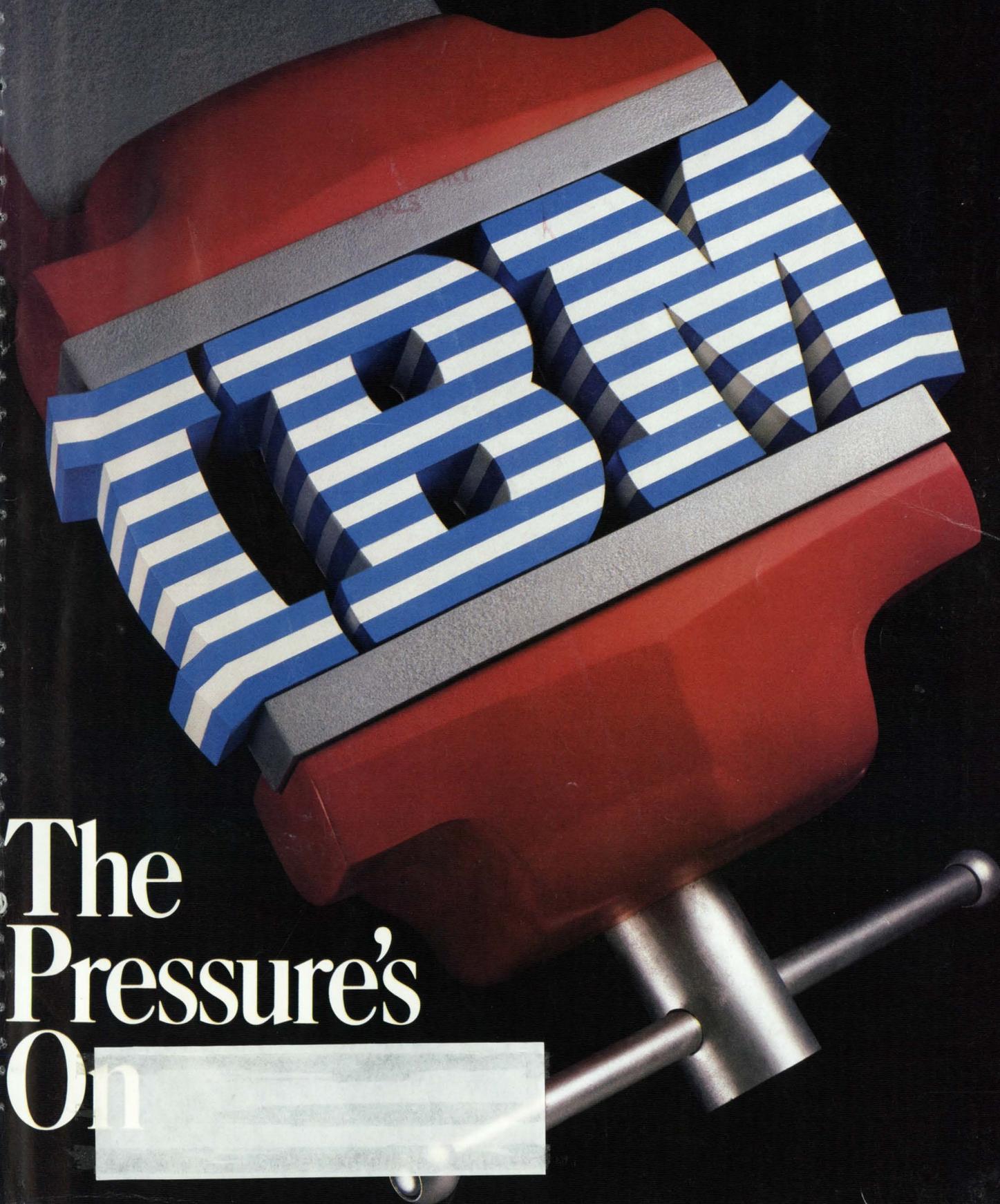


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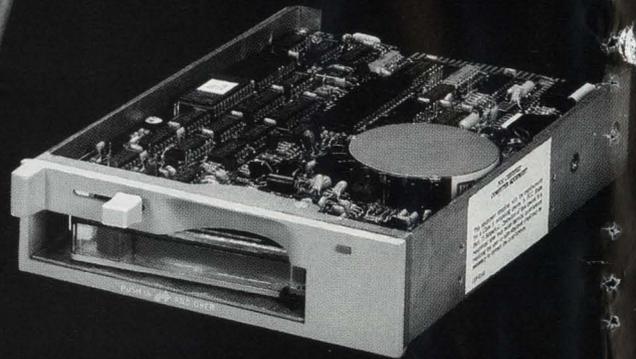
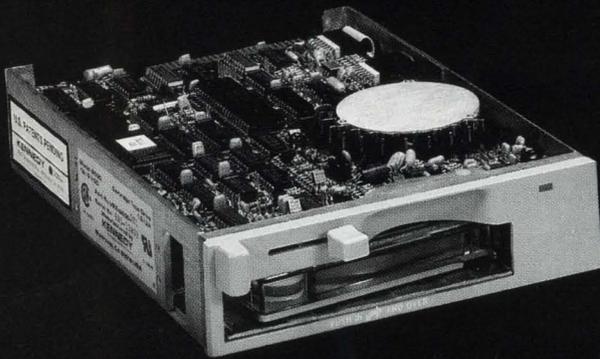
JANUARY 1, 1987  
A CAHNERS PUBLICATION

A red bench vise is shown from a high-angle perspective, clamping a blue and white striped object. The object has a complex, multi-faceted shape with several circular cutouts. The vise is mounted on a dark surface, and its silver-colored metal handle and adjustment screw are visible at the bottom right. The background is black, making the red vise and the striped object stand out.

The  
Pressure's  
On

What could possibly make cartridge  
tape drives better? How about...

# QIC-120



## Model 6500

The highest performance QIC-24 drive on the market

- 60MB capacity
- QIC-36, QIC-02, SCSI interfaces
- Half the repositioning time of competitive products to reduce file oriented backup time
- Direct drive motor for improved reliability and increased margins
- Non-rotating head reduces parts count
- 14000 hour MTBF

## Model 6550

The highest performance QIC-120 drive on the market

- 120MB capacity
- QIC-36 (modified), QIC-02, SCSI interfaces
- Half the repositioning time of competitive products to reduce file oriented backup time
- Direct drive motor for improved reliability and increased margins
- Non-rotating head reduces parts count
- 14000 hour MTBF
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But the fact that 8380Es are arriving is nothing compared to the performance that's arriving with them.

**Double capacity without doubling floor space, power or aggravation.**

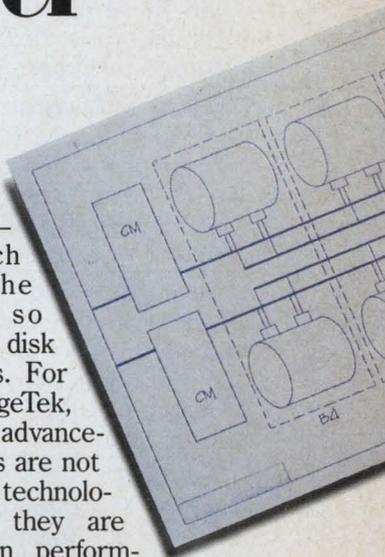
Every StorageTek 8380 customer can now double capacity without moving into more floor space or moving out a single drive. 8380E upgrades are made on-site; on hard-

ware our customers already own.

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**StorageTek**

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Storage Technology Corporation Louisville, Colorado 80028-0001

CIRCLE 4 ON READER CARD

# DATAMAT

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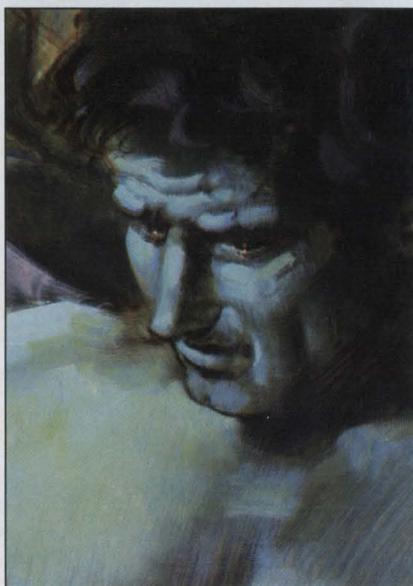
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PHOTOGRAPH BY WALTER WICK;  
3-D ILLUSTRATION BY BRUCE MOROZKO

INTERNATIONAL  
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## Editorial

### A New Look

This first issue of 1987 begins DATAMATION's fourth publishing decade. As you have noticed by now, we open our 30th anniversary year with a new look. What you may not yet have noticed is that our new look is the architectural structure of a more reader-friendly information package.

Not unlike the challenge you meet when upgrading your own information processing environment, our task was not a simple one. Nearly a year ago, art director Kenneth Surabian was presented with a seemingly insoluble dilemma: to redesign DATAMATION to provide more information for its readers, making the editorial package easier to access, more tightly organized, and more graphically appealing. The caveat: at all costs, retain and showcase those elements that have made DATAMATION the most important and widely read magazine in its field for the past 30 years.

As you read, you will see he has succeeded.

Starting here on the table of contents, you will find a more informative, easier-to-use guide to our pages. We have expanded our Look Ahead column, and have made it international in scope. News In Perspective has been reformatted to allow more stories with more graphic information. The look of our features has also been redesigned, and each now includes a succinct abstract for a swift appraisal of its contents. A new section called Real Time now consolidates our product coverage and departments.

We unveil our new look with our annual IBM issue. As our special coverage points out, IBM this year—unlike any other in its history—is being faced with its first real challenges for leadership in almost all of its traditional markets. From mainframes—where its 3090s have fared worse than expected—to the midrange—where Digital Equipment Corp. is clearly doing Big Blue one better—the erosion is clear. IBM's personal computer leadership, once assured, is now buffeted by waves from the Pacific basin. In communications and software as well, the giant's once sure hand is questioned. Can IBM reclaim its easy dominance of the industry?

For some answers, here is DATAMATION's fourth annual IBM issue, "IBM: The Pressure's On."

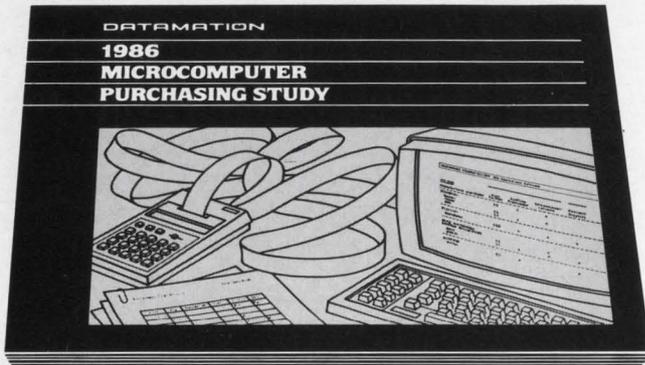


*George R. Davis*

GEORGE R. DAVIS  
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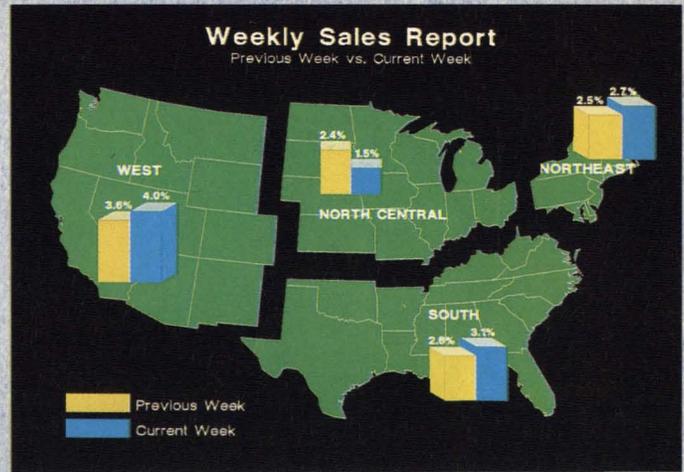
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CIRCLE 6 ON READER CARD

# Look Ahead

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## **HITACHI READIES UNIX PRODUCTS**

TOKYO -- Watch for more Unix announcements from Japanese companies as they prepare to use the portable operating system as a way out of the pcm trap. Following the recent launch of Unix systems from NEC and Fujitsu, Hitachi is now planning a new range of medium-sized Unix machines for release in 1988. The company has already commissioned outside software suppliers to work on products for the new systems. One of those companies, Toronto-based I.P. Sharp, is moving its Sharp APL language onto Unix for the Japanese firm.

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## **X/OPEN ROADSHOW DUE AT UNIFORMUM**

WASHINGTON, D.C. -- After two years spent persuading Europeans that it is onto a good thing, the X/Open group will be using this month's Uniformum show in Washington to launch itself into the U.S. market. With a membership that already includes Digital Equipment Corp., Unisys, Hewlett-Packard, Olivetti, Siemens, Groupe Bull, ICL, Philips, Nixdorf, and Ericsson, the group hopes to rally more companies around its Unix-based Common Applications Environment standard. X/Open hopes to demonstrate that the standard is a reality next month in Luxembourg when the same software will be run across systems from all 10 members. By the third quarter, they all plan to be marketing products compliant with the Common Applications Environment. In 1988, the group wants to take its road show to Japan, where initial negotiations are already under way with the Sigma software team.

---

## **WATCH FOR NEW MS/DOS VERSIONS**

REDMOND, WASH. -- Multitasking figures to become everyone's favorite buzzword later this month or early next when IBM and its partner in operating systems, Microsoft Corp., are expected to make official a couple of new versions of the standard MS/DOS operating system for personal computers. Both IBM and Microsoft are expected to announce what Microsoft calls 286 DOS, a version of the operating system that takes advantage of the protected-mode capabilities of the Intel 80286 microprocessor to support more than one application at a time. 286 DOS, also known as DOS 5, A-DOS, and CP-DOS, already has been shipped to a handful of applications developers, but a standard development kit won't go out until the first quarter. Some expect IBM to introduce a downsized version of the 286-based AT to go with 286 DOS. Separately, Microsoft will formally unveil what it calls 386 Windows, a protected-mode version of DOS for 386-based micros. Unlike 286 DOS, 386 Windows uses the same application program interface as the current version of MS/DOS, so no applications rewrites are necessary. Even applications that tie up

# Look Ahead

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the current version of Windows will run under 386 Windows, Microsoft claims. Unlike 286 DOS, however, 386 Windows hasn't been picked up by IBM yet.

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## A GATHERING OF ORGANIZERS

LONDON -- Representatives from four international labor organizations--the white collar Fédération Internationale des Employés; Techniciens et Cadres, based in Geneva; the International Metalworkers Federation; and the Postal, Telegraph, and Telephone International group--meet in London on the 12th of this month to discuss methods of organizing labor unions within IBM. About 100 delegates from around the world will be given a profile of IBM and its labor relations policy before debating union activities within the corporation and exchanging ideas about plans of action. IBM has not been invited to the meeting.

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## BASF, HITACHI CHIDED ON SOUTH AFRICA

WASHINGTON, D.C. -- It probably hasn't been too happy a holiday season for Hitachi and BASF. Under their collective Christmas tree was an open letter from several anti-apartheid organizations, trade union leaders, and the Rev. Jesse Jackson, registering the organizations' "deep concern about the role of Hitachi and BASF in supplying computers to South Africa." The letter cites a New York Times article last August that stated, "Hitachi of Japan is among the foreign companies selling computer products to the South African police." The authors note that those transactions would violate European Community and Japanese policies barring such sales, as well as possibly violating U.S. export restrictions, "since Hitachi mainframes use IBM software technology for their operation."

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## IBM ADDING SOFTWARE BODIES

TOKYO -- IBM Japan won't comment, but there's talk that the company is planning to triple the number of software developers working on applications packages for the Japanese market. Such a move may be one of the results of the recent IBM-Hitachi software licensing deal, which should eventually provide a substantial boost to IBM's software sales. Back on the hardware side, IBM Japan has also reportedly picked up another 3% of local mainframe market share in large companies during 1986.

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## SYDNEY PUMPS UP ITS COM MUSCLE

VANCOUVER, B.C. -- Canadian software consultancy Sydney Development Corp. will become one of the world's largest communications software suppliers when it completes its purchase of U.K. networking software company LDR Systems early this month. With LDR's pioneering implementations of the Open Systems Inter-

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but do you recall him ever mentioning source code?"*

It's the middle of the night. The phone rings. One of your programs has just blown up. Come and fix it.

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To keep problems from happening, The LIBRARIAN helps you monitor and control changes to make sure the proper ones get completed, tested and documented. And that only the authorized people make those changes.

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# Look Ahead

connection (OSI) networking protocols, SDC will have products for all seven layers of the OSI model. It also tightens its grip on the electronic messaging market with both its own Messenger 400 implementation of the X.400 standard and LDR's PAN-400 product. The new company will be 300 employees strong, with subsidiaries in the U.S. and the U.K., and a broad European distribution network.

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## **PHILIPS CLAIMS LAN BREAK- THROUGH**

GELDROF, THE NETHERLANDS -- The Dutch Philips group is claiming a breakthrough for a prototype fiber-optic LAN conceived at its research laboratory here. The network is now undergoing further development at Philips' Nuremberg center in West Germany, but the company is reluctant to discuss product launch dates. Spanning four miles, the network can link several hundred workstations using newly developed LAN connectors that can switch in and out of the laser beam without affecting other users.

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## **3-PART COM OFFERING DUE FROM TERADATA**

LOS ANGELES -- Teradata Corp., the seven-year-old producer of high-end database computers, this month will add communications to its DB/1012 parallel processing systems that support large relational databases. The offering will come in three parts and will permit LAN attachments. The three parts are a version of one of the company's current processors modified to enable it to talk to LANs, a set of attachment cards to permit use of a variety of common protocols, and software to reside on attached workstations.

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## **RUMORS AND RAW RANDOM DATA**

Peter Craig, president of Promod Inc., Laguna Hills, Calif., believes MIS managers, "who have been crying about backlogs," are overlooking the potential of software engineering technology. His one and a half year old company offers a series of computer aided software engineering (CASE) environments for which it last month added an Ada code frame generator, and for which it has near-term plans to offer code frame generators in Pascal and C and longer-term plans for COBOL. . . . The Toyota Motor Sales operation in Torrance, Calif., is a hotbed of applications development under IBM's DB2 relational DBMS. The company's goal is to unload applications development to the end users at the firm's three big auto making operations in Fremont, Calif., Lexington, Ky., and Cambridge, Ont. Six systems, including some that formerly ran under IMS, have been implemented on DB2. Among them are a system for combining legal and technical data in a database and a way to develop dealer profiles.

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We think it's because terminals like our VT-220-compatible WY-85 offer dramatically better *value*, any way you want to compare them. 14" tilt/swivel screen, 132-column format, low-profile adjustable keyboard. Nowhere else will you find this much performance for so little money: \$599, *green screen*; \$629, *amber screen*.

Call toll-free or write, today, for more information.

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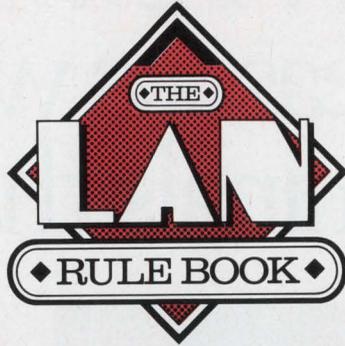
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You'll find the built-in, bi-directional tractor greatly simplifies paper handling. Just flick a switch to go from continuous forms to single-sheet feeding without having to remove the tractor paper. Push a button and it automatically reloads.

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The front panel LCD display makes this highly sophisticated machine

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MEMO

TO: The art department  
 From: The boss  
 Re: New business presentation  
 I know the new Fujitsu DL2400 is great fun, but try not to get carried away. Please narrow it down to two or three of these colors for the presentation.  
 P.M.?



**STATESIDE LUGGAGE**

J. Gutenberg  
 Mainz, Germany  
 Dear Mr. Gutenberg:  
 You'll never guess how I printed this letter. No, it wasn't with a daisywheel printer, or a laser either.  
 Believe it or not, this letter was done with a dot matrix printer.  
 Mind you, it's no ordinary printer. It's the new Fujitsu DL2400. And I can use it for a lot of things besides letters, like printing out new designs, doing my accounting and even making transparencies for presentations.  
 I can use the Fujitsu DL2400 to do all my printing. But send the service type I ordered anyway. It'll be great for monogramming luggage.

Sincerely,  
 James Smith  
 James Smith



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**CIRCLE 10 ON READER CARD**

Illustrations by the Fujitsu DL2400

10 AM  
 I need a printout of last years Accounts Payable... ASAP  
 J.R.

See it in 10:05 AM  
 Sgt  
 the new printer

DATE	DESCRIPTION	AMOUNT	BALANCE
1/15/86	...	...	...
2/15/86	...	...	...
3/15/86	...	...	...
4/15/86	...	...	...
5/15/86	...	...	...
6/15/86	...	...	...
7/15/86	...	...	...
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10/15/86	...	...	...
11/15/86	...	...	...
12/15/86	...	...	...
TOTAL			

# News in Perspective

## ARTIFICIAL INTELLIGENCE



## Building a Bridge to Expert Systems

IntelliCorp claims it's found a way to link its knowledge systems with relational databases.

BY JEFF MOAD

A year and a half ago, MIS officials at American Express Corp. decided they could improve their charge card verification system by implementing a knowledge-based hardware and software system that could automatically review a customer's credit history. There was just one problem. The system had to be tied into the company's existing large database running on IBM 3090 mainframes, and there was no off-the-shelf product that promised to merge artificial intelligence knowledge bases with mainstream databases such as IMS or DB2.

The potential rewards were such that American Express decided to go ahead anyway. A year ago the company hired Inference Corp. of Los Angeles to develop custom software, which, running Inference's Art knowledge-based system on Symbolics workstations tied together with Sun workstations, would give on-line access to the corporate database. Over 12 months and untold millions of dollars later, however, the first test version of the new American Express AI-based verification system is just now being deployed. Deployment of the complete system, though nearly on schedule, won't come until mid-1987.

"They wanted to access an existing database with hundreds of AI terminal sessions going simultaneously. It's turned out to be a complex project," Inference chief operating officer Donald Putnam remarks.

American Express certainly is not the only large company to jump on the AI bandwagon only to find its knowledge-based systems are of limited use because they can't be easily tied into one of the corporate mainstream's key resources—the central database. That shortcoming has restricted knowl-

edge-based systems in many large corporations to small, departmental applications and, according to many observers, has been a key factor in limiting the growth of the \$140 million artificial intelligence market.

One user of knowledge-based systems, Boeing AI specialist John Hoagley, complains, "We've used all of the currently available knowledge-based systems, but only in small limited applications. The inability to tie these systems into our large databases has been a critical problem. We'd like to use knowledge-based systems in mainstream applications like factory automation, but without database access, we can't."

The AI companies themselves have acknowledged their problem and in recent months have made the goal of integrating knowledge-based systems into databases and other mainstream applications the equivalent of their Holy Grail. For the most part, however, product direction

**"IT'S TURNED  
OUT TO BE A  
COMPLEX  
PROJECT."**

statements have far outnumbered actual new product announcements from AI companies aiming to bring knowledge-based systems into the mainstream. So, it may surprise some observers when AI market leader IntelliCorp, Mountain View, Ca., later this month unveils a product it claims will enable the 1,000 customers of its Knowledge Engineering Environment (Kee) knowledge-based systems software to access mainstream databases easily.

## An Upgraded Product

IntelliCorp's new product, called Kee Connection, is an upgrade of its three-year-old Kee knowledge-based software development system. The upgrade increases by a factor of 10 the number of objects Kee can recognize, which varies according to application. More significantly, Kee has received what the company calls a mapping editor, which translates Kee commands into database queries and automatically keeps track of data that are passed back and forth between Kee's object-oriented, frame-based knowledge base and a relational database using the SQL query language.

As a result, a user with an existing knowledge-based application written in Kee will be able to use the Kee Connection to tie directly into an SQL-equipped relational database.

Potential users scheduled to test Kee Connection beginning in May include Boeing (Seattle), Northrup (Los Angeles), DuPont (Aiken, S.C.), and the Los Alamos Lab.

DuPont wants to tie an AI-based process control system into its corporate database, and Northrup wants to run knowledge-based product design applications through existing databases so design engineers can compare new designs with already complet-

ed projects from which they might borrow.

Los Alamos uses Kee and other knowledge-based systems in a dozen applications, from budgeting and litigation to basic research. "Let's say we want to run an AI application on DNA coding and compare coding patterns in our database," says Los Alamos knowledge systems project chief scientist John Marinuzzi. "Right now we would have to do a manual dump of everything in our database into the knowledge base. But with on-line access to the database, we could just run the application overnight and see what it came up with."

## August Debut Possible

If the initial alpha tests prove IntelliCorp is correct and the Kee Connection works as promised in production environments, the firm will make the product commercially available in August. When that happens, says IntelliCorp chairman and chief executive Thomas P. Kehler, the company will have taken a step toward changing the way MIS thinks about AI.

"Currently, most people talk about expert systems as a way to can someone else's decision in a program. But Kee



**Thomas P. Kehler: Trying to change the way MIS thinks about AI.**

Connection brings the expert system closer to the data so Kee can address the knowledge- or rules-based part of the problem and build mainstream systems on top of that."

Apparently some in the mainstream dp world expect IntelliCorp's approach to pay off in increased sales of both AI and database systems. Kee Connection will initially run on relational database products from Oracle Corp. (Belmont, Calif.), Relational Technology Inc. (Alameda, Calif.), and Britton-Lee Inc. (Los Gatos, Calif.), with DB2 to be added late next year. Two of those, RTI and Britton-Lee, are already actively pushing for joint marketing agreements that will allow them to sell Kee Connection to their database systems customers. "We see a lot of interest in it," says RTI user interface product marketing manager Chip Hay. "A lot of our customers want to take their AI systems out of the experimental realm and turn them into delivery systems for production applications."

Of course, IntelliCorp isn't the only company planning to bridge knowledge-based systems and mainstream databases. All of the company's principal competitors—Teknowledge Inc. (Palo Alto), Inference Corp., and Carnegie Group (Pittsburgh)—have said they plan to link their knowledge-based systems into mainstream databases and applications.

Teknowledge officials say they will ship subroutines to give their S-1 system access to IBM databases by the end of 1987. Teknowledge says that plan is part of a larger effort, code-named Copernicus, which also will integrate expert systems modules directly into mainstream applications. Inference is already helping users such as American Express develop AI-to-database access utilities

on a custom basis, and plans to package some of those utilities for specific applications "early next year," according to Inference's Putnam.

Meanwhile, IntelliCorp's AI competitors criticize what they know of its approach. For one thing, while its competitors have been busy rewriting their Lisp and Prolog-based systems in more common languages like C, IntelliCorp has decided to stick to the more robust Lisp language. Critics say that means it will be harder for IntelliCorp to migrate Kee from dedicated AI hardware to general purpose workstations such as the DEC MicroVAX or the Sun Microsystems hard-

## WILL THE AI SYSTEM PERFORM PROPERLY WITH A GENERAL DATABASE APPROACH?

ware. Competitors and some potential users also wonder if a universal AI-to-database access scheme such as Kee Connection can perform fast enough to support demanding on-line applications. "I'm not at all convinced a general database access approach like that, operating across a large network of VAXs, can generate the required performance at the expert system end," says Putnam.

While the Kee Connection may bring down knowledge-based system performance, overall user productivity will be increased, insists

Kehler. "If you're an AI user and you need to hook up to your database, the issue is doing it yourself or buying a product that can do it for you," he says. It's unclear how much that productivity will cost, however, since IntelliCorp has yet to establish a price for the Kee Connection.

Kehler calls the Lisp vs. C argument a nonissue. Users don't care what Kee is written in, he says. And, although sticking to Lisp has made the migration to general purpose hardware a tougher job for IntelliCorp, Kee already is running on Sun workstations, and both Kee and Kee Connection will be running on the VAXstation in April, with the IBM RT PC and the HP 9000 to follow.

The company has developed a query and analysis application over Kee Connection that enables novice users to bypass complicated SQL queries and to construct complex database searches with the help of Kee's powerful AI rules-based features such as inferencing and forward and backward chaining. The application, code-named the Navigator and scheduled for November release, presents users with a menu-based interface and gives hints and clues about related objects and categories based on what the system already has been asked to retrieve from the database. Almost entirely mouse and menu driven, the Navigator is an AI front end that brings to databases both the ease of use of 4GLs and the intelligence of knowledge-based systems.

But IntelliCorp officials acknowledge that the Navigator raises some new challenges for the six-year-old, \$18.5 million company, which so far has sold its products primarily into a small, well-defined AI market. "We've got to learn how to sell products like the Navigator to the MIS executive," says Kehler, who in recent months has added to

his sales staff veterans of Culinet and ADR, among others.

### Stiff Competition

IntelliCorp efforts to sell Kee Connection and the Navigator to MIS will also face some stiff competition. Many of the established database software companies themselves are already developing new versions of their products that incorporate within the new relational model the rules-based, object-oriented features that make AI operations like inferencing possible (see "Sneaking in the Back," Oct. 1, p. 32). One such effort is now under way at the University of California at Berkeley, where RTI consulting vice president Michael Stonebraker is heading development of an Ingres follow-on, called Postgres, which includes a new user interface and facilities to support inferencing and forward and backward chaining. Stonebraker calls IntelliCorp's approach to marrying AI functions with existing databases "fundamentally flawed" because the database and knowledge bases are kept separated. "The knowledge base rules fundamentally involve the database, so the most efficient way is to have the database itself do everything," says Stonebraker.

Other current projects incorporating AI directly into database models include Probe, a DARPA-financed development at Computer Corporation of America (Cambridge, Mass.), IBM's Starburst development, and a similar project at Microelectronics and Computer Technology Corp. in Austin, Texas.

Most of those projects, however, appear to be several years from commercial availability—and to many, that makes Kee Connection and Navigator a promising, short-term step in the right direction. ■

## MICRO SOFTWARE



## 2 Wounded Pioneers Attempt a Comeback

Will MicroPro and Digital Research have the strength to make it over the long haul?

BY SUSAN KERR

To hear Leon Williams, new chief executive of MicroPro International Corp., tell it, being first in the market isn't all it's cracked up to be.

"It's much easier to come in as a second generation player," Williams says. "Being an early entrant in a dynamic market brings great assets but also great liabilities."

Lately, several micro-computer software pioneers—MicroPro and Digital Research Inc., in particular—have experienced more of the latter. They are trying to fight their way out of what have been at least two-year slumps.

Ask any executives from MicroPro or DRI what their company's survival plan is

and the answer is likely to be the same: focus. After expensive flirtations with handfuls of product lines, each company has decided to concentrate on what it knows best.

In MicroPro's case that means WordStar, one of the industry's first micro-based word processing programs. During the past year or two, the San Rafael, Calif.-based company has abandoned efforts to penetrate the spreadsheet and database arenas to reconcentrate on word processing. This year, the company is expected to unveil a major and long-awaited upgrade for the estimated 500,000 to 1 million copies of WordStar still in use.

Ten-year-old DRI, Monterey, Calif., is the developer of CP/M, the first disk-based operating system and, more

## News in Perspective

recently, GEM, the Graphics Environment Manager interface and applications set. The origin of DRI's current woes can probably be traced to the date IBM introduced its first Personal Computer complete with Microsoft's MS/DOS, an event that signaled a lesser role for CP/M in the 16-bit computer world. But operating systems and graphics are still the "grass roots" of DRI, says chief operating officer Bob Obuch.

This back-to-basics movement is prompted by the simple fact that smaller companies can support fewer products. Both companies are unprofitable and hit their revenue peaks in 1984: \$66.9 million for publicly traded MicroPro and an estimated \$50 million for privately held DRI. Accompanying the falling revenues has been a series of layoffs and the ouster of both companies' ceos.

### Mixed Views of Prospects

Observers have mixed views of the prospects for success. "I think the big three—Microsoft, Ashton-Tate, and Lotus—will keep swallowing up their competitors," says Alan Gross, member and former president of the New York-based Microcomputer Managers Association, which consists of companies that make large purchases of personal computers. "The word processing market is extremely fragmented and graphics is not really a big enough arena. I might buy one or two [graphics] units for every 100 people, whereas I buy 100 spreadsheets and maybe 30 database products."

Gross says MicroPro still has a presence in the market, but, he notes, "I've not seen DRI in years."

Of the two, MicroPro may have a better shot at a new life because of the breathing room provided by a total installed base of 2.4 mil-



**Bob Obuch: Going back to the "grass roots" of Digital Research.**

lion units and \$20 million in cash on hand. DRI is having a hard time living down its image of being too "techie" and not well attuned to the market. "DRI has good development people but they haven't had strong marketing," asserts Gordon Eubanks, a former DRI vice president and currently president of Syman- tec Inc.

One bright light for DRI may be the return of DRI's chief technical wizard, founder and chairman Gary Kildall. Kildall resigned as chief executive officer in mid-1985 to concentrate on a CD-ROM startup, but he was brought back last October as interim president and ceo, replacing John Rowley. The company is looking for a full-time ceo.

In its latest fiscal year, ended Aug. 31, 1986, MicroPro reported revenues of \$38.2 million and a \$1.2 million loss. The company was barely profitable the year before.

Prior to the announcement of the latest financial results, MicroPro's chief executive, H. Glen Haney, was removed, and 20% of its domestic staff was laid off. Williams, formerly a senior vice president at McGraw-Hill's Business and Financial Information Cos. and president of Monchik-Weber, was

brought on board.

These moves are credited to New York venture capitalist and MicroPro board member Fred Adler. Along with Haney's ouster, Adler revamped MicroPro's board. Today, three of its six members are from Adler & Co.

Haney "was much slower to downsize the company than I would have been," says Adler. There was one justifiable reason, he admits. During the first half of 1986, MicroPro talked to several companies about a merger, but none offered enough money to make a deal worthwhile.

With the benefit of hindsight, both MicroPro and DRI realize that focus has long been a problem.

Yet, while MicroPro was busy broadening its product lines it also faced new and more aggressive competition in its core word processing market. In 1982, MicroPro held more than 65% of that market, according to Info-Corp software research director William Higgs. Today, that number is down to roughly 9%, behind industry leader WordPerfect Corp.'s 12%.

One reason is the second generation products, as Williams calls them. A new group of products with more advanced features came out in 1983 to compete against



**Leon Williams: Aware of the "liabilities" of being first.**

WordStar. To counter, MicroPro introduced in late 1984 WordStar 2000, a new word processing program with a user interface designed to be friendlier than WordStar's.

Early this year, the company is expected to offer WordStar users an upgrade for less than \$100. Among the new features will be "on-screen bold, subdirectory support, and a thesaurus," says Williams.

### Outside the Company

Also coming in 1987 will be a WordStar 2000 enhancement with "much better file support and information retrieval support," says Williams. Later in the year the firm will introduce its first desktop publishing program for the IBM PC, designed to compete with packages from Aldus Corp. and Ventura.

DRI, along with its revamped operating system and graphics division, recently created a wholly owned subsidiary, called Interconnexions Inc. Its purpose is to explore products to interconnect different communications frameworks, as well as to produce systems software for the 80386 that will support software written for multiple operating systems, including DOS and Unix. First products should be unveiled later this year.

Whether or not Interconnexions is successful will probably have little bearing on DRI's future, according to Obuch. DRI is putting a "minimal investment and some muscle behind some of the product lines and maybe they will and maybe they won't be successful," he says, "but it would be kind of foolish for us not to try."

"We're not looking at setting the world on fire. Everybody looks for the \$100 million-plus kind of company but the micro industry is maturing. It isn't what it used to be." ■

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## MANUFACTURING

### In Search of CIM

The race to the factory floor gets hot as MSA makes a power play for the number one spot.

BY TOM McCUSKER

Computer integrated manufacturing (CIM), still viewed by many in the computer industry as a distant goal, has nevertheless caught the attention of major independent software companies. Their race from the MIS department to the factory floor follows a path of mergers, acquisitions, joint ventures, and other alliances all aimed at eventually offering integrated solutions for planning, control, design, and fabrication in tomorrow's factories.

The latest surge occurred in November '86 when the largest of the independent software companies, Atlanta-based Management Science America, catapulted to the top of the list of contestants by acquiring Comserv Corp. of Eagan, Minn., for \$10 million.

#### 500 Amaps Customers

Founded in 1968, Comserv has 500 IBM mainframe customers for its Amaps manufacturing software and 100 customers for its manufacturing software running on Hewlett-Packard 3000 minicomputers; MSA has 175 mainframe and 400 IBM System/36 and 38 customers, according to MSA.

MSA entered the manufacturing software market in 1982 when it acquired Arista Manufacturing Systems, Winston-Salem, N.C., from Xerox Corp., thus providing itself with an MRPII (second generation manufacturing resource planning) system. It expanded the system the next year with order processing, distribution, and forecasting modules when it acquired Hampden, Conn.-based Computer-

istics Inc. Through other smaller alliances and its own development efforts, MSA has updated and rewritten the Arista product to one which has 1 million lines of code from the 200,000 lines that comprised the product when it was acquired. It is now called Expert Series.

Other companies have entered the market by acquisitions, including Martin Marietta Data Systems, Greenbelt, Md. In 1975, the company acquired Hoskins of London, which it still operates as a wholly owned subsidiary, to market Marietta's products overseas.

Cullinet Software, Westwood, Mass., entered the market by acquiring rights to an MRPII product made by Rath & Strong, Dallas, and rewriting it in Cullinet's fourth generation language, Application Development System (ADS/O). The rewritten product is called Applications System Manufacturing. Cullinet has 250 mainframe manufacturing sites, reports research firm International Data Corp., Framingham, Mass.

Two years ago, McCormack & Dodge, Natick, Mass., acquired all of Rath & Strong, whose product is called Production and Inventory Optimization System (PIOS).

As could be expected, IBM dominates the manufacturing software marketplace with 500 installations of a product called COPICS and 10,000 copies of a product called MAPICS, according to International Data Corp.

MAPICS is used on the IBM System/36 and 38, a market that MSA entered last summer with the acquisition of RTS

(Real Time Systems) Ltd., of Dublin, Ireland. Neither IBM product is considered a threat by the independents because their applications are allegedly too generalized. "COPICS is a sort of starter kit," says Dennis Vohs, president of the new company being formed by MSA and Comserv. Tanya Amochaev, executive vice president of the merged unit, says some products under development at Comserv will be sold as additions to MAPICS products.

The Comserv acquisition also gives MSA a package called G-Amaps that can be sold to very large prime defense contractors and thrusts MSA into the world of Hewlett-Packard, considered to be a major hardware player along with Digital Equipment Corp., in future and present factory automation developments. Comserv's Amaps/3000 runs on the HP 3000 at some 250 installations.

Vohs says his company plans an in-house development project to transport its products to DEC VAX machines later this year. Products that will link MSA's Expert System to shop floor data collection systems and to materials handling systems are next in order. Comserv last summer introduced a product called CADlink that ties its system to IBM's CADAM computer aided design product.



Dennis Vohs, president, says the new MSA/Comserv company will port its products to VAXs.

What MSA and other major players in the manufacturing software market envision is a three-level penetration—with their products running on mainframes at the corporate level, on minicomputers in the factory, and on personal computers on the individual level. Most of the companies plan to or already have two or three of these levels. MSA, through its Comserv and RTS units, runs its software on IBM mainframes, IBM System/36s and 38s, and Hewlett-Packard minicomputers, with DEC to follow. Comserv also is aligned with a company called Fourth Shift Inc., also in Eagan, which is said by Amochaev to have installed IBM PCs that will run MRPII data downloaded from IBM mainframe databases.

#### Two Companies Acquired

Cullinet last year acquired Esvel Corp. of San Jose to give it the same three-level capability. Esvel has developed hardware-independent database systems. Cullinet last year also acquired Computer Strategies Inc., Grand Rapids, Mich., which has a repetitive manufacturing system for VAX computers.

Cullinet also developed a repetitive module for its mainframe-based Applications Systems Manufacturing product.

Rounding out Cullinet's new products is a government contracting package called CTRK that the company has developed to allow its MRPII products to be used by large prime defense contractors.

Unlike most of the competitors in the IBM mainframe environment that support multiple databases, Cullinet's MRPII products support only the firm's IDMS/R relational database. Competitors consider this a drawback that restricts a client's options, especially clients considering

using IBM's DB2 relational product.

Lewis says he doesn't know at this time if Cullinet will ever support multiple databases, but comments that

**"ALL THAT TALK ABOUT CIM, THE UNMANNED FACTORY, IS A LOT OF HOGWASH."**

the company now supports many of the functions that DB2 offers. "We will support all of the functions that our customers need," he adds.

Vohs of MSA says Cullinet will find it awkward to operate in a DB2 world if all of its manufacturing software tools are aimed at IDMS.

Martin Marietta Data Systems, whose U.S. business is split among 130 federal and commercial customers, offers its MAS (Modular Applications Software) packages in the IBM, Hewlett-Packard, and Digital Equipment environments. The company believes that selling software only is not good business in this market, according to Patrick Zilvitis, the Data Systems division president.

The company offers consulting and systems integration and even sells hardware to clients. Its CAD and factory data collection systems aren't integrated with its main MRPII products because Zilvitis thinks customers would prefer to have these functions customized.

Xerox Computer Services, which sells the Xerox Business Management MRPII

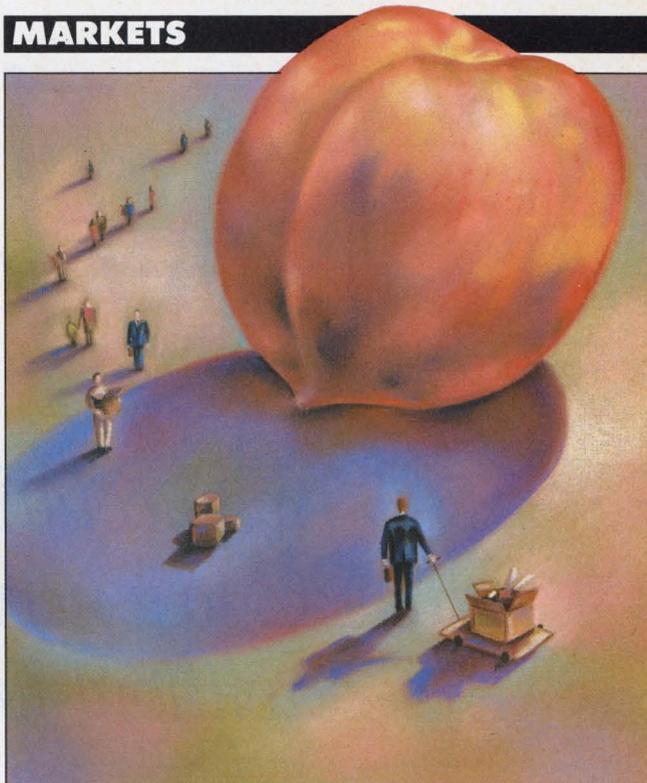
product, and Cincom Systems, Cincinnati, with its 13-module product called Control:Manufacturing, both believe in developing products in-house. Cincom soon will introduce new products aimed at defense subcontractors and users of project management and will offer repetitive systems for the Just-in-time users. Its products operate in IBM and Digital Equipment environments. Xerox's offerings are restricted to IBM 30XX and 4300 environments. But new products, perhaps relating to personal computer capabilities, may be on the way, says a Xerox spokesman. Both Xerox and Cincom have about 150 installations for each of their products.

McCormack & Dodge also remains silent about its plans, but observers expect the company soon could announce a DEC capability. With fewer than 75 installations of its product, PIOS, the company is said to be rewriting the product to fit within its Millennium integrated environment and thereby appeal to the commercial markets. Its C/PIOS (for Contract) is considered a leading product for use in the prime defense contracting industry.

As these leading firms—among at least 25 major players including such stalwarts as Boeing, NCR, and Unisys—hasten to begin offering CIM-oriented products, there are many who feel they face tough sledding, or at least a long wait.

"All that talk about CIM, the unmanned factory with the lights out, is a lot of hogwash," is the way Adam Zais, who follows the CIM market for International Data Corp., sees it. He says the ingredients of a truly integrated CIM aren't there today. Others note that hardware manufacturers, notably IBM, who are seeking to lock in prospects, are bidding computers that don't even exist today. ■

## MARKETS



# Making a Mark As a High-Tech Hub

## Despite Atlanta's success, some in The Big Peach search for an identity and answers to growth limits.

BY WILLIE SCHATZ

In the beginning, there was Scientific-Atlanta. Six engineers with \$100 each, a high-tech idea, and the virgin territory of Atlanta in which to see if it would fly.

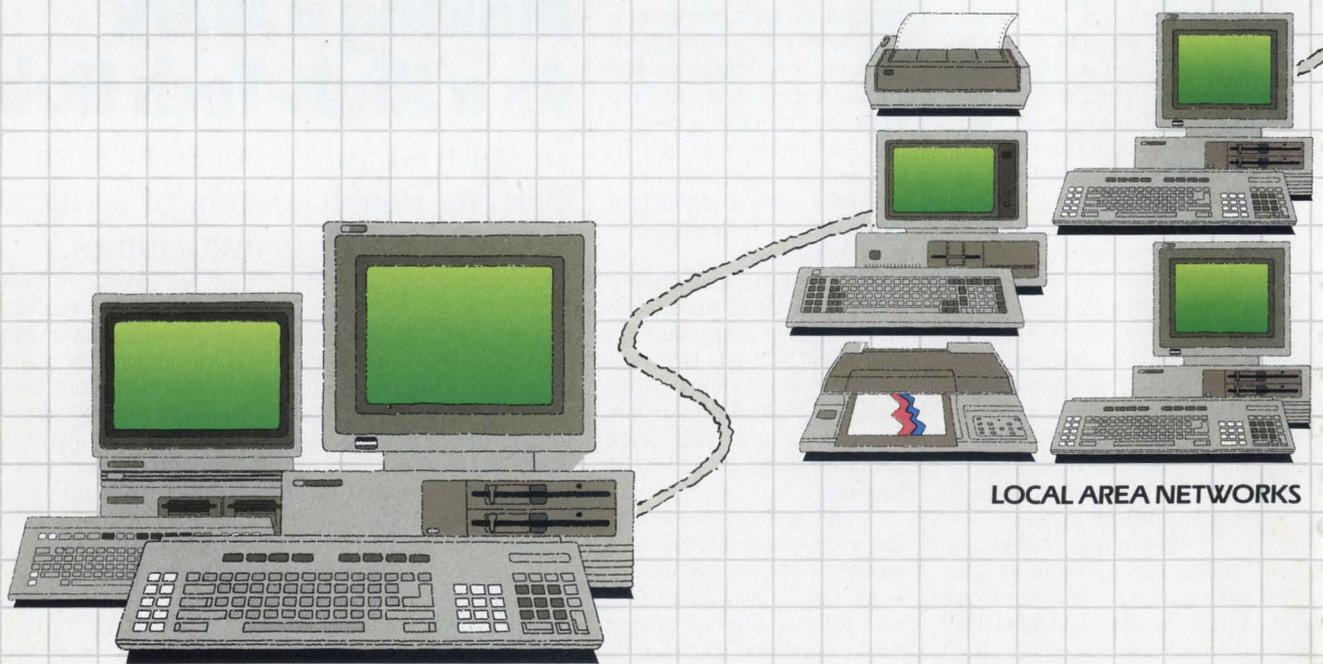
Now, the city is the home of the world's largest fiber-optic cable producer, AT&T; the world's leading modem maker, Hayes; and the world's leading independent supplier of mainframe applications software, Management Science America (MSA). And even though computer showrooms such as Dallas' Infomart and San Jose's Data-mart haven't been especially successful (see "Wide of the Mark," Sept. 1, 1986,

p. 31), Atlanta's become so confident that the city's best architect is planning to build a large computer mart called Inforum (ground breaking is scheduled to begin shortly.) Not bad for a town whose historical high point was its burning during the Civil War.

So Atlanta's come a long way, baby, as evidenced by the third Atlanta Technology Tour recently sponsored by 28 of the city's top technology companies, the State of Georgia, and the Georgia Institute of Technology. But Atlanta's not sure how much farther it has to—or wants to—travel before Technology Crescent is mentioned in the same breath with Route 128 and Silicon Valley.

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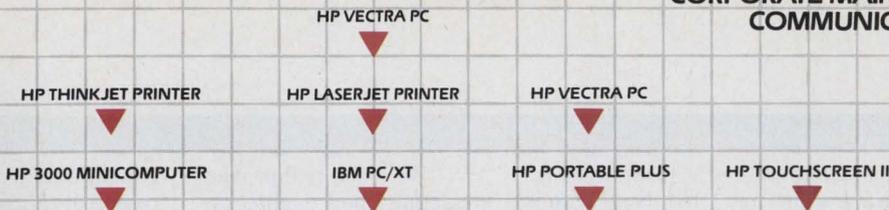
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"We've got the critical mass a city needs to become a technology center," says Michael Lott, vice president of Citizens and Southern Bank, Atlanta. "I'm not sure how or when we got it, but it's there. Companies that wouldn't think of Atlanta as a place to locate three years ago think of us routinely now. It's been an aggrandizement of our image.

"But it's too early for us to use Silicon Valley or Route 128 as models. We're not far enough along to see what we're going to be. Our character isn't molded yet. We still need a goal."

Would being number one on the high-tech hit parade do? This is America, after all. If winning isn't the only thing, it's pretty darn close. So you wanna be number five or number three or what?

### Never as Visible as Valley

"We're never going to have as much visibility as the Valley or 128," says John Alderman, president of Innovative Technology, a marketer of telephone automation products for the IBM PC. Alderman has been on the Atlanta high-tech scene since the dinosaur days of the early 1970s.

"But we can get a significant amount of that Valley-128 visibility," Alderman contends. "We're much more visible than we were five years ago. There were few companies big enough to attract national attention then. Now, we're a five or six on a recognition scale of 10. There are a few people beginning to talk about what a good place this is for high tech. But it's not the wild fratricidal zoo that San Jose is."

By the numbers, Georgia doesn't have much of a high-tech hand. According to a January 1986 survey of the American Electronics Association, California has 4,342 high-tech electronics companies, just a few more than sec-

ond-place Massachusetts, which has 1,161. New York is third with 1,103. Georgia is 15th, with 309. Not the kind of stats that make companies want to pack up and head South.

Yet, a great many firms seem to have Georgia on their mind. The state is second only to California in Japanese investments. Atlanta has the cheapest office space of any peer city. It also has a 19% vacancy rate, which means your favorite space can be had for a song. Or \$18.05 per square foot, whichever is less.

Atlanta also managed to avoid the bad trip that plagued the high-tech industry in 1985. The top 50 Atlanta-based high-tech companies posted an average 20% revenue increase, along with an 8% employment gain. Gwinnett County, where much of the Technology Crescent is located, has for the last two years been the fastest-growing county in the country.

None of this growth would have been possible without Georgia Tech. The school song talks about a ramblin' wreck who is one hell of an engineer, and whoever wrote the words got that right. Tech conducts the largest engineering research and development program of any publicly supported university in the United States. The school ranks second in the country in both dollar volume and percentage of industry-supported research.

"Tech is the catalyst in making Atlanta a high-tech center," says Said Mohammadioun, president of Samna Corp., an office automation products manufacturer. "Tech brings students to Atlanta and creates engineers. Atlanta keeps them."

It wasn't always that way. Not that long ago, Tech graduates pictured Atlanta as a town for losers, and they were pulling out of there to win.

"We had a real problem attracting good engineers," says Glen Robinson, one of the founders of Scientific-Atlanta and now chairman of E-Tech, which develops energy saving products. "After World War II, Atlanta was re-

**"WE'RE NOT FAR ENOUGH ALONG TO SEE WHAT WE'RE GOING TO BE. OUR CHARACTER ISN'T MOLDED YET."**

garded as a sleepy redneck town. Nobody wanted to come here for a job because it was a bad place and there were very few high-tech opportunities. And the Tech grads didn't want to stay because there weren't many jobs."

By making Scientific-Atlanta into a leading advanced electronics manufacturer, Robinson and his colleagues improved the city's high-tech image. But it was hardly the first place one thought of when talking high tech.

It still isn't. But the times they are a-changin'.

"Tech students used to feel they had to leave Atlanta to get a high-tech job," says Dennis Hayes, modem's main man. "They don't feel that way anymore. Atlanta's got a base to develop high-tech skills. Tech's played a major role in that. It's been a real catalyst."

So has Hayes. When he graduated Tech, he wanted to market a device that would let

computers talk to each other over telephone lines. But 1977 was the wrong time, and Atlanta was the wrong town. So he retreated to his dining room table, and the rest is history.

By starting Hayes Microcomputer Products Inc. and capturing over 70% of the modem market, he has helped blaze an entrepreneurial trail in Atlanta. Two thirds of the companies in the Technology Crescent are locally founded, and 60% were formed within the last decade.

The signs are everywhere. Mohammadioun founded Samna with three other engineers "because I wanted to leave Lanier, I didn't want to relocate, and I didn't want to work for a big company." There weren't many small, growing, high-tech companies around in 1982, so Mohammadioun went his own way.

Gary Robertson had worked for Peachtree Software and MSA before he formed the Software Link. With Robertson as director of sales and marketing, the company in just three years has become a force in multi-user networking systems. Revenues grew 543% during 1985.

### Fastest Growing Small Firm

Larry Dean has transformed 15-year-old Stockholder Systems, a designer and seller of financial packages for IBM mainframes, into the nation's fastest-growing small company in 1985, according to *Financial World* magazine. Thanks to J. Leland Strange, Atlanta hit another high-tech home run. His company, Intelligent Systems Corp., was the first company to integrate a microprocessor chip into a terminal to produce an intelligent terminal. Despite its recent troubles, it remains in the top echelon of the micro enhancement market.

That's great stuff, but

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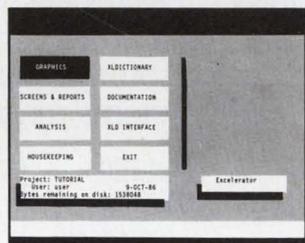
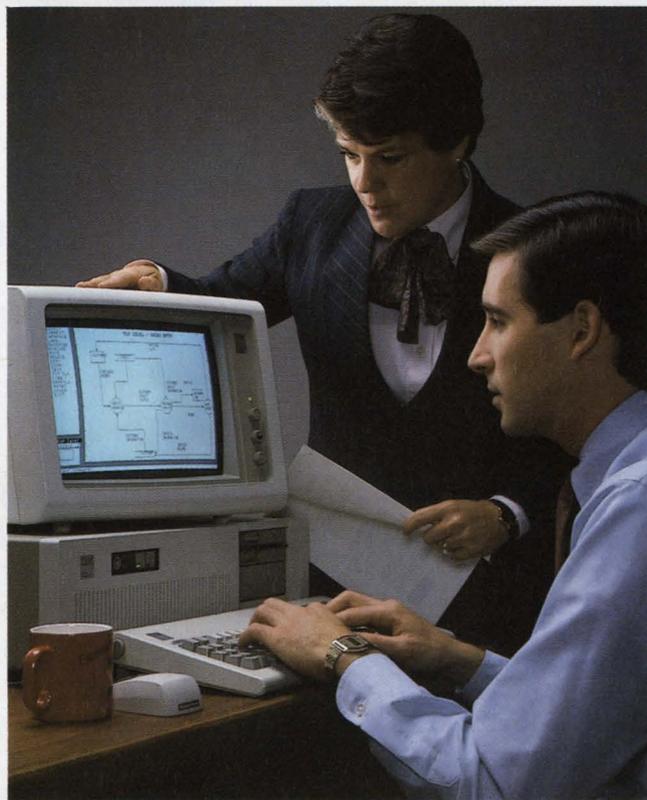
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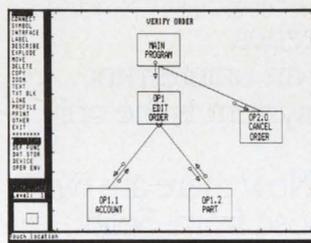
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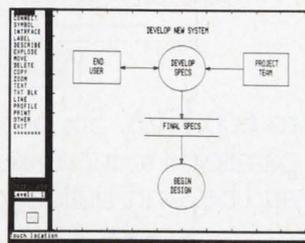
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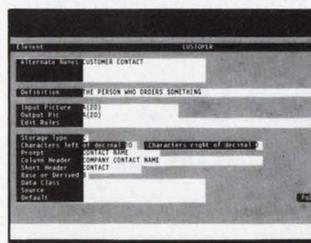
Main Menu



Structure Chart



Data Flow Diagram



Data Dictionary

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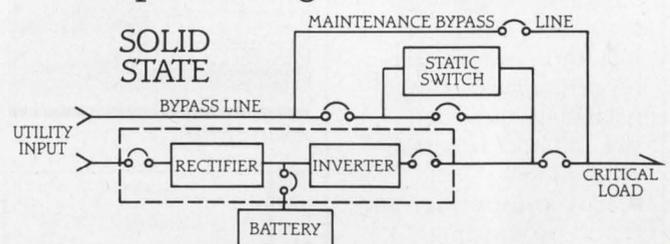
In fact, this all-electronic UPS technology is growing so fast that we've formed a new subsidiary, Ultimate Power Systems,™ to efficiently handle the business.

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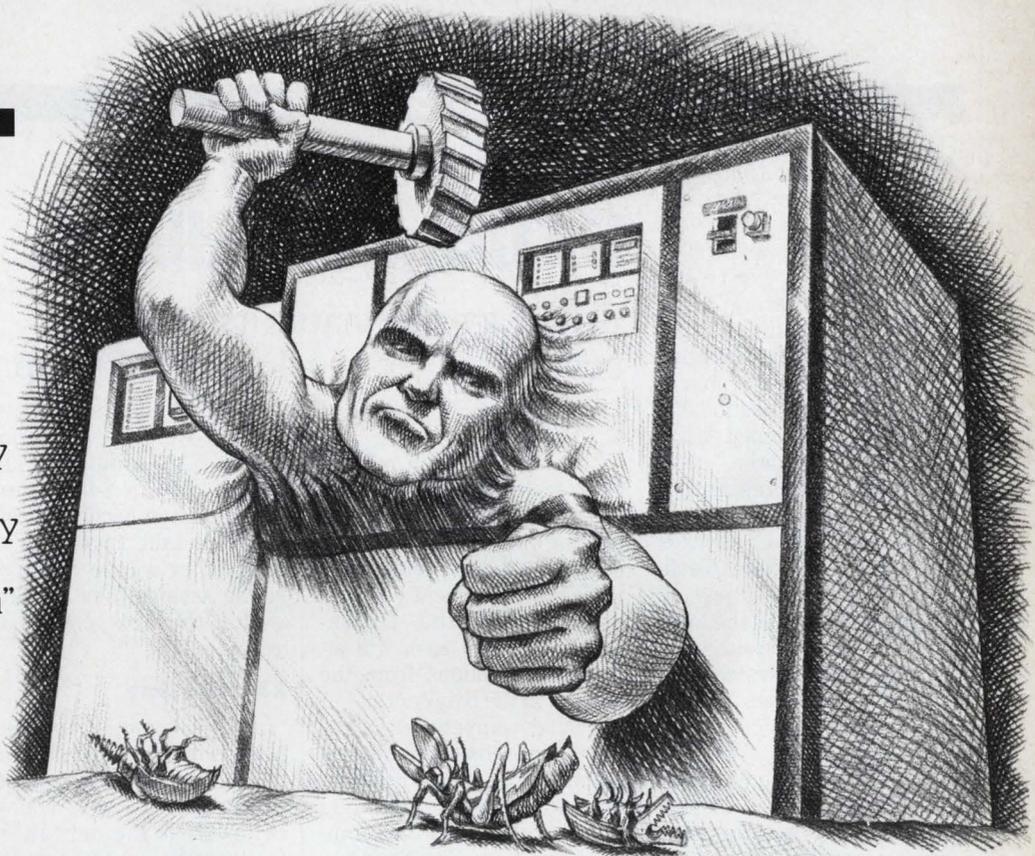
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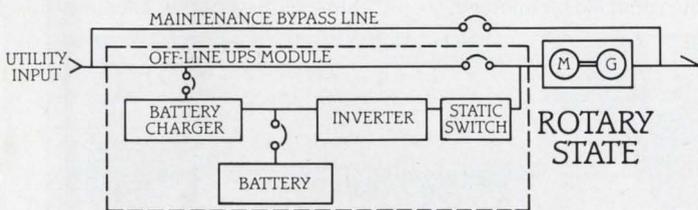
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CIRCLE 15 ON READER CARD

## APPLICATIONS

# Getting a Leg Up by Using Handhelds

### Frito-Lay automates its routes as competition in snack foods heats up.

BY ROBERT J. CRUTCHFIELD

After more than four years of evaluation, Frito-Lay is embarking on a program to equip its 10,000-person route sales force with handheld computers—devices the Dallas-based company says will affect its operations from the kitchen to the data center.

The competition in the snack food industry is heating up, with large companies such as Anheuser-Busch entering the market and regional companies such as Laura Scudder, Anaheim, Calif., chipping away at Frito-Lay's precious shelf space in grocers' snack food sections.

The company will use the handheld computers to better monitor the movement of its snack food products. Data captured by the devices, the company says, will help Frito-Lay justify its share of shelf space to grocers. The handhelds also will be used to make route drivers more productive and to automate the inventory and ordering process.

Frito-Lay racked up revenues totaling almost half of the snack food industry's \$7 billion in sales last year, according to the Snack Food Association, the industry's Alexandria, Va.-based trade association. Despite its size, the industry experienced only a 5% growth rate in 1985—its slowest since 1980. Frito-Lay, after double-digit growth of 11% in 1984, watched its growth rate drop to 5% in 1985. Analysts forecast a flat growth rate for 1986.

The industry slowdown

has been a catalyst in Frito-Lay's move to new technologies. The company estimates that its \$45 million investment in handheld computers and the upgrade of its data center will be recouped in the savings they produce within the next couple of years.

#### A Strategic Move

By committing to handhelds now, Frito-Lay may be getting a leg up on the competition, analysts say. Today, Frito-Lay is the only snack food vendor whose national sales force will use handheld computers. Route salespeople working for other snack food vendors—including the Wise potato chip division of Borden, located in Columbus, Ohio, and megabrewer Anheuser-Busch's Eagle Snacks, St. Louis—still fill out order forms for each of their customers.

Internal considerations also contributed to the company's decision to implement the handheld technology.

"By mid-1986," says Monte Jones, director of sales systems development for Frito-Lay, "growth in new products had reached a point where Frito-Lay was printing new order forms for the sales force every week." In essence, Frito-Lay, a division of PepsiCo, Purchase, N.Y., was getting buried in paper.

Frito-Lay's manufacturing and store-delivery systems move materials from the farm to the grocery shelf in only a few weeks. The operation consists of 38 plants manufacturing nearly 100 products in 240 package sizes, which are then shipped to 1,650 distribution centers.

A route salesperson, working out of a distribution center, fills out at least two forms per account—and some routes have more than 50 customers. When the forms reach the company's Dallas headquarters from the field, the paperwork has to be keyed into the system by one of more than 1,000 data entry operators.

According to Charles Feld, vice president of management services at Frito-Lay, the company's MIS department sought competitive bids from the industry. After looking at proposals from IBM, Hewlett-Packard, and NCR, Frito-Lay chose a machine from Fujitsu because

it's not exactly unique. After all, the Steves Jobs and Wozniak didn't start out in particularly posh quarters. Does this make Atlanta the next Valley or 128? Hardly. We're not talking first tier here. We may not even be talking Silicon Forest or Research Triangle.

"Three years back, you'd get a lot of questionable looks if you mentioned Atlanta as a high-tech area," says Chuck Johnson, president of Sales Technologies. When the company showed up three years ago at the Atlanta Technology Tour, it was just an idea. Now it's one of the leading providers of field sales force automation systems for large U.S. companies.

"That's changed quite a bit," Johnson says. "We need more high-tech identity, but the success of MSA, Hayes, and Scientific-Atlanta have given us considerable recognition and visibility. And because Atlanta's strength is in software and services companies, that keeps us fleeter on our feet. That means no heavy capital expenditures, no big plants, and no capital-intensive labor. We're insulated from some of that industry volatility."

#### The Crescent Is Shining

Well, Hayes, MSA, and Intelligent Systems might not quite see it that way. But they won't argue that the Technology Crescent is shining. It's just a question of how bright.

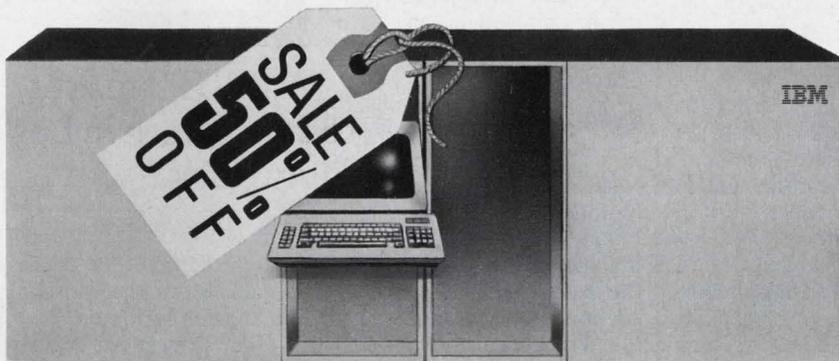
"We've got a way to go, but high tech is respectable, maybe even a bit fashionable now," says Innovative Technologies' Alderman. "It wasn't that way 10 years ago. The way you know you've made it is when there are local venture capital firms, and we've had that since the late '70s.

"Let's put it this way. There are certainly a hell of a lot more lines of COBOL written around here than there are rows of corn plowed." ■



A Frito-Lay salesman checks shelf stock using a Fujitsu-made terminal.

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V5 applies artificial intelligence to SQL query optimization. For example, few DBMSs can optimize the query "Select accounts 90-days overdue and accounts over \$10,000." But only ORACLE can optimize "Select accounts 90-days overdue or accounts over \$10,000."

### □ REASON #2: ARRAY PROCESSING OPTIMIZES ACCESS TO LARGE SETS OF DATA.

Relational DBMSs have always dealt with logical sets of data. But they manipulated only one physical record at a time. V5 eliminates overhead by physically delivering arrays of hundreds, even thousands, of records at a time.

### □ REASON #3: PARALLEL-PROCESSING OPTIMIZES COMPUTER RESOURCE USAGE.

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### □ REASON #4: MULTI-TABLE CLUSTERING OPTIMIZES JOINS.

ORACLE stores data from different tables on the same physical disk page. This technique—called *multi-table clustering*—permits you to access data from multiple tables in one disk read operation. Clustering improves ORACLE performance on all multi-table operations, such as join queries, update transactions, etc.

### □ REASON #5: HIGH-SPEED RELATIONAL SORT FACILITY OPTIMIZES DATA AGGREGATION

Ad hoc relational queries frequently request that data be grouped, ordered or otherwise sorted. V5's internal sort facility performs aggregation and elimination early, faster than previously thought possible.

### □ REASON #6: EFFICIENT ROW-LEVEL LOCKING OPTIMIZES TRANSACTION THRUPT.

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AL Huntsville . . . . . Dec 9	Orlando . . . . . Sep 17, Nov 18	MN Minneapolis . . . . . Jul 22, Sep 9, Nov 4, Dec 18	Cleveland . . . . . Jul 22, Sep 23, Oct 28, Nov 13	Lubbock . . . . . Oct 2
AZ Phoenix . . . . . Aug 5, Oct 16, Dec 2	GA Atlanta . . . . . Sep 23, Nov 6	MO Kansas City . . . . . Nov 12	Columbus . . . . . Aug 12, Sep 24, Oct 29, Nov 12	San Antonio . . . . . Aug 27, Nov 5
CA Los Angeles . . . . . Aug 6, Dec 11, Oct 14, Nov 13, Dec 16	IA Des Moines . . . . . Aug 27, Oct 29, Nov 11	MS Jackson . . . . . Sep 11	Dayton . . . . . Sep 9, Nov 5	UT Salt Lake City . . . . . Aug 6, Sep 16, Oct 7, Dec 4
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CT Hartford . . . . . Sep 10, Oct 22, Nov 13	IL Chicago . . . . . Aug 14, Sep 18, Oct 9, Nov 5, Dec 18	NE Omaha . . . . . Sep 24	OR Portland . . . . . Jul 24, Sep 23, Nov 6	VA Richmond . . . . . Sep 10
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	KS Wichita . . . . . Sep 4	NY Albany . . . . . Jul 23, Sep 11, Nov 20	Harrisburg . . . . . Nov 6	WI Milwaukee . . . . . Sep 9, Nov 13
	KY Louisville . . . . . Aug 7	OH Akron . . . . . Jul 23	King of Prussia . . . . . Jul 24	
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	MA Boston . . . . . Sep 16, Oct 15, Nov 12, Dec 10		Pittsburgh . . . . . Aug 7, Oct 16, Dec 9	
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the Japanese vendor could deliver a product that was rugged and modifiable by Frito-Lay for its route sales force at a competitive price. The handheld computers Frito-Lay is in the process of acquiring are priced at about \$2,100 each and are equipped with 256KB of memory, a printer (which remains on the van), and a modem.

## The Impact on MIS

To accommodate the handhelds, there have been changes in the data center. The MIS department is adding an IBM 3090 to its 3084 to provide for the handhelds as well as for company growth. It is also in the process of converting from the 3420 tape drive to the 3480. To upload information captured by the handhelds and download new price lists to the units, IBM 8100s are being installed in all of the distribution centers. Data go into an IMS database and later into DB2.

There have also been personnel changes. Feld says his data center staff used to work three 12-hour shifts. Now, they work five regular eight-hour days. "I changed the shift schedule so there would be more continuity in the data center and my staff would get an understanding of the flow of the work on a day-to-day basis," he says.

Feld adds that under the old schedule, operators and programmers rarely worked on the same day every week. Now, the day shift supports interactive, real-time applications, the evening shift supports handhelds, and the night shift the batch applications. "Now, the staff knows on a day-by-day basis what should be happening," he says.

To date, there are only 200 Fujitsu handheld computers being tested in the Dallas and Minneapolis areas. By the end of 1987, Frito-Lay projects, half of its sales force will be equipped with the units

and, by 1988, the remainder will be too.

The results from the first 200 units already in the field look encouraging. According to Jones, there are signs that productivity on the route has already improved as a result of the devices. At the distribution center, the company found improvement in processing orders and in keeping inventory.

"I'm not kidding when I say that the three most important events in our company's history have been the step van, Nacho Doritos, and the handheld computer," Jones says.

Despite the early results, there are still concerns. Feld says that support and training are critical.

"The problem is not managing the network, but training and support. We have to learn how to handle inquiries from 10,000 people," Feld adds. The MIS executive says Frito-Lay is looking at

**"THE PROBLEM IS NOT MANAGING THE NETWORK, BUT TRAINING AND SUPPORT."**

several support options. "Suppose there is a rash of battery problems. How does our center handle the calls from the entire sales force in the field?"

One possibility, Feld says, is a computerized phone system that would take the user through several steps to

evaluate a problem before human help is required. The system could also broadcast messages like, "We shipped a bad batch of batteries; please change your battery immediately."

## A Positive Reaction

So far, according to Jones, salespeople using the handhelds like them. "We found that the fear of using handhelds was bigger than the experience" has warranted, he adds.

Fred Carman, a former route salesperson now involved in handheld testing, evaluating, and training for Frito-Lay, says that one of the biggest advantages is that the device cuts an hour of paperwork out of the day. It also helps salespeople find out where they are either over or short in cash.

"After using the handheld, I wouldn't want to do paperwork manually anymore," Carman says.

In the future, Jones sees opportunities to apply "Just-in-time" principles, such as allocations based on orders, to the snack food business. For example, types of potato chips will be prepared based on demand determined by orders received from the routes. Additionally, sales could be broken down by product and location, something that is not possible now.

Indeed, there are widespread applications for handheld computers in other fields that utilize route sales, such as the beverage industry. Since Pepsico also owns Pepsi Cola and the procedure for its route sales force is about the same, handhelds may turn up in that division, an insider says.

Will handhelds enjoy the popularity of Nacho Doritos? Only time will tell if this device will keep its place in the Frito-Lay hall of fame with the other charter member, the step van. ■

## APPLICATIONS

# Marathon Mania

## An OLTP maker runs a race in Los Angeles.

BY EDITH D. MYERS

Tandem Computers Inc. is betting big on the March 1 Los Angeles Marathon.

The 12-year-old Cupertino, Calif.-based firm does not feel that it has been running a good race in the lucrative Southern California computer market and hopes its costly venture into marathon sponsorship will enhance its presence on the course. Tandem paid a fee of \$150,000 to be the official computer sponsor for the marathon and is tying up an additional \$400,000 worth of computer equipment for six months in support of the event.

"A gold mine," is how Ralph Chiarella, Tandem's regional business development manager for the southwest district, of which Southern California is an important part, speaks of the "Los Angeles basin." Tandem had revenues of \$757,793,000 in fiscal 1986, ended Sept. 30, 1986, with profits of \$63,766,000, but "the southwest region accounts for 5%," says Chiarella, "and we're a California company."

This won't be Tandem's first marathon. It reported times and handled other computer-based chores for the London Marathon last April. Los Angeles Marathon officials also attended "and saw what we could do," says Chiarella. The London Marathon this year had 22,000 entrants and 18,120 finishers.

Fault tolerant has been Tandem's watchword since the company was formed, and Los Angeles will see one of

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**TESTIMONIALS FROM USERS  
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**BENEFITS TO USERS  
SPURRED THE MONITOR'S  
RAPID GROWTH**

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The ability to perform capacity planning, and the use of PF keys to drive the system, were other benefits noted by these respondents. Low cost, ease of use, and low resource utilization were candidates for high honors on the lists of many of these users.

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Tandem's EXT25 system will be used to score the L.A. Marathon, the same system used in the London Marathon pictured here.

the first uses of Tandem's EXT25 distributed fault tolerant computer, which was introduced last August. Tandem will install an EXT25 near the finish line (in early December it hadn't been decided whether that would be in the Los Angeles Coliseum, where the actual finish line will be, or in the nearby Los Angeles Sports Arena), as well as one at television station KCOP, which will be televising the marathon.

### Faster Results Planned

One of the things Tandem is planning to do is to get race results out faster than ever before—15 minutes or less for early finishers and in no more than one hour for the laggards. A "clicker" tied to the computer will be pushed by a volunteer as each runner crosses the finish line.

Each finisher will be led into one of three chutes, where bar codes from bibs will be collected in order, scanned, and matched with the finish times. Complete results should be available within one hour of the last finisher's crossing.

Chiarella acknowledges

that making Tandem a household word in the Los Angeles area is really not what it's all about.

"We want to reach the business community, business leaders. It's our assumption that sports like golf and running attract these people. We're basing this assumption in part on who ran last year. We have no way of knowing who watched."

Tandem's president and ceo, James G. Treybig, and vice president and chief operating officer, Robert C. Marshall, will be among a contingent of runners for Tandem that numbered 140 employees and 30 customers in early December, when applications were still being taken.

Tandem's active participation in the race has been under way since last October.

Although it is using a sporting event to get attention, Chiarella says that Tandem isn't looking at sports as a market for its fault tolerant computers, which are characterized as OLTP (on-line transaction processing) machines. "But," he adds, "this is a great way to show what they can do." ■

## BENCHMARKS

### Perot Splits With GM

H. Ross Perot, founder of Electronic Data Systems Corp. (EDS), has sold his General Motors stock and has resigned from GM's board of directors, thus severing ties with the automotive giant. Under the terms of a buy-out plan laid out by GM, Perot resigned as chairman and ceo of EDS and agreed to refrain for a time from attempting a take-over of GM, from starting a new company that would compete with EDS in the data processing business, and from criticizing GM. GM acquired EDS in 1984 to gain a foothold in high technology, but the corporate philosophies of the two companies clashed, EDS being an entrepreneurial, results-oriented firm and GM being a traditional, bureaucratic company. This led Perot to criticize GM for being slow moving; GM, in turn, accused EDS of overcharging the company for its data processing services. GM has named Donald J. Atwood as head of high-tech operations, which include EDS, Hughes Aircraft Co., Delco Electronics, and GM's defense operations.

### BUNCH Crunch

Another step toward the dissolution of the BUNCH has been taken, as Honeywell, Bull of France, and Nippon Electric Corp. of Japan (NEC) have agreed to form a new company out of Honeywell Information Systems (HIS). Bull and Honeywell will each own 42.5% of the new company and NEC will own 15%, under the agreement. Honeywell will have the option of reducing its stake to 19.9% by the end of 1988. Honeywell says it will take a fourth-quarter charge of more than \$250 million by writing down the book value of HIS, resulting in a substantial loss for the quarter and the year. A final agreement between the three companies is expected in April.

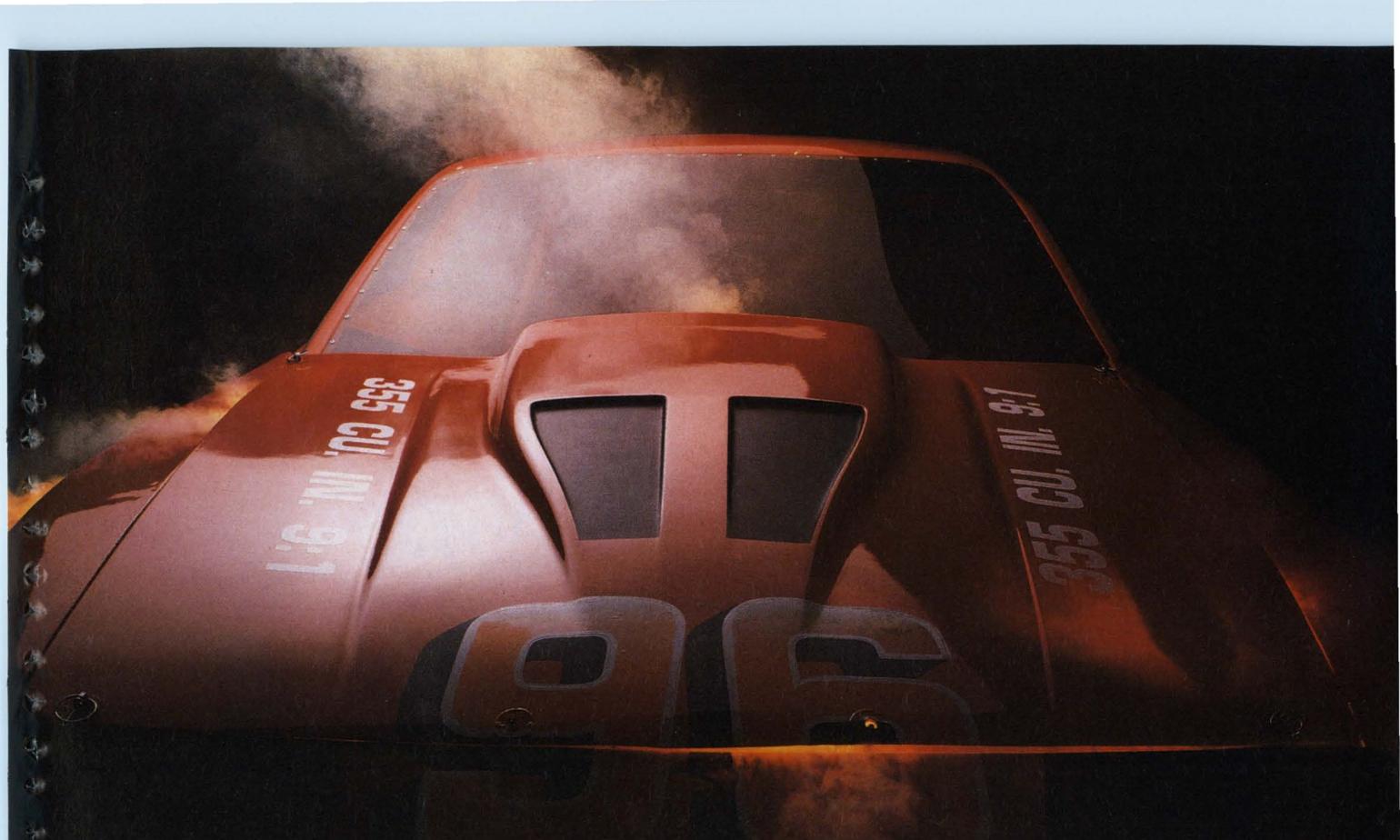
The new venture, which has not been named, would be the world's third largest computer company, after IBM and Unisys.

### No Deal

Sears World Trade will not distribute Amstrad's pc clone in the U.S. (see "Rocking the Boat," Nov. 15, p. 34), leaving the U.K. electronics company to find alternative outlets in time for a planned New Year's launch. Director of electronics at Sears, Bill Wilkinson, says that negotiations with Amstrad were terminated after Sears decided it did not want to join the already overcrowded and precarious pc clone market. The blow from Sears means that Amstrad's \$600 PC1512 is unlikely to be sold through retail stores in the U.S. Instead, the company is negotiating with a few specialist microcomputer distributors and was expected to announce a number of U.S. marketing partners by the end of '86. Amstrad says it will increase production of the PC1512 in Korea to 100,000 from 70,000 units a month in early 1987 to meet expected U.S. demand.

### Unisys Sells Aerospace Unit

Honeywell will acquire the Sperry Aerospace group from Unisys Corp. for \$1 billion in cash. The acquisition is expected to be completed by year-end. The aerospace group, headquartered in Phoenix, includes commercial and defense avionics, space systems, and flight simulation and has revenues of \$700 million. Separately, Ku-Note International, a new company formed by New York-based acquisition specialist Clayton & Dubilier Inc., and a management group have agreed to purchase the international business forms and worldwide supplies operation of Unisys for \$50 million in cash. ■



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Hazeltine 1500	X	X		
Lear Siegler ADM-3A	X	X		
Lear Siegler ADM-5	X	X		
TeleVideo 910, 910+, 912, 920, 925, 925E	X	X		
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CIRCLE 18 ON READER CARD

# Behind the News



## The Name of the Game Is Now Political Action

Long a "sleeping giant," the computer industry is now waking up to the importance of PACs.

BY WILLIE SCHATZ

Political Action Committees (PACs) are like the houseguest who came for dinner and stayed 20 years. You didn't really want one in the first place. Now that it's been around a while, you can't imagine life without one.

"You need a PAC to be a serious player in D.C.," says Olga Grkavac, vice president of government relations for the Computer Software and Services Industry Association (ADAPSO). "It's a way to support people who are supporting you. It gives you more access to mem-

bers of Congress. That, in turn, gives you more of an opportunity to plead your case, to help a member change his or her mind, or to find a compromise. You get recognized as an industry expert. It's much better to be consulted before a bill's drafted than after it's already on the legislative calendar. It's an integral part of being a player in Washington. We don't necessarily like it, but until something else comes along, this is reality."

Hey, we all have to take small doses of that now and then, but the high-tech community is suddenly consuming mass quantities. The prior reluctance of the

computer and electronics industries in Washington seems to be changing, as high tech evolves closer to the prevalent thinking and becomes more desirous of the benefits of political action as demonstrated by such power players as the automotive and steel industries.

### A Piece of the Strategic Pie

"PACs are one more element of coordination in a government affairs strategy," says a former participant in those programs for a top five computer company. "If a company chooses to have a government affairs office but no PAC, I'd question that. It's an effective process that lets you be involved in public policy so your interests are advanced, and you protect them from being harmed. Will a government affairs program be effective without a PAC? Yes, but not as much."

It's taken a while for the high-tech community to learn this lesson. These are industries, let the record reflect, that were described as "reluctant players in

## Behind the News

the game of political influence" by *The National Journal*, a widely respected Washington weekly that covers congressional affairs. If you don't think that hit home, then you should have seen the invitations to the 1985 "Sleeping Giant" Christmas party thrown by the government relations people of about 15 computer and electronics companies.

A year later, the giant is stirring. It's about time. PACs have been around since 1974, when Watergate occupied legislators' hearts and minds and campaign reform was the order of the day.

The theory seemed simple enough. No direct corporate contributions to individual candidates. No more than \$5,000 per candidate per election, and then only from multiparty PACs with more than 50 members. Any PAC under that was limited to a \$1,000 maximum per candidate per election. Strict standards were promulgated on how many company employees could be solicited for contributions and what companies could and could not say when they were asking their hired hands for bucks.

For a change, reality hasn't quite matched theory. PACs are not exactly where it's at these days. They're the Darth Vader of campaigns—if it's bad or evil or dirty, blame it on PACs.

### Viewed as a Democratic Alternative

"PACs serve as the whipping boys for deeper ills," says another former government relations director for a major computer company. They're "much more democratic," he says, than contributions to a candidate from corporate executives. "That may look voluntary, but everybody knows it's the result of the chairman going down the corridor and twisting arms. It's transparent that it's the corporation, not the senior executive, making the donation.

"Besides, a PAC is the only way for a corporation to give money to a candidate it supports. If your company doesn't participate, then you're not part of a very important aspect of the political process. What's a company supposed to do—sit out and fold its tent during an election year?"

So they're not. According to Ed Zuckerman, publisher of the twice-monthly *PACs and Lobbyist* newsletter, based in Washington, in the last election 83% of all PAC money went to incumbents. More than half the members of Congress received more than half of their contributions from PACs; members

received an average 41% of their donations from PACs.

"The corporate world has discovered PACs," Zuckerman says. No lie. There are more than 4,000 PACs registered with the Federal Elections Commission, and about 1,600 are sponsored by corporations. That's close to the number of union-sponsored PACs, but the corporations are catching up.

"The computer and electronics industries are part of corporate America," Zuckerman says. "There are more PACs and more money being spent because people think that to play the game you

**"PACS SERVE  
AS THE WHIP-  
PING BOYS FOR  
DEEPER ILLS,"  
SAYS A  
FORMER PR  
DIRECTOR.**

have to buy a ticket. It's the keeping up with the Joneses philosophy. They're defensive contributions."

Perhaps. But sometimes the best offense is a good defense. What else explains the lemming-like run to PACs?

To be sure, not every company thinks it's the only game in town. For starters, IBM doesn't have a PAC—when you're number one, you can do just about anything you want. Do you really think any Congressman from a Big Blue district who wants to get reelected—that is each one's full-time job, after all—would freeze out IBM because it didn't give at the office? Not a shot. The same theory applies to Digital Equipment Corp.; founder and main man Ken Olsen is philosophically opposed to PACs, so Digital doesn't have one. Neither does Control Data, due to founder William Norris's similar mental state.

"PACs are a useful resource," concedes Mike Aisenberg, Digital's manager of government relations. "They are a tool for enhancing your visibility, but I'm

not sure there's a correlation between impact and PACs."

### Other Options for Action

So far, there's been no correlation for the number two computer company. Digital gets its point across with a very aggressive honorarium program. The company often invites congresspeople to speak in districts where it has a major presence. It pays the speakers for their time, and the remuneration is undoubtedly appreciated just as much as a PAC donation.

"There's a different expectation of high tech," Aisenberg says. "There's an understanding that these entrepreneurs don't want to deal with the government. I call it the Galileo phenomenon.

"But congresspeople are incredulous at high technology's low level of understanding of the government. So there's no choice anymore. You've got to be involved in the process to increase your visibility. So we confront candidates' expectations through honorariums. It's a mistake to consider a company a nonplayer because they don't have a PAC."

If it is, very few high-tech players are taking a chance on making it. ADAPSO has had a PAC since 1982. The Computer and Communications Industries Association's (CCIA) PAC has been around for many years. The American Electronics Association's (AEA) Electropac, begun in 1978, has become the most effective and aggressive in the industry.

Making Electropac what it is hasn't been a stroll in the park. Before Electropac gets a cent from any company employee, the employer must approve the number and type of employees to be solicited and the wording of the solicitation. The procedure must be repeated every year. So far, about 400 of AEA's 3,000 members have allowed Electropac to solicit their employees.

"It's a very difficult procedure that turns a lot of people off," says John Mancini, AEA's manager of government operations. "Of the 400 companies that allow us access, only about 100 are actively involved. A lot of our companies either have their own PACs or just aren't interested. We've got difficult competition in a pure dollar environment.

"We're not doing enough in campaign contributions. We're not doing as much as we can or should be, but the vectors are pointing in the right direction. There's an increase in political aware-



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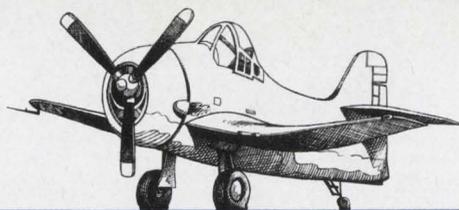
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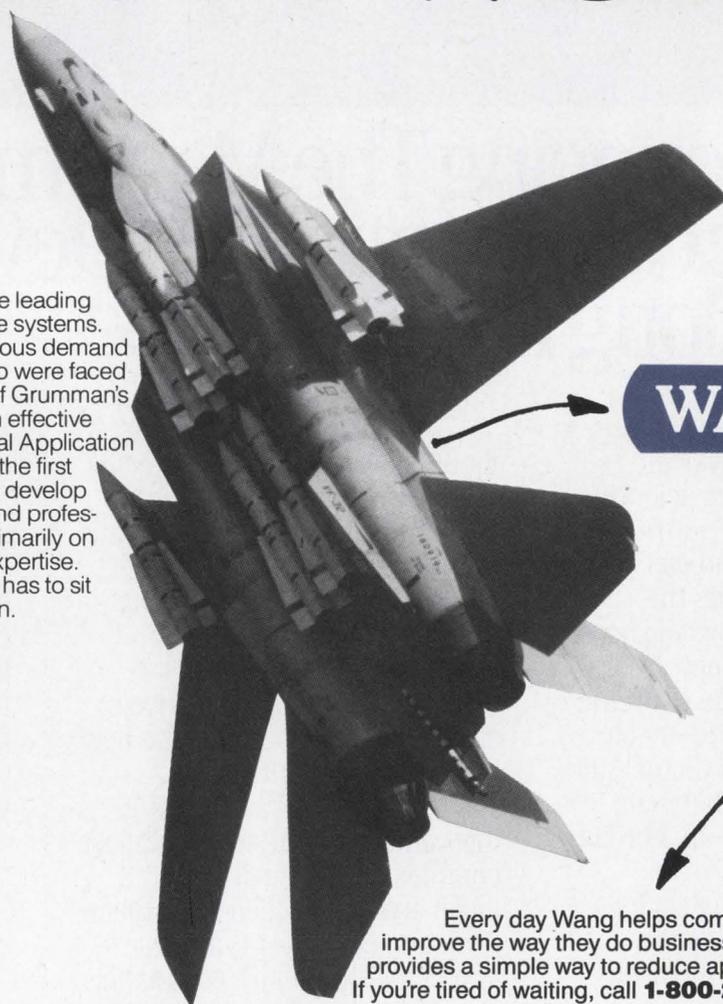
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## Behind the News

ness by our members," Mancini continues. "I think they realize that having a PAC indicates you're a serious player. Not having one doesn't indicate you're not a serious player, but I think a PAC gives you an advantage."

But does it give you game, set, and match? Not necessarily. Just like two of its mainstays, IBM and DEC, the Computer and Business Equipment Manufacturers Association (CBEMA) is PACless but not powerless.

"The issue [of a PAC] has never come up," says Ted Heydinger, CBEMA's vp for government relations. "We're smaller than AEA or ADAPSO and we've got a number of large companies that have their own PACs. There's no pressure coming from the members to have one. Not having one has not limited my access in the slightest. I don't think you have to have one. It gives you an additional presence but it's not necessary for a lot of companies. If I thought it was, I would have done it a long time ago. But I certainly wouldn't counsel our member firms against having one. The potential downside—like the errant bad story, which is always going to happen—is not nearly as positive as the certain upside."

### Experiences of HP, Xerox

At least two CBEMA members are listening. Hewlett-Packard and Xerox, for which PACs formerly were anathema, have recently started playing in the band.

"Five or six years ago, PACs weren't the HP way," explains Mary Dee Beall, the company's program manager of government affairs. "We wanted our employees to stay apolitical. If we needed something done, we let Dave [Packard, chairman of the company] do it. He had the access, so he did it. High tech never needed any Washington presence. We never needed the government to do anything. We were a real upbeat industry that wanted to keep regulators as far away as possible. Then all hell broke loose after 1981."

That's when the Economic Recovery Tax Act went on the books. *Après ça, le déluge*. Extending the R&D tax credit. Trying to cope with international trade—fair, free, both, or none? Having or not having an industrial policy. It was all too much for the ninth largest computer company to handle.

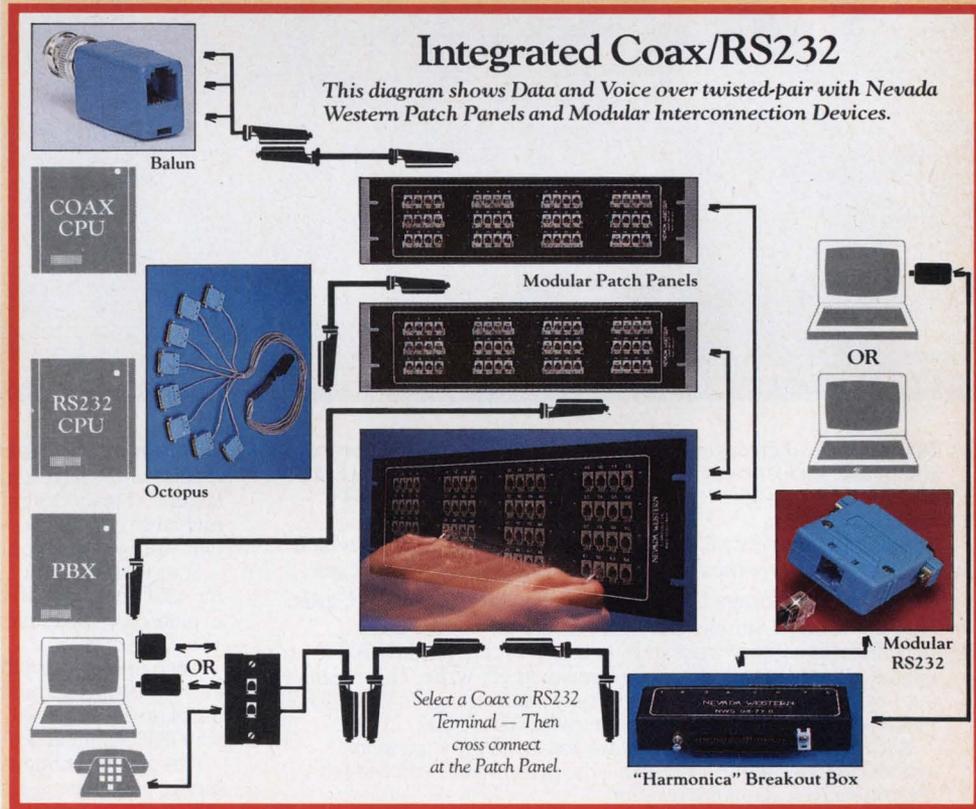
"We were in over our heads," Beall says. "Dave couldn't do it by himself anymore. We couldn't afford to let those

things roll anymore."

So, with a growing list of candidates to support, it was time to think again about a PAC. Beall and her government affairs colleagues sat down after the 1984 election and decided to seize the moment. They established a steering com-

mittee to determine how the PAC would operate and from whom it would solicit. The company demonstrated its seriousness by dropping out of Electropac, to which it had been a considerable contributor. The steering committee then decided to limit the list to the corporation's

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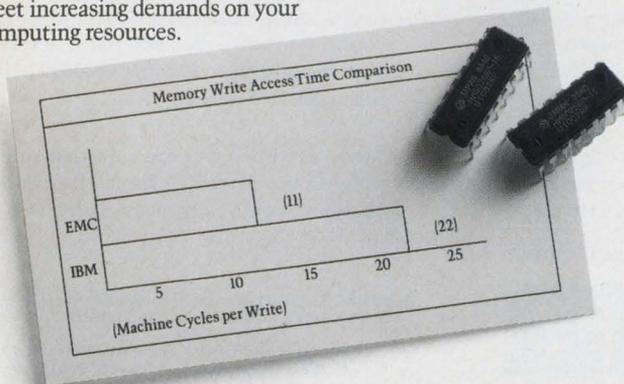
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## Behind the News

800 functional managers. Potential contributors expressed considerable anti-PAC sentiment. The committee, bloodied but unbowed, persevered.

That effort began in July 1985 with the Hewlett-Packard Employees PAC. It made its first solicitation that August, and the receipts didn't exactly register a 6.9 on the Richter scale.

It's come a long way, baby. By the 1986 election the PAC had raised \$35,000. That money was distributed to candidates who lit up the box score on HPE-PAC's candidate profile, which included such categories as voting record, membership on key committees, whether the contest was a breeze or a dogfight, and championing high-tech issues in general and HP issues in particular.

Candidates for the House of Representatives received contributions of \$250 to \$1,000, while Senate candidates received contributions ranging from \$500 to \$2,000. The exception was Republican Ed Zschau, the Silicon Valley congressman who lost the 1986 Senate election to incumbent Democrat Alan Cranston. HPEPAC, Electropac, and Intel-PAC all maxed out at \$10,000 on Zschau—\$5,000 in the primary, \$5,000 in the general election.

"Losing Zschau hurts," Beall admits. "It's going to be interesting to see how Cranston greets us next year. I've only had one member's staff tell me that since we didn't make a contribution to that member's campaign, he wasn't interested in listening to us.

### Feel Better about Congress

"I never felt we were denied access before we had a PAC, but I feel much better about our presence in Congress. I feel better about someone like Barney Frank (D.-Mass.), who didn't always vote the way we wanted but worked very hard on the manufacturing clause for us. So we gave him \$250. That won't buy us access, but it says we appreciate what you've done for your constituents and you're the kind of person we need in Congress."

They're sending the same message at Xerox. After steadfastly resisting a PAC, the company succumbed last May. The PAC has an 11-member board of directors from all the company's major units. The 7,000 potential contributors can suggest candidate recipients as well as give money to those who pass the board of directors' test. Xerox has a large number of employees in more than 100

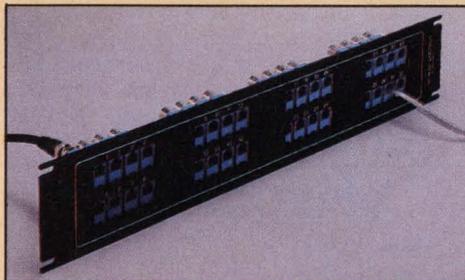
congressional districts.

"It was hard for us to be able to defend why we were in Washington and didn't have the tool others have," says Ken Klein, Xerox's counsel for government affairs. "We realized that PACs had advanced to the point where you can't

find many major unions and companies without one. It's difficult to defend not having one when everyone else does."

So if you can't beat 'em, join 'em. Even if you haven't been around for a while. When Burroughs bought Sperry, the acquiree's Washington office came

## Nevada Western Baluns: For those who would rather switch than fight!



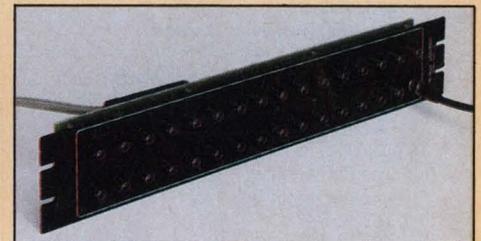
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# Behind the News

with it. When Michael Blumenthal took charge of Burroughs, it didn't take him long to send the entire Washington office packing. He's obviously had second thoughts, since Burroughs bought Sperry's government relations program hook, line, and sinker. So look for a Unisys PAC in the near future. It may be hard to find in the crowd, though.

"Since there are so many PACs, their currency has been greatly devalued," Zuckerman contends. "When there were fewer PACs, donations meant more. Members of Congress chased after them at first. Now there are so many they don't have to chase them as much."

### Making the Safe Bet

So the former hunted have become the hunters. And, like the Mounties, the PACs always get their man or woman. Or do they?

They certainly get the incumbents. It's the safe, easy way out to sign a check to the current officeholder. After all, about 97% of the House came back to

work at the same job. The Senate hardly had the same rate of return, but most high-tech PACs concentrate on House races. So your PAC throws in \$250 or \$500 or \$1,000 and the recipient wins. Or it kicks in \$10,000 and the candidate loses. Did the PAC lose or win? Does it matter?

"I don't know if we won or lost this election," HP's Beall admits. "We tend to play it safe with incumbents. Zschau, Jim Jones [former Democratic chairman of the House Budget Committee who lost the Oklahoma Senate race], and Bob Graham [Democratic candidate who defeated Republican incumbent Paula Hawkins in the Florida Senate race] were the only challengers we supported. We spent a lot of time, energy, and money on Zschau. Does that mean we lost because he did, though most of our candidates won? I think it means anything we want it to."

"It's not an empirical thing," says Mike Maibach, Intel's government affairs manager. The company's PAC was started in 1980. Bob Noyce, Intel's

founder and current vice chairman, chairs the PAC committee, which has a base of 8,000 potential contributors.

"A lot is won or lost without your PAC's support," Maibach says. "It's part of the process. We support them because we believe in them. We don't want to be able to say the PAC won an election."

"We tend to support challengers in highly competitive races. We don't mind taking on incumbents. We go out of our way to look for challenges that keep the legislature on top of what legislators are really thinking. The alternative is to stand by with your hands in your pockets and do nothing. To leave a PAC out of your public affairs effort makes the picture incomplete."

"It's a difficult thing to quantify," Electropac's Mancini says. "We're hard pressed to decide what's victory and defeat. I wish at times PACs were as powerful as a lot of people think they are."

Even if they're not omnipotent, they're still way ahead of whatever is in second place. ■

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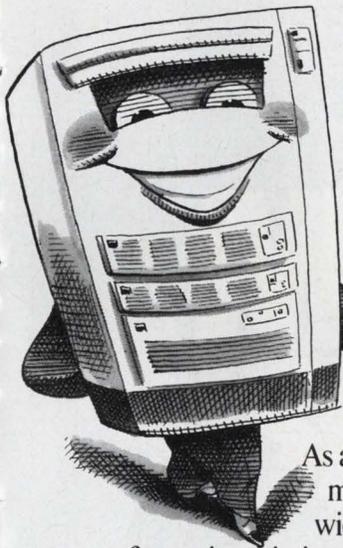
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# Your IBM mainframe could say a lot more if it spoke Xerox.

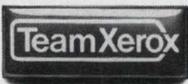


Until now, host computers couldn't "speak" to any and all printers, in different locations, without individual hardware or software enhancements.

As a result, your IBM mainframe may have been cut off from the widest range

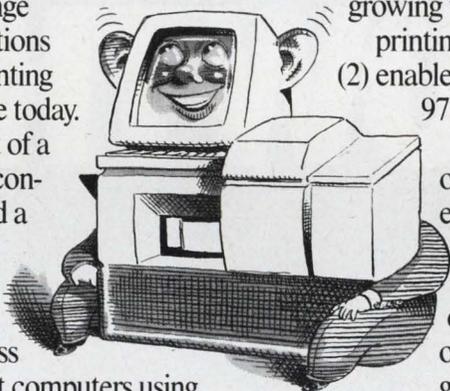
of superior printing applications (read: Xerox Electronic Printing Systems) in the marketplace today.

That's why Xerox, as part of a long-range strategy of interconnectivity, has just introduced a



remarkable host-based software

system, Xerox Printer Access Facility. It enables IBM host computers using MVS/370 and MVS/XA operating systems to "speak" to Xerox printers—from the high-speed Xerox 9790 to the tabletop Xerox 4045 Laser CP—in any location.

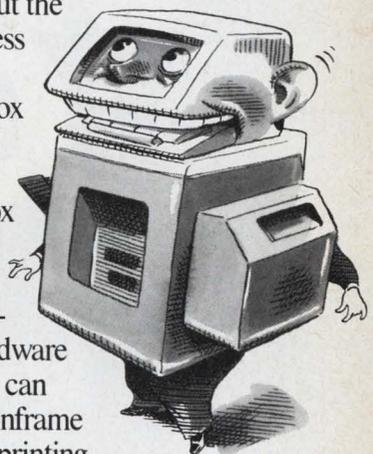
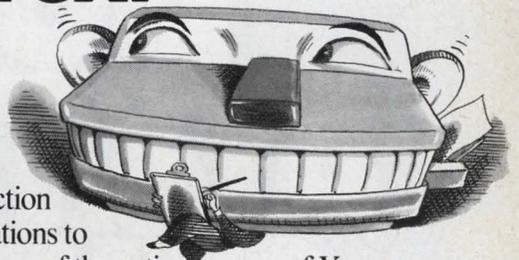


That's not all. In addition to allowing IBM's Advanced Function Printing applications to take full advantage of the entire range of Xerox printers, XPAF also: (1) Allows your host computer to use Interpress, an industry standard page description language, to output the

growing variety of Interpress printing systems, and (2) enables users of the Xerox 9700 family printers to redirect their output to any Xerox electronic printer.

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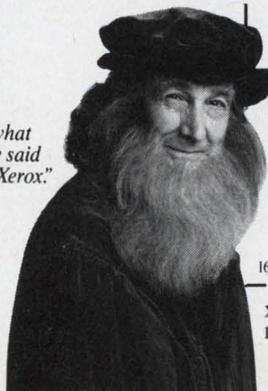
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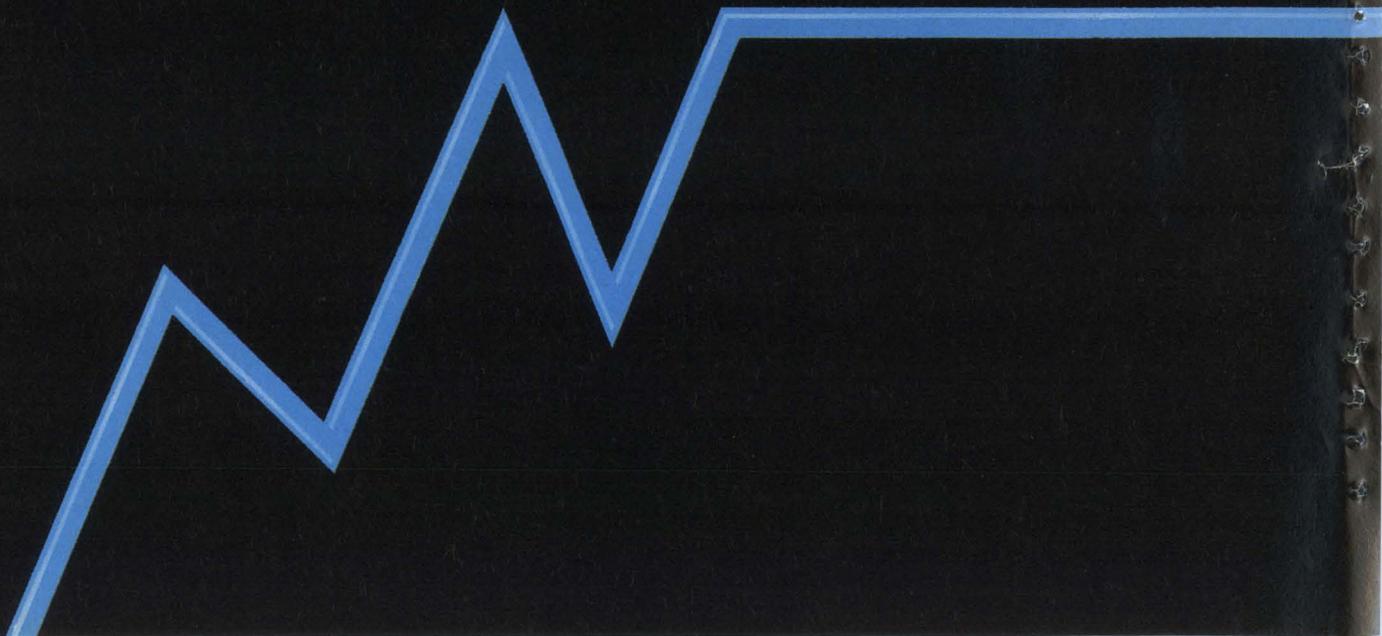
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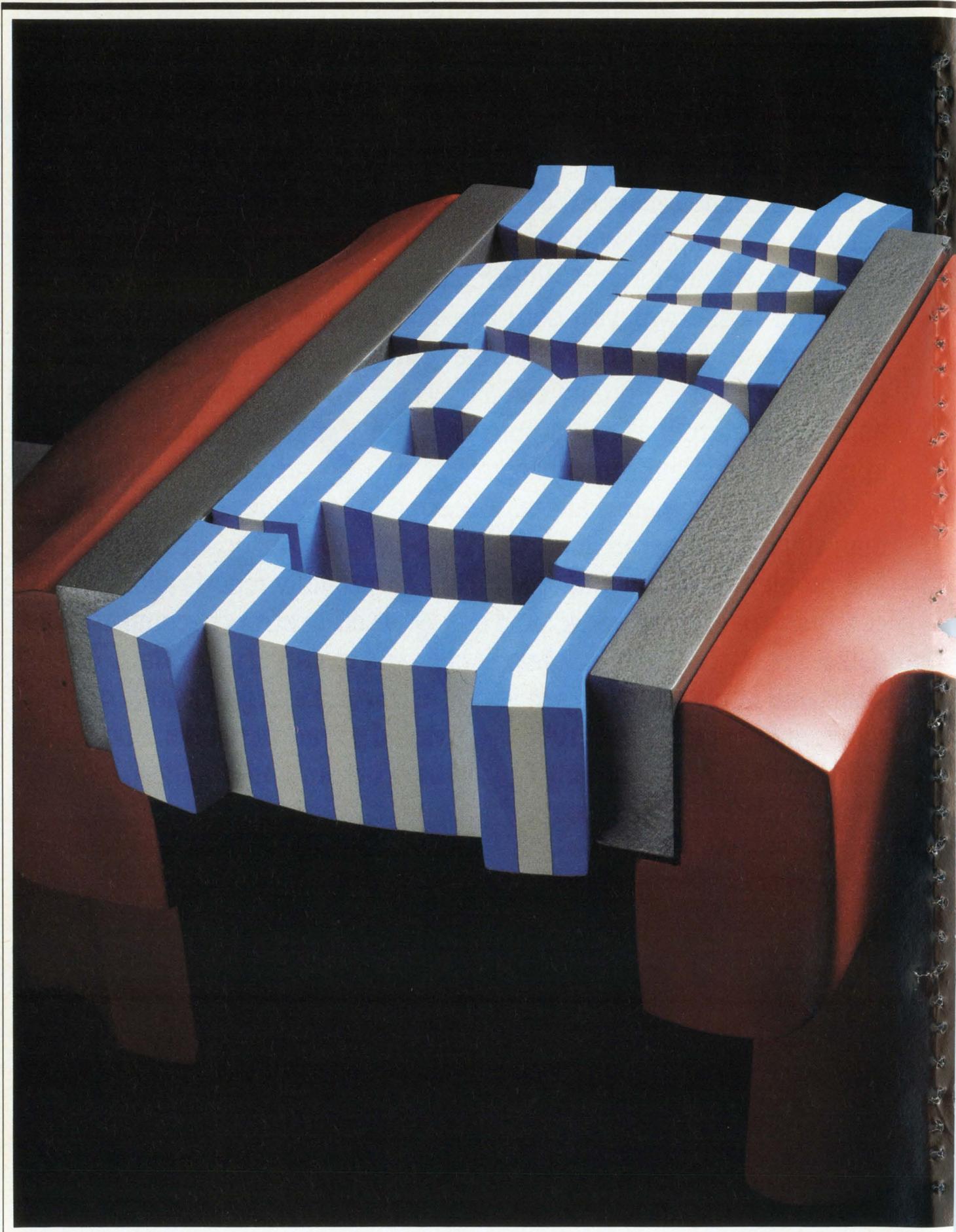
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# The Pressure's On

BY FREDERIC G. WITHINGTON

IBM's revenue in the third quarter of 1986 was only 2% higher than in the third quarter of 1985. Its closest challenger, Digital Equipment Corp., chalked up a 26% revenue gain for the same period, while not-so-near rival NCR grew by a healthy 13%. In fact, most of IBM's other major competitors grew faster than the industry leader.

Four years ago, that same industry leader strongly implied that its long-range revenue goal was to grow 15% per year. The last time it attained that goal was 1983. While IBM is maintaining the letter of its commitment to avoid layoffs, it's using every other possible means at its disposal to cut staff and increase its field forces.

Why is IBM feeling this pressure? It can't be that a decline in the industry's growth rate is solely responsible for the company's flat revenues, because most of its competitors are still growing. While it is true that those competitors as well as the industry as a whole are being squeezed on several fronts, no one is feeling those forces more directly than IBM.

There are several factors that are helping exert pressure on IBM. For one thing, the company's core mainframe business has shown signs of maturity and much of the growth that remains has gone to superminicomputer vendors and Japanese suppliers. Its interconnection problem across incompatible product lines has also turned off some customers. Others are simply not buying its sales pitch that its solutions are the best, indicating that IBM's marketing muscle seems to have weakened.

Industry influences have also had an impact on IBM. The industry's rapid progress toward telecommunications and system software standards, for exam-

Photograph by Walter Wick, 3-D illustration by Bruce Morozko

ple, has changed some products into commodity items—a business sector that IBM has traditionally handled poorly.

It appears the company is doing things to alleviate the pressure in these areas, but just how successful it will be is hard to predict. An examination of the problems and potentials in each area follows.

#### Mainframe Losing to OLTP machines

First, let's look at the mainframe front. The conventional, mainly batch, mainframe is clearly giving way in some applications to systems that are better designed for on-line transaction processing. The fact that IBM salespeople sell Stratus systems is evidence of this. Nevertheless, much processing is still better and more cheaply done in the batch mode—transaction processing systems rarely perform all the data processing of any organization. The heart of the matter seems to be the database. When a user organization properly structures all its transaction data and makes it application independent, it can apparently resort the entire processing structure into fast-response, decision support, and batch modes. It can then use whatever new tools apply, even new mainframe-based tools such as relational database managers.

Many large dp users are already in the process of restructuring their transaction data files to make them application independent. This multiyear process is painful. And relatively little hardware is bought during that time because the user cannot tell exactly what will be needed in the new, unfamiliar distributed processing network environment that usually accompanies the implementation of machine-independent files. It is a pretty good bet, though, that once this restructuring is finished and the new services become available to end users, a lot of hardware will be bought.

Much of that hardware will be workstations, departmental superminis, and database processing machines that were once considered exotic. But the new spurt in distributed processing activity will also help the mainframe market recover, at least to some extent.

The need to support high-volume batch applications will remain and many databases will continue to require central administration, with or without database machines. Still, even if there is a surge of new mainframes, will IBM's share of that market be as great as it once was? This is not nearly as certain. But at least the company will have a chance.



## Software Glue

Incompatible product lines is one of the causes of IBM's current problems. Customers who have uncoupled or loosely coupled systems aren't yet bothered, at least not seriously, by the incompatibility issue. But customers who are already prepared to implement distributed processing networks are directly confronted with the problem. IBM's incompatible product lines are certainly an obstacle for these users. The company, which has been wrestling with the intricate issue for several years, has taken a number of steps to deliver compatibility to its customers.

The most dramatic is product line extension. IBM's three main product lines have all been extended upward and downward. Many customers can now implement complete networks with System/36 or 38 processors, or even just with 370s that span a power range from the new 9370 to the 3090-400.

When customers want systems from different lines to work together, the solution is software based. IBM's Distributed Data Management (DDM) architecture permits cross-system access to files among System/36, 38, and 370 products. Another compatibility aid due for future release is a system referred to as the Repository, which will be a central cross-system data dictionary and catalog of resources.

Users can also develop applications to run on any of the systems using the Cross System Product (CSP), which is IBM's main fourth generation programming language. In addition, there's Host Data Base View (HDBV), which permits an extract of a mainframe database to be downloaded to a PC. (Other micro-to-mainframe tools already exist.)

So, if customers use DDM, CSP, SNA, HDBV, and maybe one or two tools such as the Repository that have yet to be announced, they can have a transparent network of System/36, 38, and 370 processors. This group of products serves as a kind of software glue that cements the processors together. But will this work? Probably. Some of the products have already been delivered, and they do indeed work. In any case, it has often been demonstrated that any one-to-one translation between fully specified systems can be made as long as the data are complete.

There's a cost, however, that must be paid for those translation chores. Resources are required every time cross-system communication occurs. Computer time must be spent and memory and line space must be occupied for the translation activities that do not contribute to the solution of the problem. IBM's archival Digital Equipment Corp., for one, does not have to incur this overhead. So, in the end, IBM's software glue will probably bind its lines together, but there will just as probably be holes in terms of overhead costs that will leave openings for its competitors.

BY FREDERIC WITHINGTON



Nevertheless, as more and more customers complete the process of restructuring their transaction data files, they will demand compatibility across their networks. By then, IBM will probably be able to deliver that compatibility, but at a cost in memory and processor overhead that will give such competitors as DEC, which won't incur these costs, the advantage. So IBM's answer to the incompatibility predicament may end up being too little, too late.

IBM must also get up to speed on the sales side. The company's ability to sell solutions has certainly been outstripped by its rivals. At the low end of the market, IBM has conceded failure, turning the business over to value-added resellers and other third parties that can provide better packages for customers. In other markets, it has suffered at the hands of such firms as NCR, DEC, and Tandem.

The company has launched a recovery campaign. Its joint marketing deal to sell banking software packages with Hogan Systems of Dallas is one example of those efforts. Still, it has a long way to travel on that road to recovery.

IBM also continues to do battle on the commodities front. It has been waging fights there since the late 1960s, when its peripherals became commodities. Then came terminals, tape and disk drives, and printers. Losing market share, the company counterattacked with mixed success.

### **The View Looks Brighter**

In the meantime, the view from the product front looks brighter for IBM than before. IBM has become a master of manufacturing automation. It delivered millions of megabit memory chips before most of its challengers could introduce any. The company also successfully reentered the pc printer market with U.S.-built models, gaining market share at the expense of imports.

Automated factories that use surface-mount technology will increasingly be applied to pcs, workstations, and terminals of all kinds. The potentials here are promising for IBM. The company, which may even become the leading manufacturer of low-priced commodity products, may actually end up benefiting more than anyone else from the spread of standards.

It can also benefit from more bucks. If IBM wants additional revenue, IBM can buy it. The company has already shown that it is quite willing to make acquisitions—the purchase of Rolm and parts of Intel and MCI attest to this. IBM's borrow-

ing power is prodigious: with practically no debt and the best possible ratings in all the world's credit markets, it could raise billions overnight.

The independent communications carriers, particularly MCI, would represent logical targets. They would offer IBM the largest available hunks of existing revenue—revenue from fields that are related to IBM's business. Another purchasing plus is that their stocks are relatively cheap.

Other IBM-related acquisitions that would not be so cheap include data services companies, supercomputer vendors, scientific instruments firms, and



## **IBM MAY BENEFIT MORE THAN ANYONE ELSE FROM THE SPREAD OF STANDARDS.**

manufacturing equipment makers. Antitrust questions would naturally arise as a result, but none of the areas these companies are involved in is a market where IBM competes directly.

Abroad, different laws apply, so IBM might be able to acquire computer manufacturers in Europe or Japan. Joint ventures, however, are more typical in the overseas arena. IBM already has one with Nippon Telegraph & Telephone (NTT) in Japan. That pact could be expanded or others could be added.

Back on the home front, would a plunge into the consumer electronics field make sense for IBM? Compact disks are digital and digital tapes may follow. Markets for home computers and computer-based information services, which already exist, are growing, albeit painfully, and digital television is certainly coming nearer.

In fact, the digital tv may be the biggest market ever to hit the electronics industry. If IBM becomes the lowest-cost manufacturer of commodity chips and has learned how to distribute low-price products through third parties, the company would seem a logical competitor in the digital tv market. If IBM thinks so and wants to get its feet wet early, it might

start by buying a firm like Zenith or Commodore that is already in the tv trade.

### **Attempt to Get More Revenue**

IBM will also attempt to obtain more revenue from its existing markets. For one thing, it will try to expand its software and services businesses. These ventures, which are already growing at 25% per year, probably won't expand much further without acquisitions. IBM's military electronics efforts have more potential. A major push into the Star Wars program could bring a substantial revenue increase. Those revenues could perhaps be augmented by a move into commercial avionics.

In foreign markets, IBM has already taken steps to increase sales. It's had success in Japan, the second biggest dp market in the world. The company might also move more vigorously elsewhere overseas where it sees good growth potential. Those moves seem more likely now that it must compensate for the loss of the South African market.

Of course, the company is almost certain to enter some computer market segments it has foregone—supercomputers, parallel processors, fault tolerant systems, or industrial process control. Special mention should also be made of the field of image processing.

IBM, which already competes in the in-house publishing arena, is moving more and more vigorously into engineering markets where the storage and manipulation of drawings is a major application. The company has some standards, some software, and some products. More will doubtless appear, leading in time to image processing products both in business and in science and engineering.

But we have slipped into the by-and-by. While markets for image processing systems, digital tv, relational database processors, and the like may indeed be large some day, right now we're talking about 1987.

Are the forces that have caused the pressures just discussed going to change enough in the near term to permit IBM's revenues to recover rapidly? Maybe. But it's certainly a lot easier to be an optimist for the long term than for the short. The pressure on IBM will forge new metal, but slowly. ■

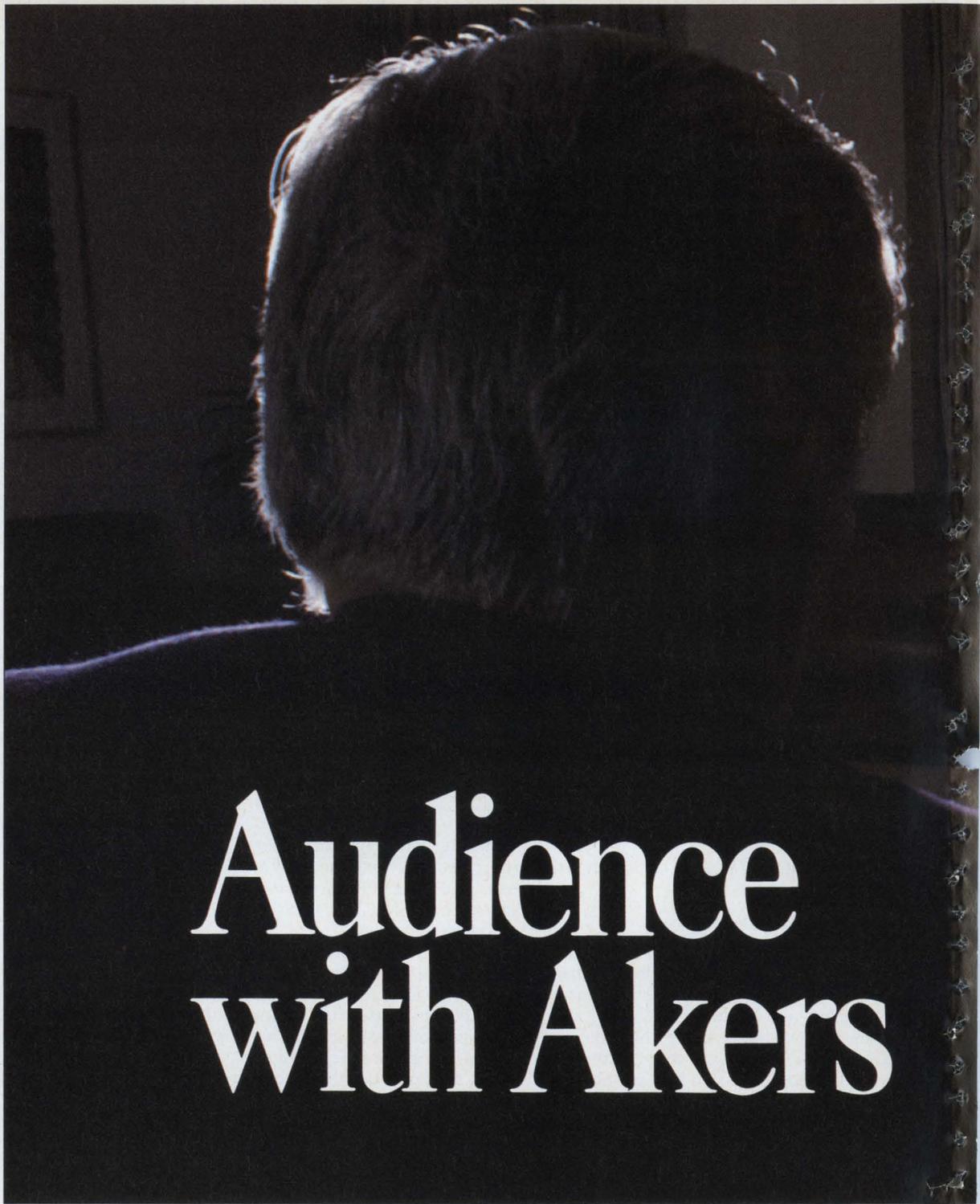
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*A 30-year industry veteran, DATAMATION advisor Frederic Withington has written four books and over 60 articles and papers on dp topics. He also has a modest reputation as a poet (see p. 116).*

## ABSTRACT

As the new year dawns, MIS executives have a lot of questions for IBM and its leader, John F. Akers. On the grand scale, MIS managers want to know how IBM is going to sustain growth over the long haul and what directions it will take in the future. How is the giant company going to serve its customers' needs, as well as its own? On the product front, they ask when will VM/XA be available, when will the void in DB2 be filled, and when will the gap between hardware and software development be plugged?

Information systems execs also wonder when IBM will resolve the interconnectivity issue, make mainframe computing power costs per MIPS comparable with lower-priced micros, and develop continuity in software. What are the company's plans in such areas as transaction processing, LANs, and MS/DOS? What kind of computer will IBM sell to what customers in the year 2001?



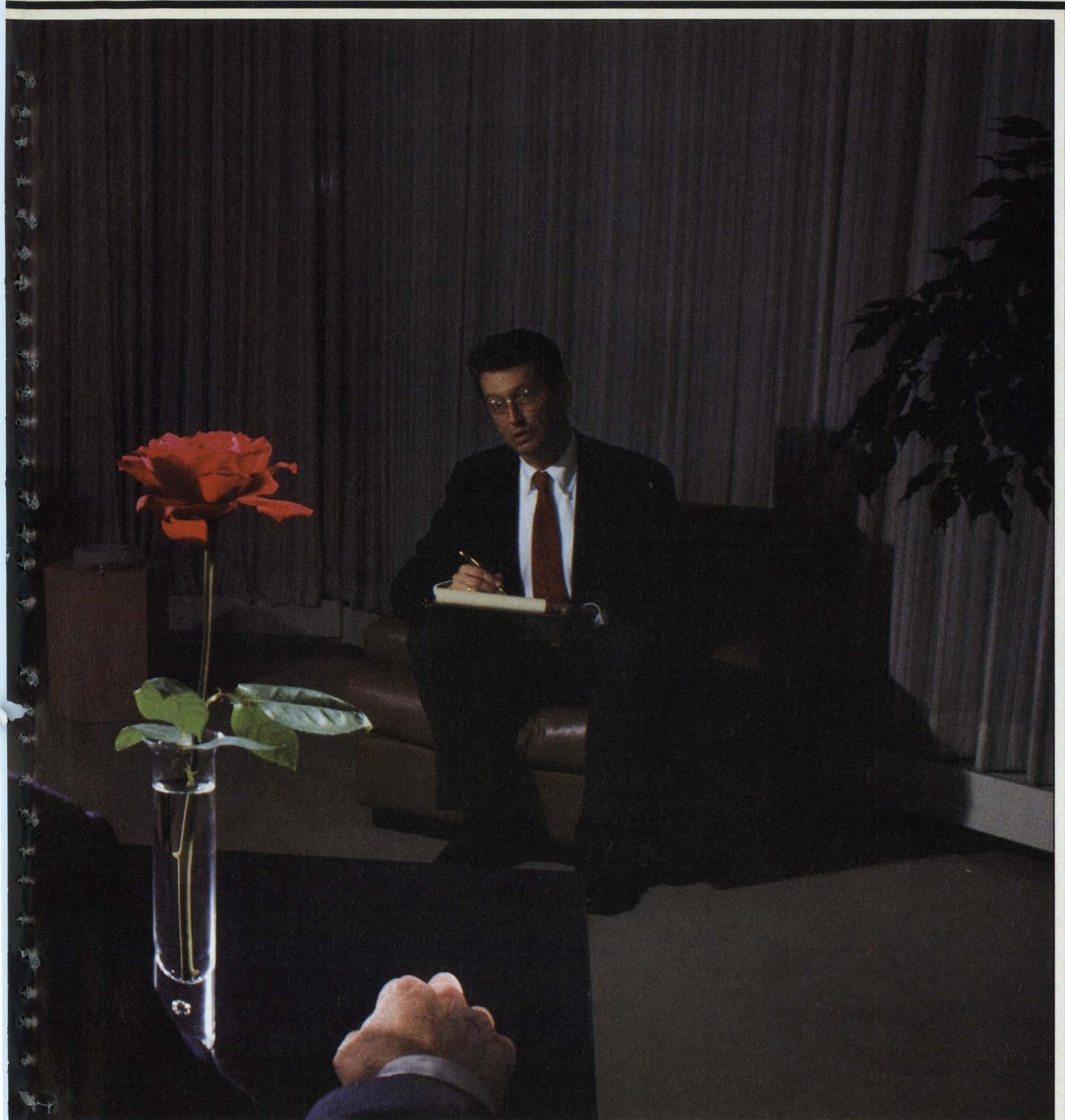
# Audience with Akers

BY JOHN W. VERITY

As chief executive of IBM Corp., John F. Akers leads the most powerful company in the world. Even if he usually stays out of sight, appearing only occasionally in news columns via carefully worded press releases, what John Akers does and says matters. The products he authorizes for development and shipment, the policies he puts into action, the prices he endorses, all shape the computer market and with it the careers and day-to-day ac-

tivities of dp professionals everywhere.

It's a rare occasion when Akers spends much time face to face with any of those professionals—most of whom are customers of his—but if he did he'd probably get an earful. Computer professionals today have a lot on their minds. With data processing woven so tightly into the daily fabric of the corporation, users need new functions from their systems, higher levels of performance, and better service than ever before. In communications they want coherence and compati-



Photograph by Peter A. Simon

bility. In software they want better integration. In hardware they want more horsepower and reliability. Overall, users simply want to know what's coming next—"Where do we go from here?" is the question they're asking. IBM, as the largest supplier with the most customers to listen to, has the most to tell users about where they go from here.

The mighty company may well be pondering the same question as it faces an embarrassing string of sour financial quarters and a series of incompatible

**USERS ASK  
AKERS, WHERE  
DO WE GO  
FROM HERE?**

computer architectures. Clearly, John Akers has his hands full, so it was not surprising when, through a spokesperson, he politely declined an interview with DATAMATION. Nevertheless, we thought it would be useful to let readers pretend they were having a one-on-one with Akers, posing a few questions and making a few comments to him in absentia.

DATAMATION always gets a quick response to its observations on IBM, so we're confident these comments and questions will be heard in Armonk.

## Audience with Akers

**Bob Jochum**  
Assistant Vp, Information Systems  
Indiana Bell Telephone Co.  
Indianapolis  
Primary Systems: IBM 3081, 3083, 3084, 3090

I don't think the mainframe market is going to remain as robust in the next four or five years as it's been in the first part of this decade, and I think that's going to give IBM some problems. How are they going to sustain their revenues and earnings growth in a market that's getting softer? As IBM tries to maintain its position in the marketplace, they're going to have to do a delicate balancing act between what's in their customers' long-range best interests and what's in IBM's long-range best interests. Those things could start to conflict.

In the past, IBM has been able to ride out the economic crisis with their large lease base. Now that they're out of the leasing business, they're much more susceptible to the economic cycle. And I wonder, is that going to make IBM a different company?

I think IBM's got to make sure they continue what's gotten them to this point, and that's service. There are a lot of good players out there. The plug compatibles are doing a pretty good job. We have an Amdahl machine that I'd say is performing very well. But what keeps us still a basically IBM shop is their reputation and the services that they deliver. They've got to continue to maintain that high-quality service. As the pressure gets to them in certain areas, they can't let that slip.

I would encourage IBM to open up their architecture and to be more aggressive about pursuing an OSI strategy, rather than sticking with their private protocol or data communication network. I work with a telephone company, and that's in my best interest.

**Ed Gropp**  
Vp, MIS  
Ralph's Grocer Co.  
Compton, Calif.  
Primary Systems: IBM 3033-U8, 4381-11  
IBM should give us a clear sense of direction on what systems and technologies will form the basis for products they will introduce in the next five years so we can make good decisions now that will not be adversely affected by a future major change.

I'd like to know what IBM's long-term directions are in terms of software development, specifically in development of software that would let me run my applications on any IBM computer from the PC all the way up.

I would like to see IBM develop network management software that would allow me to centrally control everything implemented remotely—hardware, software, and files. If we could do that, we wouldn't need people in the stores with computer expertise, nor would I have to dispatch someone to fix something when it breaks. Problems could be diagnosed and fixed remotely. If I don't have to have expertise out at remote sites, I could save enough money to buy a lot more computer equipment. The same applies to software. If I don't have to have a lot of people to support three or more different software systems, again, I could buy more computers.

**"WHAT ARE IBM'S LONG-TERM DIRECTIONS IN SOFTWARE DEVELOPMENT?"**



**Roy Dodd**  
Vp, MIS  
I. Magnin & Co.  
San Francisco  
Primary Systems: IBM 3081

One of the things I'd like IBM to give me is a single marketing source. I'd like to deal with one person who could interface to all IBM products.

Sometimes IBM's maintenance isn't what I expect or demand. Those of us in smaller accounts sometimes get the dregs. In particular, nights and weekends aren't manned by the best people, but that's when you usually need them the most. And given the billing structure, you'd think you'd get the best people then. They charge 140% during outside hours, and there are times you get people not even 40% qualified.

I don't like the long lead times between product announcements and delivery dates. IBM used to do long lead times some time ago, but lately they had gotten away from it and would deliver right away. Now they're in the old mode, which I don't think is wise.

**Lee Foote**  
Manager, Electronic Data Interchange  
Du Pont  
Wilmington, Del.

Primary Systems: IBM 4300, 3090, 30XX  
The most pressing issue IBM users face is the question of interconnectivity among various noncompatible IBM systems. It's a major problem that IBM's midrange systems just don't communicate with their larger systems. It makes life very difficult.

Mr. Akers should do more with DB2. It needs high-quality systems development tools—such as an active data dictionary and automated data analysis—to realize the full advantages of relational database.

I think Akers should make the SNA architecture more compatible with the ISO seven-layer structure. There are gateways now, but they need to be simpler. It would be in everybody's best interests for IBM to be more supportive of ISO.

IBM hasn't implemented its extended architecture for VM, and they haven't said when they're going to. That means the full advantages of using a 3090-200 or a 3090-400 are not available to VM users. When will VM/XA really be available?

In the pc arena, IBM can learn a lesson from Apple's approach. Apple has really made pcs easy to use by having common techniques across the different software.

**Akihiro Tamaki**  
General Manager, Information Systems  
Nikko Securities  
Tokyo  
Primary Systems: IBM 3081, 3090, 4381,  
Fujitsu M-380

I would like to ask about IBM's plans for the Japanese market. Five to 10 years ago, IBM began to make products with kanji capabilities. That's wonderful for us, but Fujitsu's kanji capabilities are much better than IBM's. Does IBM intend to have products made that are suitable for the special conditions in this area?

IBM's customer service in Japan is not sufficient. For example, 15 years ago IBM Japan told us a software crisis was coming. They also told us the solution was to use structured programming, writing reusable program modules and combining them, and also to set up an information center to assist our users in writing programs in end-user languages. The crisis did come, but these solutions were not enough. I don't think we succeeded very well by following IBM's advice.

I don't think systems engineers at IBM Japan have sufficient capabilities. They don't know much about designing databases, which is my field. This leads me to believe they can't offer much help in designing networks, in capacity planning, or in expert systems. We use both IBM and Fujitsu host systems at Nikko, and it's true IBM's service is much better than Fujitsu's. But we expect more of IBM.

**"I DON'T  
THINK WE SUC-  
CEEDED BY  
FOLLOWING  
IBM'S  
ADVICE."**



Photograph by Robert Poe

**Richard Kislowksi**  
MIS Director  
Denny's Inc.  
La Mirada, Calif.  
Primary Systems: IBM 3031

There seems to be a discrepancy in the cost of computing power between IBM's micro and its mainframe. At the micro level, it's much lower. When will IBM bring mainframe computing power costs down to a point comparable in cost per MIPS with the micros? Look at IBM's competitors: cost per MIPS is lower.

IBM doesn't appear to have today a micro software compendium or a software continuity from micro to mainframe, compared with Digital Equipment Corp., which has a clear continuity of software. When is IBM going to fix this?

When are we going to see a product line come from the mainframe DB2 product down through departmental computers and micros? I would like to see both a direction and deliverable products.

Akers is paying for business practices of the past, but you can pay for someone else's sins in two ways: with new sins, which IBM seems to be doing, or with short-term pain, which DEC appears to be doing. DEC's saying, "Let's clean this up even if some will not be happy." IBM's trying to be all things to all people. As a result, they're nothing to many.

**Ulrich Kiel**  
Executive Vp, MIS  
Grossversendhaus Quelle Gustav  
Schickedanz KG  
Nuremberg, West Germany  
Primary Systems: IBM 3084, Siemens  
7.890

After working with IBM systems for over 20 years, it has become more and more difficult, even from a customer's point of view, to find much to criticize about IBM.

I think IBM's strategy as a whole is impressive but from the user's point of view, it has some weak points. IBM's most important job is to guarantee their customers' software base for the future.

IBM is far behind its competitors, often by many years, in providing some important operating system components. It also needs software that automates the computer center's functions and security programs.

A high-level systems support environment, with software workbenches and compatible tools, is still missing from IBM's offerings. A complete integrated operating and applications environment from PC to mainframe is also overdue.

**Nell Cox**  
Senior Vp, MIS  
City National Bank  
Los Angeles  
Primary Systems: IBM 3032, 3033

I still think Big Blue is number one and always will be number one. Our service has been fantastic since day one. Any installation planning to select hardware will be much better off with Big Blue than with anyone else.

My biggest complaint about IBM is that they have never addressed transaction processing with their big computers. They've really blown it where transaction processing is concerned. If you trim a big IBM mainframe for transaction processing, then you get poor results with batch and it works both ways. Most of us would prefer not to go to minis. We'd like to do it with the big guys.

I'd suggest to Akers that he take a long, hard look at IBM's lease pricing. The Investment Tax Credit doesn't work anymore. Maybe IBM should follow the lead of the car people and offer 2.9% financing. IBM, you don't make it easy for us to buy from you. Those of us in the middle market turned to third parties when our 3080s needed to be upgraded because in-place upgrading turned out to be more expensive than buying a new machine. I would tell Akers to rethink pricing on in-place upgrades. The only 3080 users who actually would go to 3090s are those whose machines ran out of juice.

**"I STILL THINK  
BIG BLUE IS  
NUMBER  
ONE."**



## Audience with Akers

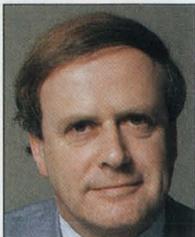
*Des Lee*  
Director, Systems and Communications  
Lloyds of London  
London

*Primary Systems: IBM 3084-Q, 3083-B*  
My main concern as an IBM user is with the System/370 architecture. I hear that the planned Summit mainframe series uses the architecture, but I'd question whether it can meet users' future needs. We'll be banging up against the physical limits of the 370 soon. I'd like to know when that will happen and what bridges IBM will build into new architectures.

With the prospect of such a major change to new architectures, I think it's important for users to have more direct input into IBM's decision-making process, particularly on future products. Users need to know what upgrades will be available and how much they will cost. Hardware prices are, in general, falling, but software costs are rising by 100% a year. I'd like to see an end to that trend and an end to IBM taking advantage of customers who must buy its operating software.

There's no doubt that IBM's customers are becoming far more astute and won't buy just anything that it builds, so I'd also like to know how the company plans to meet its 15% annual growth target. It's failed for the last two years and desperately needs to find new markets. That said, it needs to tread carefully in the U.S. to avoid violating antitrust laws, raising the question of whether it will create those new opportunities or encroach on its competitors' markets.

**"IBM USERS SHOULD HAVE MORE INPUT INTO DECISION MAKING."**



*Katsuro Kikuchi*  
Assistant Manager, Computer Systems  
Gaaken Co. Ltd.  
Tokyo

*Primary Systems: IBM 3090-200*  
IBM doesn't make it easy to hook up to other machines. It wants the other manufacturers to adapt to it. The others feel the same, of course. So, when we tried to connect our machine to a computer made by Hitachi to Nippon Telegraph & Telephone specs, we had to buy special software and an extra hardware box from independent vendors. If we have to do this every time in the future, we'll get quite tired. Hitachi and Fujitsu machines, of course, can connect to each other.

One problem we face is with MVS/XA architecture. It takes a lot of human support from system programmers. We have three, and other companies probably have more. It takes the same number of people to fly a commercial airplane. And they have to keep studying to find out what's wrong every time there's a problem. We wish it were simple enough to use with fewer people.

IBM's software is unsatisfactory. Development is delayed, and packages are difficult to use. I think the Japanese version of DISOSS was two years behind the U.S. version. I've heard it's easy to use in the U.S., but in Japan it's difficult. Another problem is that IBM is expensive because of the way it's sold. They introduce the more powerful machines in a new series first, then the less powerful. So we commit ourselves to buying the new machine, but we might really only need the power of one that is announced later. So sometimes we may be using only half the power of the computer we have. It makes us feel like we've been cheated. It's true, though, that the problem is not confined to IBM alone.

I have general questions about the future. I've been involved with computers for 20 years. Some things have changed a lot, and some have changed very little. Some things that we expected, like natural speech input, have not yet come true. So I'd like to know what kind of computer will be used in the year 2001. Now we have two diverging types of computers, the conventional and the fifth generation type. When can these be expected to converge again? What will the office be like in 20 years?

*Reported by Robert J. Crutchfield, Mary Kathleen Flynn, Susan Kerr, Gerhard Maurer, Edith D. Myers, Robert Poe, Wilie Schatz, and Sarah Underwood.*

*Roger Cooper*  
Deputy Assistant Secretary  
U.S. Treasury Department  
Washington, D.C.  
*Primary Systems: IBM 3081, 3082, 3090-200, Sperry 1100-80, 1100-90*

The first thing I'd say to John Akers is that he's got to hustle up his 9370s. He's got taking way too long with that. He's got to tell me what to do with the System/36, 38, and 8100. He's got to get rid of OS and get some new products out, and he needs to do it soon. He's also got to decide what to do with MS/DOS.

And what are they going to do with PC/DOS? They're being priced out of the marketplace on that one. Where's that going to leave me? Should I spend money on something different? The longer they take to break away, the less chance they have of taking folks with them.

I want to know some strategy answers, too. What's IBM's LAN plan? Where do SNA and IBM's token ring products fit? What's their office automation strategy? And do they think DB2 is going to solve the world's problems?

*Charles Feld*  
Vp, Management Services  
Frito-Lay Inc.  
Dallas  
*Primary Systems: IBM 3090-200, 3094*

What is IBM doing about the gap between hardware and software technologies? The hardware is outstripping the software. We are using 1986 hardware with 1965 programming technology. When will IBM take a leadership position in software? It can't just sell MIPS anymore. ■

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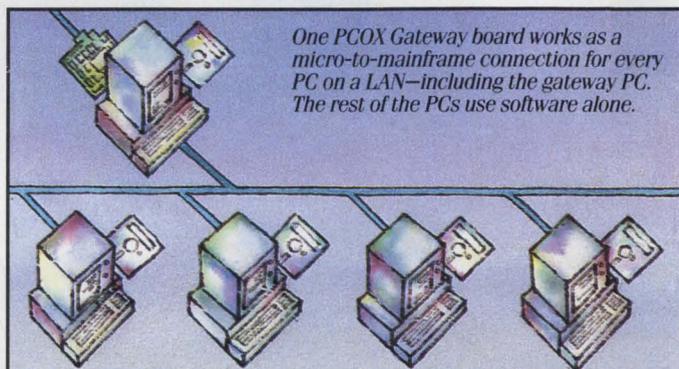
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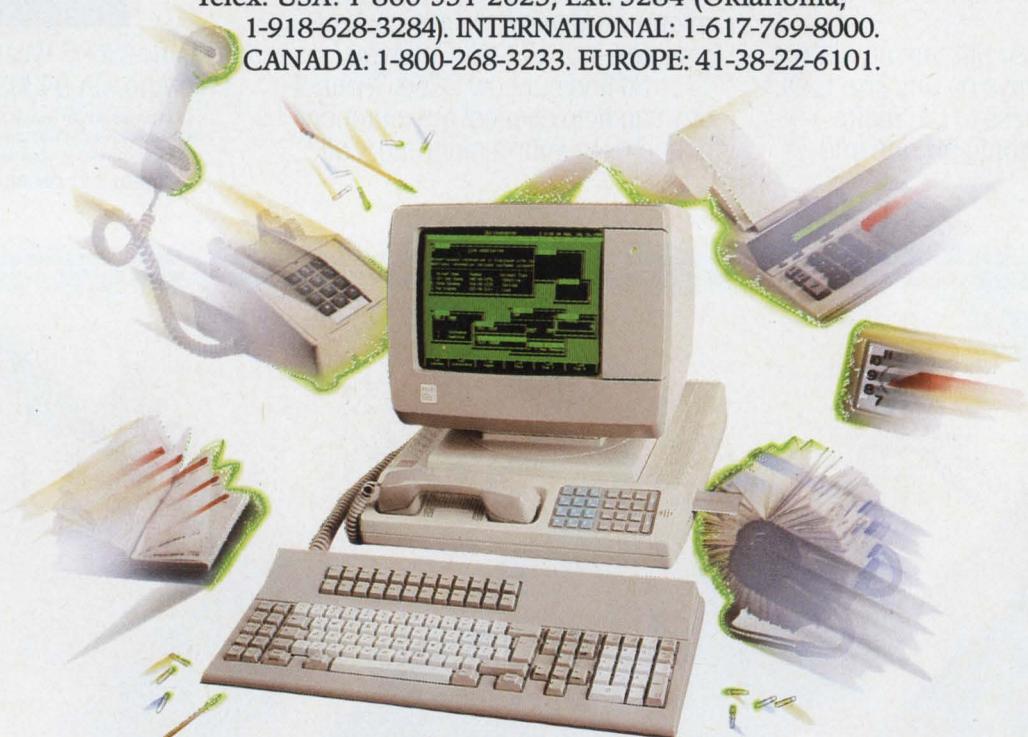


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## ABSTRACT

Not long ago, the prospect of a full-scale marketing duel between IBM and Digital Equipment Corp. would have struck many industry followers as decidedly unlikely and definitely one-sided. But, within the last year, DEC has chalked up an impressive string of marketing successes—a number of them in head-to-head competition with IBM. Much credit for that success goes to the company's integrated marketing strategy that has enabled its rejuvenated sales squad to capture coveted computer and communications contracts. That winning strategy also calls for discretion in dp departments, especially in shops where Big Blue's banner is flying high.

# It's Coke vs. Pepsi



BY LATON MCCARTNEY

"IBM and DEC are now going at each other in the same way that Coca-Cola and Pepsi locked horns," declares Al Reis, a student of marketing strategy. "Their match-up is developing into a classic marketing confrontation."

Not long ago, the prospect of a full-scale marketing duel between IBM and Digital Equipment Corp. would have struck many computer industry followers as decidedly unlikely and definitely one-sided. IBM has traditionally been one of the slickest and most effective marketers in American industry, but while Digital has always enjoyed a triple-A technical reputation, its marketing and sales efforts, especially in the end-user arena, have historically been viewed as anemic. With an engineer's disdain for hype, DEC founder and president Kenneth H. Olsen has always downplayed

marketing, defining it as "selling someone a product he doesn't need."

Digital gave marketing and sales such a low priority in the past that it was one of the few major players in the highly competitive computer industry that didn't offer its sales reps bonuses. "As a result," observes DATAMATION advisor Bruce Hasenyager, vp and director of financial systems for Merrill Lynch, "Digital's salespeople never really had a fire under them." In fact, the firm's sales force was so low key a few years ago that one customer told DATAMATION she'd given the nickname Howard Hughes to her DEC salesman, "because no one had ever seen him."

But the anecdote that perhaps best exemplifies DEC's phlegmatic sales approach surfaced in the late '70s when giant Citibank decided to buy dozens of Digital minicomputers. According to one former Citibanker, the coveted customer was actually unable to find a Digital salesperson to take its order.

All that's ancient history today, as many MIS managers and Digital competitors, notably Big Blue, have recently discovered. "The old war stories about DEC being weak in marketing and sales are out of date and completely off the mark," vows Ronald T. Brzezinski, vp of information systems at Quaker Oats in Chicago. "They did one of the best jobs in marketing to us I've ever seen."

Quaker recently picked DEC over five other vendors—IBM and Hewlett-Packard among them—to install a distributed processing system at 13 of its regional plants and at the company headquarters. Brzezinski outlines some of the reasons behind the DEC decision: "To start with, their people knew our business, the food and beverage industry. They sized up the audience in making their presentations and tailored their pitch to each group's particular interests. In this regard, they were head and shoul-

ders above the competition."

But what really sold Quaker, Brzezinski explains, "was that their people stressed connectivity. They presented Digital as a network supplier as well as a computer supplier. [They] emphasized that they intended to enhance our existing resources and link them together rather than replace them. That was what we wanted to hear."

It seems that customers other than Quaker are hearing, believing, and buying DEC's message. Within the last year, Digital has had an impressive string of marketing successes—a number of them in head-to-head competition with IBM. DEC beat out IBM in a bid to link Avon Products Inc.'s IBM and Burroughs mainframes with some 400 or so Apple and IBM personal computers that are scattered around the company.

DEC also sealed a deal last fall to supply Aetna Life & Casualty in Hartford, Conn., with executive workstations that will be tied to IBM machines. About the same time, Boston Co., a major investment firm, signed on the dotted line for a VAX 8500 cluster network. DEC marketing people consider this a big coup, because Boston Co. is a subsidiary of major IBM customer and big-time dp user American Express.

#### **A Pilot Contract from Bell Corp.**

Perhaps the most important DEC deal of all is a pilot contract won from Bell Corp., the Bell Labs spin-off that serves the seven regional telephone operating companies. To capture that contract, DEC was in competition with IBM and two fault tolerant vendors, Stratus and Tandem. DEC, whose strong suit has never been telecommunications, was given the assignment of using its VAX cluster capability to drive network transmission traffic in a key test application. The cluster technology proved so successful that Bell Corp. recommended it to the regional operating companies, six of which have since become customers of the minicomputer giant.

Digital is on such a roll that even when its marketing effort is misdirected, its loyal customers often put it back on the right technological track. "DEC's salespeople were aggressive with us, but in the wrong place," reports John M. Hammitt, vp of information management at Pillsbury Co. in Minneapolis. "Until recently, they were concentrating their efforts entirely on engineering and manufacturing. Yet, in trying to sell the engineers one more DEC computer, they were missing the broader issues and op-

## **Big Blue Boxes Back**

IBM has already taken steps to counter Digital Equipment Corp.'s marketing offensive. For one thing, the computer giant announced last September that it was transferring about 2,800 employees into its sales force. These new recruits, according to the company, will concentrate primarily on IBM's largest and most valued customers. They'll be serenading these valuable information processors with a new marketing theme song that sounds remarkably similar to Digital's.

"Today, there are two things being pushed by IBM—connectivity and solutions," says DATAMATION advisor John Imlay, who is also chairman of Management Science America, in Atlanta. "For the first time, IBM is really pushing applications software as part of a total solutions approach, and it's stressing its ability to connect any machines in the midsize range, although naturally IBM isn't mentioning any competitor's name."

Several senior MIS executives who attended IBM conferences in Berlin and Monaco last year noted this shift in marketing emphasis. "Usually, the talk at these conferences is all about bits and bytes and whether the 3090 is faster than Amdahl's X-5," says one attendee. "But this time, the emphasis was on applications rather than technology. One seminar, for instance, focused on computer aided manufacturing. IBM put together a panel of CAM experts and discussed the issues that are important to CAM users. It was selling solutions to CAM, not iron. That's a dramatic change."

IBM has also made some effort to align itself with applications software vendors who can abet its marketing efforts in specific industries, a tack DEC has pursued effectively for years. The company entered into a joint agreement with Hogan Systems of Dallas, a leading software supplier to the banking industry. "The joint venture with Hogan is significant," points out Stephen T. McClellan, a computer service industry analyst at financial services giant Merrill Lynch, "because it's the first move IBM has made in quite a while to sell someone else's mainframe software."

The Merrill Lynch vice president says he can't work up much enthusiasm about IBM's long-term applications software marketing prospects. He's still waiting to see if other Hogan-like pacts will be announced by Armonk. Meanwhile, other analysts who track Big Blue's hardware and communications business point out that to date, IBM's talk about connectivity and solutions is largely just that—talk.

BY LATON MCCARTNEY

**PILLSBURY  
PULLED DIGI-  
TAL OUT OF  
THE NARROW  
NICHE IT WAS  
FILLING AT THE  
BAKING  
GIANT.**

portunities within the company. We didn't let them get away with this, however."

Hammitt says that the Pillsbury staffers who were developing the company's technology and applications architecture recognized the strength of Digital's product line and effectively pulled DEC out of the limited niche it was filling within the firm. "We brought them to the table and said, 'We want to make sure you guys can play and here's what you have to do to get in the game.'"

DEC is definitely in the midrange game at Pillsbury and other important dp shops. What's going on here? Has the company been feeding its once seemingly devitalized sales team steroids? Who's stacking the sales DECK? The hearty and healthy Ken Olsen, who comes from strong Scandinavian stock?

The key to DEC's emergence as a major marketing force can be found at the company's worldwide sales headquarters in Stow, Mass. Here in this

## It's Coke vs. Pepsi

large, handsomely designed facility set in the apple orchard country an hour or so from Boston, the field marshals in Digital's marketing corps have been quietly but most effectively implementing a marketing and sales strategy that was first mapped out three years ago.

"At the time, we recognized that in order for us to continue growing, we had to broaden our sense of marketing from being a set of activities that were not as well integrated as we'd have liked to having all marketing activities work together toward the goal of our being a total systems provider," explains William G. "Jerry" Whitmore, DEC's soft-spoken vice president of basic industry marketing. "Consequently, we began creating a new environment at Digital which Ken Olsen described as 'one company, one strategy, one message.' Ken used that rallying cry to lead us into integrated marketing. Quite frankly, that's the difference in DEC today. We're now marketing around an integrated set of products."

Put another way, DEC decided to promote what were perhaps its two greatest assets, a common product architecture and the network capabilities to interconnect a wide variety of gear. That interconnection issue has become more and more crucial to users who have been casting about for ways to tie their mish-mash of machines together. Integrated marketing was exactly the right approach at exactly the right time.

### Reorganization on Industry Lines

As a first step in this integrated strategy, the company reorganized along industry lines, putting its European sales operations under DEC veteran Pier Carlo Falotti, president and ceo of Digital Europe. At the same time, responsibility for worldwide and U.S. marketing and sales went to senior vp John C. "Jack" Shields, whose seniority at DEC is attested to by his double-digit ID card that was issued during the early days of the company.

Industry analysts give both Falotti and Shields high marks for structuring a dynamic marketing and sales organization. "Falotti and Shields are both real go-getters," confirms Morgan Stanley & Co. computer analyst Carol E. Muratore. "DEC has always had a superior oem sales management, but under Jack and Pier Carlo the company has developed excellent end-user sales management as well."

Since it initiated the integrated marketing approach, Digital has hired a slew of new salespeople, including a number

of former IBMers. One of those ex-IBMers is Robert Hughes, now DEC's vp of service industry marketing. The company has also hired senior account managers who have extensive experience in banking and other industry sectors that DEC is specifically targeting in its marketing campaign. Although the firm still doesn't pay sales commissions, it has sweetened the pot with quota club bonuses and even stock options for the senior people. These moves have put DEC's

## DEC'S INCURSION INTO THE DP SHOP HAS SET OFF ALARM BELLS AT IBM HEAD-QUARTERS.

sales incentives on a par with those of IBM and other major vendors.

In the battle for end-user accounts, DEC's strategy has been to establish beachheads in various corporate departments. Digital then uses these departmental sites as staging areas for an effort to broaden sales penetration within the company. "We take a departmental approach," explains Whitmore. "We come in from the engineering side, from manufacturing, finance, and the office. When you start to have solutions in these departments—solutions that are all Digital based—you start looking at Digital as having the ability to be a total systems provider to the company."

DEC often gets help from departmental users in spreading its gospel, especially in the office. That's a place where the minicomputer maven is winning the competitive race, according to office automation consultant Amy Wohl of Wohl & Associates in Bala Cynwyd, Pa.

The company also naturally scores big with the engineering community. "In companies like Du Pont and General Dynamics, where engineering is paramount, the engineers have gone to bat for DEC to play a much larger role," says John J. Connell, president of the Office

Technology Research Group in Pasadena, Calif. "And their word carries enormous clout in these firms."

As eager as DEC is to become a total solutions provider, it is nevertheless being extremely careful not to alienate MIS departments, especially in companies where IBM's banner is flying high in the computer room. "We're not coming into an all-blue mainframe shop and saying that we're immediately going to displace everything," insists George M. Shea, DEC's director of general service industry marketing.

Perhaps not, but Digital's sudden, albeit unobtrusive, incursion into the dp shop has certainly set off alarm bells and warning sirens at IBM headquarters in Armonk. "IBM is running scared," observes Connell of the Office Technology Research Group. "The MIS fiefdom has always been built around IBM and engineering around DEC. But lately, Digital has been making inroads into IBM's turf." Stanley's Muratore agrees. "DEC owns the scientific and engineering markets," she says. "Now, it's becoming a force in the commercial market as well."

To keep those commercial accounts, Big Blue is fighting back. But it clearly has a prolonged struggle ahead if it is to hold its ground in the ongoing marketing wars with Digital. Users should benefit from the competitive situation. Thanks to the connectivity policies now espoused by both vendors, users can hook equipment from different manufacturers into a single, integrated system. "I'm very strong on the multivendor approach," declares Brzezinski of Quaker Oats. "It enables us to benefit from the major strengths of the different manufacturers."

Ultimately, connectivity also provides users with a little more leverage in dealing with their major dp suppliers. "The vendor in this competitive, multivendor environment is no longer awarded a business simply because it's an established presence in the company," notes Pillsbury's Hammitt.

DEC's Shea reiterates the line Digital is following: "We're telling our customers that we can offload new applications in a nonthreatening way that will complement their existing resources. And we're telling them we'll interconnect our computing resources to their existing mainframe. We're not posing a threat to MIS." Well, maybe not to MIS, but surely to IBM.

*Laton McCartney, a contributing editor to DATAMATION, is a freelance business and technology writer based in New York.*

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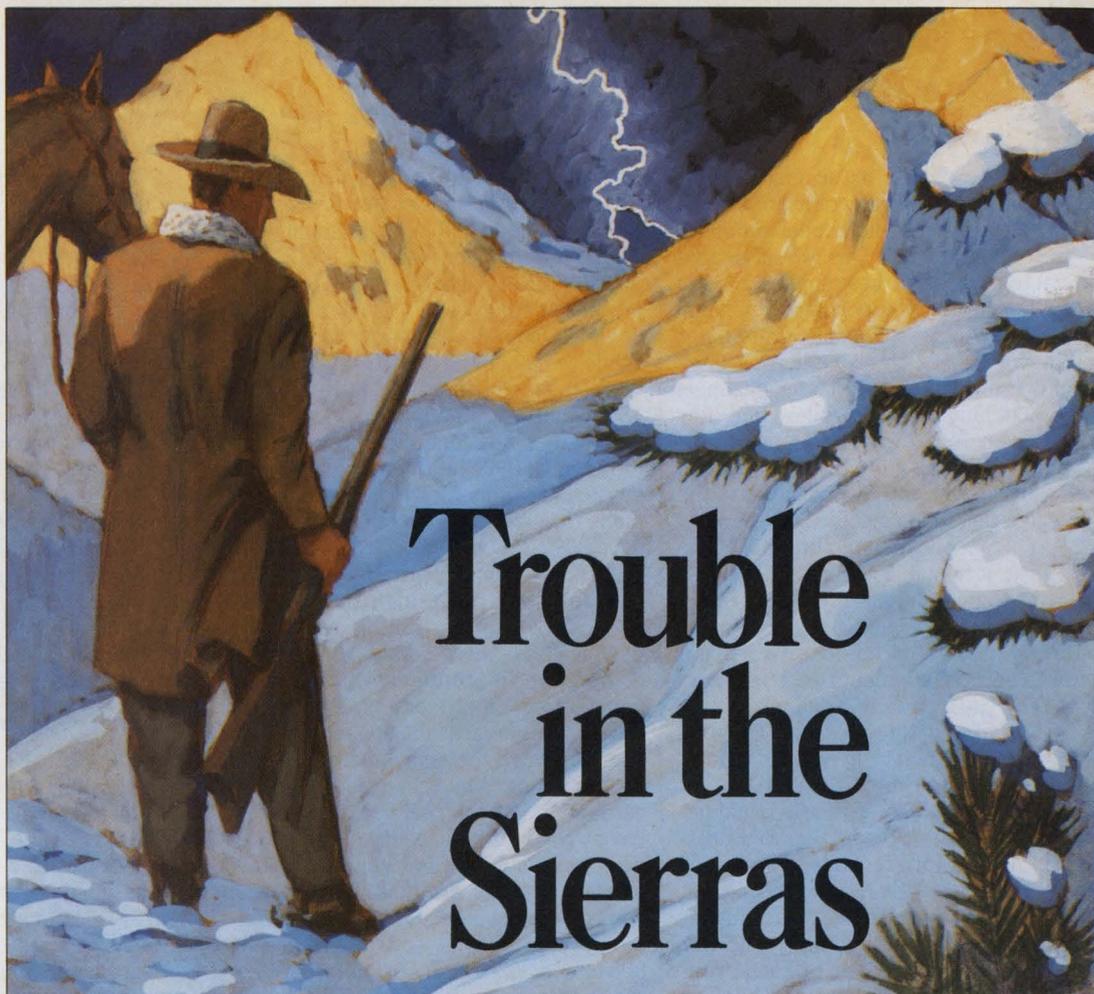
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CIRCLE 30 ON READER CARD

## ABSTRACT

At the turn of the year, IBM had between 1,500 and 1,800 3090s installed throughout the world. But despite these solid numbers, it's clear that the company has failed to move its mainframe user base into the Sierras as far and as fast as it would like.

As a result, IBM is on the spot. And its shareholders won't be the only people who are disappointed if the company fails to make the 3090 a big success this year. Users as well as investors who shelled out for the 3090 stand to lose their shirts, too. But Big Blue has some tricks up its sleeve to jazz up the machine and sales. So users will probably be getting more price/performance and functionality on their 3090s.



# Trouble in the Sierras

BY HESH WIENER

If everything were hunky-dory in the mainframe business, owners of 3081s and 3084s would be raising hell. In the two years since the 3090 was announced, those high-end machines should have lost a great deal of value. Users trying to unload unwanted 308Xs should be discovering the hard way that the market for their used mainframes has gone softer than mush. After all, that's to be expected when there are more sellers than buyers.

But things haven't turned out that way . . . yet. Instead, so many companies have ordered used 308X machines from third-party lessors and dealers that prices actually rose during part of the last quarter of 1986. Various industry estimates pegged the worldwide installed base of 3090s at between 1,500 and 1,800 systems at the turn of the year. Despite these solid numbers, it's clear that IBM has failed to move its mainframe user base into the Sierras as far and as fast as it would like. As a result, Big Blue is on the spot. Its shareholders won't be the only people who will be disappointed if the company fails to make the 3090 a big success this year. Users as well as leasing investors who bought the systems

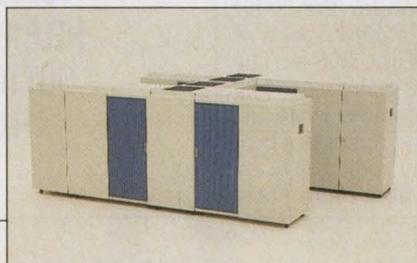
stand to lose their shirts, too.

It's safe to assume that IBM will revive its high-end marketing. To do so, it could tailor its 3090 in three ways to make it more appealing. First, it could reposition its largest processors to make them more attractive by improving price/performance or by upgrading its MVS/XA operating system. The series could be capped with configurations that boast six or possibly eight engines.

Second, IBM could take a more radical route and replace the 3090 range with a new line of high-end machines. Current 3090 users would be offered a box of electronics to bring their systems in line with the revised versions. This is more or less what IBM did 15 years ago with the System/370s.

Between the extremes of repositioning and obsolescence lies a third—

**The quad-processor 3090-400 is the top of the Sierra line.**



and wiser—solution to lackluster sales. IBM could produce a new range of Sierras while keeping the old model numbers more or less intact. This would send a signal to users that the company aims to provide proper support for installed 3090s. Sierra users would be grateful for a performance improvement. They would similarly applaud faster channels with matching disk controllers and new disk drives. And a way to join more processors into a single cluster under one software license would also increase the appeal of the 3090 machines.

If IBM chooses to pursue such a strategy, it would have many options. For one thing, it might offer users of the original machines inexpensive upgrades if they kept their old versions. Or it might offer free enhancements to customers who move up from, say, a dual-processor 3090-200 to a quad-processor 3090-400.

Both tactics have been used before. When the original 308X, the 3081-D, was replaced by the 3081-G, users could upgrade from either a model D or a model G to a model K. More recently, IBM revised its 308X line by adding the so-called X models that provided more performance; months after the X announcement, IBM came out with a modestly priced performance booster to the non-X 308Xs. The booster, which made the older versions nearly as fast as the newer ones, mollified IBM's early 308X customers.

Many 308X models have held their worth because they can be economically upgraded. But upgrade potential alone is not enough to preserve a machine's value in the used equipment market. The larger 308X machines—the 3081-K and the 3081-KX, the 3084-Q and the 3084-QX—have survived succession in splendid economic health. During the fourth quarter of last year, a loaded 3081-K sporting a 32MB of main memory and 24 channels was worth nearly \$1 million, while an equally robust 3084-Q was valued at more than \$1.7 million.

### Smaller Processors Sacrificed

While fat 308X systems were defying the laws of economic gravity, however, the smaller processors in the series—the 3083 models—were all clobbered. The 3083s were sacrificed to make room in IBM's line for the larger 4381s. Currently, IBM's 4381s pack as much wallop as any of the 3083s. The only exceptions are the models J and JX. All the 4381s are air cooled, while the 3083 is water chilled and requires a heat exchanger to run in an air cooled environment. The 3083s cost more to maintain,

take up more floor space, and, in the wake of several newer IBM processors that rank above and below them in power, they seem older than they are.

The aftermarket treatment of smaller 3090s could well follow the same downhill course taken by the 3083s. While the 3090-150 and 3090-180 are far more powerful than the 4381-14s, the 4381 line will almost certainly be replaced by faster midrange systems before many 3090s hit the used equipment market. It is this future series of superminis that will have the most impact on used 3090-150 and 3090-180 prices. The pressure to improve price/performance will then ripple up through the 3090 line.

Other ripples can be caused by technical advances. As IBM produces computers, it routinely incorporates engineering improvements. Most of these changes are not apparent to the user, although they may affect the value of equipment. While changes in memory cards or other internal hardware rarely have a big impact on used mainframe values, that is not the case with the 3081-D, which trades for less than the 3081-G, a comparable machine that uses a different memory protection scheme. Similarly, 3081s and 3084s are worth more if they are in the X group, even if the non-X models they succeeded have been modified to give them performance equal to that of the newer editions.

Sources in the leasing industry say that the X models are not the only versions of 308X machines that were different from the first units IBM shipped. Several significant engineering improvements were made during the course of IBM's initial 308X manufacturing runs. These differences, according to the lessors, have not affected the performance, reliability, or market worth of 308X processors, nor have they changed the maintenance costs or the availability of spare parts. IBM has actually done an admirable job of introducing processor improvements without penalizing its customers.

**UPGRADES  
HELP IBM EVEN  
OUT ITS CASH  
FLOW.**

There's no guarantee that IBM will use the same marketing plan with the 3090s that it used with the 308X line. But the fact that IBM's strategy worked so well, as evidenced by the success of the 308X, means that users should not be surprised if it is repeated.

In fact, IBM's mainframe situation hasn't changed very much since the 308X strategy was formulated. First and foremost, IBM is selling its mainframes outright, not renting them. While the company does get continuing revenue from monthly software licenses and service contracts, it does not get hardware rental payments. As a result, IBM's revenue and earnings have become somewhat more volatile, rising rapidly when the rate of installation is high and falling sharply between new product cycles.

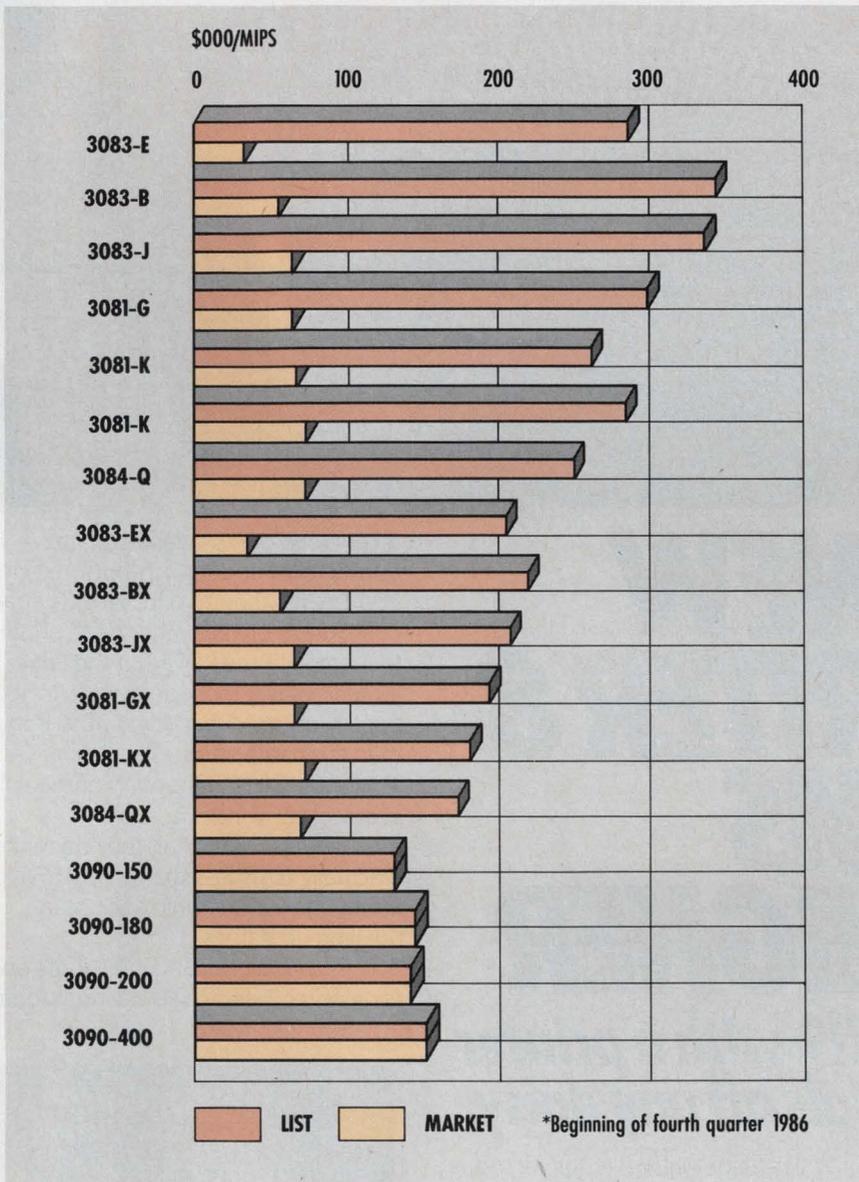
### Competitors Gain Strength

The sale of upgrades for installed machines helps IBM even out its cash flow, but less of the users' cash is flowing IBM's way. The company's competition—software-compatible makers as well as vendors of incompatible equipment—has acquired great strength and legitimacy over the past five years. While software-compatible makers pose less of a threat than they did in the past, there are other rivals out there that are putting IBM at more serious risk. In that category are Digital Equipment Corp. and Tandem Computers, two challengers that have recently been eating IBM's lunch.

Reacting to this competition, IBM has come up with a counterattack. The company's plan is to sell 370 systems for both big and small jobs in an effort to limit the incursion of other vendors into its base. By offering a smooth upgrade path within a single architectural environment, IBM hopes to reduce the number of purchase options open to users. But maverick users are only one of IBM's problems.

The company also faces irresistible forces emanating from research labs around the world. IBM's inability to control the pace of technological progress actually provides another incentive for an evolutionary Sierra. If IBM chooses to introduce a mainframe line, say, every seven years, and kills off older machines, it will end up with a real mess on its hands. Even if each of its new mainframe series is far ahead of anything the competition offers, there is no way for IBM to get seven years ahead. At some point in each product cycle, IBM's machines will be second rate. And without a rental base to sustain steady cash flow, the company

FIGURE 1 IBM Mainframe Price/Performance<sup>a</sup>



cannot tolerate the big swings in sales that such a big bang mainframe strategy would produce.

By shipping a relatively steady stream of enhancements and by revising its mainframe lines as new technologies become appropriate, IBM can simultaneously maintain a strong product position and reduce fluctuations in its income and profit. Challengers would be forced to march at the same taxing pace.

IBM's direct competition must match or exceed its technology and price. Makers of incompatible equipment must provide incentives to encourage defectors.

An evolutionary tack also safe-

guards IBM from some of the consequences of breakthroughs made by rivals. When IBM loses its lead in some area of computer technology, it can at least catch up more quickly if it is poised to put enhancements into its products on a regular basis.

**Overplayed Its Hand**

It now seems that IBM overplayed its hand at the time of the first 3090 announcement. Users who expected the company to raise the peak performance levels of its large mainframes were satisfied by the 3090-400. These same users will be pleased as punch with even larger

processor complexes. But users who had hoped for great improvements in price/performance were disappointed. Used 308X machines offered much better price/performance than new 3090s, starting back in 1985 when the model 200 was announced. Because the 3090-400 was not available, the 3084 offered pretty much the same top performance, too.

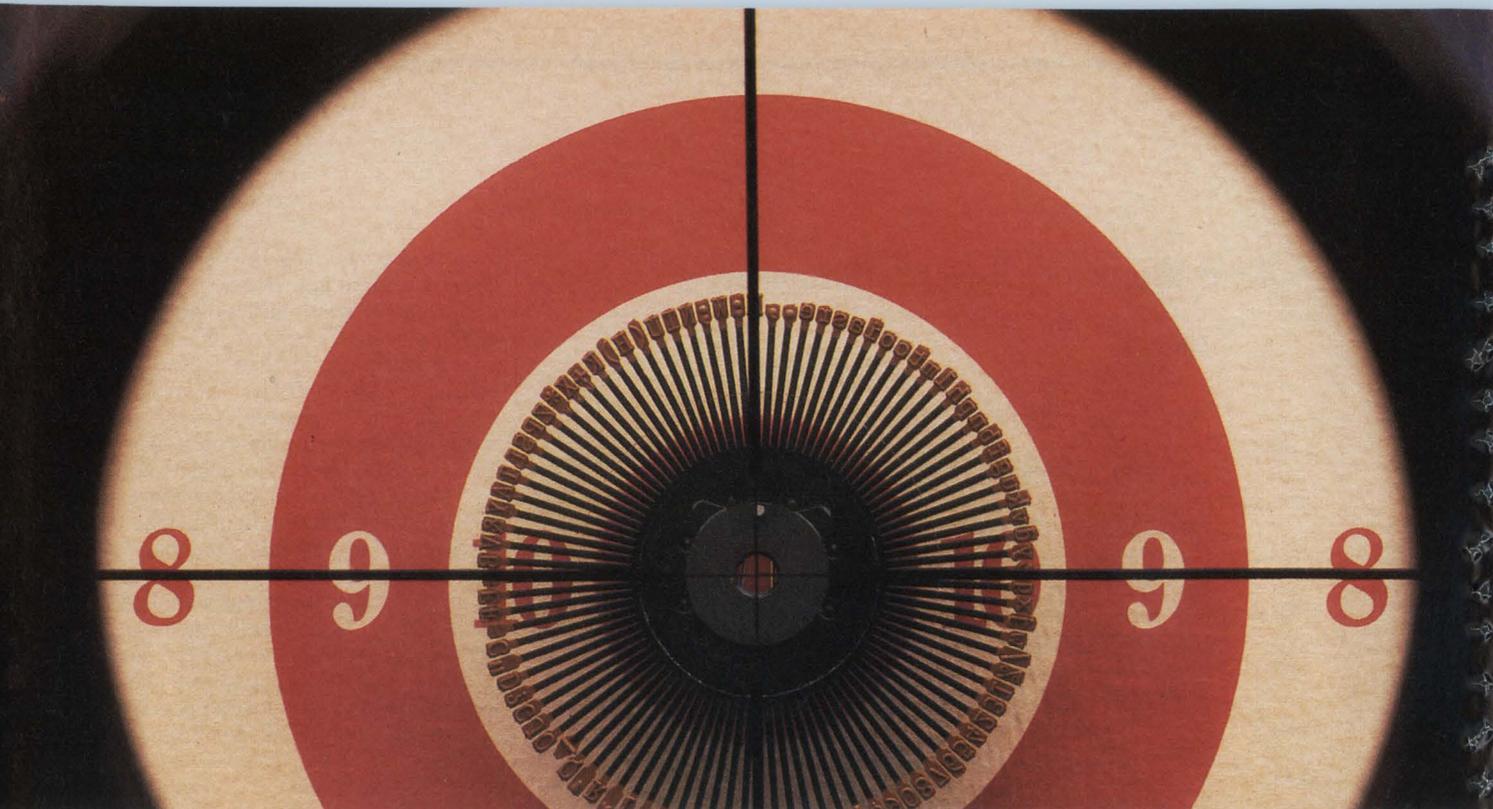
While IBM could differentiate the 3090 from the 308X without making substantial improvements to the machines—a new version of MXS/XA and a handful of new instructions would do the trick—such a tactic would doubtless engender a great deal of enmity on the part of users. So IBM is obliged to make real improvements in order to keep its orders simmering. Some of these improvements will raise the residual values of installed 3090s while others will reduce them. Some users may also be forced to invest additional money in order to keep their machines current.

A remote possibility, but one that every 3090 user must consider, is that IBM won't do anything more with the machine. If that's true, then the 3090 would be nothing more than a midlife kicker in the 30XX line. That would mean that a really new generation of large mainframes will be announced within the next couple of years.

Under this scenario, 3090s would prove to be poor investments. The Sierras would not long outlive 308X machines, at least in economic terms, and their sad, short story would probably go down in IBM history as a failure. No matter how snazzy IBM's next generation of large machines might be, it would still have to be marketed to a wounded and distrustful user base.

It is highly improbable that IBM would make such a suicidal marketing move. Thus it is unlikely that the Sierras will be short-lived machines. But it is possible, even probable, that they will have a shorter economic cycle than the five years the large 308X processors have so far enjoyed. Unless IBM can provide its 3090 users with much more price/performance and functionality—and pronto—their faith in the Sierras' future value will dwindle, and with it, their willingness to buy the iron. ■

*DATAMATION contributing editor Hesh Wiener is the publisher of Computergram International, a daily report on the dp industry; Computer and Communications Buyer, a monthly newsletter that covers the IBM mainframe world; and two other industry publications.*



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## ABSTRACT

IBM's initial success in the micro market far surpassed anyone's expectations, including its own. But when demand for PC products slowed, not only did the company feel heat from increased competition, it also felt the shockwaves from the shakeout in all market segments. Big Blue then made its problem at the low end even bigger when it drifted away from the strategies and standard that had made it the undisputed champion in the micro arena. To recapture that title, IBM must rebuild its micro muscle by providing new state-of-the-art offerings and by beefing up its existing wares with value-added features.

# Rebuilding Micro Muscle

BY MICHELE S. PRESTON

Once upon a time IBM was the undisputed ruler of the personal computer kingdom. It captured this coveted crown by adopting the strategies that had made its reigning rivals Apple and Tandy the leaders at the low end. But that was some five years ago, and today that crown has slipped because the company itself slipped up on customer support and on products such as the IBM Portable, PCjr, and the PC Convertible. These slip-

ups resulted in substantial market share losses for IBM. To stem those losses and recapture the title, IBM must work at rebuilding its muscle in the micro market.

IBM's initial success in the microcomputer market far surpassed anyone's expectations, including its own.

Several factors were instrumental in that success. First of all, IBM pursued an open architecture approach, which encouraged third-party activity on the applications software and peripherals



front. Second, the company moved one step ahead of the market by adopting Intel's 8088 16-bit technology for its PC products. And third, it capitalized on the micro momentum already started by Apple at the end-user level. To encourage PC purchasing even more, IBM set up dealer networks for retail distribution. Ironically, it is these very strategies that made the PC effort so successful in the early stages that are at the root of IBM's problems today.

The computer giant's winning PC strategy had a profound impact on the market. By the end of 1983, IBM had captured 25% of the \$5.2 billion micro market. In the meantime, IBM-compatible vendors had also gained additional market share. Leaders of the first generation, such as Apple and Tandy, however, suffered serious setbacks as their market shares nosedived.

IBM's big success at the low end enticed other major vendors to enter the market. Taking the pc plunge were Digital Equipment, Data General, Wang Laboratories, Xerox, and AT&T. These companies have had limited success because they never implemented strategies tailored to the unique characteristics of the micro market. Just as IBM missed the boat in the early minicomputer market, the mini makers missed their opportunity in the fledgling micro field.

Meanwhile, venture capitalists, recognizing market opportunities of their own, poured millions of dollars into new PC compatible companies and into software developers, peripherals suppliers, and computer retailers. By the middle of 1983 hundreds of hardware manufacturers were producing compatible products. Some were cheaper than the PC and some offered additional features.

IBM's position remained unaffected by the increased competition from hardware manufacturers hoping to capitalize on the company's open architecture approach and the standard it had created. But when demand slowed, not only did IBM feel the heat from increased competition, but it also felt the shock waves from the shakeout in all market segments. The company further compounded the situation when it began to drift away from the basic strategies that had contributed to its initial success.

One of IBM's major strategies was to incorporate in the PC state-of-the-art 16-bit technology—technology that attracted both developers and users. After the introduction of the PC in August '81 and the PC XT in March '83, IBM came out with several products that had technical

### In The Beginning

In August 1981 IBM unveiled the Personal Computer, changing the world of office automation forever. The entrepreneurial Entry Systems Division (ESD), Boca Raton, Fla., implemented strategies that at the time were counter to anything IBM had ever done. The daring division pursued a PC policy that advocated an open architecture, support of third-party software and peripheral developers, and a dependence on retail distribution. The introduction of the IBM PC, which reigned supreme from 1981 to 1983, showed that the team at Boca Raton had clearly done its homework.

A major part of that homework assignment consisted of analyzing the combination of factors that had made Apple computers such a big success at the low end. Perhaps ESD's short development schedule prompted it to veer off the proprietary path and seek third-party sources for key components of the PC architecture. The independent business unit then beat the bushes for a vendor to supply an operating system. ESD ended up with Microsoft, which, after several permutations, produced MS/DOS. The person behind the product was Microsoft chairman Bill Gates, who also helped convince IBM to incorporate a 16-bit microprocessor instead of the eight-bit processor that had been used in pcs.

The 16-bit entry chosen by IBM was the Intel 8088. Since the pacts for the chip and the operating system were nonexclusive, Intel and Microsoft were free to sell their wares wherever and whenever they wanted. They did, and as a result, the IBM/Intel/Microsoft architecture became the industry standard. Hardware vendors, following that standard, flooded the market with compatibles.

The potentially large installed base of PC and compatible products attracted the development talent of application software and peripherals vendors. Knowing that the newest and best applications would be developed first for the compatible systems, users literally put their money on this architecture, further solidifying the standard. Through its open architecture program, IBM aggressively sought the support of third-party developers.

The incorporation of the 16-bit 8088 set the stage for the emergence of the second generation personal computer architecture. The advanced performance of these systems in terms of memory, speed, and support of peripheral devices provided the necessary platform for software developers to produce more advanced business applications. Users, in turn, were able for the first time to see the real productivity pluses of pcs when they fired up such application software packages as the legendary Lotus 1-2-3 and dBase on their pcs.

ESD also broke the Big Blue mold when it decided to distribute its PCs through retail outlets. New dealerships sprang up overnight and the sales force that emerged promoted the IBM Personal Computer more enthusiastically and effectively than IBM's in-house team ever could have. After all, why would IBM salespeople want to sell a \$3,000 PC when they could sell a \$1 million mainframe? Since IBM's direct sales organization was not pushing the PC to the traditional buyer—the MIS manager and dp director—this group continued to ignore the importance of the personal computer in the office. Even mighty IBM didn't realize what a powerful force the little PC would exert in the office market or within the company itself.

BY MICHELE M. PRESTON

weaknesses and were not fully compatible with the standards the company itself had created. As a result, these micros did not attract third-party development and they failed to meet end-user needs.

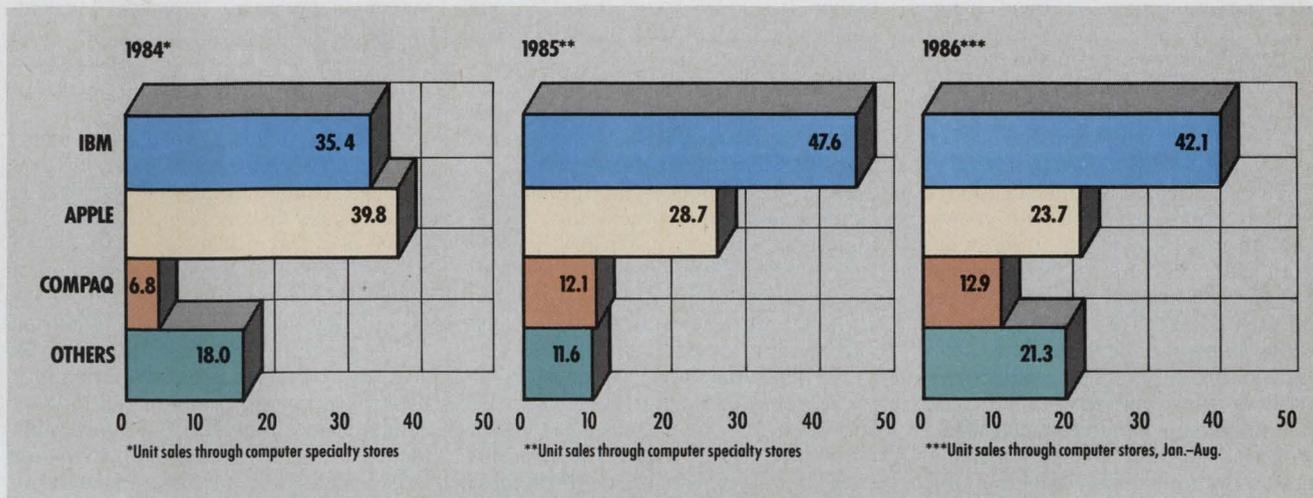
#### PCjr First on the List

First on that list of market misses was the PCjr home computer, which IBM finally introduced on Oct. 19, 1983, after months of intense industry speculation. The PCjr turned out to be an embarrassing failure for IBM for several reasons. First of all, the ill-fated machine was not

PC-compatible and offered a very short supply of software. Delivery delays also contributed to the product's failure. IBM was unable to ship the PCjr in the fourth quarter of 1983, which turned out to be the tail end of the boom cycle in the home computer market.

The next problem product to appear was the Portable Computer, which IBM unveiled in February 1984. IBM had been convinced by Compaq Computer's success that portability was the way to go. Once again, however, IBM's new micro was not fully compatible with the PC and

**FIGURE 1 PC Market Share 1984-1986**



it also didn't have features such as dual-mode display that Compaq offered. Approximately 120,000 of these machines were sold before it was discontinued in 1986.

Six months later, IBM took the wraps off the PC AT, which should have signaled the beginning of the third hardware product cycle based on the 32/16-bit architecture of the Intel 80286 microprocessor. Demand for the AT has been strong; it currently represents 20% of IBM's unit shipments. Yet despite that demand, an operating system that takes full advantage of the power of the 80286 chip has yet to be delivered.

During the past four years IBM has introduced other computers with the PC nomenclature, including the 3270 PC, the PC 370, and the RT PC. But these machines have had no real impact on the office market. As a result of this lackluster product performance, the bulk of IBM's PC revenues are still derived from sales of its Intel 8088-based systems.

By not pushing the state of the art, most of IBM's micro business is in the commodity market. The stability of the Intel 8088 architecture has created an opportunity for other vendors, both domestic and international, to gain market share by offering either prices or features that are better than IBM's. In 1985, IBM's unit market share peaked at 47.6%. By the middle of 1986 the company's share had dropped to 42%.

This market share decline coupled with the general slowdown in demand for personal computers has put pressure on this segment of IBM's business. Clone vendors with low-cost production or low-cost operations have gobbled up as much

as 20% of the market by selling compatibles at prices that are as much as 40% cheaper than IBM's. Many of the low-cost production outfits are located in the Far East, while the low-cost operations concerns are usually mail-order distributors. Other firms, like Compaq, have tried to beat IBM at its own game by offering fully compatible products with higher performance. All this knife-sharp competition has done more than shave points off IBM's market share. The clone companies are in fact driving pc prices even lower, which puts still more pressure on revenues.

That pressure would not have been there if IBM had maintained control of the

**THE MICRO STANDARD WILL NOT BE CONTROLLED BY IBM ALONE.**

PC standard it created, which resulted in the grass roots implementation of microcomputers in office environments. The over 6 million IBM-compatible pcs installed in that environment means that users have made an enormous investment not only in terms of hardware and software dollars, but also in terms of time. These users, who may by now be pushing the limits of these systems, want

an upward migration of the architecture to protect their investment.

Although dp professionals are regaining control of purchasing decisions, the grass roots implementation of pcs that started several years ago has created a sophisticated user base that will continue to demand products that are fine-tuned to their needs. In the past, software developers played a key role in determining the success of hardware architectures. If the most popular applications were not available when needed, users simply did not buy these systems. In the future, the micro standard will not be controlled by IBM alone, but by a combination of interests—users, application developers, operating system suppliers, microprocessor vendors, and hardware manufacturers.

**Office Environment Altered**

The proliferation of pcs has not only radically altered the office environment, but has also presented corporations with significant problems in trying to tie personal computers into office systems and in supporting such a broad base of users and applications.

IBM is also trying to control its own micro direction. IBM never recognized just how significant the personal computer would be to the office market or to the company itself. As personal computers infiltrated the market, other IBM product and marketing divisions began to feel the impact. Because that impact has turned out to be so broad, microcomputer strategies are now being determined at even higher management levels within IBM.

What does all this mean to IBM's future? The company is at a crossroads. To

## Rebuilding Micro Muscle

regain its momentum in the microcomputer industry and recapture market share, IBM must make strategic changes in the way it has operated its personal computer business over the last few years. To begin with, those executives making the strategic decisions at IBM must begin to listen to the needs of end users.

The increasing sophistication of desktop users, combined with growing dissatisfaction among dp professionals, means that IBM's offerings will no longer be blindly accepted simply because they bear the IBM logo. The company must deliver real end-user benefits. The current confusion in the market creates an opportunity for someone—whether it's IBM or a systems integrator such as Electronic Data Systems—to step in and assist corporations in implementing office solutions.

IBM must once again start offering state-of-the-art technology that fulfills a market need. It must also add advanced features to its current systems, creating value that elevates it above the clone companies that compete on a price basis. Such features might include built-in communications protocols that aid micro-to-micro networking, micro-to-mini or micro-to-mainframe communications, graphics facilities that emulate state-of-the-art technology incorporated in Apple's Macintosh, and high-performance storage devices.

Last September Compaq took the lead in evolving the industry standard with the introduction of its Deskpro 386. The company decided to take such a bold

step because it felt there was a need for a micro that delivered 80386-type performance. It also theorized that IBM would not be coming out with its 80386-based system until late this year.

In the meantime, there's been considerable controversy over what IBM's next micro move will be. Most speculate that IBM will come up with a proprietary system to eliminate the problem of clones. Salomon Brothers Inc., on the other hand, believes it is in IBM's interest to follow a value-added approach as Compaq has done in the past. This would conceivably take it out of the league inhabited by its clone competitors.

The distinction between a proprietary system and value added is a fine but important one. In the past, IBM has offered products that have been proprietary in varying degrees. All of them, including the RT PC, PCjr, PC Convertible, TopView, and the PC 370, have been unsuccessful. The reason for their failure was that they did not fulfill a user need. The advantages they provided were not sufficient to compensate for the fact that they could not operate industry-standard software and peripherals because they were not fully compatible. This obviously meant that software and peripheral developers would not commit development resources to machines that they did feel would earn broad enough user acceptance.

### Success Depends on Three Factors

Regardless of the route IBM chooses—proprietary or value-added—the success of its new products will depend on three

factors: whether the features meet real user needs, whether the products provide an upgrade path to protect users investment, and whether applications and peripherals users require to customize generic hardware for specific needs are available.

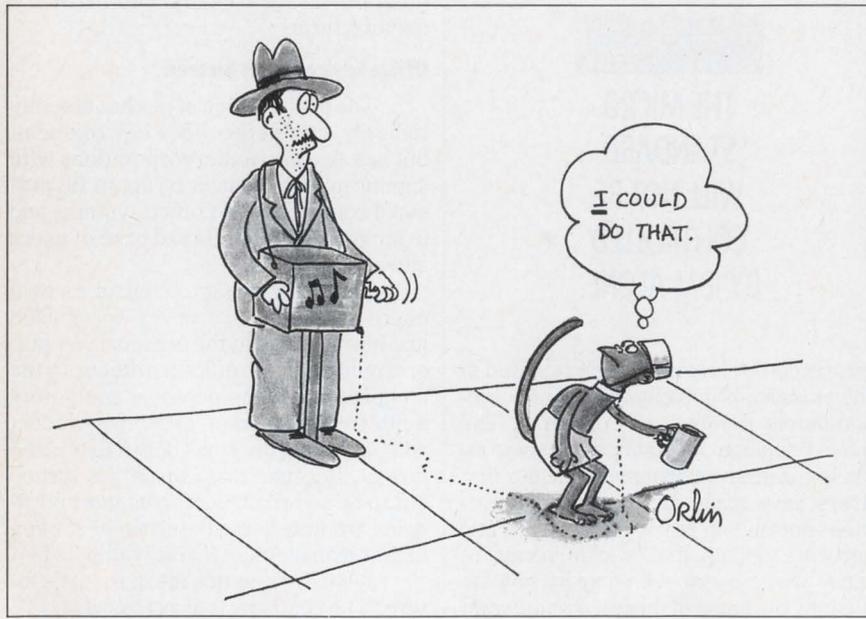
IBM also needs to resolve its micro dealership dilemma. The dealership system has resulted in the overdistribution of PCs, heavy discounting, and the emergence of a gray market of unauthorized agents. This has cut down revenues of even the best value-added dealers—dealers that IBM needs to effectively sell and support its large customer base. In an effort to consolidate distribution, IBM has placed a moratorium on authorizing additional locations. Its Customer Fulfillment Option also creates incentives for large accounts to purchase through the retail channel.

The company must take further steps to improve the quality of its distribution outlets. The majority of computer dealers, who do not have enough expertise to sell and support next-generation systems, will be lost when it comes to marketing the increasingly important total solutions envisioned by IBM in networking, communications, and applications. Even those dealers that do have the expertise are at risk because of the disarray and dissension in their ranks.

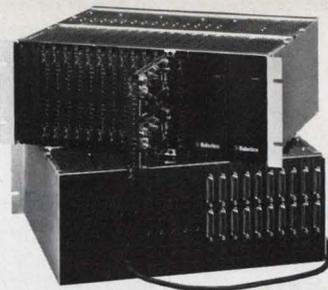
IBM must limit distribution of advanced systems to those channels that can provide strong customer support and end-user training. The company must also redefine the roles of these distributors and its own direct salespeople, so that the two sales forces are supporting, not competing with, each other.

Finally, senior IBM management must bite the bullet and determine the relative positioning of micros in the cooperative processing environment the company is attempting to build. IBM must make it clear to its corporate users that it has a cohesive strategy for offering information processing capability in a seamless fashion. Within that seamless framework are cpus, systems software, applications, and of course, communications from the desktop to the departmental work group and from the corporate database to the external database. The management responsibilities for executing such a strategy must be well defined. If so, IBM should be able to pump up its processing muscle in the microcomputer arena. ■

*Michele Preston is a vice president at Salomon Brothers Inc. in New York.*



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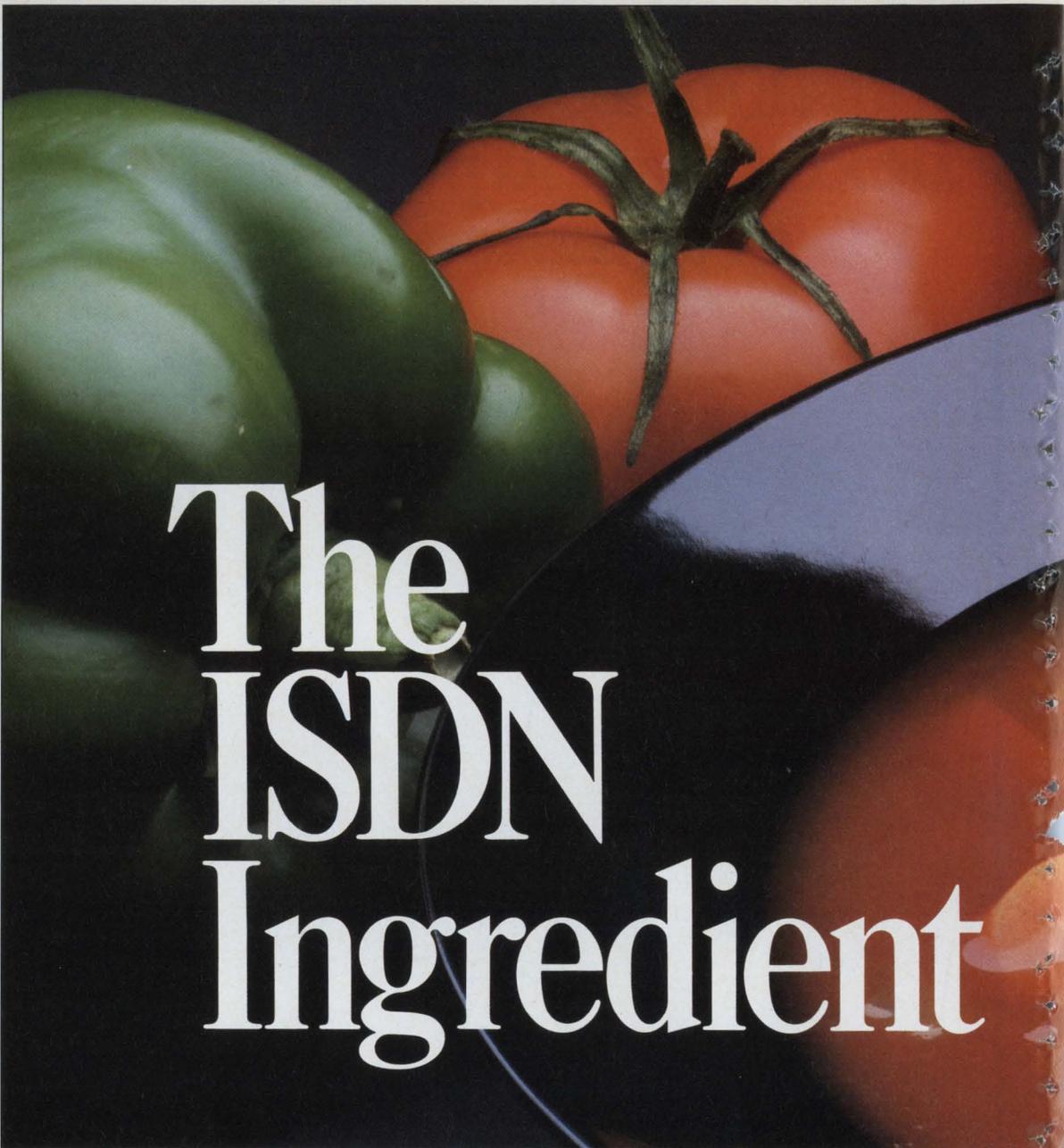
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## ABSTRACT

The Integrated Services Digital Network (ISDN) has evolved from a blue-sky technology into a Big Blue opportunity. Recognizing that opportunity, IBM has formally committed itself to ISDN and is working on new products that support the new voice/data functions.

Fueling IBM's ISDN drive is the Rolm CBX II along with a host of interfaces for SNA and a new range of terminals. Friction between the two companies, however, could slow that drive. But if IBM gets up to speed on the product front, ISDN could provide the company with the product connectivity it needs. Nevertheless, supporting ISDN will not be easy for IBM, particularly the task of adapting the closed SNA system to the more open environment of ISDN.



# The ISDN Ingredient

BY PETER PURTON  
AND PAUL TATE

With very few exceptions, IBM's performance as a supplier of telecommunications products has been singularly unimpressive. But with its traditional dp business under intense pressure, the company is more determined than ever to be successful in the telecom arena. IBM is pinning many of those hopes for success on the integrated services digital network (ISDN), a technology that promises standardized end-to-end digital communications for a wide range of services.

IBM has officially stated that ISDN is a strategic factor in its corporate future. "ISDN is one of the basic tenets of IBM's telecommunications directions," the company revealed to DATAMATION in a recent statement. "IBM's development

and manufacturing divisions have accepted ISDN as a 'given' and will provide hardware and software interfaces for digital access on our future products."

Based on a set of standards recommended by the Comité Consultatif International Télégraphique et Téléphonique (CCITT) in Geneva, ISDN will permit data, text, graphics, and voice to share the same network infrastructure. The type of terminal used will be the sole determinant of the network's function, which means a facsimile machine, pc, or telephone can be plugged into the same socket. A split bus structure will allow more than one terminal to be used at the same time; thus, a user interrogating a database will be able to discuss the information on the screen with a colleague on the other side of the building or on the other side of the world.

Photograph by Brian Kosoff



While full implementations of ISDN are unlikely before the turn of the decade, a number of trials in the U.S., Japan, and Europe are already under way. IBM has been quick to spot ISDN's potential and has already taken part in two of those experiments, both of them in Europe. The first trial, performed in April 1985 in conjunction with the Belgian government's telecommunications authority, used an ITT 1240 PBX and two IBM PCs to test ISDN protocols. The second, early in 1986, was conducted with British Telecom, and used a System X exchange, PCs, and IBM mainframes. This year, it plans further testing with other PTTs, including the West German Bundespost.

The trials were set up to help test the three different aspects of ISDN—the public network, the private network, and the different kinds of terminals. Most ob-

**ROLM IS STILL  
ACTING LIKE  
AN INDEPENDENT**

servers agree that IBM will concentrate on the last two.

IBM's early interest in ISDN does not surprise the telecommunications industry. David Boyce, Northern Telecom's U.K. managing director, points out that "IBM is interested in telecommunications because that is what will bring its services to people's desks. IBM effectively owns the mainframe world and the desktop. They must be keen on developing a significant position between."

Other observers, though, believe that IBM's ISDN moves are as much defensive as they are aggressive. One independent consultant close to IBM in Europe confides, "Connectivity is absolutely crucial to IBM. They see their mini-computer market being eroded by Digital Equipment Corp. and the pc market being eroded by everyone else. They have

to get their communications sorted out. ISDN could do that job for them."

Spearheading the IBM move to ISDN is Rolm, its Santa Clara-based subsidiary. Rolm has sold over 20,000 of its CBX range of PBXs. Approximately 5% of these incorporate the Rolmlink product, which is described by IBM as "close to ISDN." Rolmlink, which integrates voice and data, supports two 64kbps channels and a signaling channel, although this uses proprietary protocols.

Rolmlink already has an installed base of over 1 million lines in the U.S. The product's penetration of foreign markets, however, is almost nonexistent. In a position statement on ISDN issued last January, Rolm claimed that "Rolmlink can be viewed as the first high-volume implementation of an ISDN-like product in North America." It added that "Rolm can implement ISDN basic and primary interfaces as they are currently specified on the existing CBX architecture and will, as the standards become clearer and customer needs and demands crystallize."

### Stories of Culture Clash Widespread

But in many ways Rolm is still acting like an independent company within IBM and the stories about the culture clash between the two companies are widespread. That certainly poses a problem for IBM as it tries to implement a corporate-wide ISDN policy.

Some of those frictions with Rolm have been felt across the Atlantic. Rolm Europe Ltd., formed in the U.K. in August 1985, has been conspicuous by its absence in European telecom markets. Observers had expected a rapid move to capture liberalized European telecom markets while there were still sales to be made. Instead, the company's moves have been slow and tentative.

Rolm Europe was originally supposed to be located at Wootton Bassett in the southwest of the U.K. The building plans were soon scrapped, however, and in October of last year, Big Blue announced that the 20 or so Rolm Europe employees would be moved to IBM's existing plant at Havant on the south coast.

It also appears that IBM does not intend to set up a separate Rolm sales force in Europe. This may be because it feels it's gained enough telecom marketing experience in the last few years selling its own analog PBXs. Or it may be because it isn't convinced it can compete head-to-head with other European PBX vendors.

Nevertheless, industry analysts are convinced that Rolm is preparing to in-

## IBM on ISDN

*IBM's position on the integrated services digital network (ISDN) is not only important to the company's communications drive, it's also important to the information processing industry around the world. To better assess the company's stand on this crucial communications issue, DATAMATION asked IBM Europe the following questions, which were answered in a written statement.*

**DTM:** To what extent does IBM consider ISDN the networking standard of the future?

**IBM:** We are witnessing a profound technological evolution. Today, transmission facilities are predominantly analog; within five years or so, many will be digital. Accordingly, we feel that ISDN, along with OSI, will evolve to become one of the very important networking standards of the future. ISDN is extremely significant to IBM and will be extremely important to our customers. ISDN represents a business opportunity for IBM. The technology can yield improvements in performance and reliability, and its use will enhance connectivity for our customers. Increased bandwidth and the prospect of widespread use of fiber-optic technology will likely allow faster response times and greater throughput. ISDN essentially will reduce transmission as a barrier in telecommunications.

**DTM:** How much work does IBM plan to implement ISDN on IBM systems?

**IBM:** We expect that some additions to Systems Network Architecture (SNA) will be required to adapt it to ISDN. There is also quite a bit of work to be done in implementing ISDN in the many IBM products that attach to the networks today. ISDN is one of the basic tenets of IBM's telecommunications directions. IBM's development and manufacturing divisions have accepted ISDN as a given and will provide hardware and software interfaces for digital access on future products.

**DTM:** Which laboratory is responsible for IBM's development work on ISDN?

**IBM:** No single laboratory has been assigned this responsibility. ISDN impacts every product that attaches to a network. Therefore, several IBM product development laboratories around the world will be involved in implementing ISDN interfaces on their products. The architecture and standards responsibilities for ISDN are handled centrally at our Research Triangle Park, N.C., facility.

**DTM:** Does IBM cooperate with government telecommunications authorities in all the countries implementing ISDN?

**IBM:** In principle, yes. There are, however, resource constraints that might prevent IBM from handling *all* requests. IBM has engaged in joint projects with Belgium and the U.K. in conducting successful ISDN field tests, and IBM is cooperating with PTTs on ISDN projects in other countries as well.

**DTM:** Does IBM see a different role for ISDN in Europe, compared with the U.S.?

**IBM:** No. As a worldwide telecommunications supplier, our profound desire is to see ISDN evolve into a single, worldwide standard and to see it implemented consistently in all countries. We also believe that our customers will require a high degree of consistency in connecting devices to their international networks.

**DTM:** Would IBM like to see all the world's telecommunications operators use this single standard? Does IBM think it will happen?

**IBM:** While we would like to see network operators use a single standard, we anticipate significant variations among countries in their implementations. These regional variations are likely to impede unnecessarily the progress toward development of a portable worldwide digital communications interface. Initially, we expect variations to exist. Through time and effort, these differences will slowly converge. We do not foresee a time of no national variations.

roduce an ISDN PBX in Europe in the near future. A version of Rolm's successful CBX II voice/data PBX is reported to be undergoing approvals procedures in Britain. The Yankee Group's Jay Borden, based in Watford, England, adds that if the CBX II is announced in Europe, it would make sense only as an ISDN model.

"The CBX II would make a good candidate for an ISDN PBX," according to Borden. "It is already being used as an integrated voice and data switch in the U.S. It's just a matter of adapting the bus structure and developing some sort of user interface.

"Looking at it from a competitive

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## The ISDN Ingredient

viewpoint, the PBX going through the approval procedure right now has to be ISDN," insists Borden, who went on to point out that Ericsson in Sweden, Plessey in England, and Siemens in West Germany are already offering ISDN switches on the European market. "IBM would have to take this route if it is to have a chance of success," declares Borden.

Borden believes IBM's ISDN will be a Europe-only product, at least initially. "Just as you can't buy IBM's OSI products in the U.S., I don't expect IBM will make its ISDN products available there immediately," he says.

But whatever happens with the Rolm products, supporting ISDN is not going to be easy for IBM. SNA clouds that support picture, says Northern Telecom's Boyce. "IBM's problem is that for some years it has been promoting a network strategy that is diametrically opposed to ISDN. SNA is a closed proprietary system."

IBM is acutely aware that it cannot ignore international standards once they have gathered momentum. The company has "shown a greater willingness over the past 12 months to bend to pressure from standards-making authorities, especially in Europe," says the Yankee Group's Borden. "If it wants to sell to public operators or gain their approval for connecting equipment to the public network, it must provide products with some degree of conformance to standards."

Other industry watchers believe that IBM will partly adapt SNA to meet ISDN standards. In an international report entitled "ISDN: The Commercial Benefits," published last May, U.K. research company Ovum predicted that "the most likely outcome is that IBM will incorporate ISDN standards for bearer services within SNA as it has done with X.25 standards and will ignore ISDN standards for teleservices."

That approach is unlikely to please

the world's telecom agencies. The strongest proponents of comprehensive ISDN standards, the PTTs, are hoping the network protocols will help them retain some control over future developments in information technology.

### Technology Is Outpacing ISDN

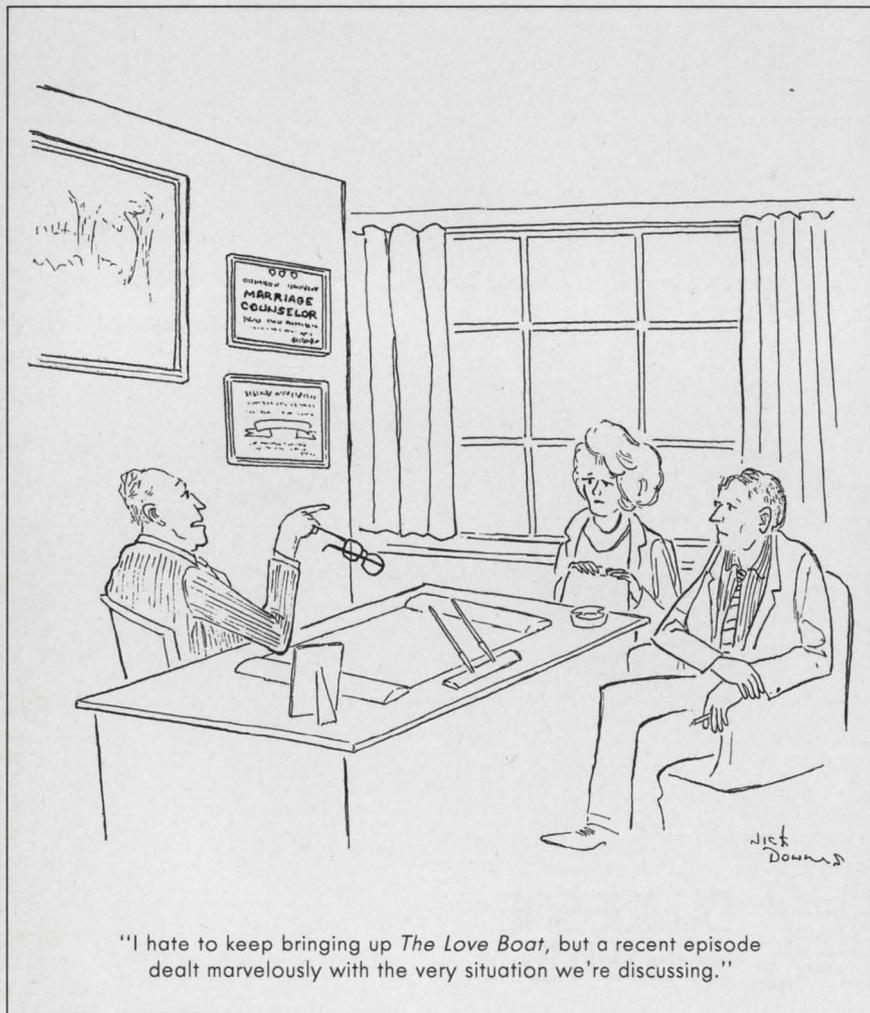
The problem is that since ISDN was first proposed, many of its most attractive benefits have been outpaced by developments in technology. For example, the links between pcs and fax machines promised by ISDN are now possible without it. Other features such as last-number redial and stored number dialing, a novelty when first announced as a facility with ISDN, are now commonplace. ISDN is also supposed to make data communications easier, but in the last few years there have been vast improvements in datacom services over conventional and other non-ISDN networks.

Improvements in terminal technology have made most of these facilities possible. IBM hopes to build on these improvements. Within the next few months, the company is expected to unveil a new line of ISDN-based terminals under its Office Master product line. "The Office Master will be a lot more powerful than the PC or an intelligent terminal," says one IBM source. "That's where ISDN will come in."

What do such moves mean for PTTs, which would like to see intelligence built into their own networks? These precedents auger ill for the PTTs. They would like to see the intelligence that makes these facilities possible built into the network. But if that happens, the computing industry loses control of a very valuable business area. Thus, if the provision of such facilities is the purview of the terminal makers, then the role of the PTTs is reduced to providing cables rather than services.

That's something that wouldn't upset IBM too much. As IBM Europe's chairman Kasper Cassani puts it, "In most countries the telecommunications agencies are extending their monopoly authority to new businesses, in particular by control over the use of the network and control over procedures for attaching equipment to the network. We think this is a potentially harmful development. PTTs should be able to participate in these new business areas but on a competitive basis." ■

*Peter Purton is a freelance telecommunications journalist based in Bath, England.*





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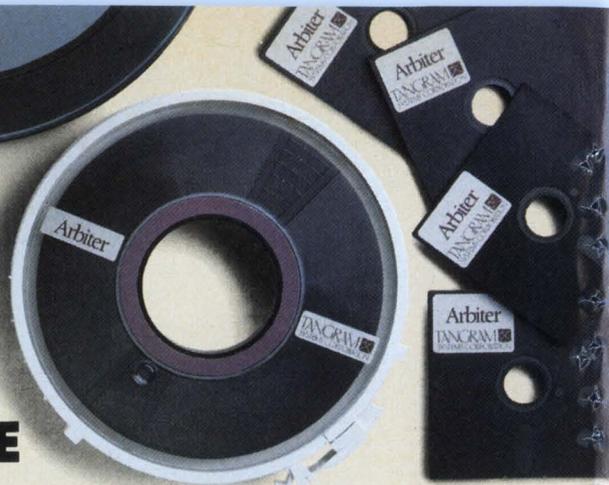


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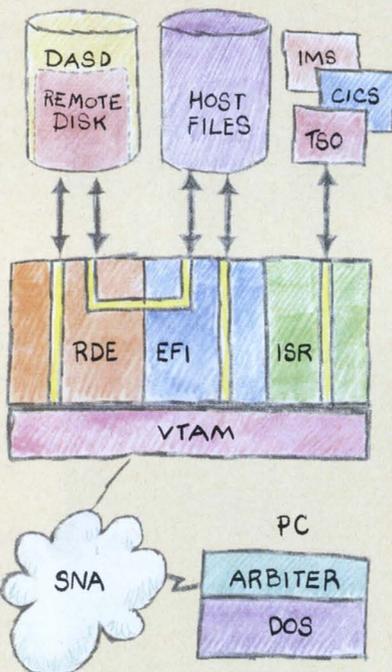
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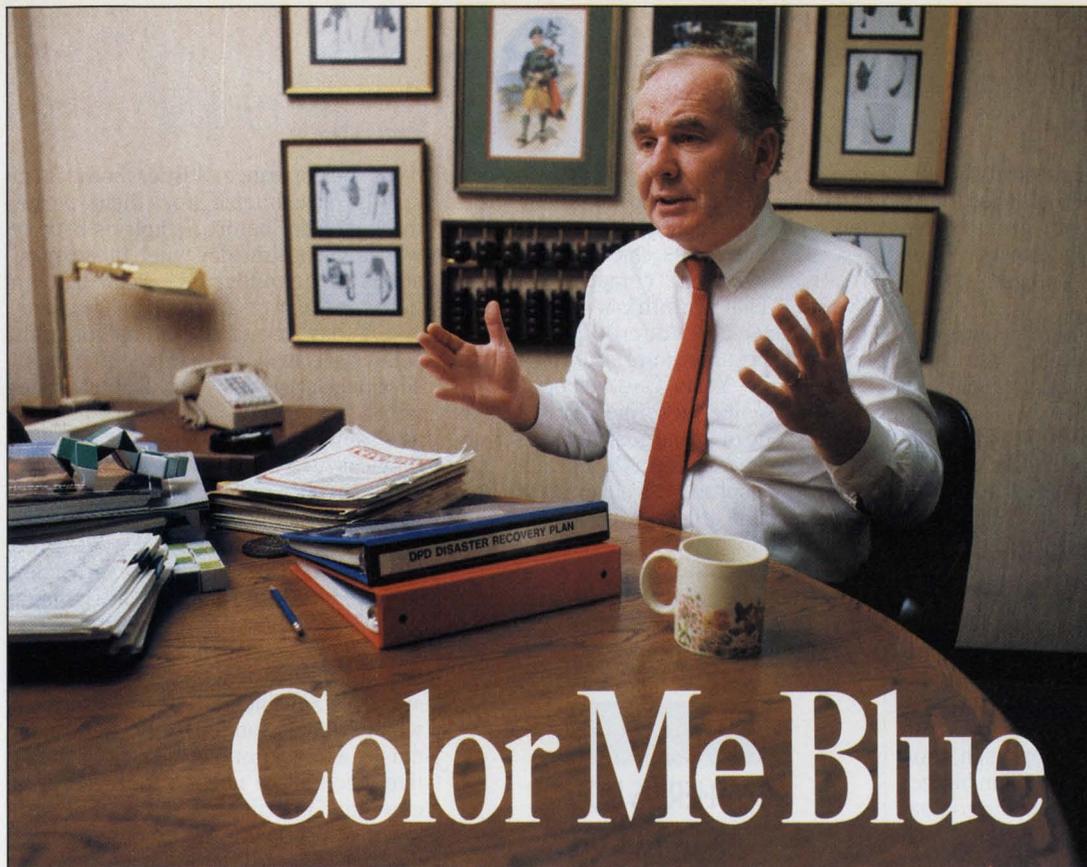
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## ABSTRACT

Joseph Brophy, senior vice president of data processing at Travelers Corp. in Hartford, Conn., bridges the gulf between the executive suite and the MIS department like a colossus—with a foot in each camp. And when it comes to computer camps, there can be no doubt that DPMA's Man-of-the-Year is as true-blue as they come in the insurance or any other industry. A leading-edge user, Travelers has helped IBM hone its technological edge. With Brophy at the helm, the company is charting a daring course into the world of office communications, sailing in all-blue waters.



# Color Me Blue

BY RALPH EMMETT CARLYLE

The insurance industry is the cornerstone of the IBM empire. This market, which is the least polluted by the influence of archival Digital Equipment Corp., is a bastion of loyal customer support. It's here, in this bluest of blue worlds, that early releases of the computer giant's most advanced and experimental products are put to the test. And it's here, in one of the most information-intensive environments known, that the cutting edge of IBM technology is honed.

At the heart of IBM's empire stands Hartford, Conn., the so-called insurance capital of the world and home to many of the leading corporations in the field. The city, which by some measures has the greatest concentration of computing power, networking, and dp resources in America, has become a favorite location for IBM to do its state-of-the-art stretching exercises. Not surprisingly, this wonderland of MIPS has also attracted more than its fair share of MIS management luminaries. These bright and guiding lights

**At the heart of IBM's empire stands Travelers Corp. in Hartford, Conn., the insurance capital of the world, where the computer giant's most advanced products are put to the test.**



are working with IBM to push the leading edge of technology to the limit. The latest of these executives to gain national recognition is Joseph T. Brophy, senior vp of dp at Travelers Corp., who was named Man of the Year by the Data Processing Management Association (DPMA) in 1986.

A researcher by temperament and a manager by habit, 53-year-old Brophy bridges the traditional gulf between the executive suite and the MIS department like a colossus—with one foot in each camp. Like previous Hartford-based winners of the DPMA award, such as Aetna Life & Casualty Co. vp Irwin J. Sitkin, Brophy was singled out for his unusual skill at blending business and technology strategies and his talents as an industry seer.

This potent combination of abilities has enabled Brophy to scale the senior management ladder at one of the largest financial institutions in the country—ascending via the MIS route. As senior vp of dp at Travelers, Brophy shares in the major business decisions of a corporation with \$50 billion in assets. He is the man entrusted with the vital role of harnessing new technologies to gain a competitive edge.

His views are eagerly sought by user organizations and vendors, and he has been putting his money where his mouth is by engaging in a rapid but controlled decentralization program. Micros have helped fuel this decentralization

## Color Me Blue

drive. So far, Travelers has doled out some 17,000 PCs to its employees for office and home use. Brophy predicts that PC population will explode to 60,000 in three years once the support staff is streamlined.

"Once the bulk of our transactions are captured electronically, we won't need an army of paper pushers," Brophy declares. Today, approximately two thirds of Travelers' work force are made up of clerical or administrative personnel. Brophy would like to trim that to one third by 1990.

### Discarding and Replacing OA

To support this changing corporate work environment inside Travelers, the notion of office automation has been discarded and replaced by the concept of office communications. This focus on peer-to-peer communications, which is the essence of the Travelers approach, took up most of Brophy's \$350 million budget last year. Under his guidance, the company has introduced advanced voice mail and teleconferencing technology. Document transfer is handled through IBM's DISOSS, with 4,000 mailboxes defined and another 6,000 expected this year.

Travelers is one of the rare examples of a company going beyond the pilot stage with this controversial software. On-line text management, electronic mail, and decision support software is liberally sprinkled throughout the network. Linking all this together is some of the most advanced IBM networking technology to see the light of day.

There is, however, one big snag in this progressive scenario: IBM's sluggish pace of software development. As overlord of this all-blue shop that has one of the largest and most sophisticated SNA networks in the world, Brophy has become dependent upon IBM—a dependency he shares with his MIS colleagues in the insurance trade. "The company has certainly been slow to provide the peer-to-peer technology we need to build our network," admits Brophy, who adds, "but at least the elements are now there."

The elements Brophy refers to are actually products currently being beta tested within Travelers' 3,000-person dp organization. These products include new Advanced Peer to Peer Networking (APPN) software; unannounced Texas Instruments interface chips that broaden the bandwidth of IBM's token ring LAN technology; and a new IBM/Microsoft operating system for the PC. Brophy is very reluctant to talk about any of these

projects. "Let's just say that IBM is working closely with us to solve our problems," he says, and smiles.

Travelers' MIS chief describes his relations with the computer giant as "warm." That warmth is mutual. Several top IBM executives offered flattering testimonials in support of Brophy as DPMA's Man of the Year. One senior IBM vp, Allen J. Krowe, described Travelers as having "one of the largest and finest leading-edge capabilities in the industry."

But despite IBM's eagerness to help Travelers and other advanced customers create companywide networks, Brophy doesn't expect the company will be able to deliver the necessary software until next year. He believes that IBM may also



**"THERE'S NOT AN OUNCE OF STUFFINESS IN BROPHY."**

be under the software gun with its next generation of Intel 80386-based PCs. "This could be one reason," he theorizes, "for IBM's present difficulties and the industry slump. Many large corporations want to make the transition to a network of peers or knowledge workers, but are holding back because the software isn't there."

Brophy estimates that his dp budget won't climb much above the 12% mark this year—the same growth threshold hit in 1986. "We should really open the purse strings in 1988," he reports, "and our dp budget should double over the next four years."

Over this period, dp should begin to break away from its current position as a standalone cost center, evolving into a more integral component in Travelers' overall operations. In this mode, dp would function as an information utility that offers around-the-clock availability, efficiency, and reliability. Brophy and his team are already halfway there.

Every morning, Brophy has his key MIS personnel get together with end users, customers, and representatives from IBM and voice mail network supplier AT&T. These get-togethers, which are conducted in person and via teleconferencing, are held to review the previous

day's performance. "Everybody is instantly accountable for their performance the day before," explains Brophy, who envisions the day when these evaluations can be conducted in "constant real time" as the transactions actually occur.

Today, an average of 4 million transactions are analyzed in the course of one session. On a yearly basis, that translates into 1 billion transactions. While these assessment sessions are worthwhile, they can also be a little nerve-racking to insiders. "It's not for the fainthearted," notes one of Brophy's divisional chiefs, "but it does foster cooperation. Problems don't fester and customers know we [including IBM and AT&T] are committed to keep raising the standard."

That's a goal that standard-setter Brophy heartily supports. The DPMA sees this amiable and unassuming man, who has a passion for Celtic culture and music, as a prototype of the MIS executive who will be needed to oversee the emerging information utility. Forward-looking firms in information-intensive industries are already casting their nets in search of this new breed of dp leader, known in today's parlance as the chief information officer.

They'll have a tough time finding the likes of a Joe Brophy—the Joe Brophy who is mathematician, philosopher, actuary, technician, musician, and businessman. A Renaissance man in a real-time world, Brophy is a modest person. "He's real low key," confides a colleague. "I think he's embarrassed by all the authority that goes with his position. There's not an ounce of stuffiness in him."

But there's much more than an ounce of Irishness in him. That strong Irish temperament stood him in good stead when he served in the Korean War and when he returned stateside to serve in numerous project management roles, a time he describes as his "initiation by fire." His hearty constitution and robust build have also helped him withstand the 18-hour work days that have become a fact of his busy business life.

"I'll probably wear out before I retire," he quips. Brophy's recipe for success, which probably won't wear out, is simple and straightforward: "The most important thing is a finely developed sense of intuition. . . . Intuition enables people to know where to get information, whom to trust, and in what way to share. The key," he declares in his self-effacing style, "is to know how to listen and to surround yourself with good people." ■

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## ABSTRACT

**IBM's non-U.S. sales account for around 43% of its total revenues. Sustained growth in dp markets outside North America helped the company maintain a stable position in 1985. But in the last 12 months, some foreign subsidiaries have been struggling, too. Japan is looking healthier, and reorganization is the order of the day at IBM.**

BY PAULTATE

It is no accident that IBM's name is almost as familiar to people in Milan or Manila as it is to people in Minneapolis. IBM has had foreign subsidiaries selling its products ever since the day it began life as the Computing-Tabulating-Recording Co. in 1911.

Now, IBM's globe-circling operations make other dp vendors look like members of the Flat Earth Society. At the end of 1986, the world of IBM contained 134 countries and the corporation is as dominant in many of those national dp markets as it is at home in the U.S.

The subsidiaries in those countries vary widely—from IBM's largest in West Germany, which is now 76 years old, to its youngest in the Portuguese free port of Macao, Southern China, now in its second year. What's clear is that IBM has always regarded its business as truly international.

That worldwide sales network makes the company a great deal of money. In 1985, 43% of IBM's \$50 billion gross income came from outside the U.S. That amounted to \$21.5 billion, three times Digital Equipment Corp.'s total income for the year and twice the total income of Burroughs and Sperry combined, even before they started selling some of the family silver.

More important, that international business kept IBM's profit slide for 1985 down to 0.4%, despite the serious effects of the slowdown in U.S. dp sales. Net profits from non-U.S. operations grew by 19% that year compared with a 13% drop in profits in the U.S. As president and ceo John Akers put it in IBM's 1985 annual report, "Substantially all of the growth continued to be in non-U.S. portions of the business."

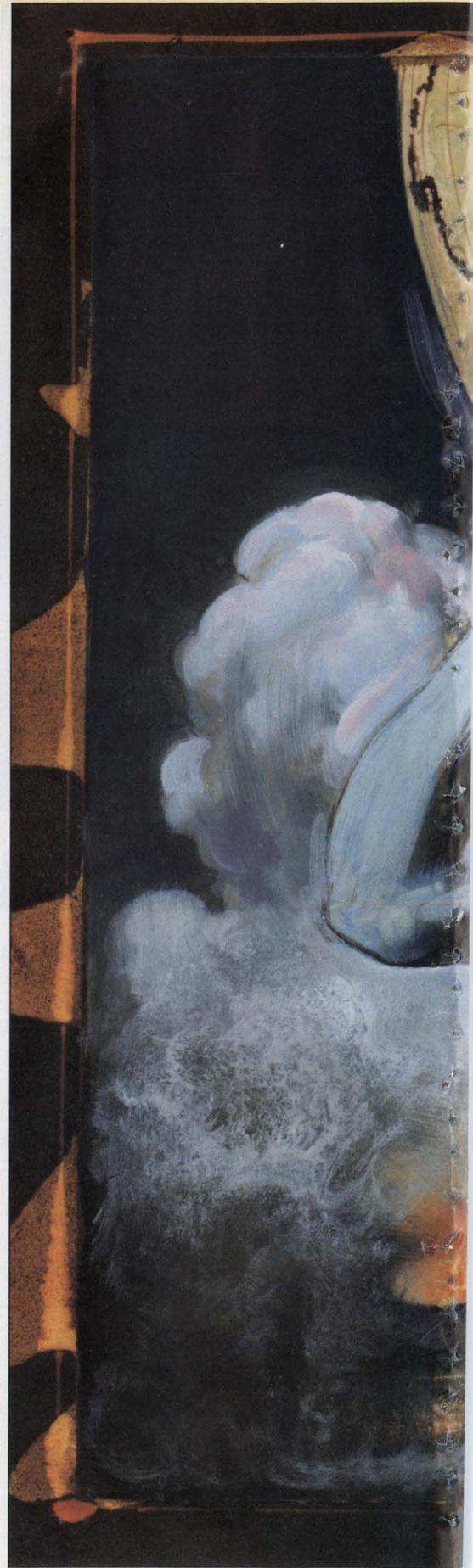
In the last 12 months, however, things have changed, and the world is beginning to weigh heavy on IBM's shoulders. Akers was already warning analysts last fall that the company's international business was "beginning to moderate." With 1986 revenue growth expected to be down around 5% overall, and net profits off by well over 10%, it's clear that IBM's international business didn't have the same effect as it did in 1985.

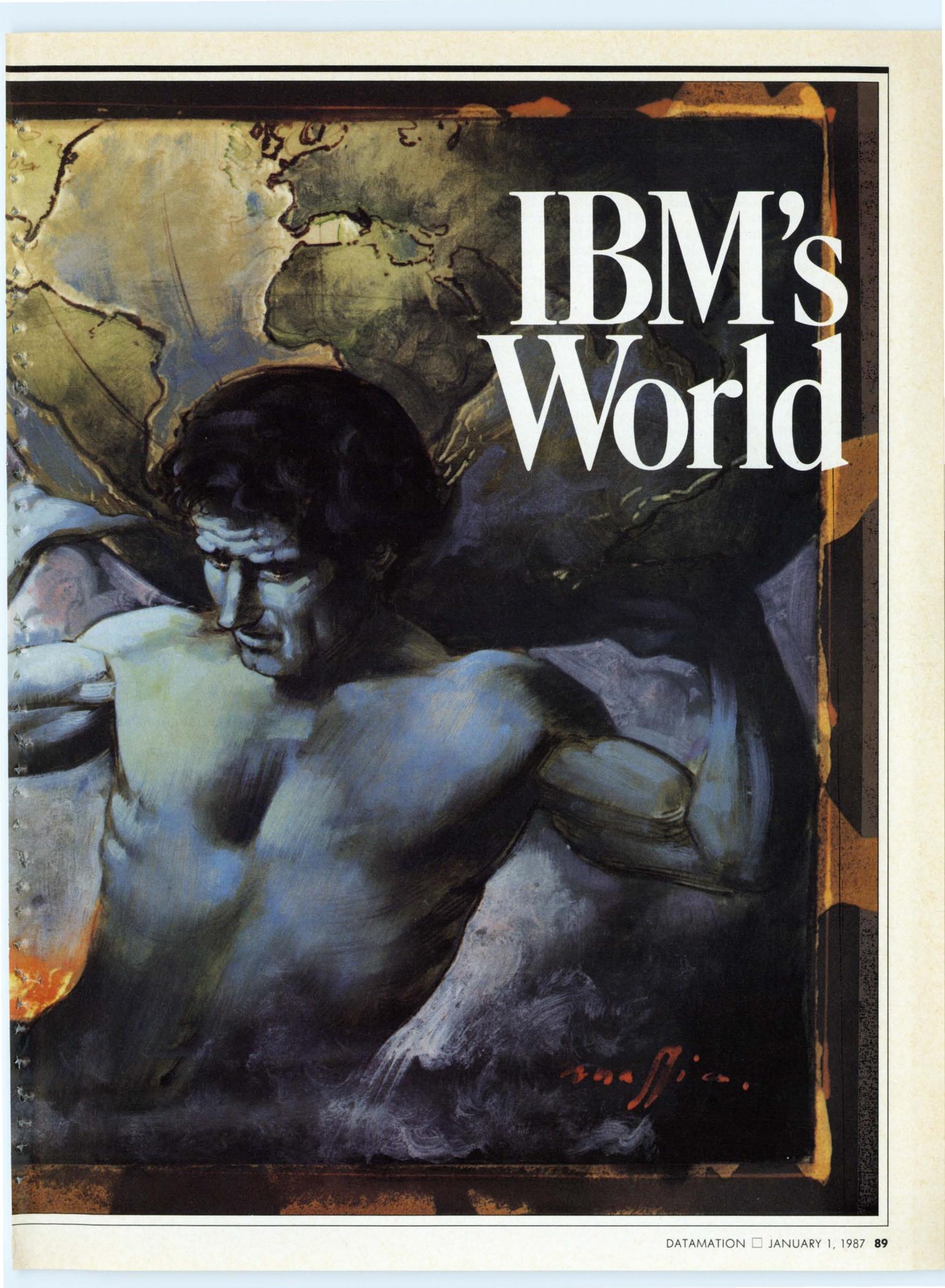
So what in the world has gone wrong for IBM, and where? An official IBM statement explains, "The moderation of growth in our World Trade operations affects all major geographic areas, generally to the same extent. The exception is Japan, where our business still shows a strong growth over 1985."

That's not much of an explanation. In fact, it is IBM's large European subsidiaries that are feeling most of the pinch. Sources in Australia also suggest that IBM's growth is slow.

That's serious for IBM. Of the company's top 10 international subsidiaries, seven are European (see Fig. 1). IBM Australia is also on that list and so is IBM Canada, which was already suffering from the side effects of the U.S. slowdown back in 1985, with a growth rate of a mere 2.6%. Japan is the company's saving grace, and since the headquarters of the Asia/Pacific Group was moved to Tokyo in 1984, IBM has managed steadily to claw back some of its market share (see "Slow

Illustration by Daniel Maffio





# IBM's World



ly But Surely in Japan").

But the problems in its other operations aren't going to go away. "In 1985, the European business helped pick up a lot of the slack in the U.S.," explains Jay Borden, a senior analyst with the Yankee Group at its European headquarters in Watford, England, "but the operating companies in Europe are not in a position to bail out the U.S. for 1986."

That's the result of two things: a slight slowdown in the purchasing of dp systems in Europe and the emphasis being placed by European buyers on product areas where IBM is not so strong—telecom, network services, office automation, and midrange systems.

**European Slowdown Won't Be So Bad**

The reason the slowdown in Europe is unlikely to be as drastic as in the U.S. is that it's a "less volatile market," says Borden. "The variety of economies tends to flatten any steep falls in sales, and the tradition of European buyers to satisfy actual rather than perceived needs makes demand more stable."

Not for IBM, though, points out Ulrich Wiel, an IBM analyst in Washington, D.C. "IBM France is having a terrible year, and I believe that is true to a lesser extent in other countries," he says. "IBM is feeling it harder than anyone else because it is heavily oriented to high-end systems where the market isn't growing, while at the low end it is easier for other companies to compete."

Market intelligence seems to support Weil's view. The Yankee Group's Borden cites ICL and Bull's return to profitability after the gloomy early '80s as an indication of stronger local competition for IBM in the mainframe sector. Now, West Germany's Siemens and BASF have merged their Fujitsu and Hitachi pcm operations into a new company, that competition will get even stronger.

At the low end, meanwhile, IBM's PC is losing market share to the host of U.S. and European clone makers. Personal computer market specialist Intelligent Electronics estimates that IBM has lost 3% market share during 1986 in the European professional pc market, down to just under 30% from over 33%.

In the midrange systems arena, IBM hasn't only got its U.S. favorites like DEC and Hewlett-Packard to contend with, but also the fast-growing European midrange suppliers such as West Germany's Nixdorf and Norway's Norsk Data.

Furthermore, Europe isn't the only area where IBM is getting hurt. In Australia, IBM looks set to fall short of its pro-

jected mainframe sales for 1986, and its target revenue of \$A1 billion, which seemed easily attainable a year ago after a 36% increase, is now in jeopardy.

The same sluggish mainframe sales are likely to continue in Canada, too. "NAS and Amdahl have made inroads into IBM's traditional mainframe base in Canada over the last two years," points out Mike Tardiss, one of the systems managers in the Canadian government's Information Technology Management Directorate, "although IBM is starting to win back some of its lost ground now."

So what can IBM do about it? "Akers doesn't have any magical tricks up his sleeve," says Weil. "It will be a matter of cutting costs, entering new product areas, and reorganizing."

That policy of reorganization is already well under way in IBM's international operations. The company now splits its international business into three geographical areas—the Asia/Pacific Group (A/PG), the Americas Group (AG), and the Europe, Middle East, and Africa Group (EMEA).

Last April, IBM World Trade formally split its old Americas/Far East Corp. into two and passed on much of its responsibilities to A/PG and AG. Each now reports directly to IBM World Trade Corp. in Mount Pleasant, N.Y. The combined gross income of A/PG and AG in 1985 was \$7.5 billion, up by 14% over 1984.

EMEA, meanwhile, has been undergoing restructuring for the last two years in an effort to pass more autonomy to the

major country subsidiaries and to cut costs at its headquarters in Paris.

IBM's national operations in the U.K., West Germany, Italy, and France are now much more in control of their own destinies, while the rest of the group's subsidiaries fall under a new Areas Division. Further internal changes were introduced last year, focusing the pan-European and national organizations more along specific industry lines such as telecommunications—always a stronger sector for IBM in Europe than in the U.S. In November, IBM also announced that it was studying plans to centralize its European distribution of high-volume products through its facility in Amsterdam.

**Fast Growth in the Far East**

IBM World Trade Asia/Pacific Group, based in Tokyo, is the fastest growing of the three groups in terms of the number of people employed and the number of countries covered. This reflects the rapid increase in dp usage in the Far East and IBM's intention to fight stiffening Japanese competition across southern Asia.

Headed by Richard T. Gerstner, A/PG was set up just over two years ago, although IBM has been doing business in the region since 1925. It was still part of the Far East/Americas Corp. until last year. A/PG is responsible for sales in 18 countries, including Japan, Australia, Korea, Singapore, New Zealand, and Taiwan. Although it has branch offices in Peking and Shanghai on the Chinese mainland, the headquarters of the Chinese subsidiary is in Hong Kong.

A/PG also looks after IBM's sales in In-

**FIGURE 1 IBM's International Top Ten in 1985**

	GROSS REVENUES (\$M)	% CHANGE IN AAC*	INTER COMPANY TRANSFERS (\$M)	NET PROFITS BEFORE TAX (\$M)
West Germany	4,500.0	17	1,693.5	644.6
France	4,183.4	13	1,920.2	626.2
U.K.	3,901.3	30	2,028.2	667.9
Japan	3,832.6	19	1,072.5	564.9
Canada	2,306.2	2.6	N/A	424.9
Italy	2,249.9	18	707.0	437.8
Spain	1,121.3	37	519.9	196.6
Netherlands	1,032.5	26	356.3	163.8
Sweden	846.4	25	354.1	122.6
Australia	632.5	36	N/A	101.4

\*Actual Accounting Currency

N/A: Not available; all figures are unconsolidated amounts based on OECD average exchange rates for 1985; some figures restated since appearing in "Europe's Elite," Aug. 1, p. 34.

Source: IBM

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dia, a sensitive subject at World Trade. IBM suddenly pulled its subsidiary out of India in 1978 after refusing to agree to the country's regulations covering foreign companies. Although IBM still has an office there above a doll museum in New Delhi, its purpose is only to clear up some of the financial mess IBM's sudden departure left behind—including a bundle of profits being held in escrow. Sales to India, which are on the increase again, are now handled by an offshore marketing group based in Sydney.

Across the Pacific, the new IBM World Trade Americas Group, based in

Mount Pleasant, N.Y., and headed by Paul Kofmehl, is responsible for all sales in the American continent outside the U.S. That covers 30 countries, including Canada, Mexico, and the rest of Latin America. The group also looks after Brazil, which, sources say, is IBM's most profitable subsidiary. IBM will not confirm or deny the assertion.

IBM World Trade Europe, Middle East, and Africa is based in Paris and headed by Kasper Cassani. EMEA is by far

## IBM's World

the largest of the World Trade groups; in 1985 its gross income was \$14 billion, up 17% over 1984.

EMEA covers 85 countries. These include West Germany, France, the United Kingdom, Italy, the Netherlands, Sweden, Spain, Israel, Turkey, and through a historical accident, Pakistan.

EMEA also has an office in Moscow, which reports to one of its associate companies in Paris, IBM Trade Development, established specifically to support sales to the USSR.

In March of this year, IBM will ostensibly lose one of its subsidiaries, IBM South Africa, following its decision to disinvest and pass the company on to local management. That decision is an interesting one because it indicated the extent to which public and political pressure in the U.S. can affect the company's foreign business. Furthermore, the way it is riding itself of direct South African involvement is unique.

The non-IBM IBM South Africa will still peddle the company's products, still be supplied by IBM for at least three years, and also be able to offer products from other manufacturers. It's an ingenious solution. The pressure groups back home in the U.S. are happy that IBM has disinvested. The South Africans are happy IBM will still be around in one form or another, and the IBM board is happy because it can now get back to other items on its agenda.

The change should make little difference to EMEA's revenues since the new company will still be buying products and besides, IBM says its South African operations accounted for less than 1% of its overall revenues.

### Continued Slowdown May Be Trouble

What may have a more serious effect, though, is if EMEA continues to take the brunt of the European slowdown in business during the coming year. Weil warns that, in the short term at least, IBM's troubles are far from over: "If Europe does slow down any further in 1987, then IBM is going to have real problems, because the U.S. business isn't going to pick up that quickly."

Of course, IBM has its two other groups to help it weather the storm, but with Australia shaky and Canada unlikely to break out of the North American dp depression before the U.S., their contributions will not be enough to protect IBM from the slings and arrows of outrageous growth. As Weil comments, "They haven't helped it through 1986, so why should they help it through 1987?" ■

## Slowly but Surely in Japan

There might not be any spectacular increases in market share or revenues for a while, but things are starting to shine again for Big Blue in Japan. IBM's aggressive legal stance over software copyrights and the advantages of its worldwide organization in development and pricing have helped keep IBM's Japanese competitors off balance over the last two years. More recently, the Japanese have also been hit by problems with the soaring yen and a lackluster economy. The payoff for IBM will come slowly, but surely, in the currency most highly valued in Japan: market share.

"We think IBM Japan is gaining 0.1% market share per month," says David Keller, a technology analyst with James Capel & Co. in Tokyo. Philip Townsend of Morgan Stanley International Inc. agrees that IBM's share of the Japanese market, particularly in large systems, "will be gently edging up" in coming months. It still has a long ways to go, though, before it climbs back into the top spot in the country. Ranked at number three in DATAMATION's Japan 10 for 1985, IBM has an estimated 23% of the Japanese market, compared with Fujitsu's 29%.

The legal disputes over software with Fujitsu and Hitachi have been a big help. Observers agree that the net effect is to keep potential customers wondering whether the two pcms will be able to continue their IBM-compatibility strategies or be forced to develop further proprietary operating systems—an expensive task.

Most of the problems with Hitachi seem to have been sorted out now that the two companies have signed a software licensing deal, but market leader Fujitsu is still having trouble coming to terms with IBM. The Japanese company recently compounded the uncertainty surrounding its future strategy by introducing both an upgraded "90% IBM-compatible" OS and its first all-Unix mainframe.

In addition to legal skills, corporate savvy has also played a significant role. Whether or not Asia/Pacific Group's move to Tokyo in 1984 was designed to light a fire under IBM Japan after several years of poor performance, the results have been clearly favorable. Because of A/PG's access to a worldwide network of contacts with highly sophisticated skills, especially in software, it is able to counter Japanese prejudices against products not developed in either Japan or the U.S.

According to Keller of James Capel, "A/PG helps keep IBM Japan from becoming isolationist, as many Japanese companies and institutions tend to do." Morgan Stanley's Townsend agrees that "the 200 or 300 people they brought in had a different marketing style and lots of new ideas."

Ironically, however, this infusion of new energy may result in what looks like a more traditional approach to selling. "They've finally started marketing in Japan the Japanese way," says Townsend. He cites the company's recent donations of computers to two universities as a means of becoming known to the senior managers of tomorrow long before they begin making purchasing decisions. "IBM's getting a name around town as having a long-term strategy," says Townsend. "People aren't going to be growing up only seeing Fujitsu and NEC machines."

IBM's increased aggressiveness in Japan, combined with shorter product lead times and a better exchange rate for imported products, is making life hard for Japanese competitors, both at home and abroad. As Capel's Keller puts it, "IBM is becoming a scarier competitor for the Japanese."

BY ROBERT POE

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## OFF-LINE

**TERMINAL PRICE CUTTING** is going strong these days. The latest round of reductions comes from major terminal manufacturers and the slashes are substantial.

As reported in the Nov. 15 Off-line, price sensitivity is one of the major reasons industry analysts at Dataquest, San Jose, called 1986 a "pivotal period" in the terminal business. Dataquest also claimed that 1987 would present new market opportunities for manufacturers, and that they would make new technological breakthroughs.

Digital Equipment Corp. recently announced it was reducing the price of its VT220 terminal by a hefty \$300, to \$795. This 27% price cut gives DEC's terminal more competitive muscle against DEC-compatible terminals from other vendors, notably Visual Technology of Lowell, Mass. This is the second price cut on the VT220 since its introduction three years ago. The first was 18 months ago, when the price was reduced to \$1,095.

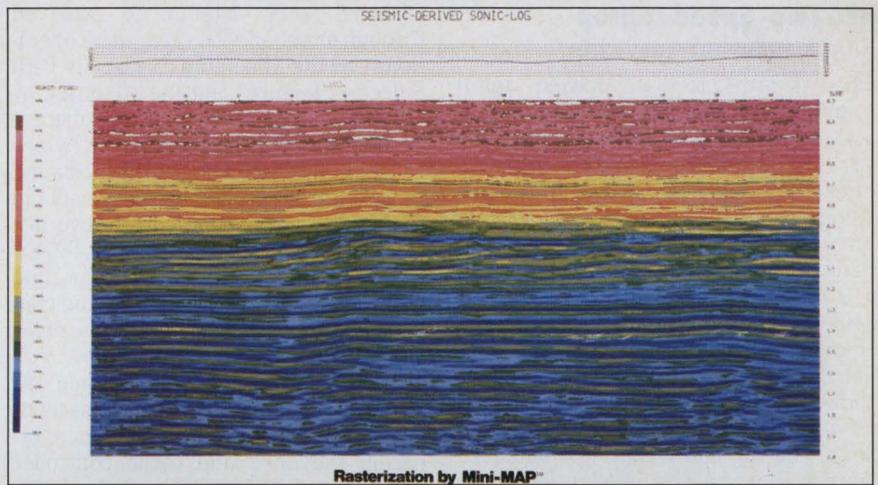
It has been reported that Digital is making this bold VT220 price cut in order to clear out its stockpile to make room for the VT300 line, to be introduced sometime this quarter. Code-named Panda, the VT300 is expected to gradually replace the VT200 line and become DEC's flagship terminal.

Claiming the price cut was "not particularly a competitive move," a spokesman for DEC said production costs had decreased and the company wanted to pass the savings on to users. The company declines to comment on the rumored VT300 product.

Another significant price reduction was announced by Wyse Technology, San Jose, one of the leading independent manufacturers of terminals. Wyse cut the price of its WY-60 high-end ASCII terminal, introduced in April '86, from \$699 to \$599, a reduction of 14%, and also incorporated additional capabilities in the existing model in the form of ANSI emulation. Wyse was reportedly reacting to increased competition in the ASCII terminal market. In September '86, Wyse cut the price of its WY-50 from \$599 to \$499. While the price cut on the WY-60 is not expected to affect sales of the WY-50, it is expected to have an impact on the WY-75, Wyse's only ANSI product.

One thing is certain as the battle shakes prices down: this latest round in terminal price cutting is definitely not the last.

## HARDWARE



Seismic photo showing the layers of the earth, produced from data rasterized by the Mini-MAP.

## High-Speed VAX Front End

New array processors offer from 38MFLOPS to 280MFLOPS of computational power.

BY THERESA BARRY

CSPI entered the field of array processing in 1976 with the introduction of its MAP series of 32-bit floating point array processors (APs). These were used in seismic research, CAT scanning, and signal processing activities, such as speech, acoustics, sonar/radar, vibration analysis, and remote sensing. The MAP line has since evolved into double-precision (64-bit) processors for matrix arithmetic applications and, later, a matrix box and processors with scientific subroutine libraries and a FORTRAN compiler. These processors are primarily Digital Equipment Corp. VMS machines. With the introduction of the Mini-MAP line in 1982, CSPI moved into small-sized array processors that consumed little power and could withstand the demands of rugged environments, such as those in submarines, trucks, and aircraft. These 32-bit floating point array processors are VMS machines, and have found application in truck-borne well logging and medical image processing.

CSPI recently introduced its latest array processor line, the Mini-MAP XL. Four models—the XL38, XL76, XL114, and XL152—offering from 38MFLOPS to 114MFLOPS, are targeted for typical signal processing applications like image, sonar, and seismic processing. They con-

tain from one (XL38) to four (XL152) APs, and each AP has three internal processors—an arithmetic processing unit, an integer processing unit, and coprocessor—operating in parallel.

Four additional models—the XL70, XL140, XL210, and XL280—are more specifically designed for medical imaging and beam-forming applications. They provide from 70MFLOPS to 140MFLOPS and also contain from one (XL70) to four (XL280) APs, but each has an additional coprocessor per AP.

An internal bus, the IOMV, was developed by CSPI to transfer data between APs at 2MBps, allowing several APs to divide up a single problem, with each calculating on part of the data. This frees up the Unibus or Q-bus of the host.

CSPI claims the Mini-MAP XL family is completely compatible with the Mini-MAP line and all its options. Over 1,700 Mini-MAPs have been shipped since 1982. A typical customer, and one that intends to upgrade to the Mini-MAP XL, says CSPI, is Geoscan Services Inc. of Tulsa, Okla. Geoscan uses the Mini-MAP to process seismic companies' data to generate pictures showing the different levels of densities of the earth. The information provided assists in the exploration for oil. The prices for the Mini-MAP XL range from \$38,000 to \$138,000. CSPI, Billerica, Mass.

CIRCLE 250

## NEC Two-Speed Laptop Features proprietary chip

NEC has introduced its newest laptop computer, the MultiSpeed. It operates at both 4.77MHz and 9.54MHz, utilizes the MS/DOS 3.2 operating system, and features two 3.5-inch floppy disk drives. Additional features include a detachable screen with LCD display, providing 80 characters by 25 lines and a resolution of 640 by 200 pixels; 512KB of ROM and 640KB of RAM; a keyboard with 85 keys, a 10-digit separate numeric keypad, and 10 function keys. A proprietary NEC microchip, the V-30, is used in the laptop. Battery life is said to be between four and six hours and the unit weight just under 12 pounds. Ports include parallel, serial, and RGB video interfaces, and an external



floppy disk controller. A 300/1,200 baud Hayes-compatible modem is optional for \$399. (The vendor expects 30% of shipments to include a modem.) NEC is planning a \$10 million ad campaign for the MultiSpeed, which is priced at \$1,995 and will be sold at retail chains and through selected vars. NEC also claims that the unit sold out in December and January, representing 10,000 units. NEC HOME ELECTRONICS INC., Computer Products Div., Wood Dale, Ill. CIRCLE 251

## 3380-E-Compatible Disk For large-scale computing

Memorex has unveiled its answer to IBM's double-capacity 3380-E disk drive for large-scale, 370-compatible computing. The 3380-compatible Memorex 3682 storage module, with two spindles, holds 5.04GB of data, any part of which is accessible in 17msecs, on average. Like IBM's unit, the Memorex drive transfers data at 3MBps. It is designed for use with Memorex's 3685 string controller, to which a maximum of four storage modules may be attached, and, optionally, the vendor's 3888-23 disk cache control unit.

Reduced seek latency is achieved through simultaneous read/write operations (via the Maximum Availability Path Selection feature) and the offsetting by 90 degrees of index marks on adjacent cylinders. The Memorex drive, which uses thin-film technology in its media and read/write heads, is said to be smaller in footprint size than the competitive IBM product. Memorex charges \$122,480 for a single minimum subsystem, consisting of one storage module and a string controller. A full string with four modules and controller goes for \$416,900. Volume discounts and vendor leasing are available. An additional special discount is being made available for customers ordering the 3682 and cache controller (which lists for \$129,000 in single quantities and is now in volume production) at the same time. Volume deliveries begin this quarter. MEMOREX CORP., Santa Clara. CIRCLE 252

## Multiple Concept Terminal

Designed for multi-user PC environments

The MC1 from Link Technologies is the vendor's third terminal and second in the MC (multiple concept) terminal series. It's designed for use in multi-user PC environments. The MC1 transmits both IBM scan codes and ASCII transmission and offers the 256 IBM character set and AT keyboard. It is designed for use with IBM XT and AT multi-user slave cards and Multi-link Advanced multi-user software. MC1 can be used as an ASCII terminal and can be switched between the IBM and ASCII protocols by the user. It has two separate serial communications ports, one to communicate with the attached PC or ASCII host computer at 19.2Kbaud, the other to communicate with a local printer at the same speed.

A 14-inch display is available in green or amber and features an 80 column by 25 line display format. System configuration is accomplished by a setup menu that can be modified by the user through keyboard commands. Available now, the MC1 is priced at \$419. LINK TECHNOLOGIES INC., Fremont, Calif. CIRCLE 255

## AT-Compatible 3270

Design is based on pc/IT and pc/microIT from Unisys

Memorex has announced an intelligent 3270-type workstation designed to be

software and device-compatible with IBM's AT. The 6273 series is based on Unisys's (formerly Sperry's) pc/IT and pc/microIT desktop computers (which are built in Japan by Mitsubishi) and is designed to connect to 370-type mainframes via coaxial cable. The machines come in two varieties, the models A and B, with two expansion slots, and the models one and two, with five slots. The A model uses a color video adapter while the B uses a Hercules-compatible monochrome adapter; each can use up to 3MB of extended memory. The larger models one and two support EGA and monochrome screens, respectively, and can use up to 4MB of memory. All four units use the Intel 80286 microprocessor running at up to 8MHz, a 40MB hard disk, 1.2MB floppy disk, and the MS/DOS 3.1 operating system. Keyboards can be either 84-key AT-compatible or 122-key 3270-compatible. If connected to a Memorex 2274 cluster controller, the terminals can switch between dual 3270-mainframe sessions. Optional software includes a 3270-file connection—to move files between terminal and mainframe—and a package designed to emulate IBM's 3279 color station. Single-quantity prices for the compact workstations are \$5,695 for the monochrome model and \$6,095 for the color model. The full-sized monochrome and color units go for \$6,195 and \$6,595, respectively. Deliveries are slated to begin this quarter. MEMOREX CORP., Santa Clara. CIRCLE 253

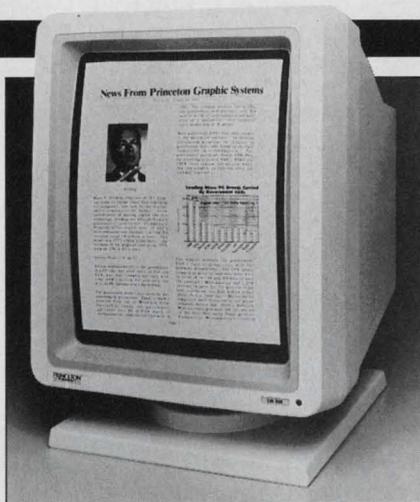
## Desktop Publishing Tools

Full-page WYSIWYG monitor and high-resolution scanner

Princeton Graphic Systems has unveiled its LM-300 monitor and LS-300 scanner, and is gearing the products to the world of desktop publishing.

The LM-300 monitor is designed for use with the IBM PC, XT, AT, and compatibles and is said to provide true WYSIWYG (what you see is what you get) resolution. It has a 15-inch, portrait-mounted screen that can display a full page of graphics and text without scrolling. It emulates a 300dpi resolution and has a pixel resolution of 1,200 by 1,664 and a 160MHz video bandwidth. Four levels of gray are provided for displaying photographs. The monitor is priced at \$750. An LM-300A adapter card, used to drive the monitor, can coexist with CGA, EGA, and other monitor cards. It is also \$750.

The LS-300 Desktop Scanner scans



at up to six seconds per page at a resolution of 300dpi. It's compatible with EGA software and can distinguish up to 32 different shades of gray, allowing photographs and documents containing text, graphs, and/or photos to be scanned into a PC. The scanner is designed for use with the IBM PC, XT, AT, and compatibles, and is priced at \$1,095, including an adapter board.

Both products are available now. PRINCETON GRAPHIC SYSTEMS, Princeton, N.J. **CIRCLE 258**

### PC-to-Fax Communications

Alternative to electronic mail

The FX-BM88 Facsimile Board from Panasonic is a PC add-on card that allows the company's Business Partner series of micros and IBM PCs, XTs, and ATs to send and receive documents to and from facsimile machines. With the board installed, a PC can edit and send a computer file or a scanned image to a Group Three (CCITT International Standard) facsimile machine and receive any document sent by one.

A document received via fax can be viewed on a computer display, edited on screen using Panasonic's version of Paintbrush, which is included in the facsimile board software, and then printed out on a dot-matrix or laser printer. A polling function and facilities for establishing a phone directory and displaying and recording all fax activities are featured. The board's integral modem provides a 9,600 baud transmission speed and automatic callback and retransmission when an error is detected.

The board will ship in volume in March and is priced at \$1,000. PANASONIC INDUSTRIAL CO., Computer Products Division, Secaucus, N.J. **CIRCLE 256**

### 386-Based Micro

Speed enhancements include zero wait states.

Zenith Data Systems recently came out with its first micro built around the Intel 80386 32-bit processor. The Z-386 pc memory bus operates at 16MHz. Speed enhancements that Zenith claims for the pc include use of paging in memory, which minimizes the use of wait-states; burst-mode refresh, which increases system speed by refreshing multiple rows of memory at once; an optional cache controller board, which stores frequently accessed data in static RAM; and Zenith's Slushware RAM, which loads ROM into RAM, enabling BIOS routines to run at maximum speed.

The Z-386 has a total of 10 bus slots, with six open; a combined floppy-Winchester controller; serial and parallel ports; sockets for 80287 or 80387 co-processors; and support for up to two Winchester disks and two floppy disk drives.

The Z-386 also supports two full-height drives and two half-height drives, an enhanced 101-key keyboard, AT-style cabinet, and 195-watt power supply.

Zenith has two versions, both available first quarter: the Z-386 Model 40, which features one 40MB hard disk drive, one 1.2MB floppy disk drive, and six open expansion slots, and the Z-386 Model 80, which has 80MB of storage. They are priced at \$6,499 and \$7,499, respectively, and will be shipped with MS/DOS 3.2 and Microsoft Windows. ZENITH DATA SYSTEMS, Glenview, Ill. **CIRCLE 254**

### Board for IBM XT

Positioned for DOS 5.0 introduction

All Aboard 286 is the most recent surface mount board product from Ideassociates, whose other boards include the full-length All Aboard and half-length Overboard. All Aboard 286 is for use in the IBM XT 286 and it also fits the IBM AT. Three memory options are offered: conventional memory to bring the AT from 512K to 640K; up to 4MB of EMS; and up to 16MB of extended memory. One-megabyte RAM chips are utilized on the board, and a total of 16MB fit on a single card through the utilization of SIMMS (single in-line memory modules), which means the chips are packed vertically on the board's surface and thus occupy less space. The board supports EGA, CGA, and MDA. The

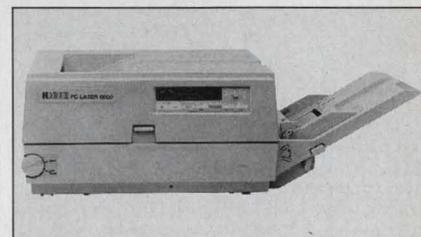
price varies according to memory capacity: with 128K, it's \$995; 4MB, \$2,595; and 16MB, \$12,995. The board is scheduled for delivery this quarter. IDEASSOCIATES INC., Billerica, Mass. **CIRCLE 260**

### 6ppm Laser Printer

Features second-generation Ricoh engine

Ricoh, the Japanese-owned office automation, electronics, and photographic equipment company whose "second generation" laser printer engine resides in laser printers manufactured by such companies as Digital Equipment, Okidata, and Epson, has introduced its own 6ppm printer.

The PC Laser 6000 is a six-page per minute, 300dpi printer with 1MB of RAM,



expandable to 2MB, and is being geared toward desktop publishing and other personal computer applications. Included in the unit's controller is its own graphics command set, which includes Diablo 630 emulation. Emulation cards for the HP LaserJet Plus, IBM Proprinter, and Epson FX-80 are optional. Centronics parallel and RS232C serial interfaces are standard. Eight resident fonts can be printed in either portrait or landscape mode. The PC Laser 6000 is priced at \$2,395 and is available now at selected dealers. RICOH CORP., West Caldwell, N.J. **CIRCLE 259**

### Desktop Laser Printer

Newest in PostScript line from QMS

The new QMS-PS 800+ is an eight-page per minute laser printer with 35 resident typestyles that QMS claims is suited for desktop publishing applications. It's compatible with the IBM PC and Apple Macintosh and is capable of printing text and graphics at 300 by 300 dots per inch resolution. Other printers in this line include the PS 800, with 13 typestyles and 8ppm speed and the PS 2400, with a 24ppm speed. The PS 800+ is priced at \$5,495 and is available now. QMS INC., Mobile, Ala. **CIRCLE 257**

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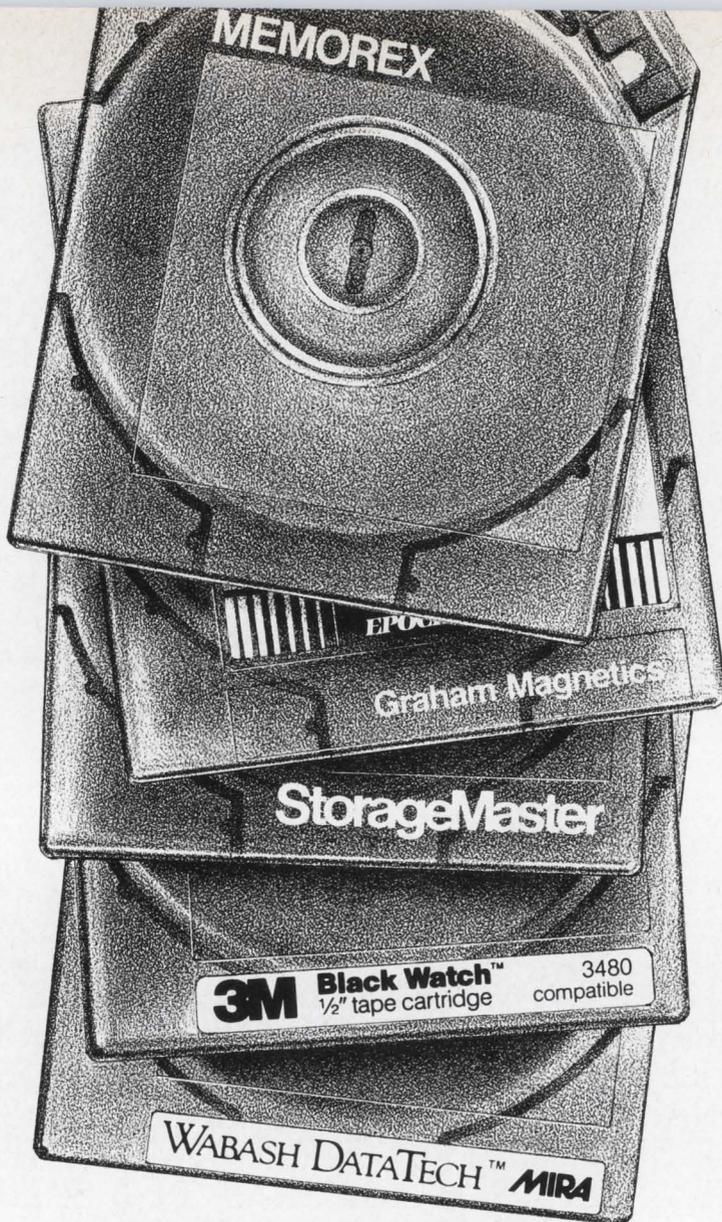
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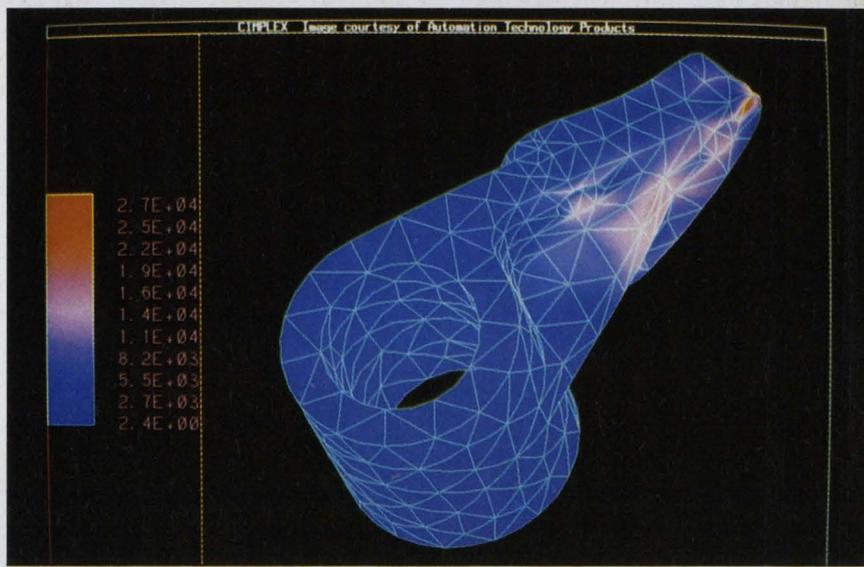
## UPDATES

THE POSTSCRIPT page description language from Adobe Systems Inc., Palo Alto, appears to be on its way to becoming a de facto standard in the burgeoning realm of desktop publishing. As described by Adobe, PostScript resides on a controller board in a printer and it allows users to take text, graphics, line art, and scanned images and mesh them to print onto a single page. The language was introduced to the public in January 1985, when Apple Computer Inc.'s LaserWriter debuted with a PostScript controller. Since that time, a couple of dozen hardware manufacturers, including Digital Equipment Corp., Apollo Computer, Dataproducts, Sun Microsystems, and Texas Instruments, have announced products with or contracts for using PostScript in their products, and over 100 software companies have introduced products touting PostScript compatibility.

This month, Datacopy Corp. of Mountain View, Calif., will release into the public domain a product it hopes will become another standard for desktop publishers. PreScript is a high-level programming language for image processing, says Datacopy, which means, simply, that PreScript tells scanners how to scan and process an image. Datacopy claims that with PreScript, third-party software developers will not have to know about image processing algorithms and will not have to migrate image processing codes to hosts. For users, PreScript allows for image scanning and processing within an application program without employing specialized programs, which, claims Datacopy, has been necessary until now. PreScript consists of four elements: a high-level language describing the imaging functions to be performed; an interpreter to translate the PreScript commands into a set of imaging commands; a signal processing router-scheduler (SPRS), which manages the image processing operation; and a set of algorithms for the image processing function. The PreScript commands are imbedded in the application program, and the interpreter, SPRS, and imaging algorithms are imbedded in an intelligent image processing subsystem, which can reside in the scanner, a separate interface chassis, or a processor board in the host. By using a separate processor, image functions can be performed at a high speed. A small standard interface accommodates communication between the host and subsystem.

Datacopy is planning to introduce in April its first intelligent scanner implementing the image processing subsystem, which is a joint effort with Ricoh Co. of Japan. A spokesman claims that a number of OEMs and about 25 computer companies are interested in both PreScript and the intelligent scanner.

## SOFTWARE



Solid modeling of a part, with pink area displaying tolerances.

## CAD/CIM on IBM Mainframes, Workstations

Integrated database for solids modeling is addressing emerging Air Force standard.

BY THERESA BARRY

CIMPLEX Release 2.0 is the latest product from Automation Technology Products, which was founded in 1983 to develop an integrated mechanical CAD/CIM software system. ATP's first product, CIMPLEX, was introduced in 1984, initially using a commercially available relational database, later using its own CIM database.

CIMPLEX is based on a proprietary systems architecture and software kernel that ATP felt could accommodate the wide variety of product definition data required for mechanical design. CIMPLEX was devised to work in the IBM mainframe environment and to take advantage of high-performance engineering workstations. ATP's goal was the development of a new generation of solids-based software applications for product design, structural and thermal analysis, numerical control (NC), parts programming, NC verification, and engineering control. Customers for this first CIMPLEX product include Ingersoll Milling Machine Co., Rockford, Ill., and the Vought Aero Products Division of LTV, Dallas,

both of which employ the system for flexible manufacturing and CIM.

Release 2.0 of CIMPLEX was introduced in November. It was designed to allow customers to integrate their previously installed CAD/CAM systems with CIMPLEX.

With the latest release of CIMPLEX, ATP is addressing an emerging standard in the field of automated manufacturing—the Product Definition Data Interface. PDDI was established by the Air Force to allow major manufacturers and their suppliers to coordinate their mutual production plans. The Air Force PDDI establishes five kinds of data that must be incorporated into next-generation CAD/CIM systems: accurate geometry, topology, tolerances, form features, and administrative data for parts control. CIMPLEX Release 2.0, claims ATP, incorporates all five elements into one integrated database, plus an additional element: assembly modeling and configuration management.

CIMPLEX software runs on IBM mainframes, including the 9370 series; graphics display is handled by Silicon

Graphics' IRIS displays. Prices begin at \$100,000, but a full mainframe-based system, including capabilities for PDDI, user programs, form features design, tolerance data on solids, assembly design, IGES and CADAM interfaces, automatic finite element analysis, solids-based NC programming, and NC verification is priced at \$375,000. AUTOMATION TECHNOLOGY PRODUCTS, Campbell, Calif. CIRCLE 265

## Ethernet for VAX Line

More DEC products for work group and departmental computing

Local Area VAXcluster System software from Digital Equipment Corp. allows for the interconnection, via Ethernet, of up to 13 VAXstation II or MicroVAX II systems to a central MicroVAX or VAX server, which manages system software, all software applications, and a shared common file system. The VAXcluster allows participating systems to act as a single system, says Digital, by sharing resources such as disks, tapes, and printers, while maintaining the independence of each processor. The software is available now and is priced at \$1,000 on the VAXstation, \$1,900 on the MicroVAX II, and \$9,500 on the VAX 8800.

Digital also introduced three new MicroVAX II and two new VAXstation configurations designed to work with Local Area VAXcluster Systems. The new VAXstation II configurations range in price from \$19,900 to \$23,900. The MicroVAX II configurations are priced from \$19,900 for a diskless/tapeless system to \$94,855 for a preconfigured Local Area VAXcluster server with VMS, DECnet/Ethernet, and Local Area VAXcluster System software licenses. All systems are available now. DIGITAL EQUIPMENT CORP., Maynard, Mass. CIRCLE 274

## Help with E-Mail

Lotus and MCI join hands

Help is on the way for those who would like to make better use of MCI Mail, the most popular electronic mail service. Lotus Development Corp., vendor of the 1-2-3/Symphony spreadsheet packages, has teamed up with MCI to build Lotus Express. The program simplifies file transfer by automating various log-on functions, provides a full-screen editor for preparing MCI messages off-line, and manages mailing lists and folders of received messages. Moreover, the soft-

ware enables any binary file created on a pc to be sent over the MCI network, according to Lotus. All control characters, such as those in a document adhering to IBM's DIA/DCA standard, are retained. Lotus expects users to transfer entire spreadsheets as well. As an option, the software can run in background mode, operating in main memory as other, foreground mode applications are executed. Even in background, Express is able to dial automatically into the MCI network according to a preset schedule, retrieve messages there, and then transmit messages and files that have been previously spooled. The user is alerted audibly to incoming messages. Express runs on all business models of the IBM PC and on most PC-compatible machines. It requires a Hayes-compatible modem and at least 256K RAM for background execution. The product, priced at \$110, is scheduled for shipment in February. LOTUS DEVELOPMENT CORP., Cambridge, Mass. CIRCLE 266

## 1-2-3-Compatible Software

Runs on DEC VAX and AT&T under Unix

Unix/Twin AT&T and Unix/Twin DEC VAX from Mosaic Software are both claimed to be fully compatible with Lotus 1-2-3 and able to take full advantage of the multi-user, multitasking features of Unix. Unix/Twin AT&T runs on AT&T 3B2 computers under Unix System V Release 2; Unix/Twin DEC VAX runs under Unix Berkeley Version 4.2 on DEC VAXs. Both versions provide Lotus Release 2 features such as larger worksheets (256 columns by 8,192 rows); enhanced (semisparsed matrix) memory allocation; easier import of ASCII files; and the ability to install on a hard disk, central server, or mini without a key diskette. Also included is a file extension for use in translating files, and a range-justify command in word processing.

Unix/Twin AT&T for 3B2 Series 300 and 400 is priced at \$1,399; Unix/Twin DEC VAX for VAX/750 and 8780 is priced at \$6,500. Both products are available now. MOSAIC SOFTWARE INC., Cambridge, Mass. CIRCLE 267

## VM Systems Software

Command monitor, printer support, and cpu communications

VM/CMS Unlimited, a startup VM systems software house, recently introduced

three new products. The first, CMS Command Monitor/Analysis Package (CMAP) provides a basic information-gathering facility to collect data about CMS commands and functions, claims the vendor. It records how users combine CMS commands—including nested commands—and facilities to solve problems and obtain information. VM/CMS claims this information is available instantaneously. CMAP is available immediately for VM/SP Releases 3 and 4, and both HPO (high-performance option) and non-HPO environments are supported. The price is \$3,000 per cpu plus 12% a year for maintenance.

VM/CMS's second product is RSCS ASCII Printer Support, or Rapid, a product it says enhances IBM's RSCS (remote spooling communications subsystem). It allows VM systems to print on serial ASCII printers. Rapid is available now for VM/SP Releases 3 and 4 and it supports RSCS Networking Version 1 Release 3 and Version 2. The price is \$2,200 per cpu plus 12% per year for maintenance.

The final product is CM/SP Single System Image (SSI), which is said to enhance the VM environment by allowing multiple VM-based cpus to communicate with each other and create a single system image to users. SSI supports uni-processors, attached processors, and multiprocessors in any combination within an SSI complex, claims the vendor. A channel-to-channel adapter must connect each processor. SSI is priced at \$100,000 per SSI complex, plus 12% per year for maintenance. It's available now. VM/CMS, Boston. CIRCLE 268

## COBOL Analyzer

For IBM mainframe environment

Inspector from Language Technology is a software tool that analyzes IBM mainframe COBOL quality using what the vendor terms objective scientific measurement. Inspector measures quality, says the vendor, by first using Thomas McCabe's metrics (which he outlined in 1976) to analyze IBM COBOL programs and build data files, then creating reports based on the information in those files. The result of the metric analysis is a set of measurements indicating the quality of the COBOL program. The McCabe metrics used for maintenance are cyclomatic complexity and essential complexity measures. Language Technology claims that Inspector allows for the measurement of the quality of software packages from outside vendors and contract pro-

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grammers. Inspector is available now for \$29,500. LANGUAGE TECHNOLOGY, Salem, Mass. CIRCLE 269

## Business Graphics and LAN

Two products for Altos Intel- and Motorola-based multi-user micros

ProChart from Altos is a standalone charting application package that allows creation of line, bar, text, pie, scatter, step, and combination charts for use in business presentations. Charts can contain multiple fonts and can be output in color hardcopy on paper, transparencies, or slides. Five preview levels are offered, allowing charts to be viewed at the speed or detail level desired by the user. ProChart is priced at \$695 for Altos 80286-based systems and \$795 for Altos 68020-based systems and it's available this month.

Enet Local Area Network is a hardware/software product that provides Altos Intel- and Motorola-based multi-user systems with a high-speed LAN environment for connection to other systems conforming to the Ethernet IEEE 802.3 standard. Altos Enet utilities are said to provide services for file copy, remote log-in, electronic mail, and other functions. Connection is accomplished through TCP/IP, and utility software also allows network access to mainframe gateways. Enet software is based on an implementation of the DOD standard used in DARPA net. The hardware is a customized version of the EXOS 201 board developed for Altos by San Jose-based Excelan, developer of LAN products for engineering, scientific, and technical office markets. The Enet LAN is available this month and is priced at \$3,000 for a complete, multi-user configuration. ALTOS COMPUTER SYSTEMS, San Jose. CIRCLE 270

## File Backup for IBM PCs

A hard disk data management package

Intelligent Backup from Sterling Software is a menu-driven, hard disk data management system for the IBM PC, XT, AT, and compatibles. The product features prompting, multiple-device support, DOS command interface, full-screen editor, help screens, and something Sterling calls intelligent backup, meaning only altered files are backed up. Intelligent Backup provides the user with information on the number of diskette files that will be needed and an estimate of the

time required to perform the copying function. It's not copy protected, is available now, and priced at \$149. STERLING SOFTWARE, Dallas. CIRCLE 271

## Business Software for Mac

Three-module integrated package

Business Sense from Monogram contains three modules: General Ledger, Accounts Payable, and Accounts Receivable/Order Entry. All modules integrate, says Monogram, so that rekeying is not necessary. The software supports a multi-user and/or multisite network environment via the AppleTalk network, as well as single user and multiple standalone users. File-locking capabilities protect against dual access of a record. Data in any of the programs can be exported to dBase Mac or converted to text or SYLK file formats for use in financial statements or with word processing, database, spreadsheet, or graphics programs. All three modules feature context-sensitive, on-line help and three levels of passwords. Minimum hardware configuration is a Macintosh 512K with one 400K external floppy drive.

An ImageWriter printer is required for printing reports. Business Sense also supports a Macintosh Plus with 800K drives, a hard disk, the AppleTalk network, and a LaserWriter printer. The product is available now and is \$595 for the combined three-module package. MONOGRAM, Inglewood, Calif. CIRCLE 272

## Three from Borland

Including first product from newly formed Scientific/Engineering Division

Borland has recently unveiled three new products.

Eureka: The Solver is the first offering from Borland's Scientific and Engineering Software Division, formed in October '86. Borland bills it as a productivity software tool for problem-solving

professionals who have traditionally relied on paper, pencil, and calculator. With Eureka, the user writes an equation, sets options, and instructs the software to solve the problem. Equations, solutions, and evaluations are displayed on separate windows. Eureka supports the 8087 math coprocessor and features pull-down menus, adjustable editing windows, SideKick-compatible built-in full-screen text editor, and on-line help. An IBM PC or compatible with PC/DOS 2.0 or later is required, and the software is compatible with CGA and Hercules and compatible graphics boards. It's not copy protected, is priced at \$99.95, and is available this quarter.

Turbo Basic from Borland is a language development environment for IBM PCs and compatibles. Borland claims Turbo Basic uses the same language development environment of its Turbo Pascal and Turbo Prolog products. The package includes a memory-to-memory compiler, full-screen editor, an internal linker and run-time library, and Microcalc spreadsheet with source code. It's claimed to support true recursion, full 8087 integration, block-structured programming statements, and is able to access all of the computer's memory. Turbo Basic is compatible with IBM's BASICA and Microsoft GWBasic, and supports EGA graphics. The price is \$99.95 and it begins shipping this quarter.

An enhanced version of Turbo Pascal for the Macintosh includes a TurtleGraphics unit, which is based on a concept designed to simplify graphics for users unfamiliar with Cartesian coordinates. A "turtle" walks a given distance on the computer's screen and turns at specified angles, drawing a line as it moves. TurtleGraphics operates in a full-screen window and can be used simultaneously with Quickdraw. Turbo Pascal for the Mac runs on the Macintosh and Macintosh Plus and is available now for \$99.95. BORLAND INTERNATIONAL, Scotts Valley, Calif. CIRCLE 273

## Looking Back

FIVE YEARS AGO IN DATAMATION: "IBM is planning to retreat from possibly the most successful business strategy of all time.

"Informed sources say that IBM's top management intends to break from the 360 compatibility which has anchored its phenomenal growth over the past 20 years. . . . It is now emerging, sources claim, that the active agents in this strategy are the company's mysterious System/38 and a piece of VM conversion software developed within Poughkeepsie and known internally as 'the Tool.' . . ." ("IBM to Bite the Bullet?" by Ralph Emmett, January 1982, p. 52.)

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3. If you need to share information with other users within your office, we offer local area networks to support office

applications

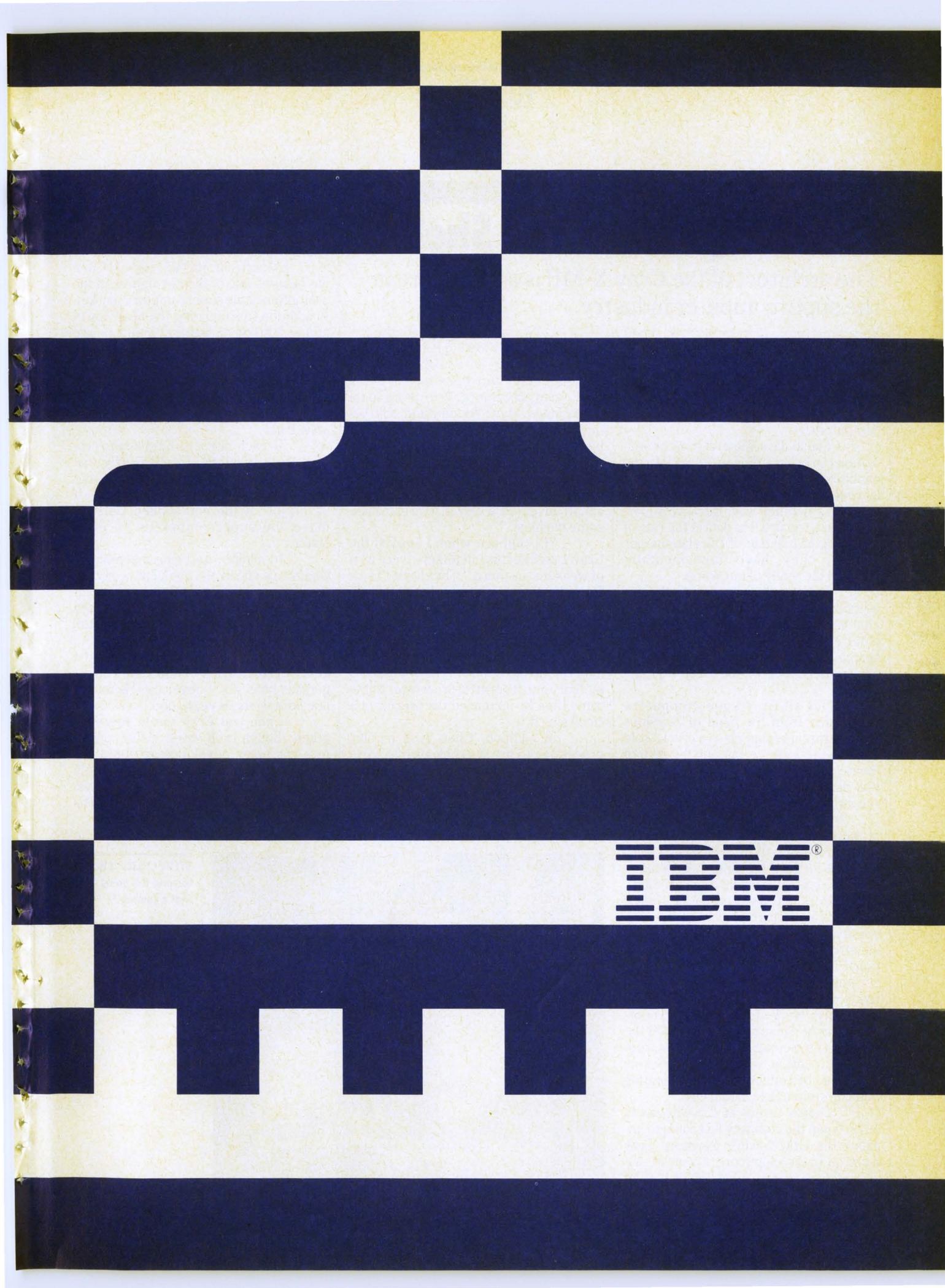
4. And for users who need voice and data communications, plus access to data bases both inside and outside of the company, we offer a digital switch, the ROLM CBX II.

By the way, these four complement each other and can be interconnected.

As you can see, we don't have to recommend the same solution for every customer's needs. We realize that your requirements are unique, and so our solutions must be flexible and responsive.

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The image features a decorative background with a repeating pattern of dark blue and light beige horizontal stripes. The stripes are of varying widths and are arranged in a way that creates a sense of depth and movement. The IBM logo is positioned in the lower right quadrant of the image. The logo consists of the letters 'IBM' in a bold, sans-serif font, with a registered trademark symbol (®) to the upper right of the 'M'. The letters are filled with a pattern of horizontal lines, which is a characteristic feature of the IBM logo. The background pattern is composed of dark blue and light beige stripes, with the dark blue stripes being wider than the light beige stripes. The overall effect is a visually striking and modern design.

IBM®

## PEOPLE

# Breaking Out Of The Shell

The architect of the Cray X-MP is a key figure in the supercomputer industry.

BY STEVE GROSS

There was a time when a nuclear scientist needed an electron microscope and an astronomer needed a telescope, but that was before there were supercomputers.

These days, supercomputer simulation can bring atoms and stars into the confines of the computer center, perhaps to reveal secrets that could not be discovered any other way. Because supercomputers can process data at the rate of hundreds of millions of calculations per second, they have fundamentally changed the study of our world.

The people who design the supercomputers are the engineers of that change. Seymour Cray, founder and chief computer designer of Cray Research, Minneapolis, is the most famous for his designing of the Cray-1 in the 1970s.

Not all Cray supercomputers have come from the mind of Seymour Cray. A machine that plays a crucial role at Cray, the X-MP, accounting for 90% of the new machines Cray shipped in 1986, was designed by a little-known Taiwanese immigrant named Steve Chen.

Chen has quietly risen to the rank of senior vice president based on his work on the Cray X-MP, which is up to 12 times faster than the Cray-1, depending upon the type of problem to be handled.

In 1971 Chen came to the United States as a graduate student at the University of Illinois. He was 27 and had an electrical engineering degree from National Taiwan University. By the time he became a U.S. citizen in 1982, he had already done supercomputer work at the university, worked on an early supercomputer at Burroughs Corp. called the Burroughs Scientific Processor, and tried his hand at what he describes as somewhat of a miniature X-MP at Floating Point Systems, Beaverton, Ore.

Chen's career at Cray began in 1979, when the company hired him to improve the Cray-1 while Seymour Cray went on to develop more advanced machines, such as the Cray-2, which was introduced in 1985, and the Cray-3, which is still in development.

C. Norman Winningstad, the former chairman of Floating Point Systems, remembers Chen as a bright computer designer who quit because his ideas didn't gain acceptance. "He was a fountain of ideas," says Winningstad, who believes Cray Research hired Chen as "a backup man for Seymour Cray."

Chen's strength is different from Cray's, Winningstad says. "Chen didn't really invent anything brand-new. He simply invented a clever way to handle some old ideas."

"I could see when I studied the Cray-1 architecture that there were a lot of weaknesses there," Chen says. "I saw I could make up [for them] very quickly without a lot of real exotic stuff."

What Chen did was to remove a bottleneck in the supercomputer's operation by improving the speed with which data can be moved from the computer's memory into its central processor. At the same time he increased the processor's clock speed.

In addition, Chen used parallel processing to break problems into parts that could be separately computed by several processors simultaneously. Chen concedes that multiple processors "are a very old idea. IBM and Burroughs have multiple processors, but they are

very loosely coupled . . . Why not use a much more tightly coupled system [to improve performance]?"

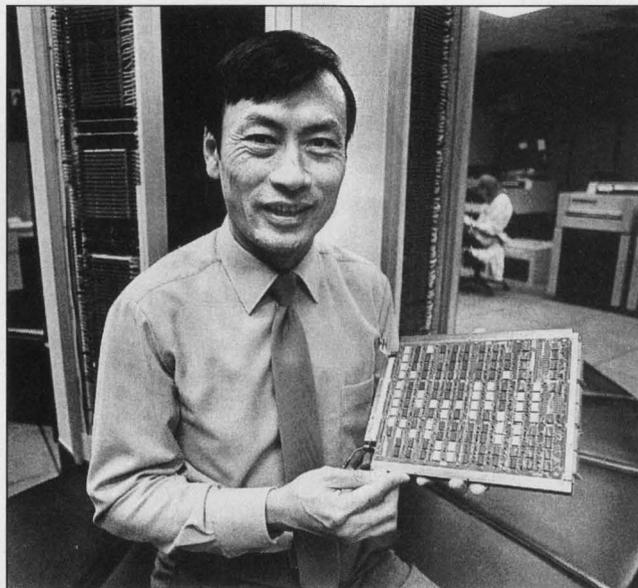
As a result, the 42-year-old Chen has become one of the key figures in the promotion of the supercomputer market. In addition to simulating the behavior of atoms and stars, supercomputers are used to simulate underground reservoirs of oil for petroleum companies, aerodynamic qualities of new aircraft for aerospace manufacturers, and crashworthiness of new cars for the automobile industry.

In each case it is the ability to process huge amounts of data quickly that has enabled supercomputers to solve these difficult mathematical problems. It is the job of the soft-spoken Chen to make the supercomputers go even faster.

In addition to being a senior vp, Chen is also head of a five-year project to develop an even speedier supercomputer based on his own design. Chen says the new machine will be at least 100 times more powerful than the Cray-1.

Chen does not claim to be the next Seymour Cray. "I don't say I am as good as he is yet. I never can claim that one because he is very good."

Chen and Cray rarely see each other, though both work at the company's computer development laboratory in Chippewa Falls, Wis. "We never talk too much among ourselves," Chen says. "I really respect him a lot . . . but as far as design concerns, I go my own way. . . . As long as I don't tell him how to do it, he



**STEVE CHEN:** "I look beyond the point that's coming."

doesn't tell me how to do it. And I feel we are very good on that level."

Chen says designing supercomputers typically requires 10-hour to 12-hour working days in the laboratory and lots of mental calculations when he's at home. Chen lives near the lab in Chipewa Falls, and says he enjoys playing tennis and racquetball in his spare time. Chen has two sons, ages 12 and 10.

"I think [designing supercomputers] is a lot of fun," he says, confessing that he does most of his work with a pencil, not a computer. "When you finish one, you don't like it any more and you want to move on to the next one that is more impressive. The driving [factor] is do something nobody could do before . . . every time you start a new project you almost start a new world, because you start from scratch."

Chen views himself as different from most other computer designers. "I think I'm very aggressive, very visionary," he says. "My strength is I look beyond the point that's coming."

His contribution to the supercomputer world will become more visible in 1987. Before beginning work on the five-year supercomputer project, Chen was involved in an interim supercomputer design tentatively called the Y-MP, a software compatible follow-on to the X-MP. Although the first working prototype of the Y-MP won't be available until mid-1987, according to the company, the first six Y-MP machines designed by Chen already are spoken for by customers.

Although he's a very private person, Chen has begun to break out of his shell a bit and meet with customers. While he says he isn't personally inclined to go out and meet lots of people, he sees the value of doing it selectively to find out what customers think of his design ideas.

"If you see too many of them you just get confused. You have to be very careful who you talk to," Chen says. "When you get enough, you close down and go home."

The normally reticent Chen also has begun to see that publicity may have some value in advancing his beliefs. "I don't like [publicity], but if it helps stir up a national interest in how to preserve our country's leadership in this area of technology . . . I don't feel uncomfortable."

*Steve Gross is a Minneapolis-based writer who has covered the computer and communications industries for the past nine years.*

## CALENDAR

### FEBRUARY

**CN '87 (Communication Networks '87).**  
Feb. 9-12, Washington, D.C. Contact CW/Conference Management Group, P.O. Box 9171, 375 Cochituate Rd., Framingham, MA 01701-9171, (800) 225-4698 or (617) 879-0700.

**CSC'87 (ACM Computer Science Conference).**  
Feb. 17-20, St. Louis. Contact ACM, CSC'87-PR, 11 W. 42nd St., New York, NY 10036, (212) 869-7440.

**NEPCON West 87 (National Electronic Packaging and Production Conference and Show).**  
Feb. 24-26, Anaheim, Calif. Contact Jerry Carter, Show Manager, Cahners Exposition Group, P.O. Box 5060, Des Plaines, IL 60017-5060, (312) 299-9311.

**Commtex '87 (ICIA Trade Show).**  
Feb. 26-28, Atlanta. Contact Bobbie Hunt, International Communications Industries Association, 3150 Spring St., Fairfax, VA 22031-2399, (703) 273-7200.

### MARCH

**CEPS V (Corporate Electronic Publishing Systems Show and Conference).**  
March 3-5, Chicago. Contact Nancy P. Walsh, Show Manager, Cahners Exposition Group, 999 Summer St., Stamford, CT 06905, (203) 352-8372.

**Hannover Fair CeBIT '87.**  
March 4-11, Hannover, West Germany. Contact Donna Peterson Hyland, Hannover Fairs USA Inc., 103 Carnegie Center, P.O. Box 7066, Princeton, NJ 08540, (609) 987-1202.

**FOSE '87 (Federal Office Systems Expo).**  
March 9-12, Washington, D.C. Contact Jackie Voigt, National Trade Production Inc., 2111 Eisenhower Ave, Suite 400, Alexandria, VA 22314, (800) 638-8510 or (703) 683-8500.

**Computer Graphics '87 Exposition.**  
March 23-26, Philadelphia. Contact National Computer Graphics Association, 2722 Merrilee Dr., Suite 200, Fairfax, VA 22031, (800) 225-NCGA or (703) 698-9600.

**17th Conference on Computer Audit, Control and Security.**  
March 23-27, Boston. Contact the EDP

Auditors Foundation Inc., P.O. Box 88180, Carol Stream, IL 60188-0180, (312) 653-0950.

**Southcon/87 Electronic Show.**  
March 24-26, Atlanta. Contact Southcon, 8110 Airport Blvd., Los Angeles, CA 90045-3194, (213) 772-2965.

**ANSI Public Conference.**  
March 25, Arlington, Va. Contact ANSI, Development Dept., 1430 Broadway, New York, NY 10018, (212) 642-4952.

**Interface '87.**  
March 30-April 2, Las Vegas. Contact the Interface Group, 300 First Ave., Needham, MA 02194, (617) 449-6600.

**1987 IEEE International Conference on Robotics and Automation.**  
March 30-April 3, Raleigh, N.C. Contact Robotics, North Carolina State Univ., Division for Lifelong Education, Box 7401, Raleigh, NC 27695, (919) 737-2261.

**ADEE West (Automated Design and Engineering for Electronics Exhibition).**  
March 31-April 2, Anaheim, Calif. Contact Show Manager, ADEE West, Cahners Exposition Group, 1350 Touhy Ave., P.O. Box 5060, Des Plaines, IL 60017-5060, (312) 299-9311.

### APRIL

**The Great April Fair (Informatics and Telecommunications Trade Show).**  
April 4-12, Milan, Italy. Contact Lisa Tucci, Delia Associates, P.O. Box 338, Route 22 West, Whitehouse, NJ 08888, (800) 524-2193; in New Jersey, (201) 534-9044.

**SICOB 1987 (Information Processing, Automation, Office Organization Show).**  
April 6-11, Paris. Contact SICOB, 4 Place de Valois, 75001 Paris, France, (01) 42-61-4621.

**Mini/Micro Northeast Show.**  
April 7-9, New York. Contact Florence St. Peter, Electronic Convention Management, 8110 Airport Blvd., Los Angeles, CA 90045-3194, (213) 772-2965.

**COACH Conference XII (Canadian Organization for Advancement of Computers in Health).**  
April 12-15, Toronto. Contact COACH, #1200, 10460 Mayfield Rd., Edmonton, AB T5P 4P4, Canada, (403) 489-4553.

## BOOKS



## Why the Sky Is Blue

**BIG BLUE: IBM'S USE AND ABUSE OF POWER** by Richard Thomas DeLamarter, Dodd, Mead & Co., New York (1986, 393 pp., \$22.95)

BY EDITH HOLMES

"THINK." I can still see the squared-off black letters etched on the silvery metal plaque set within a blue plastic block. The paperweight sat on my desk from grade school through high school—a gift from my father, a chemical engineer who recalls receiving it at a demonstration of IBM's Model 650, 30 or more years ago.

The 650, an electronic unit-record accounting machine that used punch cards and was a precursor to the digital computer, receives a mention in Richard Thomas DeLamarter's book about IBM, its founders, and power, *Big Blue: IBM's Use and Abuse of Power*. So does

"THINK," the Thomas J. Watsons' (both Sr. and Jr.) constant admonition to their troops. Had it not already been taken as a book title by William Rodgers for his biography of the Watsons and IBM (Stein & Day, New York, 1969), *THINK* might well have been the best name for DeLamarter's excellent book, for that is what this work compels the reader to do.

DeLamarter is no casual observer of his subject. As a senior Justice Department economist he labored on the U.S. government's 13-year antitrust case against IBM from 1974 until the Reagan Administration dropped the suit in January 1982. In *Big Blue*, DeLamarter traces the history of the company, from Watson Sr.'s close association with National Cash Register chief John Patterson—the two were named in NCR's 1912 antitrust conviction—to its present sta-

tus as the world's undisputed computer industry titan.

His thesis is that IBM's success is based not on excellent management, superior products, and satisfied customers, but on the clever exploitation of an exclusive position of power. IBM is a monopolist, claims DeLamarter, determined to maintain market share at all costs.

For proof, he turns whenever possible to IBM's own documents. Made public in large numbers during the course of *U.S. v. IBM* and a dozen or so private antitrust actions brought against IBM during the '60s and '70s, these internal files provide extraordinary glimpses into the workings of a company whose attitude toward self-disclosure has been likened to that of the Kremlin.

Such a view into IBM is not likely to be available again. The Justice Dept.'s access to IBM's memos largely ended when the trial began in May 1975, and IBM's post-1975 files are believed to be sanitized—screened and purged of any potentially incriminating material—in keeping with the advice and counsel of its antitrust lawyers.

IBM's origin as the Computing-Tabulating-Recording Co., Watson's refinement of price discrimination and other "dirty tricks" he learned from NCR's Patterson, and the company's 90% market share of the tabulating and accounting machine business by 1930—the monopoly on which the firm built its computer business—begin the story. But the tale that DeLamarter tells (and the documents he marshals) has its heart in more recent exploits—particularly in IBM's rushed announcement of the System/360 computer line and the company's subsequent honing of a variety of anticompetitive business practices. Among these were promoting "software lock-in" (assisting in the development of enough machine-specific applications software as to make it expensive for customers to switch from IBM hardware); developing "knockout" or "fighting" machines (products, often announced long before they were ready, that were aimed at undercutting competitors in one market and were effectively subsidized by IBM's profits in others); and changing equipment interfaces (the ploy IBM used successfully in its battles with plug-compatible mainframe and disk drive makers, add-on memory manufacturers, and leasing company competitors) (see "Square Pegs, Round Holes, Big Bucks," Oct. 1, p. 52).

So well does *Big Blue's* author make his case that wishful thinking would substitute his effort for the unwieldy trial record in the federal antitrust suit. DeLamarter blames the eventual failure of the suit on IBM's unending protraction of the case and on the pro-business attitude of Republican administrations, ultimately in the person of William F. Baxter, who as assistant attorney general in charge of the Justice Dept.'s Antitrust Division moved for dismissal on the grounds that the suit was "without merit."

Judge David N. Edelstein, who presided over *U.S. v. IBM* from 1972 until Baxter's withdrawal, permitted the government to begin presenting its case without first describing in detail what it would argue and what proof it would provide. The amendment of the Justice Dept.'s original 1969 complaint to include new issues just five months before the trial started led to continued discovery—the interviewing of each other's witnesses and the exploration of each other's files—throughout the six-year trial. Perhaps at no time was the lack of direction more apparent than when, for 70 trial days, attorneys read portions of depositions and documents into the record, with the judge mostly absent from the bench.

Judge Edelstein contended on several occasions that the rules of civil procedure prevented him from running the case any other way. "We can't talk about managing these cases," he said of large antitrust actions. "We can only talk about amputating them."

And, in part because the government's case against IBM was neither managed nor amputated, the trial transcript swelled to more than 110,000 pages. In nearly 700 trial days, IBM and the Justice Department presented fewer than 100 live witnesses and more than 17,000 documents to the court.

DeLamarter describes his book as his "report to those who paid the bill for the case—the people of America." In fairness, the contribution of all the parties to the way in which the trial was conducted ought to be part of that report. Clearly, a critical shortage of leadership by the court, and the Justice Department itself, also contributed to this result.

Nonetheless, the job DeLamarter has done of extracting the best of the documents and testimony from the vast trial record restores much dignity to the case the Justice Department had. His

account of IBM's past and its present concentration of power indeed has "ominous implications" for the future of the industry, the nation, and the world—particularly where communications and information services are concerned. The reader can only hope that Digital Equipment Corp.'s current success in enabling communications among computers within its own product line and with IBM's machines suggests that—contrary to DeLamarter's contention—IBM hasn't won these fields yet.

Unfortunately, DeLamarter's portrait of IBM as an ominous power is likely to be downplayed in today's climate, as IBM chairman John F. Akers tries to reverse the company's seven straight quarters of slowing revenue growth and declining earnings with a program of cost-cutting, new products, aggressive marketing, streamlined management, and long-term diversification. Though everything is relative, the company—valued at \$75 billion last November compared with \$97 billion six months earlier—looks to the public as though it has fallen on hard times.

Then again, one has only to read *Business Week's* November cover story on IBM's comeback to recall pertinent sections of *Big Blue*. The magazine's description just two months ago of IBM's use of "technical experts at no extra charge to help customers plot computer strategy" and its mention of a "war room"—complete with maps and lists of target areas aimed, in particular, at Digital—are reminiscent of DeLamarter's account of past "no-cost" aid to customers and similar campaigns against a host of companies from Honeywell and Control Data to Amdahl and Memorex.

As the Justice Department did when it brought its antitrust suit against IBM on the final day of the Johnson administration, DeLamarter recommends that the government break IBM up into several competing companies. His book was published within days of the November election and the Democrats' return to majority party status in the U.S. Senate. Despite President Reagan's continued popularity, the political winds appear to be changing. Just Think. ■

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*Edith Holmes, who spent two years covering U.S. v. IBM as a reporter for Computerworld recently left her position as DATAMATION oem correspondent to join Federal Computer Systems, a forthcoming trade publication, as editor-in-chief.*

## LETTERS

### Machine Politics

In reading your article "Machine Politics" (Nov. 1, p. 54), it struck me that automatic teller machines (ATMs) could be adapted as automated voting machines (AVMs).

The security issues have been addressed, the network is in place, the use of the machines has been growing, they are conveniently located, and the vote tallies could be done in minutes.

THOMAS E. LISS  
Lisle, Illinois

### Sweet Talk

I am writing regarding the article "Milestone Management" by Frank Sweet (Oct. 15, p. 107).

I am employed as senior quality assurance analyst in the Electronic Systems and Operations Division of Michigan National Bank. I have been employed in data processing positions since 1971, including computer operations, systems analysis, programming, and project manager in a variety of environments. I am currently heading a project to identify tools and define standards and procedures for project planning and project management in my division.

I consider the article by Mr. Sweet to be dangerous. It gives the impression that the planning and management of a project amount to writing a set of activity lists with due dates and comparing these date estimates against the actual delivery dates.

A basic flaw in this use of milestones is that it encourages guessing by asking for a completion date. Rather, the project team should compute the effort needed to accomplish a deliverable. Treating effort and schedule as interchangeable parts encourages managers to equate persons with time, i.e., that "men equal months."

I certainly agree with "Uncle Ted's" two rules for success ("Keep your commitments. Don't make foolish promises."). Unfortunately, Mr. Sweet's methods ensure that foolish promises will be made. That is what happens when project managers and developers make guesses about due dates.

Developers consistently miss promised dates because they make guesses without fully considering all the factors that contribute toward the workload. They often do not have the tools and/or data they need to calculate schedules.

I am uncomfortable with the as-

## READERS' FORUM

### The True Dp Professional

(To the tune of "The Modern Major-General" by Sir William S. Gilbert and Sir Arthur S. Sullivan)

On IBM, I use VSAM with ID CAMS utility.  
Creating paths to datasets, I index with agility.

Including free-space ratios for high updatability,

I add a password to prevent unwanted readability.

With secondary indices, I add adaptability

Within the master file to read and write with high mobility;

Then write the OS JCL for added flexibility,

To execute my programs well for corp'rate visibility.

Design for problem program codes with structured methodology,

I use commands with operands developed in astrology.

To optimize the system, I use virtual technology,

And document the whole darn thing in lucid phraseology.

I write a user manual in language that's not technical,

Then demonstrate it all at once—it's really quite a spectacle.

As analyst or programmer with methods quite exceptional,

I am the very model of the true dp professional.

NEIL ZOD  
Consultant  
GE Consulting Corp.  
Philadelphia

### IBM and the Democratic Way

The philosophy in the axiom, "Democracy may not be a perfect system, but it's the best one around!" would certainly apply to the industry's tendency to roll over and accept any and all Big Blue announcements and releases. After years of dumping overpriced, incompatible, ill-conceived, and technologically obsolete iron on American and world markets, which can only expect more of the same in the future, and after amassing huge revenues and profits from industries that are now captive to huge investments in IBM gear, Big Blue cannot even now, it seems, outwit itself.

In 1986, your customers didn't abandon you, Blue. (Hardly, when they're hooked!) They're just exhausted, that's all . . . financially, organizationally, and operationally. They've installed

and digested all the various PCs, 5520s, 8100s, 34s, 36s, 38s, (and on, ad nauseam) you've sold them, and they've sincerely tried to bring some order, some connectivity (that you promise but don't deliver) to the hodgepodge.

But whatever financial corner you turn to reestablish your growth numbers, you can rest assured who's going to pay the bills. We know you strive "Not to be big. . . but to be great." But until you are, it's great being big, isn't it?

DATAMATION's Oct. 15 Off-line (p. 145) informs us that "things have been very quiet in the computer industry this year," and that "the high point" was IBM's announcement of 100 new products at NCC. But of course! Of what possible significance was the announcement of NCR's 9800, or Compaq's 386, to name only two. Software to connect IBM middies is where it's at, isn't it?

And when you decide to shut off the S/36, the market will queue up to replace it with the 4300 departmental system (more old iron in new skin.) What a business. It could only happen in a democracy.

JIM THORPE  
Office Automation Consultant  
Sarasota, Fla.

### On AT&T's Pullback from the Computer Industry

AT&T, AT&T  
Announced its attack on the industry.  
AT&T, AT&T  
Said Unix would give it big clout.

AT&T, AT&T  
Wasted a billion carelessly.  
AT&T, AT&T  
Lost its shirt in a rout.

AT&T, AT&T  
Now has a "network strategy."  
AT&T, AT&T  
How will this one work out?

FREDERIC WITHINGTON  
Exalted Industry Veteran  
Concord, Mass.

### The Apple is Down

While trying to grapple  
With gravity,  
Newton  
Was helped by an apple  
He didn't  
Compute on.

EDMUND CONTI  
Programmer  
Summit, New Jersey

sumption that developers can produce accurate schedules. Mr. Sweet neglects to provide even a hint as to the methodology they will use. I will not assume that behind the schedule estimates lie accurate algorithms. I expect that the "double and add" method would be used. Developers indeed will produce "wildly pessimistic dates" in order to meet their managers' success criteria.

Mr. Sweet states that he prefers to weight "look-ahead" ability higher than volume productivity. If volume productivity is subordinate to estimating, it is certain that productivity will go down and estimates will go up. Eventually, the staff will be made up of persons whose skill is to accurately estimate unacceptable due dates. If the reward system is primarily based on making accurate estimates as early as possible, productivity and quality will be discouraged. Why should developers produce more and better products when they will not be rewarded?

Michigan National's Quality Assurance Department surveyed the user and developer management. One section of the survey asked if the respondent would prefer an on-time installation of a product that did not fully meet requirements or a late installation that met all requirements. Of the users, 70% preferred the late, complete delivery. Interestingly, the dp development managers replied that the due date was more important. The survey clearly showed that the developer's perception of the relative importance of quality vs. timeliness did not match the user's.

Sweet's technique is appropriate for evaluation of only one element of performance. The milestone method is not a planning or project management methodology. It does not allow for task dependencies, budget planning, resource management, etc. Based on my experience and education, I do not accept that these other elements can be discounted.

In the conclusion, the author asserts that "complex, automated project management schemes" are abandoned because they are too much work. I suggest that he investigate a few of the simple, effective tools rather than propose an inadequate alternative. His method will not handle project planning or project management. It is simply a novel approach to evaluating one element of employee performance.

THOMAS A. SIEGLER  
Michigan National Bank  
Lansing, Michigan