 50 days a year, a network could see multiple interruptions [of power service]."

In the event that a brownout becomes a blackout, a full-line UPS is the only answer to saving the battery for the file server, says Dina Seredian, Clary marketing coordinator.

A number of backup power systems notify the computer once a power failure is sensed. Typically, the file server broadcasts a warning to all users on the network that a limited amount of time remains and they must get off. If they don't, the system removes them and all files are shifted to a "safe state" before the system shuts itself off. Du Pont's Bowen sees another problem here, however. "We don't necessarily want to shut down every time a pigeon lands on our power line, which can happen [with a standby]."

Recently, the big gaps in price and size between standby and on-line UPS have begun to close. Topaz's Royalty says prices of full-line systems have fallen to \$2 a watt—and occasionally to just over \$1 a watt—from about \$3 a watt.

That's not much higher than the average price of between 75 cents and \$1 a watt for an off-line system.

One of the reasons, says Sola Electric marketing manager Kevin McGowan, is increased offshore assembly of the more labor-intensive UPSS, which has made their prices more competitive with SPSS, the manufacture of which is heavily automated.

### A Climate of Hype and Confusion

This blurring of distinctions and the generally chaotic nature of the LAN market have created a climate that often encourages hype and confuses purchasers.

"What you have are a lot of claims and counterclaims," advises Andy Naples, of Electrical Distributors Inc., an Atlanta industrial distributor that handles low-power UPS for LAN customers. "There are questions about what you can ethically call a real UPS."

"If they [vendors] get switching time down real low, they can claim it's an on-line system," Naples continues. "The LAN user hasn't had to deal with all this in the past. He didn't use his pc enough to require backup power, which was provided only to the centralized mainframe."

Vendors themselves don't agree on the problem, let alone the solution. While some point to noise and voltage variations as a greater threat to LAN integrity than to power line service, others argue that today's micros are virtually immune to routine voltage spikes and noise.

In any event, the impressive market projections for LAN-oriented UPS suggest that the waters will get even more crowded over the next few years. In addition to the vars, dealers, and distributors that sell the bulk of UPS equipment to the LAN user community, backup power system vendors increasingly will be exploring other sales channels, such as direct sales to end users (Du Pont bought direct from Clary) and computer oems.

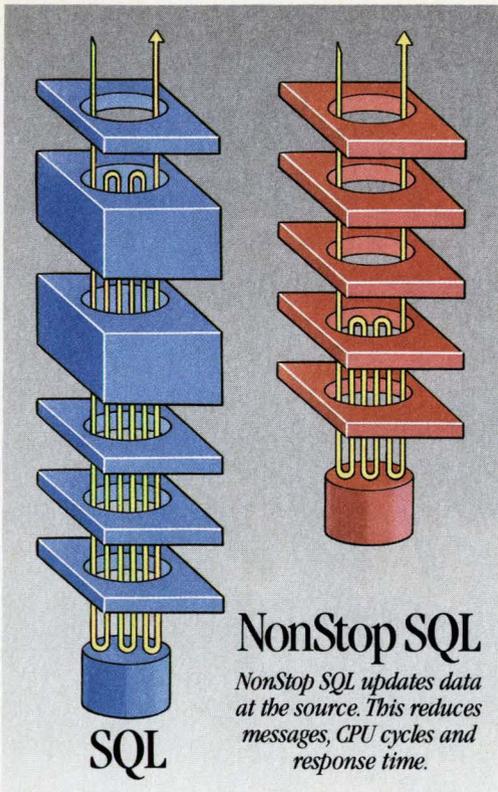
At last, the prices are low enough, the end-user requirements severe enough, and the threat of disaster real enough to have elevated UPS from its old status of forgotten stepchild of the computer industry.

"We haven't even touched the tip of the iceberg," says Sola's McGowan. "When customers start learning the hard way that you need a high level of insurance against power problems, we won't have to bring up the rear anymore." ■

*Mark Mehler is a freelance writer based in New York.*

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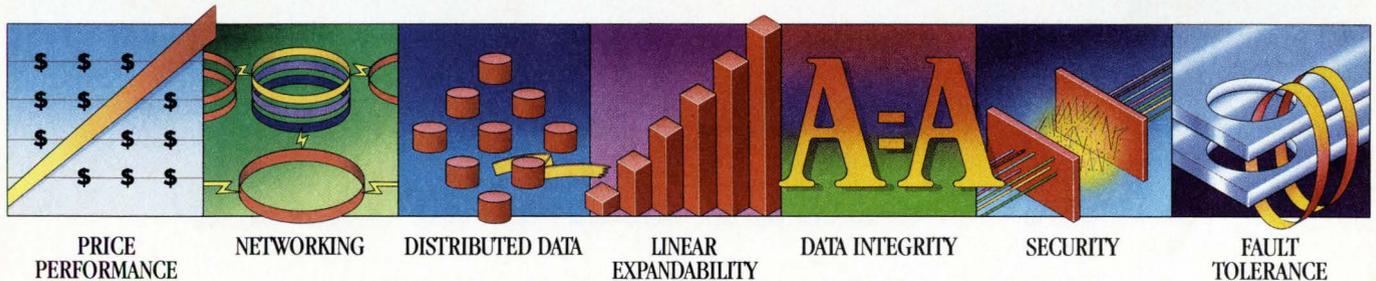
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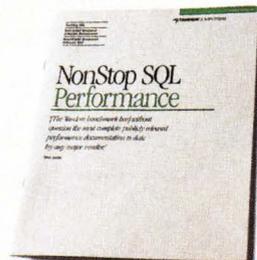
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BY BRAD SCHULTZ

VM, strange and remarkable, is the Vienna of operating systems: a place where different computing cultures may meet. "If one can attribute politics to operating systems," says Robert Jay Creasy, a member of the technical staff at the Palo Alto IBM Scientific Center that created VM, then VM's Control Program (CP) "certainly is the most egalitarian. All operating systems are welcome."

On the one hand, VM welcomes the batch production-oriented culture strongly associated with blue-collar automation. In the IBM world, the regimented and collaborative work styles and centralized computing that are characteristic of this culture come to VM because virtual machines generated by CP may be supported by the batch operating systems MVS and VSE, or by VM's own Batch Facility.

On the other hand, VM accommodates the IBM world's opposite culture of highly interactive and decentralized computing, which has a strong association with white-collar automation. In fact, this culture must come to VM; the only highly interactive IBM-originated mainframe operating system is Conversational Monitor System (CMS). CMS can run only on virtual machines created by CP, VM's kernel and the only OS that can virtualize IBM mainframes. Similarly, AIX/370, the Unix operating system that is pending for IBM mainframes, permits highly interactive applications, but also can run only as a VM guest.

#### VM Runs Unopposed In the Market

Because IBM is tying Unix to VM, no other mainframe OS, from any vendor, seriously threatens VM in the marketplace. Digital Equipment Corp.'s VMS is the closest thing to a rival, but it runs only on DEC computers.

As for whether VM competes with MVS and VSE, there are some users who say VM is the only reason they stay with

IBM mainframes. Further, VM allows many VSE users to defer or avoid costly VSE-to-MVS migrations. Yet, even Robert Cook, chairman of the largest independent VM software vendor, VM Software, Reston, Va., concedes that VM complements and may even sustain demand for MVS.

Whether or not VM and MVS compete with each other, they are the only mainframe operating systems that are guaranteed full Systems Application Architecture coverage. VM is the only IBM-

originated OS family that runs on all 370s and plug-compatibles, from the most powerful, the 3090 Model 600E, to the least, the 9370 Model 20.

VM's versatility, according to Michael Braude, vice president of the Gartner Group, Stamford, Conn., has caused it to eclipse VSE as the most widely installed IBM mainframe OS family. The market researcher estimates that there were 24,600 VM site licenses at the end of 1987 and predicts there will be 31,000 and 37,000 at the ends of 1988 and 1989,

respectively—a two-year growth rate of 54%.

#### Large VM Usage Found

The 1988 DATAMATION/Cowen & Co. large-scale systems survey (see "IBM Puts on the Gloves with MVS/ESA," May 15, p. 56) found nearly half of the IBM mainframe community had current or imminent VM operations: 42% of respondents reported running VM, and another 6% revealed plans to use VM before 1990.

A fairly typical VM user is the world's largest paper manufacturer, James River Corp., Richmond, Va., which runs only VM on several 4381s and 9370s. During the day, says IS manager James Bateau, CMS is run for highly interactive applications, such as on-line database query. After

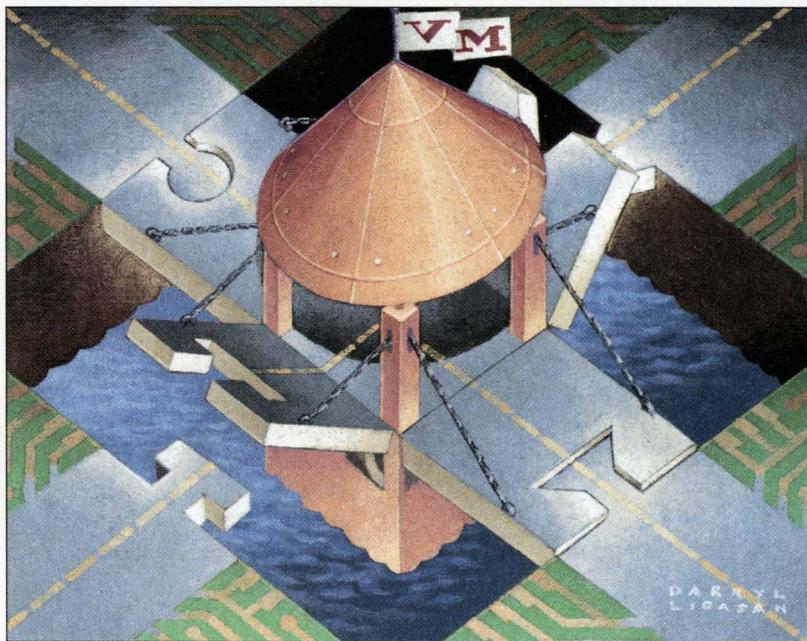
hours, VM Batch Facility is run for batch production applications, such as payroll.

One of the biggest insurance companies, John Hancock Mutual Life Insurance Co., Boston, also runs some Batch Facility on a VM-only 3084Q, says information center manager Vinnie Lamenza, but like most VM sites, the lion's share of its applications run under CMS.

Jervis B. Webb, Farmington Hills, Mich., a large manufacturer of material handling equipment, including conveyors and cranes, runs batch under MVS as a guest of VM on 4381s, according to Jim Bur, technical support manager.

Amid VM's exploding growth, DEC has entered the mainframe market in force. Recently, it gave VMS an on-line

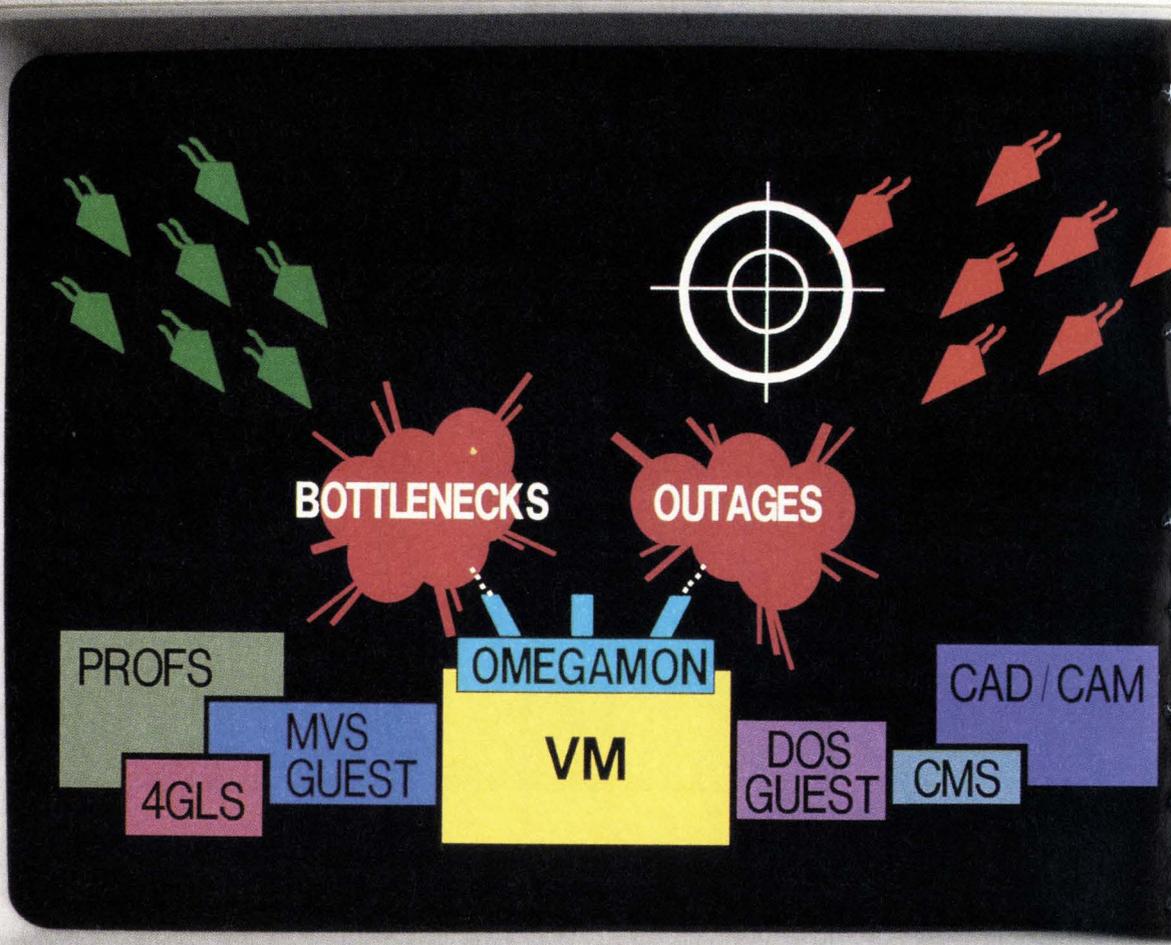
# VM: The Crossroads Of Operating Systems



**VM's ability to accommodate the OS needs of many different computing cultures is probably the top reason for its having outstripped VSE as the most widely installed IBM mainframe OS family. Competition for VM from any other IBM mainframe OS essentially does not exist.**

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## Which VM Should You Use?

This chart is a list of applications with recommended VM variations

| Application                | 1st Choice | 2nd Choice | 3rd Choice | 4th Choice |
|----------------------------|------------|------------|------------|------------|
| • Applications Development | VM/IS      | VM/HPO     | VM/SP      | VM/PC      |
| • Information Center       | VM/HPO     | VM/IS      | VM/SP      |            |
| • Development Center       | VM/IS      | VM/HPO     | VM/SP      | VM/PC      |
| • Artificial Intelligence  | VM/IS      | VM/HPO     | VM/SP      | VM/PC      |
| • CAD/CAM                  | VM/IS      | VM/HPO     | VM/SP      | VM/PC      |
| • Graphics                 | VM/HPO     | VM/IS      | VM/SP      | VM/PC      |
| • Office Automation        | VM/HPO     | VM/IS      | VM/SP      | VM/PC      |
| • Vector Processor         | VM/HPO     | VM/XA      |            |            |
| • Scientific Applications  | VM/HPO     | VM/IS      | VM/PC      | VM/SP      |
| • Conversion               | VM/HPO     | VM/XA      | VM/SP      |            |
| • Departmental             | VM/IS      | VM/SP      | VM/HPO     |            |

Source: VM Software Inc., Reston, VA

## Flavors of VM

The premier track of VM releases, Extended Architecture (VM/XA), runs only on IBM's three largest mainframe models, the 3081, 3084, and 3090. Normally, it is bought only to run multiple operating systems as coexisting guests. It does this with Preferred Machine Assist, which optimizes a 30XX's resources to handle demand that is higher for certain so-called "preferred" guests than for other guests.

Last year, IBM announced a phased introduction of VM/XA/System Product that would supersede VM/XA/System Facility. A 3090E series cpu may be equipped to run as many as four preferred guests under VM/XA/SP, which carries a monthly license charge of \$4,500 and a single charge of \$112,500 (for processor group 30) or \$216,000 (for processor group 40).

VM/XA/SP supports considerably more storage and I/O channels than does VM/XA/SF, but James Batteau, IS manager at James River Corp., Richmond, Va., says his company will pass on VM/XA/SP release 1, available now, because the communications support of VM/XA/SP release 2, due later this year, will be far superior.

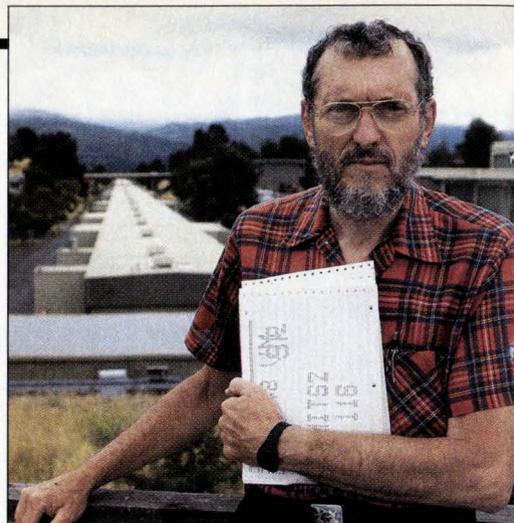
For simplicity's sake, four circulating VM versions may be counted if VM/XA is treated as a single version. The other three versions are Integrated System (VM/IS), System Product (VM/SP), and High Performance Option (VM/HPO). VM Software, Reston, Va., recommends the following implementations:

- VM/IS on a small 370 for CMS end-user applications where systems programmers are unavailable for customization efforts.
- VM/SP on a small 370 for end-user applications or software development under CMS, or guest-running of VSE where systems programmers are available.
- VM/HPO on a moderate to large 370 for extremely intensive CMS applications, or production utilization of an MVS/SP guest; a new VM/HPO option allows this VM version to run on four loosely coupled mainframes.
- VM/XA on a large 370 for multiple MVS guests, perhaps in combination with a great many implementations of CMS, which, unlike MVS and VSE, is a single-user operating system that can execute only one task at a time.

As for fitting these versions with processors, VM Software recommends implementing only VM/IS on a 9370 Model 20, 9370 Model 40, 9370 Model 60, 4321, 4331, and 4361; VM/IS or VM/HPO on a 9370 Model 90, 4341, and 4381; VM/SP or VM/HPO on a 3033; and VM/HPO and VM/XAS on a 308X or 3090.

Analysts agree that no 370 series has a greater stake in VM than the smallest, the 9370 series announced last year. They say that not many users will justify buying 9370s to run MVS or VSE because those families demand too much technical support.

There are only two other operating system families that will support 9370s or any other 370 series: VM and AIX/370, which can run only as a VM guest. Thus, analysts see VM demand, in part, driving 9370 demand.



SLAC'S JOHNSTON: Scrapping MVS for VM.

transaction processing subsystem, an answer to IBM's Customer Information Control System (CICS), but analysts say that VM has a tremendous advantage over VMS in commercial computing, if only because VM supports far more of those applications than VMS or any other operating system. Conversely, VMS is seen as more competitive with VM in the scientific/engineering arena.

DEC corporate consulting engineer Roger Heinen, a codeveloper of VMS, notes that VMS cannot virtualize a VAX (the "VM" stands for "virtual memory"), although DEC is doing experiments with virtualizing operating systems.

On the other hand, because the same version of VMS runs on every computer that DEC actively markets, and it is DEC's only proprietary OS, VMS users do not have the concerns about upgrades and migrations that afflict IBM customers, Heinen says.

### VM Helps Users Avoid Costly Conversions

Ted Johnston is one of a number of users who say they have IBM mainframes only in order to run VM. The system programming manager at the Stanford Linear Accelerator Center (SLAC), Palo Alto, says SLAC cheerfully avoids MVS in crunching numbers on an IBM 3081K and 3033U to analyze the results of federally funded atom-splitting experiments (a 3090 soon will be added).

Johnston says a number of laboratories like his have avoided or are shutting down IBM's most expensive operating system, MVS, by turning to VM Batch Facility. Nevertheless, for SLAC's money, VM competes with the processor/OS solutions of other vendors, rather than with MVS.

MVS runs certain batch production applications much more efficiently than VM can with its Batch Facility, say VM-related suppliers.

It is true that VM lets VSE users avoid or delay costly and troublesome VSE-to-MVS conversions when they bump

## The Crossroads of Operating Systems

against VSE's 16MB virtual address space limitation. Exploiting the fact that VM's 2GB virtual address space is 125 times greater than VSE's space, many users have chosen the alternative of implementing VM in order to establish a few VSE guests (see "VSE Users: Orphans of

the Storm," March 15, p. 69).

Yet, while running multiple VSE guests under VM may stretch the VSE experience, VM can facilitate VSE-to-MVS migrations in at least three overlapping stages. First, applications may be developed under CMS guests that eventually

will be used under MVS, perhaps even under an MVS that runs alone. Next, a target MVS environment that runs as yet another guest may be developed and tested. Finally, when the target MVS environment becomes ready for production use, applications developed under CMS guests may be slid over while the VSE guests are phased out. Following a similar scenario, VM is widely used to facilitate upgrades from one MVS version to another.

Without the high interactivity that only VM's CMS can provide, the software development generally necessary at MVS sites is cumbersome and prone to growing unwieldy, says utility developer George Schmid, of Syllog Corp., Hackensack, N.J. In theory, all programs that compile under MVS will compile under VM, although modifications may be warranted to make this practical.

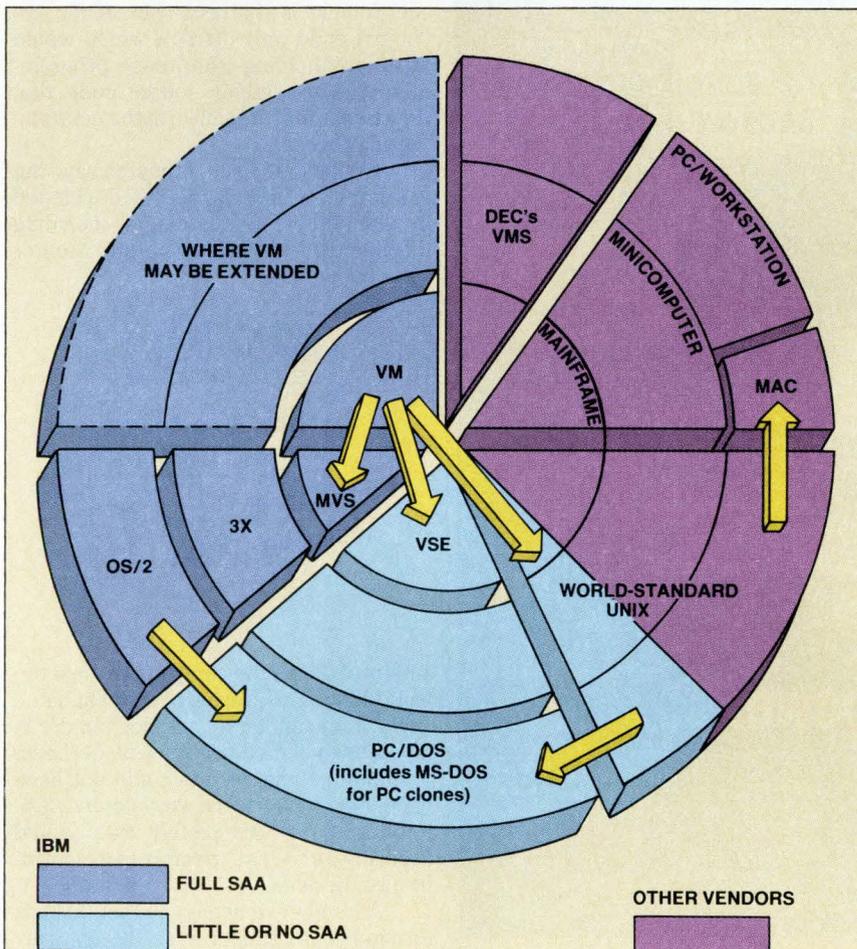
Schmid writes programs in assembler under CMS to eventually run under MVS. He once wrote such programs under the MVS Time Sharing Option (TSO), which, he says, IBM brought out when VM was an experiment, in order to give the fundamentally batch-oriented MVS a very thin interactive veneer. TSO, however, can't support the quality of editing and debugging tools that programmers generally prefer, Schmid says.

Syllog develops MVS utility software under VM's CMS, doing so remotely via a timesharing service. Sequential Software, Dumont, N.J., does the same, but it is rather odd in that it develops software under VM on an XT. IBM has confirmed that it is dropping support for VM/PC, a VM version that ran on PC 370s and XTs and ATs equipped with special memory and processor boards to simulate a minimal 370 environment. IBM says there are no immediate plans to market something similar to VM/PC for PS/2s.

### VM Lets OSs Share a 370's Resources

It should be noted that VM's hospitality for guest operating systems is the only means by which two or more simultaneously running operating systems may share a 370's resources. This contrasts with the alternative means of partitioning resources so that each OS runs with only a fraction of the mainframe's full power. MVS, VSE, or VM Batch Facility guests run on an appropriately modified CP "kernel." VM Batch Facility can run only atop CP, whereas MVS and VSE can run by themselves (normally faster that way than as guests). "Some systems may handshake with CP for better performance, but this is beyond the CP architecture," notes IBM's Creasy. Adds VM

## Virtual Machine Ties Between Operating Systems



In the diagram, the arrows indicate virtual machine relationships that are possible between six pairs of OS families: MVS, VSE and Unix may run as guests of VM; PC-DOS may run as a guest of either OS/2 or (on 286- and 386-based computers) Unix; and (on Apple's Macintosh II) the Macintosh "OS" may run as a guest of Unix. Thus, the OS at the source of each arrow may present to its user a simulation of the computer that is really driving that OS, and the OS at the arrow's point may run on this simulated (so-called "virtual") machine, perhaps as the only OS the user knows is running.

Only Unix and DEC's VMS span all three of the indicated computer classes. It is speculated, however, that IBM could extend VM support into the minicomputer and even PC/workstation classes.

The diagram reveals two empty areas. One is bordered by VMS, Macintosh and Unix; the other sits between VSE and PC-DOS in the world of all actively marketed IBM OS families. Given that, the former area represents the only spot open for another commercial OS (such as the Pick OS or a Unisys proprietary OS). The proportions of these OS areas do not imply estimates of market size.

Source: Brad Schultz

## The Crossroads of Operating Systems

Software's Cook, "Eight percent [slower] is about as good as [overhead penalty] gets" with MVS or VSE guests.

Still, a slower VM/MVS or VM/VSE can make more sense than conventional MVS or VSE implementations for two reasons: the guest relationship facilitates migrations and upgrades, and it allows a different mode of computing (CMS, AIX/

370) to come aboard and coexist. "At SHARE," says a member of the IBM user group who requests anonymity, "we used to say that VM tries to be a hospitable host, but MVS is not a particularly hospitable guest." Much has been done since VM/SP's advent, however, to trim the overhead penalty for guest-running, such as the introduction of Preferred Ma-

chine Assist on large 370s.

### Object Code Only Policy Chills Some

CMS is the same across all VM versions, so the technical differences of VM versions are essentially the technical differences of their CP components. Customizing VM is usually a matter of modifying CP, and the greatest fear of VM systems programmers such as Johnston and Schmid is that IBM will render CPs "object code only" (OCO), which would mean withholding from those programmers the assembler source code that they tweak and embellish in the customization process.

On the OCO issue, Johnston says the VM Batch Facility was jointly developed by IBM and a few customers, including the Stanford Linear Accelerator Center

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and Intel Corp., the company that set the ball rolling. This means of running batch applications under VM entailed hundreds of extensive modifications of CP code, Johnston estimates, and could not have happened if VM were completely OCO. Rendering VM completely OCO would probably force SLAC to scrap its IBM mainframes, he adds.

A number of users say that IBM has threatened to render VM's CPs entirely OCO for years. An IBM spokesman, David W. McGorry, says, "We will provide tools so that people can maintain their [VM] systems, and we intend for customers to be able to do just what they have always done. We also will provide service and maintenance where necessary."

Independent VM consultant Sean McGrath, Oakland, Calif., who is mainly in the business of modifying CP code, suggests that IBM could not effectively support a completely OCO VM because Big Blue often turns to its CP-modifying customers for help in rendering such support.

*Brad Schultz is a freelance writer based in New York.*

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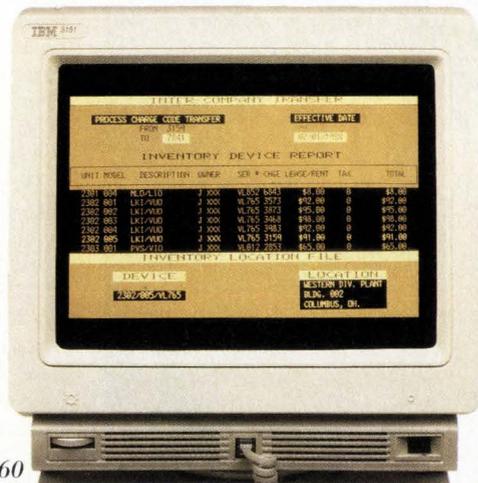
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Ultimately, higher level applications of ISDN on the public switched network will replace most of the company's myriad networks, linking all its offices and restaurants around the world.

As we are doing for McDonald's, AT&T and your telephone company can help your business realize the networking efficiencies and cost savings of ISDN.

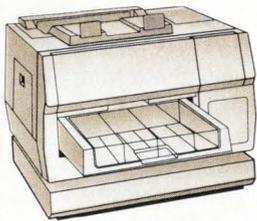
© 1987 AT&T



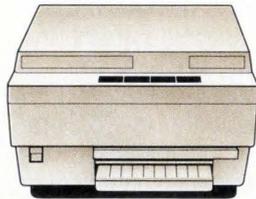
**AT&T**

The right choice.

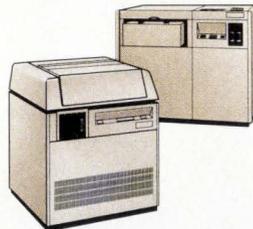
# Inside the revolution



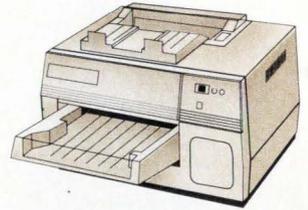
NBI, Inc. Model 908



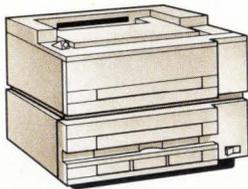
QMS-PS® 800  
QMS-PS® 800+  
QMS-PS® 800 II



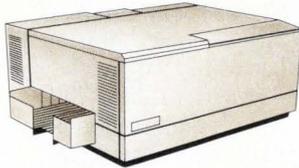
Linotype Company Linotronic™ 100  
Linotype Company Linotronic™ 300



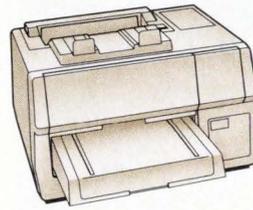
Digital Equipment Corp.  
ScriptPrinter™



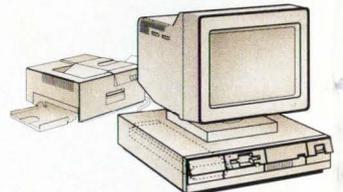
Qume Corporation ScripTEN™



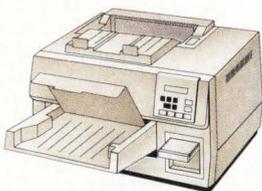
Diconix Dijit® 1/PS



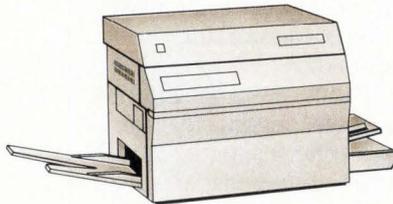
AST Turbo Laser® 1/PS



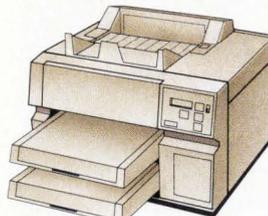
IBM 4216-020 Personal Pageprinter™



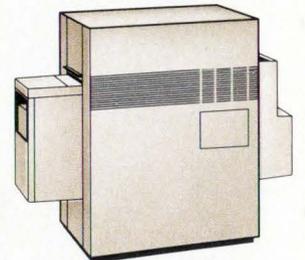
Texas Instruments OmniLaser™ 2108



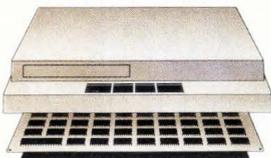
Varityper VT-600



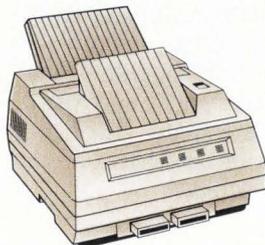
Wang LCS15™



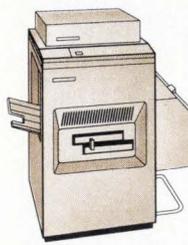
Agfa-Gevaert P400PS™



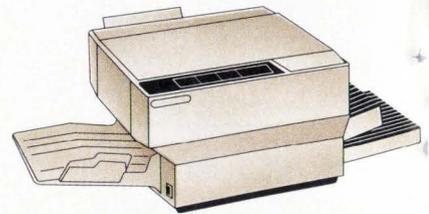
The Laser Connection PS Jet/PS Jet+™



NEC Information Systems  
SilentWriter™ LC-890

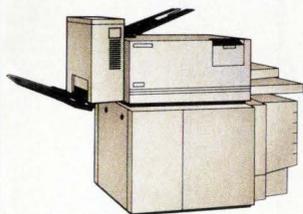


QMS-PS® 2400

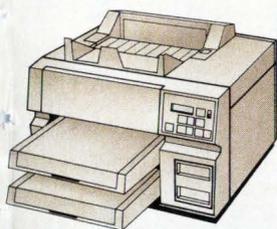


Apollo Computer Inc.  
Domain/Laser 26™

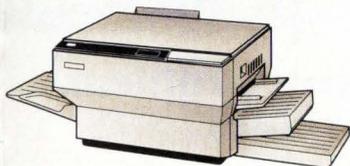
# e printers a is going on.



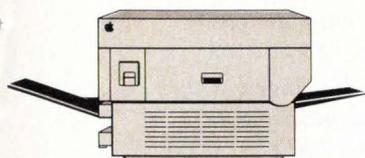
Digital Equipment Corp. PrintServer 40™



Texas Instruments OmniLaser™ 2115



Dataproducts Corp. LZR™ 2665

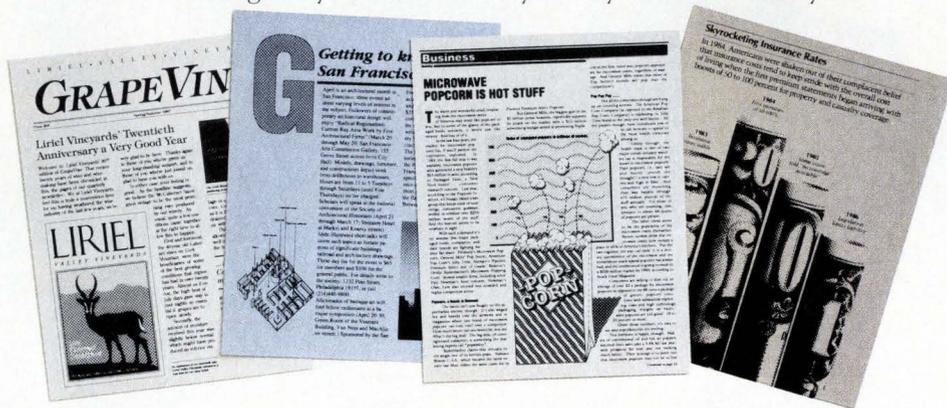


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POSTSCRIPT® from Adobe Systems started a revolution in business communications. That's why you'll find POSTSCRIPT in virtually every popular laser printer sold today.

POSTSCRIPT, the page description language, is the unanimous choice for some very good reasons. POSTSCRIPT gives you the option of printing from an IBM® PC, Macintosh™, or mini/mainframe.

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company's needs. Since POSTSCRIPT is device independent, you can design a document, then professionally print it later at a higher resolution.

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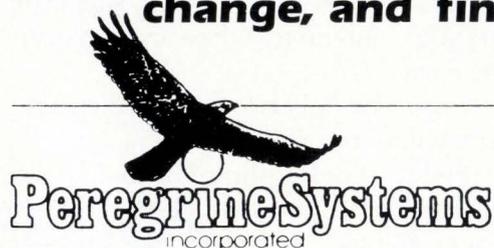
Circle 48 on Reader Card

RV4

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75015 Paris  
Tel. 40-60-05-12

**Peregrine Systems, USA**  
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Suite 320  
Irvine, CA 92718  
Tel. 714-855-3923

**O. Dati, Spain**  
P. de Gracia 2, 4  
08007 Barcelona  
Tel. 301-3999

**Paragon Technology, UK**  
Mountbatten House  
Victoria Street  
Windsor, Berkshire  
Tel. 853-857-181

**O. Packages, Italy**  
via Menabrea 18  
20159 Milano  
Tel. 02-60-70-941

# New Products

## TRENDS

**FASTER, CHEAPER PAGE PRINTERS** will soon be coming to market, analysts and vendors agree. Microprocessors that have been customized for printer applications will improve the price/performance of page printers that are expected to come out within the year.

Both National Semiconductor Corp., Santa Clara, and Weitek Corp., Sunnyvale, Calif., have brought out such chips customized for printers. Embedded with graphics instructions as well as the capability to understand PostScript page description language, the new chips reportedly will increase the performance while reducing the price of page printers.

Brand Parks, an analyst with San Jose-based Dataquest Inc., says, "The bottleneck has been that the processor couldn't format data for PostScript and print it out as fast as the data came in." Parks says NatSemi's chip "permits the laser engine to keep up with the data."

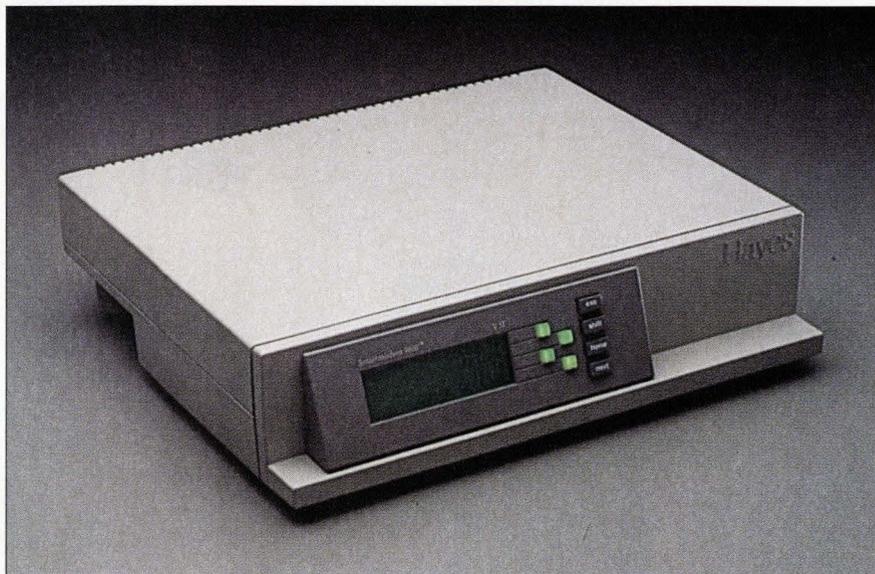
NatSemi's 32-bit CMOS microprocessor, which is designed specifically for printers, is based on its 32000 family of 32-bit microprocessors. The chip has been customized to include 18 graphics instructions, such as a bit-aligned block transfer function, pixel processing, and high-speed pattern and line drawing. The vendor claims that its new chip offers controller performance up to six times faster than a comparable controller based on a Motorola 68000 for only about twice the price. NatSemi is targeting its chip for low-end (zero- to 20-page per minute) nonimpact printers. One printer maker that has announced plans to use NatSemi's chip is Canon, Lake Success, N.Y., which helped develop it.

In May, Weitek brought out a series of 32-bit RISC processors targeted for high-performance laser printers that print at up to 60 pages per minute. John Rizzo, vp of marketing for Weitek, claims that chips in the HyperScript-Processor family will enable a printer to perform between five and 40 times faster than current printers, such as Apple's LaserWriter Plus. Two vendors that are developing printers based on Weitek's chips are Data Technology, Santa Clara, and HanZon Data, Bothell, Wash.

Both NatSemi and Weitek have garnered third-party support from font library makers and page description language companies, such as Bauer Enterprises, San Jose, and Bitstream Inc., Cambridge, Mass.

*If you'd like additional information about products covered in this issue's hardware Trends, please circle 211 on the reader service card.*

## HARDWARE



Hayes has entered the V.32 market, which is two-and-a-half years old.

## Hayes' First V.32 Modem Targets Mainframe Market

The leased-line Smartmodem 9600 features automatic dial backup and Trellis coding.

BY MARY KATHLEEN FLYNN

Hayes Microcomputer Products Inc. has entered the V.32 modem market. For two-and-a-half years, products that comply with the CCITT V.32 specification for synchronous, asynchronous, full-duplex 9.6Kbps modems have been on the market, but until now pricing considerations had deterred Hayes from making a true V.32 modem. Garry Betty, senior vp at Hayes, told DATAMATION last fall that most pc users wouldn't pay the high price of V.32s, which currently sell for \$1,500 to \$3,000 (see "Price-Cuts Hit Modem Market," Dec. 1, 1987, p. 36).

This summer, Hayes has come to market with a fully compliant V.32. Still convinced that V.32s are too pricey for most pc users, Hayes is targeting its \$1,999 Smartmodem 9600 at the mainframe network environment, Betty says. Although the new modem can be used with a pc, Hayes recommends that pc users who want 9.6Kbps use its older V-Series Smartmodem 9600. Introduced last summer and priced at \$1,199, the asynchronous V-Series doesn't comply with the V.32 standard in that it is only half-

duplex and it communicates only with other Hayes products.

In addition to compliance with the V.32 standard, the new synchronous modem offers several features that distinguish it from the V-Series and make it more appropriate for the mainframe network, according to Betty. Whereas the V-series is for use over dial-up lines, the new modem transmits over two- and four-wire leased lines with automatic dial backup. And with the new V.32 product, it is the network that provides error control (SDLC and bisync). In addition, the product offers near and far echo canceling for improved satellite transmissions. HAYES COMPUTER PRODUCTS INC., Norcross, Ga.

CIRCLE 262

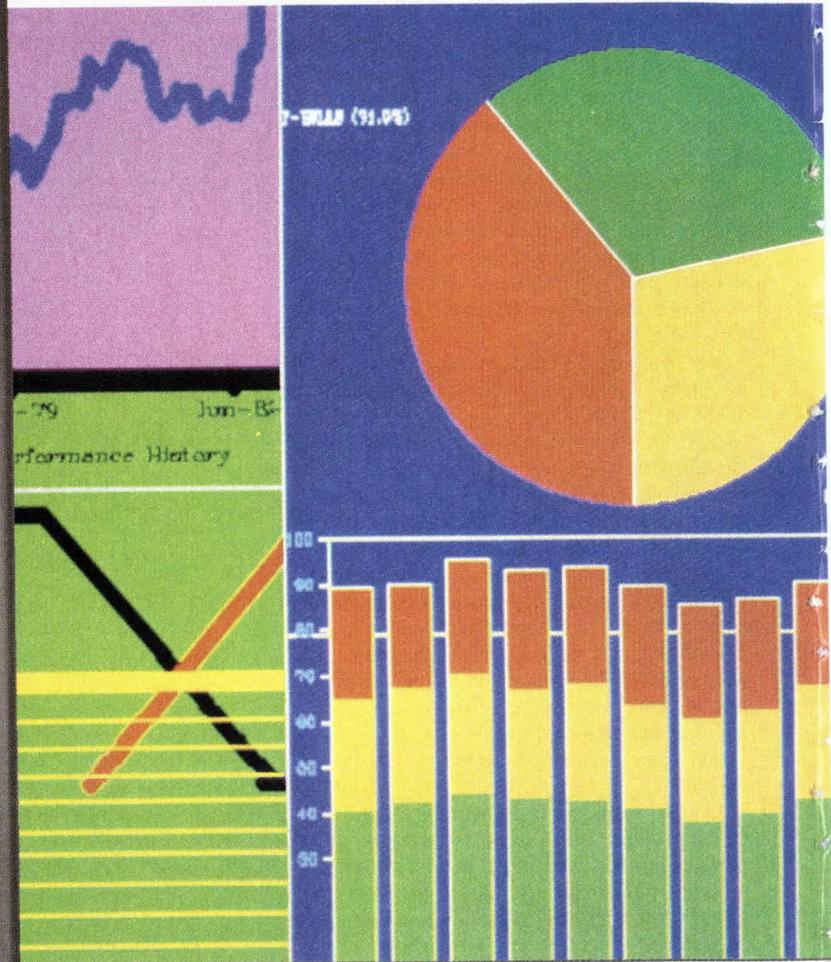
### Video Graphics Subsystem

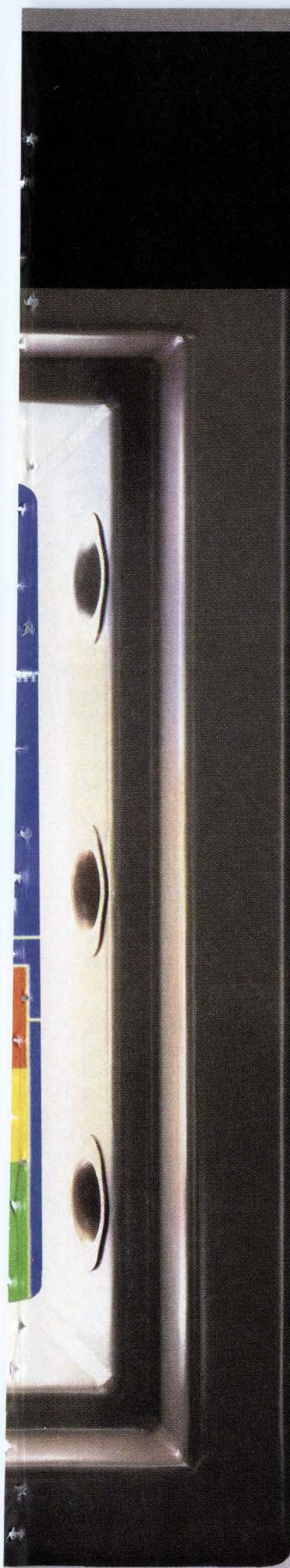
More colors and faster processing touted in new subsystem.

Hewlett-Packard Co. has rolled out a new high-performance video graphics subsystem for personal computers.

HP claims the new product offers more colors, sharper text and graphics, and faster processing of images than

# AT&T Power Protection Systems: Your best security against costly downtime.





**Eliminate the cause of up to 50% of your computer downtime: power disturbances.**

Power disturbances, brief and imperceptible, cause very visible data loss, data errors, and equipment damage, all resulting in costly downtime.

According to AT&T Bell Laboratories and IBM research, a typical computer site experiences as many as 135 commercial power disturbances a year, accounting for up to 50% of all computer downtime.

**The protection solution.**

To combat these disturbances, AT&T offers a full line of Uninterruptible Power Systems (UPS).

Available in 1, 3, 5 and 10 KVA single-phase models, and 10 and 20 KVA three-phase models, these systems effectively eliminate power fluctuations, including noise, transients, peaks, brownouts, and distortions.

Each system includes a built-in battery reserve for protection against blackouts.

**A 50-year advantage.**

Why specify AT&T's power protection equipment over that of other manufacturers? Because AT&T has an unmatched 50 years of experience in manufacturing power equipment. And, because AT&T also designs and manufactures computers, we have a unique understanding of what should go into a superior power protection product.

For instance, our parallel

processing architecture offers reliability few others can provide. It also maximizes cost-efficiency: less power is needed to run our system, and heat loss is substantially reduced.

**Easy does it.**

AT&T UPS protection systems are easy to install, need no operator, and require no scheduled maintenance.

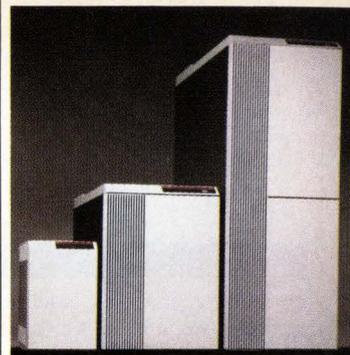
Furthermore, AT&T backs you with an unequalled nationwide service network and a 24-hour toll-free number for technical service support.

**Fast delivery.**

AT&T is ready to ship from stock. Once our Dallas facility has your order in hand, we'll have your system speeding on its way to your site. So for maximum security against power disturbances, along with low-cost, trouble-free performance, call AT&T at **1 800 982-0030**.

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AT&T's UPS is available in 1, 3, 5 and 10 KVA single-phase models; and 10 and 20 KVA 3-phase models.



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The right choice.

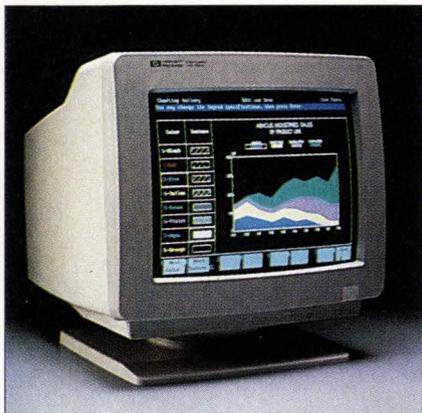
# New Products

## BRIEFS

competing products, such as the video graphics adapter built into IBM's PS/2.

Designed for business and entry-level CAD/CAM applications, HP's video graphics subsystem includes either a color monitor (priced at \$695) that displays up to 256 colors simultaneously, or a monochrome monitor (priced at \$250) that shows up to 64 shades of gray, and a video graphics adapter (priced at \$445) for use with either monitor. The HP Touchscreen Plus, priced at \$530, is offered as an accessory for the color display. All components are available now.

The product is compatible with software written for MDA, CGA, and EGA standards, as well as for the Hercules graphics card. The display automatically ad-



justs the viewing area to accommodate applications written for different standards, HP says. HEWLETT-PACKARD CO., Palo Alto. CIRCLE 263

### Laptop Computer

Features printer, modem, phone, and modem/cellular interface.

MicroDirect Inc. has unveiled its Complete Portable Office, which combines an ink jet printer, an optional portable cellular telephone, and a modem/cellular interface with its existing Turbo Laptop.

Based on an 80C88 microprocessor, the product features 1MB of RAM, a supertwisted liquid crystal display screen with backlighting, an 80-column text display, a 640 by 200 pixel graphics display capability, a 95-key keyboard with a separate numerical entry keypad, a built-in 1.2Kbps Hayes-compatible modem, built-in lead acid batteries that provide six to 12 hours of operating time, a dual-floppy disk version, and a 20MB hard disk configuration. The Complete Portable Office is available now and is priced between \$4,999 and \$5,500, depending

on configuration. MICRODIRECT INC., Everett, Mass. CIRCLE 264

### X.25 Board

Lets pcs access a packet switched network without a PAD.

ICOT Corp.'s Network Systems Div. has introduced an X.25 packet-level board for IBM PC bus and PS/2 Micro Channel pcs and compatibles. The pcPATH X.25 allows a pc to directly access a packet switched network using the high-speed, error-correcting X.25 protocol, without the use of a PAD (packet assembler/disassembler). The product supports access speeds up to 19.2Kbps.

The new product is targeted at large, multinational customers that are developing private or hybrid packet switched networks using the X.25 international standard protocol. The board is unbundled from an existing ICOT product, which provides 3274/3278 SNA emulation over X.25 in single-user and local area network environments. Available now, the new product is priced at \$595. Software is priced separately.

The vendor plans to deliver emulations for Digital Equipment Corp., asynchronous, 5250, and LAN environments later this year. ICOT NETWORK SYSTEMS DIV., Mobile, Ala. CIRCLE 265

### Modem Kit

Users can produce their own modems for sale or in-house use.

Renex Corp. has brought out the Modem Manufacturer's Kit, which enables users to produce modem half-cards (300bps, 1.2Kbps, and 2.4Kbps) for sale or in-house use.

The Renex kit contains all materials and plans necessary for manufacturing modems, says Renex, including camera-ready PCB artwork, an assembled working modem for testing, a blank board and parts, a complete set of schematics, and a complete list of parts and their suppliers.

The modems produced with the kit are Hayes-compatible, and can be used with IBM PCs, XTS, and ATs. They are certified to comply with FCC regulations, according to the vendor. They operate synchronously or asynchronously.

Licensing fees for the kit, which is available now, start at \$4,795 per manufacturing site. Evaluation modems with software can be purchased now from Renex for \$795. RENEX CORP., Woodbridge, Va. CIRCLE 266

**Intelligent Information Systems Inc.**, Hackensack, N.J., has introduced a **remote access device** that eliminates the need for a remote control unit. It allows IBM 5250 and compatible terminals and printers at a remote site to communicate with a System/36 or 38 over dial-up or leased lines at speeds up to 9.6Kbps. Available now, the IS-353 is priced at \$1,995 for two units. CIRCLE 267

**Seiksha America Inc.**, Mahwah, N.J., has entered the high-end printing market with several new offerings. The SBP-10 **18-pin dot matrix printer** for IBM minicomputers and mainframes is priced at \$4,495. The BP-5420FL **24-pin impact dot matrix business printer** for DEC VAX machines is \$1,999. The SL-130AI **24-pin dot matrix printer** is \$999. Two **9-pin color dot matrix printers**, SK-300AI and SK-3005AI, are \$649 and \$849, respectively. CIRCLE 268

**C. Itoh Electronics Inc.**, Irvine, Calif., has rolled out two **graphics terminals** that emulate DEC's VT330 and VT340. An optional Ethernet LAN connection is offered for both. Available now, the monochrome CIT334 is \$1,895 and the color CIT344 is \$2,895. CIRCLE 269

**Hewlett-Packard Co.**, Palo Alto, has brought out two **electrostatic plotters**. Available now, the HP 7600 Series, model 240D is priced at \$22,900, and the model 240E is \$27,500. CIRCLE 270

**Arnet Corp.**, Nashville, has rolled out an **add-on eight-port serial board**, designed for the IBM PS/2. Available now, the Multiport/2 board is \$995. CIRCLE 271

**Emulex Corp.**, Costa Mesa, Calif., has brought out an intelligent, multiport, multiprotocol, multipersonality **data communications coprocessor board for the IBM PS/2**. Priced at \$1,595, it is available now. CIRCLE 272

**NEC America Inc.**, has introduced a **four-function office machine** that combines a facsimile, a telephone, an answering machine, and a copier on one terminal. Available now, the NEFAX 3EX is priced at \$2,395. CIRCLE 273

**Everex Systems Inc.**, Fremont, Calif., has rolled out two new **personal computers**, both available now. The STEP 386/25 runs at 6MIPS, and the STEP 286/20 runs at 4MIPS. Prices are available from the vendor. CIRCLE 274



# CINCOM Boosts Production At Holly Farms.

**PROBLEM:** Improving programmer productivity in order to reduce a large applications backlog

**CINCOM SOLVED IT:** With MANTIS Application Development System



**Mr. Bill Clontz**  
Director of Computer Services  
Holly Farms Foods

During a period of explosive growth, Holly Farms found itself with two problems: a large applications backlog and a short supply of programmers able to step in and produce immediate results. The solution was MANTIS<sup>®</sup>, the application development system from Cincom<sup>®</sup>.

"MANTIS was ideal for us because you don't need 2-3 years of experience to use it," explained Bill Clontz, Director of Computer Services at Holly Farms. "It lets us take new graduates, quickly train them and, in a matter of weeks, turn them into valuable programmers."

As a result, programmer productivity at Holly Farms has reached an all-time high. "We've seen substantial improvement ratios," Clontz said. "In the time a programmer might turn out one CICS command-level program, he can turn out from six to eight programs on MANTIS."

Most of the 500-plus MANTIS applications now in production at Holly Farms are aimed at streamlining costs. For example, Data Processing used MANTIS to develop a model of how chickens consume feed over the course of their lives, allowing Holly Farms to cut production at one of its feed mills by 1½ days a week.

"We've got key users who are picking up on the term 'MANTIS,'" Clontz noted. "Around here, MANTIS has become a synonym for 'get it done quickly!'"

Find out how MANTIS can boost your productivity. Call us today for more product and customer success information. Or, write Marketing Services Department, Cincom World Headquarters, 2300 Montana Avenue, Cincinnati, OH 45211.

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**It will  
take two  
years  
for the  
average DP  
department  
to catch up  
with  
demand  
for new  
applications.**

**UN**

A Unisys computer system will get you ahead, instead of keeping you years behind.

Our fourth-generation languages cut programming time by a factor of 10 or more.

With Unisys 4GLs, you can quickly develop new applications and build an integrated software system. Backlog is dramatically reduced. You'll be able to give your user community better command of the information it needs.

But that's not the only way Unisys can help.

Our people have career experience in a wide range of businesses, from banking to manufacturing to communications. So when you're trying to get a jump on user demand, you'll be working with professionals who have done it before in a business like yours.

Unisys is a \$10 billion international information systems company that offers an integrated product line, from micro

to mainframe. Our systems give you a continuous growth path of more than 144 times in computing power, saving costly software conversions.

We believe that by providing better information you can make better decisions.

And a system that helps you get ahead is the best decision of all. **BETTER INFORMATION. BETTER DECISIONS.**

# UNISYS

The power of 2

## New Products

### TRENDS

OFFERING A "LIFETIME GUARANTEE" may be the latest wrinkle in the software business. On-Line Software International Inc. is making just such an offer with its site licenses.

On-Line's lifetime guarantee actually translates to a trade-in policy. "Any customer buying a product," explains Howard Sorgen, president of the Fort Lee, N.J.-based development house, "can trade in on any other product in the future. Those dollars [spent on the original product] are always good."

In other words, a customer spending \$30,000 today to license any of On-Line's 23 products can trade it in for any other product at a later date, and the \$30,000 spent on the first license will be subtracted from the price of the second.

Lest anyone think that it's dissatisfaction that might lead customers to exchange one On-Line product for another, Sorgen suggests several scenarios in which a customer's changed business requirements might make the new policy attractive: "If a data center closes, or if through a merger or an acquisition a company ends up with two of the same product, or if IBM comes out with some announcement that changes a customer's requirements."

What role, if any, that the trade-in program will play in customers' buying decisions remains to be seen. Robert E. Woodrow, senior vice president of MIS at Bank Leumi Trust Co. of New York, an On-Line customer, says that although he regards the policy as "an additional incentive" to purchase from On-Line, he wouldn't buy a product purely on the basis of it. "It's not enough to cause me to discount [the lack of] certain features and functions," he says.

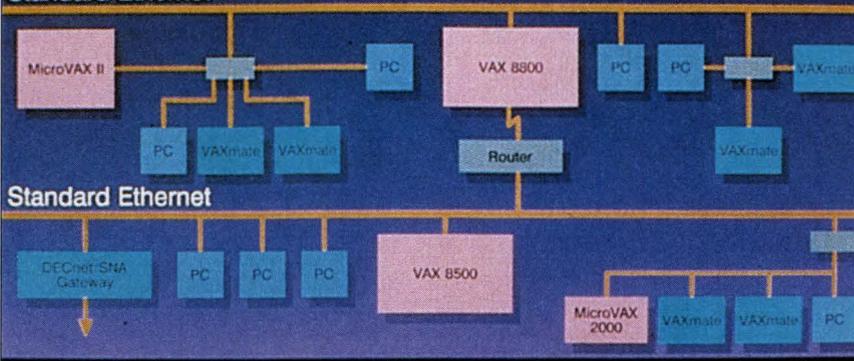
Another On-Line customer, Wendy Richman, senior vice president at Manufacturers Hanover Trust, New York, puts more weight on the policy. "All things being equal—and even if things were only close to being equal—this would make me buy the product." The policy, she believes, "protects the buyer and gives [me] flexibility."

Will the idea catch on? Tough to say, but don't put any money down; of the three On-Line competitors contacted by DATAMATION—Computer Associates International Inc., Garden City, N.Y., Pansophic Systems Inc., Oak Brook, Ill., and Information Builders Inc., New York—none plans to offer a comparable policy.

*If you'd like additional information about products covered in this issue's software Trends, please circle 212 on the reader service card.*

### SOFTWARE

#### Standard Ethernet



VAX/VMS allows MS/DOS-based pcs to access the DECnet/OSI network.

## DEC Speeds Up Its Pc Integration Software

File server performance is improved in new release of VAX/VMS Services.

BY MARY KATHLEEN FLYNN

Digital Equipment Corp. has brought out version 2 of its VAX/VMS Services for MS/DOS. It's an integrated pc software package that allows MS/DOS-based machines to use DEC's Network Applications Support to access information and services on the DECnet/OSI network. This enables any VAX on the network to act as a file, disk, and print server to groups of pcs.

DEC says the new version is faster than the earlier one. The new release is said to offer a 30% improved file server performance. DEC attributes the increased speed to multithreading, which enables it to handle requests from several pc users concurrently.

DEC has also added a Local Area Disk server, which separates out MS/DOS applications that VMS users don't need and then stores those applications on a VAX disk, thereby allowing high-speed access to those applications.

Licensed with DECnet-VAX at no additional cost, the new version is available now. Documentation and media are priced at \$650.

DEC has also released products that allow pcs and Ultrix terminals to access IBM 3270s via DECnet without requiring VAX/VMS Services. The Ultrix product is priced from \$250 to \$3,600; the MS/DOS product is \$199. DIGITAL EQUIPMENT CORP., Maynard, Mass.

CIRCLE 275

### DB2 Change Control

Endevor-DB2 automates steps in the DB2 development cycle.

Business Software Technology Inc. has introduced an automated change control system for the DB2 development environment.

The new product, Endevor-DB2, can be used on its own or in conjunction with Endevor-C1, Business Software Technology's library management and change control system for the MVS environment at large.

Endevor-DB2 tracks all the change events in the DB2 applications development cycle. It handles tasks that have traditionally been done by hand, such as the coordination and synchronization of DB2 program components and processes.

The product's Access Facility enables DB2 programs to run in batch mode. Because Endevor-DB2 doesn't require TSO (Time Sharing Option), it reduces system resource usage by up to 60%, according to the vendor.

Endevor-DB2 is available now. The complete product is priced at \$28,500. Individual components, such as the Access Facility, are priced at \$9,500.

Endevor-C1, which was introduced a year and a half ago, is priced at \$64,500. BUSINESS SOFTWARE TECHNOLOGY INC., Westboro, Mass.

CIRCLE 276

# It's not a High-speed Printer Unless it's High-speed on the Tough Jobs!

## Introducing the NBS 3840 Laser Printer for a TRUE 40 pages per minute!

**Mix text, graphics and forms, in any combination, and the NBS Southern model 3840 will still give you 40 pages of pure output per minute!**

NBS Southern's model 3840 gives you forty honest pages per minute — form, text and graphics — all on a single pass on standard cut sheet paper at 300 dots per inch.

If you're tired of watching output speed degrade as forms and

graphics get more complicated, it's time to look at NBS Southern's 3840. It houses a true 57 resident fonts, with optional expansion to over 150. In fact, it supports the entire Bitstream® font library, and fonts may also be loaded directly from the host computer.

With the addition of NBS Southern's PAGEWARE™ Forms Description Language (FDL), you can easily merge text with complex documents, logos, signatures and other special graphics.

For computer printing requirements up to 200,000 pages per month, the NBS Southern 3840 is the ideal solution. It improves accessibility to the mainframe

from local terminals, it offers customized printer performance to meet local user needs, it eliminates the cost of pre-printed forms, and it solves the delivery problem inherent in moving printed materials from the printing site to a remote utilization point.

For detailed specifications and pricing information, contact NBS Southern, Inc., 11451 South Belcher Road, Largo, Florida 34643. Telephone 813/541-2200; outside Florida 800/327-5602; FAX 813/546-8042.

**NBS**  
Southern, Inc.





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DCA has made it our number one objective to keep up with IBM<sup>®</sup>'s technological direction with LAN-to-mainframe communications. And we've succeeded.

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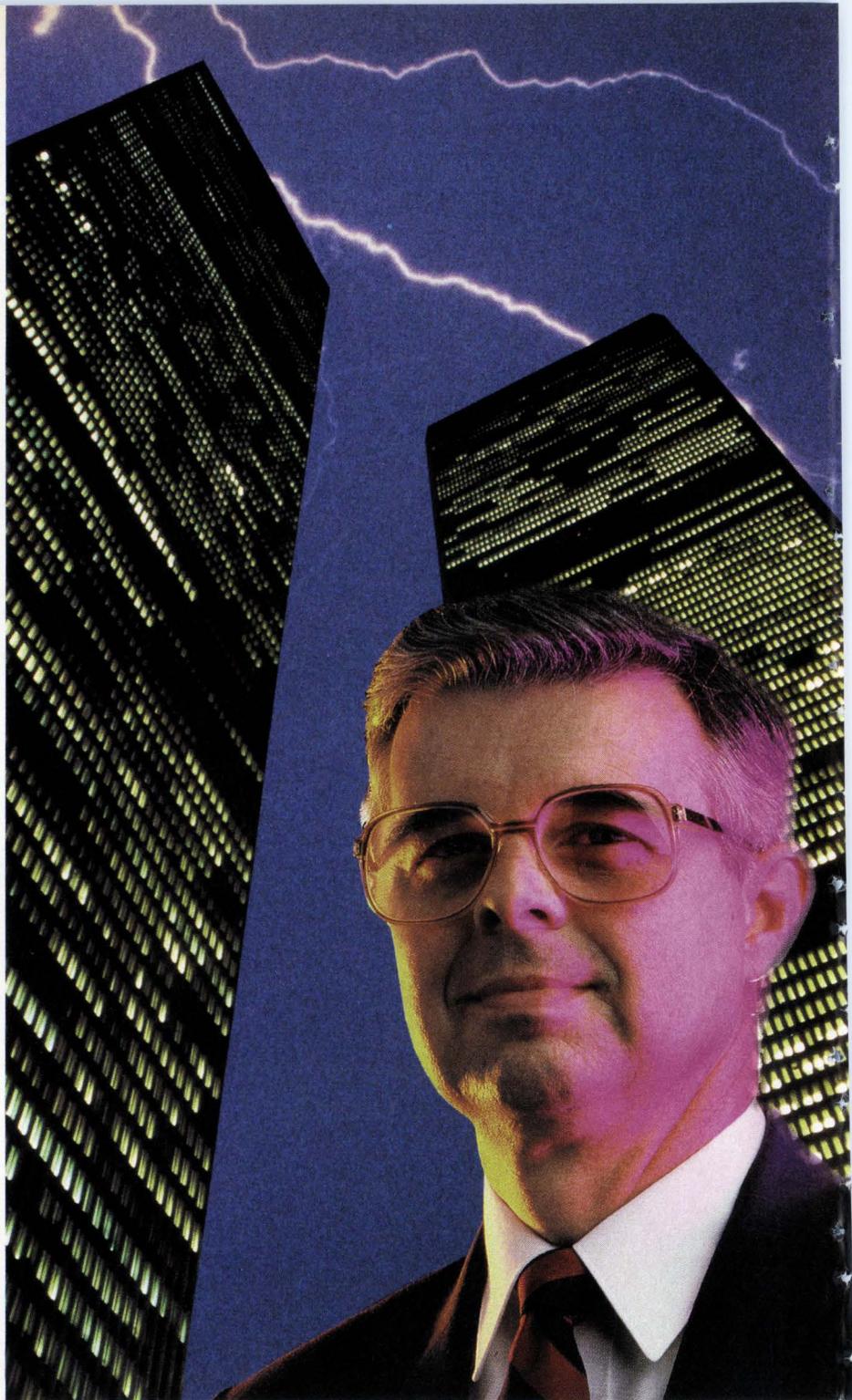
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# New Products

## Mainframe DBMS

CCA enhances its Model 204 DBMS for IBM 370 machines.

Computer Corp. of America (CCA) has announced version 2 of its MODEL 204, a database management system that runs on the full range of IBM's 370 architecture. The new version offers increased performance, including faster transaction rates, support for larger numbers of concurrent users, and improved sequential processing, according to CCA.

The vendor claims peak transaction rates are up to four times greater than current rates. The redesign of internal algorithms (used for transaction processing scheduling and concurrency control) and an advanced query optimizer algorithm account for the increased speed. The new product supports up to 2,500 users—five times the number of the previous release.

CCA expects to begin shipping the new version in the fourth quarter. MODEL 204 is currently priced between \$30,000 and \$200,000. No price increase for version 2 was anticipated at press time. COMPUTER CORP. OF AMERICA, Cambridge, Mass. CIRCLE 277

## Unix & OS/2

NCR brings out Unix and OS/2 for pcs and workstations.

NCR Corp. has delivered its first Unix offering for personal computers. The 386/ix family brings the functionality of Unix System V, release 3, to NCR's 32-bit 80386-based PC916 and compatible pcs. NCR has also brought out a version of OS/2 for its AT-compatible 80286- and 80386-based pcs.

Developed by Interactive Systems Corp., Santa Monica, Calif., the 386/ix Unix family consists of three components, all of which are available now. The operating system itself is priced at \$645; the software development system is \$595; and the VP/ix, which enables MS/DOS programs to run under Unix, is \$395.

NCR's multitasking OS includes features that NCR says are not found in Microsoft's OS/2: a dual-boot function, for booting up in either DOS or OS/2; structured file directories, one of which segments DOS and OS/2 files into the appropriate directories; processor frequency switching; and support for 3½-inch disks and 720KB or 1.44MB storage capacity. Available now, NCR's OS/2 is \$325. NCR CORP., Dayton, Ohio. CIRCLE 278

## Banking Software

Software Alliance debuts an integrated banking system for Unix.

Software Alliance Corp., a Teknekron Co., has released a Unix version of its Total Banking Solution, a turnkey system designed for community and midsize banks. It was originally developed by Bankmatic (which Software Alliance acquired several years ago) for the Data General MV family of 32-bit minicomputers. Updated last fall, the Total Banking Solution includes 30 applications and supports up to 1,000 users on large com-

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UNAMORTIZED COST: .00
EFFECTIVE YIELD:  .0000
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puters and up to 30 users on entry-level TBS/PC systems. At press time, it was installed at approximately 50 banks, according to Software Alliance. It is priced at \$90,000.

Available now, the Unix capability is targeted for seamless operation on machines running IBM's AIX (so far announced for the PS/2, RT PC, and 9370), DEC's Ultrix, and other compatible Unix environments. SOFTWARE ALLIANCE CORP., Berkeley, Calif. CIRCLE 279

## Project Management

Multiuser package for government contracts is introduced.

Micro-Frame Technologies Inc. has brought out a networked multiuser version of its M\*PM project-planning software for aerospace and defense contractors.

Tailored to the scheduling, cost-accounting, and reporting requirements of government contracts, M\*PM incorporates the work breakdown structure, a tree-like data organization used by government agencies, such as the Department of Defense and NASA.

M\*PM-LAN supports up to 100 users on IBM ATs and XTs over a LAN. Priced between \$30,000 and \$60,000, it is available now. By the fourth quarter, the vendor plans to deliver VAX VMS and VM/CMS versions. MICRO-FRAME TECHNOLOGIES INC., Ontario, Calif. CIRCLE 280

## BRIEFS

**MCI Communications Corp.**, Rye Brook, N.Y., has added an **X.400 gateway** to its MCI Mail service. XChange 400 allows customers to exchange messages with electronic mail systems that conform to CCITT X.400. CIRCLE 213

**Thomas Business Systems Inc.**, Boca Raton, Fla., has begun to offer a **free database access service**. The computer brokerage company's database lists equipment for sale from end users, brokers, and itself. It contains 5,500 IBM parts, 4,400 DEC items, and 3,700 assorted manufacturer parts. Thomas sells a pc communications program that gives access to the database for \$25. CIRCLE 214

**Systems Strategies Inc.**, a New York-based subsidiary of AGS Computers Inc., has released a **portable version of IBM's Distributed Data Management architecture**. The new product, cDDM, allows users of non-IBM systems to share data files with remote systems on an SNA network transparently. Prices are available from the vendor. CIRCLE 215

**Tymnet, McDonnell Douglas Network Systems Co.**, Anaheim, Calif., has begun offering two new **password-based network security services**. Prices for PassLife and PassChange are available from the vendor. CIRCLE 216

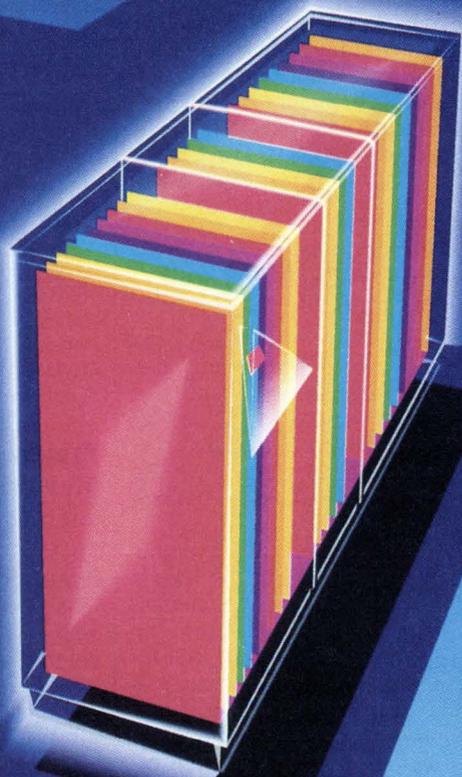
**SAS Institute Inc.**, Cary, N.C., has released version 5 of its SAS System under VSE. It's an **integrated software system for data management, analysis, and presentation for IBM's 370/30XX/43XX and 937X machines**. A first-year license fee ranges between \$3,200 and \$15,000. CIRCLE 217

**The Wollongong Group**, Palo Alto, has added a **VMS datacom package** to its integrated networking line. Available now, prices for the MicroVAX version of WIN/TCP for VMS begin at \$2,000; VAX product prices begin at \$8,000. CIRCLE 218

**Sun Microsystems Inc.**, Mountain View, Calif., has brought out a **network service** for Sun systems. The SunStart service is available in a variety of packages and in unbundled components. Pricing can be obtained from Sun. CIRCLE 219

**SPSS Inc.**, Chicago, has brought out a **forecasting and time series analysis package for IBM XTs, ATs, PS/2s, and compatibles**. SPSS Trends II is available now for \$695. CIRCLE 220

# The new COMPAREX 8/8X Processor-Series



**COMPAREX – the newest and largest alternative to IBM in Europe.**

# The biggest thing about the COMPAREX 8/8X processors: How small and economical they are.

If you're committed to the IBM\* world – software, hardware and applications – but your 4381 just can't cope any more then all IBM can offer is an additional 4381 or a leap of faith to a 3090: the devil or the deep Blue sea.

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## **The COMPAREX 8/8X family – 4381 size and convenience 3090 performance.**

The COMPAREX 8/8X family is ideal for users who need the power and capabilities of the low-end 3090s but don't have the space. Like the 3090s the first three members of the 8/8X family are uniprocessors. But unlike the 3090s they really are small about 1.5 square metres (16 square feet) – roughly the size of a non-executive desk. That's less than a fifth of the space required by a "small" 3090, with similar savings in weight, power consumption and air conditioning.

## **Power – wherever you look.**

The 8/8X processors are powerful enough, but that's not all. Up to 32 channels can be attached to each system, with support for 6 MB/sec transfer to and from selected COMPAREX peripherals. This feature provides channel constraint relief for many users, revitalising on-line operation and re-opening the batch window.

But the real power behind the COMPAREX 8/8X comes from BASF and Siemens, two European giants who have combined to launch COMPAREX a new alternative to IBM.

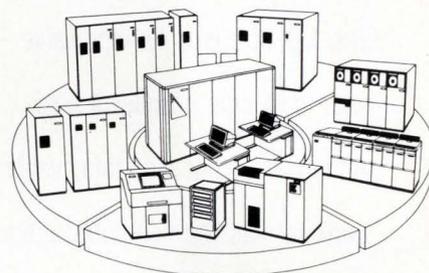
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# SIEMENS

## **The MX 300 is Siemens' state-of-the-art SINIX Computer.**

The MX 300 is the new SINIX<sup>®\*</sup> multistation computer designed with teamwork in mind. It is capable of supporting up to 12 workstations which makes it the natural choice for departments and branch offices of large companies and the ideal solution to a variety of tasks in medium-size businesses.

The MX 300 is truly impressive – both inside and out. Its elegant slimline tower looks so good it seems a shame to hide it under a desk.

And inside, it has a certain quality that speaks for itself. It is so powerful and fast that each of the 12 users will think he has the computer entirely to himself.

For all this it is stunningly simple to use, offering windows, mouse control and graphics at eight workstations. The MX 300 can be tailored to suit your individual requirements in terms of the number of screens and printers, the size of main memory and the capacity of the hard disk. If ever your needs grow the MX 300 can grow with them.

And let's not forget all the other SINIX computers with their new levels of performance, such as the new X20 single-station system with its super high-speed processor, and the flagship model, the MX 500, which can now support 64 workstations – twice as many as before.

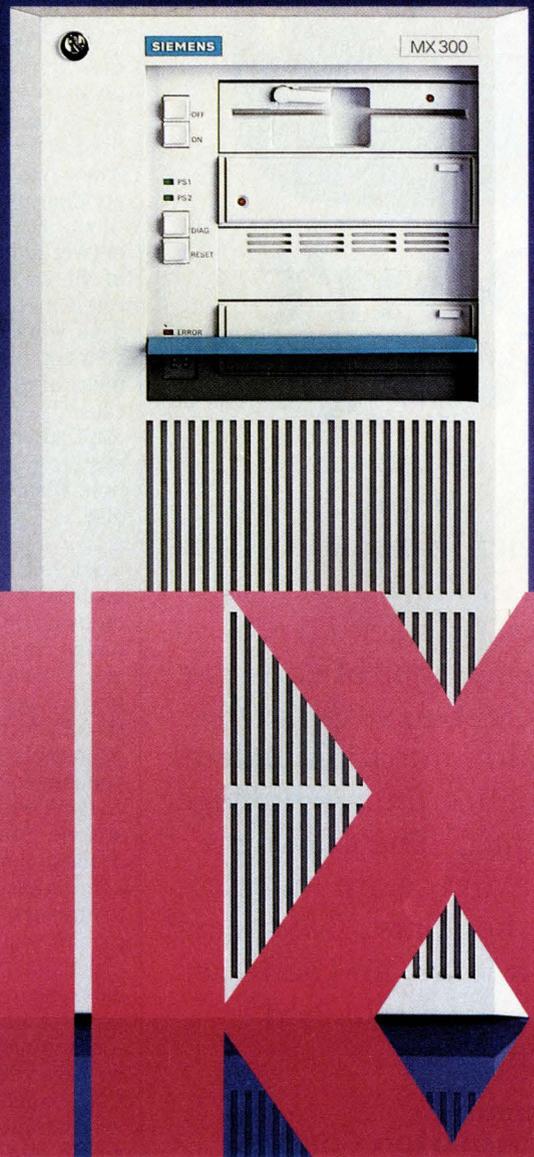
Find out more from Europe's No. 1 in UNIX computers: Siemens AG, Infoservice 134/Z388 P.O.B. 23 48, D-8510 Fürth, Federal Republic of Germany.

## **Siemens is Europe's No. 1 in UNIX.**



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# SIEMENS

### READERS' FORUM

#### Progress Engineering

Articles such as David Stamps' "The Tough Search for Telecom Talent" (Dec. 1, 1987, p. 65) have been appearing in engineering publications for years. The truth is that neither the demand nor the dollars are there for telecom talent.

The demand isn't there because most of the people doing the hiring simply don't know what they're looking for. Most telecom managers are retired or fired AT&T or RBOC operating or maintenance types who never had to even operate their own networks, let alone design them. That work was done by AT&T's networked engineering group, and most of the critical operations were incorporated in the switching system. These days, when the guy with some three to 30 years of experience is hired and makes a mess of it, he is generally kept on—because his boss, the top telecom person, can't admit to not knowing much about systems design, acquisition, or operation. Blame is placed on almost anyone else.

The dollars aren't there because most telecom managers simply aren't qualified to be anything more than intermediaries between the pre-1984 telephone company monopoly and their users. The reason for this is that their employers never trained them, paid them rock-bottom wages, and gave them an impossible job. To paraphrase the old "enjinneer" saw, people who last week couldn't even spell "teelcomp" suddenly are one. Some raises were given to some of these people, but most were only token increases, and now they aren't about to hire someone who is more competent than they are for more money than they make. So, they go for quantity, throwing inexperienced bodies at their problems.

So much for the old analog systems problems. Now comes digital. Here we have very few of the old RBOC people. The younger—and more technically savvy—people were laid off. We have a whole generation of data processing managers, and their staffs, who don't even know how their cpu communicates with their peripherals, much less with their digital network communications. Oh, I know a lot of them talk a great network operations game, but when you really get into it, their network's nothing more than the old ADP shop running a line printer in the corner.

To add to the general chaos, we have self-styled consultants running around who are just as unqualified and in-

experienced as those they are trying to serve. Most of these guys are breaking the engineering practice laws of every state, because the state licensing boards haven't yet realized the great swindle going on. When some lives are lost, and some really critical public dollars go down the drain, then they will pay attention.

Another fact of life is that you don't need the high-priced systems engineering people after the system is designed, tested, and accepted. Why not use these outside consulting engineers to set up the competitive atmosphere necessary for the best, most effective, lowest-cost acquisitions. They can supervise the installation, testing, and acceptance, assume the liability, and then move on to some other client. The rest can be handled by lower-cost operations and maintenance people. Why try to hire, train, and keep this very expensive and scarce engineering talent when it is only needed for such a short time?

It astounds me to the point of anger to see the tremendous waste and corruption that seems to abound in the communications, computer, and control applications in company after company, industry after industry, and government agency after government agency. As the U.S. working population continues to decline, help of any kind will become increasingly scarce over the next decade. If we are to keep inflation down to just a dull roar, we have to become more productive.

The last great opportunity for quantum productivity improvements is in automating the white-collar functions—that is, so-called office automation. The key to office automation is the application of communications, computers, and control technology. All seem to be getting a bad name because of the meddling of amateur do-it-yourselfers. Hiring professional engineers, who must keep abreast of the latest technology just to survive, is the most cost-effective way of solving this problem.

DANIEL B. McDEVITT  
Progress Engineering  
Tulsa, Okla.

*If you'd like to share your opinions, gripes, or experiences with other readers, send them to the Forum Editor, DATAMATION, 249 W. 17th St., New York, NY 10011. We welcome essays, poems, humorous pieces, or short stories.*



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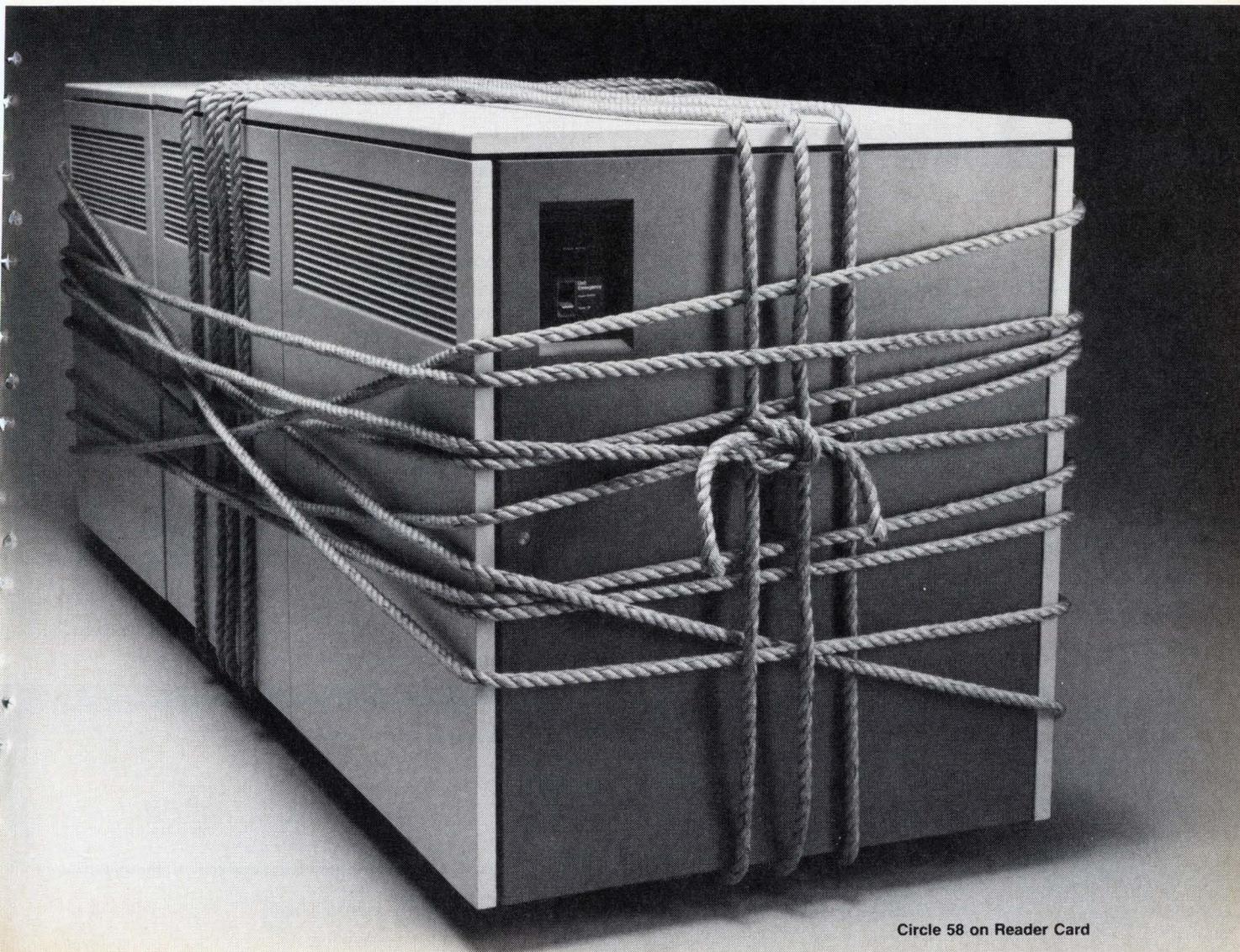
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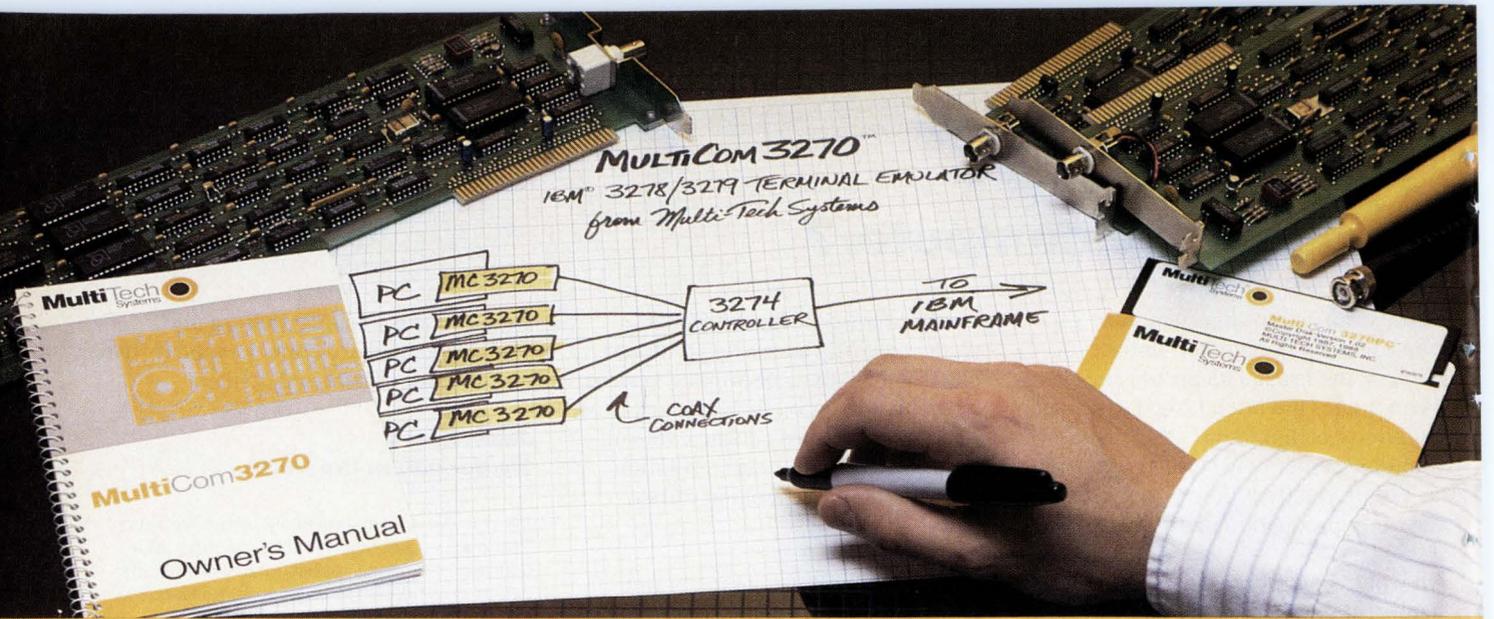
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- However, one problem that network managers still have is the high cost of the emulators.
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- And who is Multi-Tech Systems? If you are involved with dial-up modems, you probably know us. We've been making modems, multiplexers and other data communications equipment since 1970. The quality of our 2400 bps MultiModem™ line is unsurpassed, as evidenced by our recent selection as Editor's Choice by PC Magazine. This same commitment to quality extends to our 3270 products as well.
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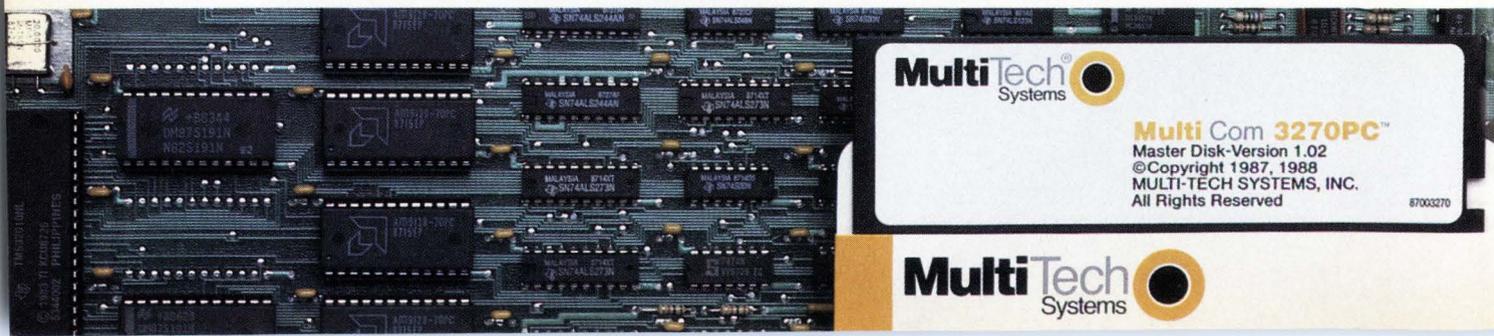
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# Departments

## CALENDAR

### AUGUST

#### **National Conference on Artificial Intelligence.**

Aug. 21-26, St. Paul. Contact Claudia Mazzetti, American Association for Artificial Intelligence, 445 Burgess Dr., Menlo Park, CA 94025, (415) 328-3123.

### SEPTEMBER

#### **International Society for Optical Engineering (SPIE) Symposium and Exhibition.**

Sept. 6-9, Boston. Contact SPIE, P.O. Box 10, Bellingham, WA 98227-0010, (206) 676-3290.

#### **Capital Microcomputer Users Forum.**

Sept. 7-8, Washington, D.C. Contact Kelly Fitzgerald, National Trade Productions Inc., 2111 Eisenhower Ave., Suite 400, Alexandria, VA 22314, (703) 683-8500.

#### **ShowCASE Conference III.**

Sept. 20-21, St. Louis. Contact Donna Skaggs, Washington University, Campus Box 1141, 1 Brookings Dr., St. Louis, MO 63130, (314) 889-5380.

#### **OOPSLA '88 (Conference on Object Oriented Programming: Systems Languages and Applications).**

Sept. 25-29, San Diego. Contact Barbara Noparstak, Digitalk Inc., 9841 Airport Blvd., Los Angeles, CA 92680, (714) 731-9022.

#### **Omni User Conference.**

Sept. 26, Chicago. Contact the Omni User, P.O. Box A 3031, Chicago, IL 60690.

### OCTOBER

#### **TeleCon VIII (Teleconferencing Users Conference).**

Oct. 10-11, Anaheim, Calif. Contact Applied Business teleCommunications, Box 1506, San Ramon, CA 94583, (415) 820-5563.

#### **Gulf Information Technology Exhibition & Conference.**

Oct. 10-13, Dubai, United Arab Emirates. Contact Trade Centre Management Co., Gulf Information Technology Exhibition & Conference, P.O. Box 9292, Dubai, United Arab Emirates, tel. 372200.

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The Devon Engineering facility of Unisys Networks is a major data communication and networking software development center. We are currently seeking individuals with five or more years' experience in:

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NETWORK ARCHITECTURES  
PROTOCOL DEVELOPMENT  
NETWORK STANDARDS**

As part of our staffing plan, positions are currently available in the following areas: BNA, X.25, OSI, SNA, and TCP/IP Development.

Our facility offers a professional atmosphere and is located in suburban Philadelphia.

For confidential consideration, write or send resume to **Human Resources, Unisys Corporation, Devon Engineering Labs, Dept. HBD, P.O. Box 1874, Southeastern, PA 19398-1874.** An affirmative action employer.

# UNISYS

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## Career Opportunities

# DATAMATION

## 1988 Editorial Calendar and Planning Guide

| Issue Date | Recruitment Deadline | Editorial Emphasis   |
|------------|----------------------|----------------------|
| Aug. 15    | July 27              | Enterprise Computing |
| Sept. 1    | Aug. 11              | Japan 10             |

Call today for information:

National

**Roberta Renerd  
(201) 228-8602**

West Coast

**Ellen Sherwood  
(714) 851-9422**

East Coast

**Janet O. Penn  
(201) 228-8610**

Software supplier, Atlanta, Georgia, seeks Manager, Planning Systems. Direct development and specification of financial products; support sales and installation. Requires BA Finance, Economics or related. Two years experience in position or as manager for financial information systems vendor. Eighteen months financial systems design experience across main frame/mini/micro environment. One year experience project management developing application tools and decision support systems; demonstrated ability to communicate with sr. management Fortune 500. \$40K/annum. Send resume c/o Ga. Dept. Labor, 2811 Lakewood Ave. SW, Atlanta, GA 30315. Control No.GA5293193 or nearest Georgia Job Service Center.

Data Processing Consulting

## PROJECT-ORIENTED CONSULTING!



## WHAT IS IT?



### It's NOT Contract Programming!

A Contract Programming Shop is basically a temporary help service, supplying programmers to fill short term labor needs. Contract programmers generally get involved only in the late stages of system development, doing what they already know, over and over. And unfortunately, many contract programmers are effectively out of work between assignments. Contract programming is honest work, but it's NOT SEI's work.

### It's NOT Just Management Consulting!

Management Consultants, on the other hand, often get involved only in the earliest stages of system planning and rarely take a direct hand in building the systems that they plan. Our opinion is that this has an unfortunate tendency toward Blue Sky. And, of course, management consultants often miss out on the fun of seeing the systems they plan come to life. Management consulting is a respectable profession, but it's NOT SEI's profession.



### So, What IS Project-Oriented Consulting?

Project-Oriented Consulting stands squarely between the extremes represented by Contract Programming and Management Consulting, combining the best features of both worlds. At SEI, our clients look to us for RESULTS— not just plans or code. Yes, we do planning, and our business sense is second to none. Yes, we do implementation, and our technical credentials are nationally recognized.

But more important, we do ALL of those things, and all the steps between. We use technology to solve business problems. We use our business experience to solve them effectively and sensibly.



### Interested?

If this sounds like the kind of work YOU should be doing, send a resume and salary history to:

**SEI Information Technology**  
Attn: David Monroe, Recruiting Coordinator  
450 East Ohio Street  
Chicago, Illinois 60611

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(Continued on Next Page)

# Glaxo's Growth Is Your Opportunity

Glaxo Inc. is not only one of the Top 10 ethical pharmaceutical firms in America, we're also the fastest growing research-oriented company in the country. As such, we can offer exceptional career opportunities, state-of-the-art facilities, and a firm commitment to producing the most effective pharmaceuticals that experience, imagination, and advanced technology can create. Join Glaxo, and apply your knowledge and career ambitions where they'll do you the most good.

We currently have the following positions available at our Corporate Headquarters located in Research Triangle Park, N. C.

## SENIOR OFFICE AUTOMATION ANALYST

This position, within our MIS Department, will be responsible for providing user training and technical consultation for office automation hardware and software on IBM PCs and DEC mainframes, performing system analysis for the implementation of Office Automation hardware and software systems, and providing support of electronic publishing applications.

Background must include a Bachelor's Degree in Computer Science or related area with 6-8 years experience in office automation. Extensive IBM personal computer skills in word processing and communications is required. Candidate should also have experience in the DEC environment and knowledge of how DEC interfaces with IBM. Experience in electronic publishing applications and INTERLEAF is desirable.

Candidates responding to this position should refer to Job # 3650B918 on all resumes.

## SENIOR OFFICE AUTOMATION ANALYST

This position, within our MIS Department, will support chemical word processing and graphics integration, provide user training and technical consultation for office automation hardware and software on IBM PCs and DEC mainframes, and perform system analysis for the implementation of OA hardware and software systems.

Background must include a Bachelor's Degree in Computer Science or related field with 6-8 years experience in office automation. Extensive IBM personal computer skills in word processing and communications is required as well as experience in DEC environment. Knowledge of how DEC interfaces with IBM is required. Chemistry background is also desirable.

Candidates responding to this position should refer to Job # 3650B919 on all resumes.

At Glaxo Inc., growth opportunities and up-to-date facilities are complemented by a location (near Raleigh/Durham) that has excellent resources in close proximity. Prestigious universities, scenic vistas, lively recreational areas, and exciting cultural opportunities are all a part of the daily life of the Glaxo professional. Further, we reward talent and creativity with an excellent salary and benefits package (including a completely equipped, on-site athletic facility). Candidates interested in these positions, please send your resume, including salary history and CORRESPONDING JOB # AS MENTIONED ABOVE, to:

Human Resources Department

# Glaxo Inc.

PO Box 13398

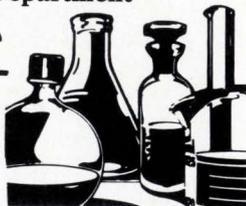
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## GREAT CONSULTANTS ARE MADE NOT BORN!

## HERE'S HOW WE DO IT!



### SEI builds experts. We build them by:



- Having them work alongside senior SEI consultants, nationally recognized authorities in such areas as Data Base Management, Distributed Processing, Industrial Automation and Robotics, Networking, Communications, and Hardware and System Software Development.
- Assigning them to demanding, challenging projects that cover the range of planning and development activities for system and application software on mainframes, minis, and micros. SEI builds the basic product delivery systems through which our clients conduct their businesses.
- Providing opportunities to represent SEI on technical and standards committees that set directions for the industry.

### Talent is Required, Of Course!

There are some important abilities you need to start with. SEI's consultants are characterized by general good sense, good technical backgrounds, and an attitude that the next challenge could be even better than the current one.

We look for people who work hard, are eager to learn, are serious about their careers, and who enjoy the variety and challenge of Project-Oriented Consulting. (For more about Project-Oriented Consulting, see our message on the previous page.)



### Interested?

If YOU'VE got what it takes to become a STAR, send a resume and salary history to:

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Attn: David Monroe, Recruiting Coordinator  
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*(Continued on Next Page)*

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Consider what you want from your career and then picture an ideal lifestyle. If you could have the right environment for both, your next career move would be an easy one. With CAROLINA POWER & LIGHT COMPANY, a major force in Southeastern power generation and distribution, the personal and professional environments come together to provide an excellent base for long-term satisfaction.

Let's examine our state-of-the-art technological environment first. Along with wide use of personal computers, we're operating two IBM 3090-200's, one IBM 3083J, one Amdahl 5860, and one Amdahl 5870. The CICS on-line environment has been growing at the rate of 40% per year. Recently we have expanded to a new Data Center. We're operating under MVS/XA and VM/CMS utilizing an SNA/SDLC network consisting of over 3,000 terminals and printers. Our programming languages are COBOL and DATACOM's IDEAL. We have a growing Information Center environment and are aggressively pursuing end-user computing and office automation technologies.

Now, about personal lifestyle. With CP&L in the beautiful Carolinas, your leisure time can take place in the mountains or on the seashore—or in many great areas in between. Year-round, we enjoy a mild but seasonal climate and a wide variety of recreational and cultural events. The area has a moderate cost-of-living, excellent schools and fine housing.

We have recently completed a large strategic planning study and have a significant backlog of technical and application development projects. We are in transition from a largely maintenance mode to an aggressive development mode. We are seeking talented individuals for the following:

#### **SYSTEMS ANALYSTS**

5-plus years experience in a development environment versus a maintenance environment. Highly desired experience would include: Structured analysis techniques; Relational Data Modeling; DATACOM/DB; On-line real-time systems; Arthur Andersen's Method/1; Prototyping; Application Generators.

#### **PROGRAMMERS**

1-5 years structured coding experience in a development environment versus a maintenance environment. Highly desired experience would include: DATACOM; COBOL; IDEAL; CICS.

CP&L offers competitive salaries, excellent benefits, and opportunities to advance. If interested in becoming part of our important team of professionals, send resume with salary requirements to: **Susie Brown, Recruitment Representative, Dept. DM 715, CAROLINA POWER & LIGHT COMPANY, P.O. Box 1551, Raleigh, NC 27602.** An Equal Opportunity/Affirmative Action Employer.

# **CP&L**

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# LET'S TALK BUSINESS!

**\$33,000 - \$65,000 to Start!**



If our message on the last two pages has intrigued you, you may be a person we need, at one of our offices across the country. Here's what we're currently looking for:

**SEI/Chicago** is seeking system software and application programmers, with 2-6 years experience in:

- Unix and C applications and internals
- IBM mainframe COBOL (CICS or IMS a plus)

**SEI/Los Angeles** is seeking programmer/analysts, with 2-6 years of experience in any of:

- IBM mainframe Cobol (CICS or IMS a plus)
- Networking: Ethernet, GM MAP, X.25
- Unix and C applications

**SEI/Phoenix** is seeking applications and system software programmers, with 2-6 years of experience in:

- Networking: Ethernet, GM MAP, X.25

**SEI/New York** is seeking application designers and programmers, with 2-4 years of experience in:

- Mainframe systems and applications, especially information delivery systems
- Publishing/fulfillment experience of particular value



## Interested?

SEI offers permanent positions, top salaries, excellent benefits, and unlimited opportunity for growth and development. Send a resume and salary history to:

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