Executive Report
Information centers scramble to justify their existence/51

In Depth
E. F. Hutton builds one network for information flow/63

TOP OF THE NEWS

DEC aims at traditional IBM markets with more VAX products and a revamped marketing strategy. Page 10.

A court decision against Data General to force systems vendors to unbundle software, according to legal observers. Page 118.

Top Ford information systems executive explains decision to rely on IBM in developing comprehensive office automation strategy. Page 71.


The leading artificial intelligence conference focuses on practical applications. Page 6.

Network manager's nightmare solved with remote management package. Page 45.

The eleventh-hour cancellation of a meeting with analysts last week has triggered more speculation that all is not well at Convergent Technologies. Although Convergent President Paul Ely said the meeting was rescheduled to coincide with fall product announcements and new developments in vertical market efforts, sources continue to hint at the possibility of layoffs or wage freezes at the systems manufacturer.

McComrick & Dodge next week will introduce a version of its application development system, Millennium:SDT, for IBM's DB2 at its users group conference in Reno, Nev. It will also announce a version of its general-ledger application package for Cullinet's IDMS DBMS, company spokesmen said.

IBM last week confirmed it is "redeploying" some workers from its Rochester, Minn., plant, where the System/36 and 38 are manufactured, to its Boise sub.

BY MITCH BETTS
WASHINGTON, D.C. — The nation's largest supplier of home mortgage funds is about to move records on four million loans to a new $50 million computer system that skeptics say will not work and that corporate spokesmen admit is $25 million over budget and 19 months behind schedule.

The enormous cost overrun and installation difficulties occurred largely because the new system was riddled with some 1,000 software bugs, necessitating 15,000 tests by a staff of 60 working 12-hour shifts, including weekends and holidays.

The critical test will come Oct. 1, when the Federal National Mortgage Association, the government-chartered corporation commonly known as "Fannie Mae," shuts down its current batch processing system and turns on a new Laser Reporting system. The soon-to-be-outdated Aggregate Exception System ran on a Control Data Corp. Cyber machine, whereas Laser Reporting runs on an IBM 3084 mainframe using the MVS operating system and Cullinet Software, Inc. IDMS software.

Despite Laser Reporting's troubled three-year history, William A. Dawson, executive vice-president for technology at FNMA, expressed confidence that it will work Oct. 1, when an initial batch of two million loans are scheduled to be put into the data base management system.

In response to publicly expressed doubts that the system will run smoothly, and in light of the software problems, Dawson said his department has spent a year of testing to eliminate Cobol software bugs, including using 10% of Fannie Mae loan records. Information regarding the test will be given to vendors.

Mac Dbase readied, amid user doubts

By Douglas Barney
Ashton-Tate is expected today to make a belated entry into the Macintosh software market, launching a version of its Dbase III program for the Apple Computer, Inc. product.

Ashton-Tate's move has revived debate over whether a single strong software product can create sufficient enthusiasm to make the Macintosh a sales success with business users who have been slow to endorse the non-IBM-standard computer.

Users contacted last week, including one who had standardized on the Macintosh, were skeptical of the impact that Ashton-Tate's entry would have on the Macintosh market.

"There will be virtually no impact," one user said. "The pressure to buy Macintosh computers is from the schools, and they are not interested in Dbase at all."

Net to test OSI compatibility

By Elisabeth Horwitt
GAITHERSBURG, Md. — OSI.net, a prototype network that is currently under joint development by 25 vendor and government organizations, will begin operations later this month. Ultimately, the project will guarantee business users that different vendors will exchange data and documents using Open Systems Interconnection protocols.

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Teen hacker charged with Congress, school break-ins

By Susette Burton

ROCKY RIVER, Ohio — The Rocky River police recently charged a 17-year-old with computer to break into computer systems around the nation, including ones in local Congress. Sgt. Lyke Westfield of the Rocky River police said the juvenile was charged July 29 in the Cuyahoga County Juvenile Court with theft of services and receiving stolen property, which consisted of telephones taken from the Lakewood City School District.

Westfield said the youth allegedly used the long-distance telephone lines of Cleveland companies to hook up with computer systems in other cities, including those of the Lake-wood City School District, the Mil-

Bugs plague $50M system

From page 1

bugs was first made public by two former project programmers who had been forced to resign after allegedly discovering that they had not been paid for their overtime work.

Dawson, however, said that a year of rigorous testing to rid Laser Report-
ing system of software bugs as well as a successful pilot test, ensures that the system will work.

Even with the bugs eliminated, Dawson acknowledged that the switchover embodies risks, mainly because the old reporting system will be shut off at the same time the new one is turned on.

"Doing it every step we can to make sure it works, because this system is so different from the current system that we can’t parallel it at the time of installation," Dawson said.

Causes of user concern

The software problems and lack of a backup during the initial operation period may be cause for concern among an agency’s customers. "I’m not real confident it will work. A lot of things make me real apprehensive about the whole thing," commented a systems analyst at an Ohio mortgage firm, who insisted on anonymity.

The government-chartered cor-
poration wants Laser Reporting to pro-
vide monthly updates on more than four million loans, based on monthly accounting reports filed by lenders.

The old Aggregated Exception Sys-
tem is batch-processed on a Control Data Corp. mainframe and contains only 20% of Fannie Mae’s loan portfolio. The new Laser Report-
ing system is expected to replace not only this system, but also three other loan reporting systems in a phased process beginning in 1987. The four systems are incompatible but will be integrated in the Laser system.

A variety of reasons, Fannie Mae missed its March 1985 deadline for implementing the system, so it now is expected to start up in Oct. 1. Consequently, the 60-member staff is working 12-hour shifts around the clock, including weekends and holi-
days, to meet the deadline, Dawson confirmed. Hal Burd, manager of the Laser project from 1983 to 1985, said the original cost estimate for Laser was roughly $30 million. Burd is now senior vice-president for operations at Horizon Financial Corp. in Gaith-

ersburg, Md.

"We found more program bugs than I anticipated, and therefore . . . our people have worked more hours and gone through a lot more bugs than we anticipated," Dawson said, adding that he is aware that some staff members are unhappy about the arduous schedule.

Two senior programmer/analysts, Frank Rega and Barry Crawford, were forced to resign after they balked at working the long hours.

"Fannie Mae made it a big public commitment to go live with the sys-
tem. They don’t want to be embar-
rassed, so they’re going to push this thing through . . . no matter what," Rega said.

Dawson, in response, said that al-
though some programmers have spent 24 hours on the job, on average the employees are working 9 hours a week in overtime, which he called "par for the course for our business."

"We have 1,500 customers. I can’t set up a schedule and move it without inconveniencing all those customers. And so it’s almost a holy date with us, and we have to make it," Dawson explained.

Crawford criticized the Cobol pro-
grams as overly complex, making them hard to debug. "They went hog-
wild," he said, "writing over a thou-
sand modules. A reporting system shouldn’t be that complex no matter how big the organization.”

Dawson, however, said the pro-
grams had grown complex because of numerous changes in Fannie Mae’s business during the three years of de-
velopment, but he added that the program bugs have been easy to fix because the system is well designed. The system employs numerous Co-
bol programs written under the su-
ervision of the Arthur Andersen & Co. consulting firm.

"We’ve found about 1,000 pro-
gram bugs, but they’ve all been mod-
est in terms of difficulty to fix. I think that says that we’ve applied a lot of change, but we have a very well-designed system," Dawson con-
cluded.
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That should help you make up your mind fast!
Sun broadens line, signals workstation war

DEC, Apollo expected to answer with rollouts

By Rosemary Hamilton

Making the first move in what is expected to be another round of intense competition among the major workstation vendors, Sun Microsystems, Inc. gave its product line a major face-lift last week. The company added a long-awaited high-end model, cut mid-range prices and introduced the first version of its operating system that combines the University of California at Berkeley 4.2 and AT&T System V versions of Unix.

"It was a major move forward, and it was very aggressive in price and performance," said Robert Herwick, a senior analyst at Hambrecht & Quist. "What’s really positive is the broadening of its product line.

Included in Sun’s announcements last week were the first long-awaited high-end color workstation, the Sun-3/110LC, and the Sun-3/200 high-end series, which boasts a rating of 4 million instructions per second (MIPS) and is based on the new Motorola, Inc. 68020 microprocessor that has a clock speed of 25 MHz. The systems are expected to ship within 90 days of order, the vendor said.

Not alone

However, Sun will not be alone in the spotlight for long. Apollo Computer, Inc. said it will make a high-end announcement this week. Also, Digital Equipment Corp. said last month that it would be introducing workstation-related products this month and has already disclosed that DEC will ship a low-end workstation by year’s end. Additionally, Silicon Graphics, Inc. has scheduled a number of announcements for the Association for Computing Machinery’s SIGGRAPH computer graphics show, which will be held next week.

"Sun is ahead now, but Apollo and the others will catch up," said Vicki Brown, senior analyst at International Data Corp., a market research firm based in Framingham, Mass.

But Sun’s full range of offerings is expected to strengthen its position in the workstation market, analysts said. It now has a complete line of products, from the very low end with a diskless monochrome system that costs $7,900 to a high-end system that can support up to 48 users and start at $33,900.

Sun also cut an average of $3,000 from the price of each of its $7/5 and $3/160 systems. It will also offer a $19,900 CPU and memory package to upgrade the 3/160s to the 3/200 systems.

In addition to the hardware offerings, Sun introduced its new operating system, Sun OS 3.2, which is the result of a team effort between it and AT&T to merge the features of both the academically oriented Berkeley 4.2 version of Unix and the more business-oriented System V version from AT&T. The operating system will be released in two phases, the first of which is available within 90 days of order.

Phase I is based on the Berkeley 4.2 version with 4.3 enhancements and includes some of the systems calls, library routines and commands of System V. Phase II, scheduled for shipment in the second half of 1987, will reportedly provide complete System V Interface Definition compatibility, including the System V terminal driver interface.

According to Sun, Phase I has "minor differences" between 4.2 and System V. The functions that have not yet been merged are handled by providing the 4.2 capability in a default location and the System V functions as separate directories or libraries. A user can select the preferred environment by specifying the appropriate programs for either 4.2 or System V.

Superior because of true merging

Sun claims that Sun OS 3.2 is superior to Apollo’s version of System V and Berkeley 4.2 because it is a true merging of both, whereas Apollo’s two separate operating environments residing on the same system. An Apollo spokesman said he had not reviewed the new Sun operating system closely enough to comment on it.

The Sun-3/110LC color workstation, with a base price of $15,900, will compete directly with Apollo’s Series 3000 color system, which has a starting price of $16,900, and the IBM RT Personal Computer, which starts at $16,485.

The Sun-3/200 series will compete with high-end offerings from both Apollo and DEC. Its base price of $33,900 is competitive with the pricing of both the DEC VAXstation 2100 and Sun’s own 370 and 570 systems, but its 4-MIPS rating is considerably less than the double of that of the DEC and Apollo systems.

The Sun high-end systems will be offered in three desk-side versions: the $260M monochrome model, the $260C color model and the $260G gray-scale model, each with a 19-inch monitor. The monochrome version has 1,600- by 1,280-pixel resolution, the gray-scale and color models have 1,520- by 900-pixel resolution.

Each of the $260V models uses a 20-MHz Motorola 68811 floating-point coprocessor. An entry-level system includes 8M bytes of memory, a 12-slot card cage, Sun OS 3.2 and associated systems software.

Main memory in the $260V systems is 32M bytes and will be sold in 8M-byte increments at a cost of $12,000 each.

Monochrome version

The monochrome version, with a 280M-byte disk drive and 66M-byte, 1/4-in. tape, costs $51,500; a similarly configured gray-scale version costs $58,500, and the color version costs $62,500. For an additional $10,000 per system, another 280M-byte disk drive can be added.

The 3/110LC is based on a 16.67-MHz Motorola 68020 chip and a 16.67-MHz 68811 coprocessor. It can display up to 256 colors simultaneously.

The 3/110LC comes with a 15-inch monitor, 4M bytes of memory, a 280M-byte disk drive expandable to 12M bytes, an Ethernet interface, two EIS-432 serial ports and a video interface. The system with a 71M-byte disk drive costs $21,900, and a system with a 142M-byte disk drive, the maximum capacity, costs an additional $4,900.

The gray-scale version has the same entry-level price of $40,000, while the color version starts at $19,900.

The company will offer file servers based on the 3/200 models at prices starting at $31,900.
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New Dimensions in Software Productivity.
AI’s commercial impact is focus of science group’s show

Meeting to separate science, engineering

By Eddy Goldberg

Palm Springs — When the largest trade show for artificial intelligence, AAAI-86, opens today, a new goal will be added to its traditional charter. Rather than just disseminating pure AI research, organizers hope to add a new goal will be added to its traditional charter. Rather than just disseminating pure AI research, organizers hope to add a new charter to connect PCs to an IBM System/38. He was desperate. "‘The DP manager said, ‘Get out of here. You’re not going through dealers. You make a little extra by buying from IBM’s products whenever possible. They say IBM charges higher prices and offers slower delivery than competing vendors.

But Ed Macke, who manages approximately 300 IBM Personal Computer XTs and ATs at Northrop Defense Systems Division in Chicago, is not going to IBM. "If you go away from IBM, you risk being cut off at the pass at some point in the future," he says. "You’ve got to be sure of compatibility with the IBM PC standard."

Macke does have to choose from an ever expanding vendor base with the well-known names. The issue of non-IBM companies is "not only whether they are going to stay around, but how well will they be able to maintain compatibility. If IBM makes a change, I need a company that has money behind it that can afford to immediately try to catch up with that change," John Doe’s Base ment can’t do that."

In Macke’s experience, trying to match different vendors’ products within a single system can be extremely trying. Macke has seen hard disk drives crash with emulation IBM boards, PC network boards and color graphics adapters. "It’s a real zoo," he says.

According to the president of one of the lesser known board companies, too many managers feel pressured to buy add-in boards on the basis of name recognition, rather than price and performance. "Rather than buying on price and performance, they’d rather take the path of least resistance," says Tim Farris of Boca Research, Inc. in Boca Raton, Fla.

"By getting brand-name products and name recognition, too many managers feel pressured to pay more for products that will perform similarly to IBM boards," he adds.

Furnished more than 1/4 years ago Farris — who confided Qua drum in 1981 — Boca Research makes memory and multifunction boards. Farris, one of its chief products, includes several functions, including expanded memory and graphics card emulation, all on one board.

"The interesting thing here is that we have the same components as IBM, and the same factory that assembles our boards does work for IBM," Farris notes.

"It is virtually impossible to stay abreast of everything, but if somebody does not want to risk losing money, they can bring it in [for evaluation] whether it’s from a small company or not," says Bill Barr, president of corporate systems at the Bank of New England in Boston. "We acquire boards from either dealers or vendors for 30-day evaluations. She advises other managers to document things well and make them accessible to others. "You’ve got to have some kind of central reference," she says.

When vendors continue to struggle for recognition, even the key companies have been experimenting. Expectations for IBM mainframes. Also, Aion reportedly will announce ADS/VM, a version of its Application Development System for IBM VM operating systems.

Intense competition

The intense competition for add-on business has come because of Teckmar’s woes, according to Whitney Lynn, interim marketing manager. "Teckmar’s product repertoire will be ‘streamlined’ so the company can concentrate on graphics boards, and tape drives, Lynn explains.

One consultant who helps companies set up information centers maintains that in some cases, choosing products from lesser known companies can be a sale proposition. In micro-to-mainframe linkages, it is best to stick with tested products like Digital Communications Associates, Inc.’s Irma and boards from Pathway Design, Inc., advises Dan Ryan, a senior associate at the Boston Systems Group, Inc. in Newton.

Because expanded memory boards are so new, and because there are few major companies like Digital, the consultant notes that new "no-name brands can be too risky, according to Ryan. But with conventional memory boards, most companies’ products are straightforward and reliable. "A serial port option, for instance, "If you can find somebody who gives you an extra 128K and an extra serial port for the same price, then you might as well go for it."
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VMBATCH FROM VM SOFTWARE, INC...THE VM EXPERTS
Five years old, modified IBM PCs still remain on the job

By Douglas Barney

Five years after the announcement of the IBM Personal Computer, a debate rages over the usefulness of the original technology. For many, the IBM PC is obsolete, and they will settle for nothing less than an IBM Personal Computer AT or compatible with the more powerful Intel Corp. 80286 microprocessor. Others gnash their teeth in anticipation of a micro based on the powerful Intel 80386 microprocessor.

But for some, even the original PC, with a few enhancements of course, does the job. "I've got one that can still run the Coke, with the 16K bytes of random-access memory and cassette port, and I use it still," says Colin Kuskel, director of training and a principal of the Center for Advanced Data Processing in New York. Kuskel has enhanced the machine with new disk drives and more memory, but he claims the machine runs all the current software and remains useful.

The introduction of hard disk drives that fit into one of the PC's expansion slots and accelerator boards that boost its speed to the rate of an IBM PC XT has also helped to keep the PC competitive with newer machines.

"The initial target for the hard disk device was the old full-height IBM PCs," says Ian Warhaftig, International Data Corp. (IDC) senior market analyst in its storage products research. IDC anticipates that 230,000 of these devices will ship in the next year.

Market Access International, Inc., a San Jose, Calif.-based research firm, says the challenge for IBM is to repeat the success of the PC with a new generation of products based upon the 80386 chip.

"A leader has to obsolesce itself, IBM will have to self-obsolesce before others obsolete it," says Fred McNeese, an IBM spokesman.

But success has not always come so easily, even to IBM. When it introduced the IBM Portable Personal Computer, expectations ran high. Due to poor sales, however, the machine was withdrawn from the market to the delight of Compaq Computer Corp. fans everywhere.

The failure of the IBM PCjr to create the much heralded home market was well documented, and IBM announced it was discontinuing manufacturing in March 1985.

And even the PC line, with its open and imitable architecture, has a debate rages over the usefulness of clones lately. Low-cost clones of the IBM PC have cut into IBM sales. Indications show that this competition will only get worse as the low-cost leaders are supplanted by lower cost, higher speed marketers. "The PC has now been turned against IBM," notes Bill Johnson, president of Market Access International, Inc., a San Jose, Calif.-based research firm.

The challenge for IBM goes beyond just obsolescing the clones with a "clone killer." The real challenge is to repeat the success of the PC with a new generation of products based upon the 80386 chip.

"A leader has to obsolesce itself, IBM will have to self-obsolesce before others obsolete it," says Fred McNeese, an IBM spokesman.

With Compaq publicly committed to beating IBM to the 80386 punch, the challenge for IBM may be enormous. There is little doubt, however, that IBM's sleeves are big enough to hold a few aces.

-- Mitchel J. Hayes
Doubts surround Mac Dbase plan

From page 1

upon us at this point," said Dick Webb, audit partner with Peat, Marwick, Mitchell & Co., an accounting firm in New York that has approximately 6,000 Macintosh computers and uses Microsoft Corp.'s MS File as its data base. Last year Lotus Development Corp. announced Jazz, an integrated package heralded by some as the 1-2-3 for the Macintosh. But sales of Jazz never took off and did not noticeably boost business sales of the Macintosh. Microsoft's Excel, an integrated product launched last year, has enjoyed more success, however.

The very nature of Dbase may make it a difficult fit for the Macintosh. A key strength of the Macintosh is its ease of use through icons, the mouse and menus. The traditional strength of Dbase, on the other hand, has been its programming language, which must be mastered in order to use the advanced capabilities of the software.

May use more icons

But some sources argue that the product will make extensive use of the Macintosh's icons and menus and will therefore be easy to use. Ashton-Tate last week declined to be interviewed concerning today's product announcement.

"I don't see that there would be anything detrimental about Dbase that would make us change from the MS File. It would not be worthwhile to bring all our products up to speed on the full capabilities of something like Dbase," Webb said.

"It certainly makes it a more credible machine," said Rick Richardson, national director of microcomputer technology for Deloitte Haskins & Sells, a New York-based accounting firm. "I am not going to advocate changing to the Mac simply because of the upgrade in data base. I will say that if I was advising a client to change to the Macintosh, Dbase would not be worthwhile to bring all our products up to speed on the full capabilities of something like Dbase," Webb said.

"It certainly makes it a more credible machine," said Rick Richardson, national director of microcomputer technology for Deloitte Haskins & Sells, a New York-based accounting firm. "I am not going to advocate changing to the Mac simply because of the upgrade in data base. I will say that if I was advising a client to change to the Macintosh, Dbase would not be worthwhile to bring all our products up to speed on the full capabilities of something like Dbase," Webb said.

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144 examples make learning easy

Since ICCF is interactive, you would think you could experiment with its facilities using the IBM manuals as a guide. If you've ever tried this, though, you know it doesn't work. Since IBM manuals don't give much examples, it's difficult to figure out what you need to enter and how to code it. As a result, most people stop learning ICCF long before they have mastered a practical subset of it.

In contrast, DOS/VSE ICCF gives you 144 examples that show you not only how to use an ICCF command, but also why and why you should use it. Then, after you use these examples for training, you become familiar with the reference materials. In fact, you can usually refresh your memory about an ICCF command without referring to the reference text; the examples themselves will tell you all you need to know.

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In other words, after the first three chapters, you can read about the ICCF facilities in any sequence you choose. Or, you can simply use the book as a reference. No matter how you use it, whether or not you're experienced, we guarantee this book will help you use ICCF more effectively.

Partial ICCF contents

Section 1: How ICCF fits into the batch operating system environment: how data is stored by ICCF; how ICCF itself uses processor storage.

Section 2: A practical subset of system and editing commands: how to use advanced ICCF system and editing commands, how to use macros that group commands.

Section 3: How to use ICCF's submit-to-batch facility that lets you transfer jobs to POWER; how to use the ICCF command to manage and control the execution of POWER jobs.

Section 4: How to run programs in interactive partitions; how to write your own procedures for execution in interactive partitions.

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MS Works to lead Macworld debuts

By Peggy Web and Douglas Barney

BOSTON — Several major products for Apple Computer, Inc.'s Macintosh will debut at the Macworld Exposition this week.

Most significant among the products is the expected release of MS Works, an integrated package from Microsoft Corp. that includes financial modeling, word processing, data base and telecommunications applications.

General Computer Co. of Cambridge, Mass., will introduce its $1,199 Hyperdrive FX/20, an external 20M-byte hard disk drive for the Macintosh.

National Instruments Corp. of Austin, Texas, will introduce MacBus, a $1,495 programmable I/O processor that can connect with personal computer cards, and Labview software, an engineering workbench for developing custom instrumentation systems.

Several introductions will center around desktop publishing, and include Aldus Corp.'s Fontastic Fonts, which are two fonts for both the Apple Laserwriter and ImageWriter printers, Adobe Systems, Inc.'s 10 font packages for its Postscript printer and Ergotron, Inc.'s Mac Buffer, a server for the Laserwriter.

Other products to be announced include 20/20 Combo, a 20M-byte hard disk drive and tape backup combination from Lodow, Inc.; Filemaker Plus from Corethought, Inc.; Macbook Plus and Macport Plus from Peripheral Land, Inc.; and Promodem 2400 from Promomeus Products, Inc.
DEC launches two mid-range VAXs, direct assault on IBM

Products solidify line, open markets for firm

By Donna Raimondi

BOSTON — Digital Equipment Corp. last week launched its most direct attack yet on traditional IBM markets as it announced two mid-range VAX minicomputers and related products.

The products did not represent a technical departure from other VAX series computers. Their importance, DEC officials maintained, was in filling out DEC's VAX line, permitting the company to pursue customers in insurance, banking, aerospace, automotive and other markets traditionally considered IBM captives.

"This is more than a ho-hum announcement of two more VAXs," said International Data Corp. analyst Richard Mukita. "The combination of new machines, repricing and emphasis on the VAXBI interface is important for DEC's overall strategy. They more directly contrasted IBM and DEC this time," he said.

Among the introductions last week were the VAX 8550 and 8700 models, VAXBI bus-based configurations of VAX 8200 and 8300 systems, a terminal server, memory enhancements for older VAX products and a bridge to allow the 8600 and 8650 processors to access the VAXBI bus.

"The VAX 8550 is a general-purpose system that could serve large departmental office systems, simulation or computer-aided design. The 8700 model — similar to the 8550 in processor performance — is closer to the VAX 8800 in size and is said to be better suited for high-speed data collection, artificial intelligence, financial modeling and very large simulation programs, DEC said.

DEC stated that its compatible VAXs, Vaxclusters and related products are ready to take over in shops that are traditionally all IBM. "Their challenge here will be an educational one, to get that message across to MIS managers," IDC's Mukita said.

Robert Hughes, DEC's vice-president of industry marketing, compared DEC's strategy of compatible systems, and standardized software to the development of planned, standardized highways. IBM's Binary Synchronous Communications protocol is like an old two-lane road, he said. Its separate operating systems and separate size systems and its separate staffs necessary to direct operations of dissimilar architectures mean that IBM customers often have to go the long way to get where they are going.

The recently announced VAX 8550 — with almost two times the performance of its companion system, the 8500 — comes in a 27-in.-wide cabinet similar to the 8500's. DEC plans to offer an upgrade kit for an 8500-to-8550 conversion in the near future.

The 8550 offers I/O speeds of up to 16M byte/sec. Memory starts at 20M bytes and ranges to 80M bytes. A building block system costs $364,000 and includes 20M bytes of memory, the Ethernet networking capability, a four-port disk controller, one year of VMS and Decnet software licenses and a one-year, on-site hardware warranty.

Other configurations include a $378,000 Vaxcluster building-block system; a $398,000 VMS preconfigured system with an R481 456M-byte disk drive, a TUSB1-Plus streaming tape drive and controller and a DMD82 multifunction communications controller; and a $441,000 office automation system with 48M bytes of memory, Ethernet, a KDB50 four-port disk controller and one-year licenses for VMS, Decnet and All-In-One office automation software.

The 8700 systems start with 32M bytes of main memory and range to 128M bytes. The 8700 delivers the same I/O and memory capacity as the high-end VAX 8800 but has the same processor performance as the VAX 8550, DEC said. The 8700 comes in a large cabinet that allows connection of up to four VAXBI interface I/O channels for an aggregate bandwidth of up to 30M byte/sec. of I/O traffic. An 8700-to-8800 board addition upgrade kit will be available in the fall and has not been priced yet, DEC said.

DEC also announced native VAXBI configurations of its 8200 and 8300 systems that range in price from $79,000 to $127,000 for the 8200 and from $106,000 to $157,000 for the 8300. It released 16M-byte memory array expansion packages ($48,000) for the two new systems and 4M-byte memory arrays ($12,900) for the 8200 and 8300.

The Decserver 200 terminal server connects up to eight terminals, printers or modems to an Ethernet local-area network. The 200/20 TC model costs $3,450 and implements eight RS-232C asynchronous lines for terminal and printer connections, modem control and access to non-DEC systems. The 200/DL model costs $3,050 and provides eight ports for terminal and printer connections only.
IBM will be selling and supporting the ORACLE relational database management system (DBMS) on the IBM System/88 line of fault-tolerant computers. ORACLE is compatible with IBM’s mainframe database management systems, SQL/DS and DB2. This compatibility allows applications written for SQL/DS or DB2 to run on the System/88 under ORACLE.

Oracle Corporation President Larry Ellison said, “We are very excited about this agreement, and are 100% committed to making our relationship with IBM an enormous success. We have always worked hard to maintain compatibility with IBM’s DB2 and SQL/DS products.”

Oracle Corporation, founded in 1977, produces and markets the ORACLE relational database management system, fourth-generation software tools and decision-support software. In 1979 Oracle introduced the first commercial SQL-language DBMS. Today, ORACLE runs on a wide range of computers, including IBM mainframes, DEC, DG, HP, Stratus and most other minicomputers, and a wide variety of microcomputers, including the IBM PC/XT and PC/AT. ORACLE runs under most operating systems, such as MVS, VM/CMS, VMS and AOS, as well as UNIX and MS/DOS, and several others. The System/88 is the latest entry to the list of ORACLE-supported systems.

Oracle Corporation distributes its products through a worldwide network of 30 direct sales offices. In addition, ORACLE is sold by IBM on the System/88, and by other computer manufacturers, including Sperry, Stratus and Honeywell. Today, 31 of the top 50 multi-national corporations use ORACLE.

For further information, contact Oracle Corporation, 20 Davis Drive, Belmont, CA 94002, or call 1-800-345-DBMS.
Net to test compatibility

From page 1

oped by the International Standards Organization. The first test to be conducted on the network, scheduled for Sept. 1, will determine system interoperability using the OSI file transfer access method (FTAM).

The OSInet project is one of the first carried out in cooperation with the Corporation for Open Systems (COS), a user and vendor organization recently founded to coordinate and provide direction for OSI standards development and testing efforts.

"We fully expect that test protocols developed on OSInet will be transferred to COS," said Steven Wendler, OSI marketing manager for Digital Equipment Corp. The "National Bureau of Standards (NBS), one of the projects will be a joint development effort by the NBS to develop and implement DOD protocols and OSI." Wendler said.

There are any number of ways to implement an OSI layer," noted John Haefner, chief of the systems and network architecture division at the National Bureau of Standards (NBS), one of the project's charter members.

"Different vendors' products may not be compatible, even though they all use the same OSI design specifications. An example of this is packet-switching networks that all use X.25, but still cannot exchange data. OSInet is set up to avoid this nonsense," Haefner said.

Vendors who are charter members of the OSInet joint development committee include DEC, AT&T, IBM, Amdahl Corp., Boeing Computer Services Co., Hewlett-Packard Co., Sperry Corp./Burroughs Corp., Wang Laboratories, Inc., Honeywell, Inc. and UK computer manufacturer ICL PLC.

"OSInet will enable us to resolve most interoperability problems with other vendors before our products reach the user," DEC's Wendler said.

"It also provides a way for us to demonstrate OSI communications for skeptical customers who have heard about the standard without seeing anything solid for too long," he said.

Among user organization charter members are the U.S. Department of the Navy, the Defense Communications Agency and the U.S. Department of Agriculture.

One of the network's first projects will be a joint development effort by the NBS and the Department of Defense (DOD) to develop and test gateways between current DOD protocols and OSI.

The Defense Communications Agency plans to use OSInet facilities to help it evaluate products that may enable the DOD communications protocols to communicate, or even merge, with OSI standards, a Defense Communications Agency spokesman said.

Boeing will be one of eight participating in the FTAM interoperability test scheduled for next month. "Boeing has been involved with OSI since its inception," said Laurie Bride, Manufacturing Automation Protocol/Technical Office Protocol (MAP/TOP) program manager at Boeing.

The aerospace company's own OSI testing facilities are already linked to OSInet via an X.25 packet-switching connection.

"We currently have systems from more than a dozen vendors linked on a MAP/TOP network; OSInet will allow us to test interoperability with a broader set of vendors," Bride noted.

The OSInet project will be coordinated with the efforts of other standards organizations such as NBS, the MAP/TOP Users Group and COS, Haefner said.

The OSInet organization plans to "work closely with COS in order to avoid duplication of effort," he said.

"Then we'll be right where we want to be, with everyone solving a piece of the puzzle." Most vendors that have joined OSInet are also members of COS.

The project has a target number of 100 organizations participating in the network by early 1987, Haefner said. A January 1987 deadline has been set for all 25 charter members' systems to be communicating over OSInet.

The 'only comparable instances of such widespread vendor cooperation were the OSI internetworking demonstrations that took place at Autofact '85 and National Computer Conference '84,' Wendler said.

"But those were temporary; these facilities will be available ongoing, and reprise a much bigger vendor commitment," he added.

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**HP to adopt Imagen DDL for Laserjet, enhancing desktop publishing ability**

**By Maura McEnaney**

PALO ALTO, Calif. — Hewlett-Packard Co. is scheduled this week to announce plans to incorporate Imagen DDL as the composition language for its Laserjet line of printers.

The announcement should end speculation about HP's plans for enhancing its desktop publishing capabilities, which have been limited by its lack of a powerful page description programming language. Until now, HP has been using its own Printer Command Language (PCL), an instruction set that controls features of Laserjet.

Whereas PCL was designed to take advantage of Laserjet features and emphasize the compatibility of HP's printer line, Imagen's DDL addresses entire document layout. It also allows pages to be created in any order and images to be easily repositioned. "HP wanted to have a more powerful product for the desktop publishing market," says Cathy Dingman, an analyst at market research firm CAP International, Inc., in Marshfield, Mass. "Once they have a product with a page description language, they will be in the game," she says.

Under the terms of the agreement to be announced today, Santa Clara, Calif.-based Imagen will license DDL to HP. Laserjet products incorporating DDL will not be available until the fall, notes Chuck Ulfers, marketing manager for HP's Boise division in Idaho. HP will still support PCL, he says, because "we still believe the average user of a laser printer is not into desktop publishing."

There was some speculation earlier this year that HP would incorporate page description language functions into a new version of PCL; however, that is no longer necessary, Ulfers says. HP selected Imagen as the vendor of the page description language because it is highly compatible with HP's line of printers and is oriented more toward producing entire documents than market leader Adobe Systems, Inc.'s Postscript, used in Apple Computer, Inc.'s popular Laserwriter printer, he explains.

"It gives HP the wherewithal to compete with Apple without having to sell the Apple Laserwriter," says a high-level HP executive, publisher of WYSIWYG newsletter in Redwood City, Calif.

With more than 500 independent third-party software vendors supporting PCL on its printers, HP will not have a viable attracting vendor to DDL, CAP's Dingman claims. Page composition software vendors that have committed to DDL include Autodesk Inc., Digital Research, Inc. Autocad, SCO Xenix, and many more.

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**Crays boosts low-end power**

**By Donna Raimondi**

MINNEAPOLIS — Cray Research, Inc. last week announced new low-end supercomputer models as well as price reductions and a boost in CPU performance on existing models.

The Minneapolis vendor released a $12 million X-MP/44 system with four CPUs that share a four-million-word (64-bit words) emitter-coupled logic (ECL) bipolar memory arranged in 32 interleaved banks. The system is the smallest four-processor model that Cray makes, a spokeswoman said. Other X-MP/4 machines have eight- or 16-million-word memories.

The new $7 million X-MP/22 system has two CPUs sharing two million words of metal oxide semiconductor (MOS) memory arranged in 16 interleaved banks. This model is the entry-level, dual-processor model, the Cray spokeswoman said. Other models in the X-MP/2 series have four-, eight- or 16-million words.

"The demand for Cray machines is strongly in favor of dual- and quad-processor systems, so the new products and the price adjustments are just an effort to boost the low end of those lines," said supercomputer analyst Jeffrey Canin of the investment firm Hambrecht & Quist in San Francisco. In the past, Cray has paid more attention to the high end of its line, in which customer demand is strongest, he added.

Cray's low end is in need of filling out, and this announcement appears to address that need, according to Canin. The most powerful superminicomputer from the so-called Crayettes companies — Cray-compatible vendors in a lower range — reaches only about one-third the power of Cray's entry-level, single-processor XM-P system. Cray has explored and rejected any systems in the superminicomputer range, so the move does not appear to be competitive with the Crayettes, Canin said.

Prices on all one- and two-processor X-MP systems have been reduced. The single-processor X-MP/1 series machines' prices were slashed $1 million, and from $500,000 to $1 million came off the dual-processor models' prices. The prices of the X-MP/4 systems that use ECL bipolar memory have not been reduced because prices of ECL memory have not fallen, the Cray spokeswoman added.

The increase in CPU performance is owing to a speedup of the X-MP clock period to 8.5 nsec from 9.5 nsec, a move Canin called a "mid-life kick" for older systems. This was possible because of chip replacements in both the CPU and memory, the spokesperson said. All new systems, which are compatible with the older systems, now incorporate the faster clock time.
By Eddy Goldberg

MOUNTAIN VIEW, Calif. — Stressing an ongoing commitment to engineering and scientific users, National Advanced Systems Corp. (NAS) last week announced the AS/XL Vector Series of mainframe processors, priced in the $3.5 to $15 million range, and scheduled for shipment beginning this October. A smaller uniprocessor Model V60 and dyadic Model V80 are scheduled to be available this October. A smaller uniprocessor Model V60 has a planned release date of first-quarter 1987, and the three-processor Model V90 and four-processor Model V100 are slated for third-quarter 1987 releases.

Software supported for the AS/XL Vector system includes: ASC/Nastaran, a finite-element-method software package, from MacNeck-Schwender Corp. in Los Angeles, available now; and the NAG Fortran Library from the Numerical Algorithms Group in Downers Grove, Ill., available in third-quarter 1987.

Other software includes Vector and Array Syntax Translator/Extended, a Fortran program preprocessor that converts scalar applications into vectorized code and provides portability and compatibility between 3090 Vector Facility applications and the AS/XL Vector Series, developed jointly with Pacific-Sierra Research Corp. in Los Angeles and available now; and Mat Advantage, a mathematical library of core numerical algorithms from Quantitative Technology Corp. of Beaverton, Ore., also available now.

The Vector series features an internal storage hierarchy consisting of main storage, dynamic working storage and a cache buffer. Dynamic working storage, with an average access time of 12 nsec, comes in 512K-byte, 1M-byte and 2M-byte increments.

Located between the cache buffer and main storage, dynamic working storage provides additional access to faster chips for data and instruction fetches, according to Claude Steinmayer, director of worldwide scientific computing for NAS. He said access time in cache is 4.5 nsec, compared with 120 to 150 nsec in main storage.

He also noted the AS/XL Vector Series is air-cooled and has a footprint one-third of comparable IBM 3090 vector processor configurations.

In terms of performance, Steinmayer cited an August report from the Argonne National Laboratory in Lemont, Ill., that shows Linpack, a public-domain software library consisting of software routines with a high percentage of floating-point operations, ran on the AS/XL Vector Series at 60 uniprocessor at 43 million floating-point operations per second (MFLOPS); the IBM 3090 Model 200 uniprocessor with one vector facility ran the Linpack at 15 MFLOPS, Steinmayer said.

Pricing for the AS/XL Vector Series is $3.61 million for the V50, $4.79 million for the V60, $8.01 million for the V70, $11.36 million for the V90 and $14.24 million for the V100. The 3090 VF Extend will have a one-time fee of $50,000.
HONG KONG — NCR Corp. recently indicated to users in Hong Kong that extensions to its 9800 series of fault-tolerant, general-purpose mainframes will be released, along with a full line of banking software, toward the end of this year.

Though no specifications were revealed, a spokesman did confirm that the software will include data bases, fourth-generation tools and Cobol-based products.

An automatic teller machine, dubbed the 5841, and a banking terminal based on NCR's Tower microcomputer will also be launched in the fourth quarter. The terminal will run under Unix and/or a new transaction operating system, the spokesman said.

NCR made the unofficial announcement to users in an effort to hold its ground against IBM in the financial sector of Hong Kong. Prior to the April announcement of the 9800 series, NCR suffered a spate of user defections to Big Blue.

NCR financial services manager Mike Darch admitted that if the company had been able to launch the machine earlier, "it would have made those banks' decisions a lot harder to make."

Underscoring the point, the Belgian Bank in Hong Kong has reversed its decision to migrate from an NCR 8500-based banking system to IBM, on the strength of the recent NCR announcement. In a deal valued at $350,000, the bank has contracted to purchase a two-application processor 9822 with two data storage units.

— Francis Pearce

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IBM PC grip slips in UK

LONDON — IBM's grip on the UK personal computer market slipped in the first six months of this year as competition from IBM-compatible suppliers intensified. According to market analyst Romtech Ltd., in the last three months of 1985, IBM accounted for 50% of business microcomputers sold through dealers. By the second quarter of this year, its share was down to 44%.

This is a slight rise on the first quarter's figures because, Romtech said, IBM came back with a new range of products.

LONDON — Cost-cutting and business sell-offs at the troubled UK computer manufacturer and communications group STC PLC have glossed over the firm's latest mid-year figures. Financial results released last week show the company posted pretax profits of $73.1 million in the first six months of its fiscal year, more than twice the earnings that were announced during the same period last year.

STC's computer subsidiary, International Computers Ltd. (ICL), bought by STC in 1984, was once again the saving grace at the company. ICL posted revenue of $839 million, up 11%.

The mainframe company was the only division of STC to boost its revenue.

Compiled from the Computerworld International News Service.

Plessey takeover bid barred

LONDON — A bid by General Electric Co. PLC (GEC) to reshape the UK electronics industry by taking over its rival Plessey PLC has failed. After eight months of heated debate concerning the wisdom of creating a British company with combined revenue of $11.1 billion, Paul Channon, secretary of state for trade and industry, last week came out against the move.

GEC's bid for Plessey was referred to the Monopolies and Mergers Commission in January, a body that polices corporate mergers in the UK. The commission's report, published recently, rejected GEC's overtures.

Channon accepted its finding that the takeover would operate "against the public interest."

Plessey, which reportedly fought hard and sometimes acrimoniously with GEC, welcomed the outcome.

However, a dispute is brewing about the future of System X, a digital public switch developed by Plessey, GEC and STC PLC, its original developer.

Although the commission has rejected an overall merger, it supports the rationalization of the joint development. Both GEC and Plessey manufacture and sell the system, with
EDITIORIAL

Protecting user rights

Slowly but steadily the consumer protection ethic that has sent shivers along the spine of American manufacturing has wended its way into the computer industry. A recent advance, begun last October but only recently picked up by reporters, involves a pending court case that pits a small Fort Lauderdale, Fla., construction firm, James A. Cummins, Inc., against micro software giant Lotus Development Corp.

Cummins' principal, James A. Cummins himself, alleges that he used Lotus' Symphow- ny product to prepare a contract bid that turned out to be inaccurately computed and further alleges that a Symphony software defect caused said miscalculation. Lotus says it was Cummins who messed up.

The Cummins v. Lotus case has serious implications for users and vendors alike: A court decision in either direction could set important precedents in the matter of software vendor liability, or lack thereof, to businesses that feel they suffered because of software inadequacies. Currently, even the most conscientious software firms cannot say any such responsibility, promising only to replace individual software diskettes found to be defective.

(Another front, meanwhile, ADAPSO, the software and service industry's trade association, is waging a campaign to adopt stronger warranties—guaranteeing that products will perform according to specifications, for example—to stave off court decisions that could impose even stricter liability.)

If the courts hold microcomputer software firms responsible for losses caused by software bugs or, worse yet, by end-user misuse, we can expect a rash of lawsuits—many too petty— to assault the industry. In fact, if you must know, we expect that a whole new realm of legal practice would spring up like daffodils in May.

Smaller software companies with fewer resources would be threatened. Large software firms have cash reserves, large quality-control staffs and large legal departments which would gain an even greater competitive advantage.

It takes no wild speculative leap to see clearly that the spectre of lawsuits and the actual eventual loss of small, aggressive software firms would combine to stifle innovative research and development and ultimately do great disservice to computer users everywhere.

The software industry should be smart enough to move quickly and forcefully to fend off this vision before it becomes reality. Stronger software warranties are a must. Software buyers, like any other consumers, have a right to expect that a product will perform as promised. Steadily improving service and support is another need, since user dissatisfaction is often seen greater than ever on this score.

As to Cummins v. Lotus, the issue may be one of human as opposed to software error; if so, using the case to plunge the software industry into the nightmare world of damage suits goes far beyond what is equitable or necessary to protect user rights. What is needed is wisdom, consideration and action from the software industry, not creation of another legal profession windfall by capricious courts.

Mapper turns PCs to coprocessors

The Softalk column, "4GLs Drawing Bead on PCs" [CW, May 19], addressed how products such as Information Builders, Inc. Focus and others suffered from performance problems when running on personal computers.

Sперry Corp.'s Mapper software is used by more than 500,000 people around the world, making it the most widely used fourth-generation language. It is available on all sizes of computers, ranging from PCs to mainframes. To avoid a performance problem when installed on a PC, it comes with a fully sized expansion board that contains a Motorola, Inc. 68010 CPU and 512K byte of random-access memory (RAM).

This is used, along with a proprietary operating system, to run the Mapper software while the PC's existing CPU is employed as the I/O processor. This makes the PC a coprocessor. When the PC is not running the Mapper software, the 512K of RAM is available to DOS.

It might be unfair to refer to the Mapper software as a fourth-generation language, because it is really a complete end-user computing environment, but it has features and capabilities to gladden the heart of the most sophisticated DP professional. Those who have seen it run on a PC cannot believe it, finding almost no limit in functionality compared with the mainframe version.

Due to its mainframe heritage, Mapper software even supports two added PCs as slave terminals, running terminal emulation software that is included in the package. This ability gives us support for three concurrent users.

It changes our perspective of the system, too, so that we now think of the PC that contains the Mapper software and board as a host for the added "terminal" PCs and the one who uses the tube and keyboard of the "host" PC as just another terminal user.

We use PC Mapper (called Personal Mapper system) to develop and test applications and upload them to our mainframe Mapper system for all to share.

I understand that there is a Unix version of the Mapper system written in the C language that will be marketed soon. This would make Mapper software available on an even wider range of computers, which would address another problem mentioned in the article: portability.

Freddie G. Bieleswiss
President, Texas Integrated Technologies, Inc.

Letters to the Editor

Responding to my contribution to the Reader's Platform, "SDI demands trillions of instructions, 99.999999% reliability" [CW, June 2], letters to the editor by Edward Fuchs, "AT&T reports no such croc rates" [CW, July 14], and Capers Jones, "Software quality data distorted" [CW, July 28], have ignored the major point I wished to make. Both writers object to my use of data from an article, "Cost, cancellations impair software quality" [CW, Nov. 26, 1984], in which Jones is reported as saying, "In very large programs, defects in coding, documentation and incorrect bug fixes result in an average of 300 serious errors per 1,000 lines of code." My attribution of Jones' study to AT&T was incorrect as properly noted by Fuchs.

It is also true as stated in Fuchs' letter that "a software system can deliver reliable performance though it may contain some errors." And Jones writes that from "90% to 97% of the defects" are usually found before delivery of a program to users. These statements are directly related to the point of my contribution. Reliable means that the same results (from a program or experiment) can be counted on each time a process is repeated, which means we can count on the small proportion of errors Jones and Fuchs indicate are likely to remain after testing, debugging and delivery.

James Baginski, quoting General Accounting Office reports in Aviation Week & Space Technology [July 14, 1986], states that "only 2% of software products could be used when and as delivered." The main issue my article was addressing is not how many errors remain in a complex software program, but that the models underlying the program may have bugs that the codes (no matter how reliable) are most unlikely to be able to correct.

David Bendel Hertz
Distinguished Professor, University of Miami
Intelligent Computer Systems Research Institute

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Letters should be addressed to the Editor, Computerworld, Box 2171, 375 Cochituate Road, Framingham, Mass. 01701-9171.
Beyond promises of support: Cost-effective software service

The purchase price of high-quality personal computer software is not really very high. Consider that micro packages costing a few hundred dollars do as much as the multimillion-dollar mainframe packages of years gone by.

But software vendors and customers alike are discovering the cold, hard truth on the bottom line: Support is very expensive. In fact, most vendors run their support services, such as 800-number hotlines, so as to discourage "trivial" questions. Several told us that they wanted the user to have to call two to three times before he got an answer. One major vendor said that if a package purchaser asked for help a second time, he was told, "You should have asked the first time." They do not mind providing it, they said, but at a charge.

In reaction, many software vendors are starting to charge for help. They do not mind providing it, they say, provided they can at least break even (or perhaps make money) on the support function. Users say they would not do some of this if the help the vendor provided was not worth the fee. Too often, those manning the phones are inexperienced employees, unable to do more than read the manual.

In-house support alternative

However, there are alternatives: The first is to create an in-house support program. Nearly everyone eventually does some of this, but it is not always a profitable venture, if you are paying for paid help. To break even, you must have some users who are not all tough ones and if he works really hard. We estimate that 4,500 questions per year, for a per-question cost of $11.11 to $16.15.

Assume that each user uses three different software packages and asks one question about each package per month (a very conservative model). That comes to $2,250 per month, or $27,000 to $39,600 per user per year. And it means you would need a support person per 125 users, just to provide software support. You would still need other support people for training, bringing up whole new packages, training new employees, writing and maintaining standard software packages, and so on.

Buying software support

An alternative to in-house support has recently become available: You could buy software support. So far, two possibilities are active.

The National Bureau of Standards has recently become available: You have a relatively new idea, fee schedules are geared at offering a specific amount of support for a specific price. The vendor generally promises a "no-bug-safety" level of service.

Since such support should be profitable to the vendor and, at the same time, helpful to the customer, expect announcements of such programs to be a common occurrence in future months. Some very large software firms are moving into this type of service, and their policies tend to set the standards others follow. Since this is a relatively new idea, fee schedules are not yet well understood, but software support is seen to plan to charge more than the next application package, but less than the cost of in-house support.

Another, a new kind of software service organization is starting. Personified by Debby Pain's Micro Support Resource Corp. (MSR) of Bala-Cynwyd, Pa., and edi-
Leading Edge®, the first company to develop affordable IBM®-compatible personal computers, now offers the first affordable Hayes-compatible modems: The Model "L" Series™ Modems.

Like our personal computers, the Model "L" Series Modems do everything the industry standard modems do, except cost a lot.

For example, they can access databases. And databases represent what could be considered one of the largest compilations of information in the world, with data on every topic from the stock market quotes to corporate histories to the current exchange rates. Model "L" Series Modems can send and receive data to and from personal computers all over the world. You can send electronic letters to locations all over the country or over the ocean. It's infinitely faster than conventional mail and a lot less expensive.

They allow you to use your own personal computer to send and receive Telexes.

They can also provide access to mainframes, making your personal computer a personal work station wherever it is — in the office, at home or on the road.

And Model "L" Series Modems allow you to network with other personal computers. You can share data or share programs. You can even transfer files between two completely incompatible systems (i.e. Apples® and IBMs).

Yet at $149.95 and $289 respectively, the 1200B and 2400B Model "L" Series Modems are priced below equivalent Hayes Modems. In fact the Model "L" Series 1200B, including software and a 24-month warranty, is priced at one third the price of an equivalent Hayes Modem. We're just reaffirming what we proved with personal computers. You don't have to pay a lot to get a lot.

To make the connection for yourself, call 1-800-USA-LEAD for more information and a dealer near you. (617) 828-8150 in MA. For our special "Fleet" pricing call our Fortune Fleet Division at 1-800-457-7286, (617) 769-8050 in MA.

Leading Edge Hardware Products, Inc.
225 Turnpike Street, Canton, MA 02021 (617) 828-8150

Leading Edge Hardware Products, Inc. Fortune Fleet Division
55 Providence Highway, Norwood, MA 02062

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By David Bright

Gold Hill to broaden LISP line

Gold Hill will announce Acorn, a three-tiered software tool for building expert systems on conventional processors. Acorn is intended for AI programmers able to use the full power and flexibility of the language.

By Bybee, executive vice-president of engineering for Datablocks.

Other applications might include the implementation of process control devices, including sensors and data logging systems.

The implementation of process control devices is simple in concept, according to Bybee. "For hook up a processor to monitor different sensors and then take appropriate action based on what is read in those sensors."

The problem, however, is that current products have been difficult to program and have not been flexible. "There is very little available that allows users to put together a development system using the tools that you will be using for doing the actual control," Bybee said.

"Normally," he added, "with your system, you just might find. 'You get what you need.' It is hard to find a better way to characterize the state of office systems integration.

While the 'everything solution' remains nowhere in sight, some practical solutions to specific integration problems are available. Though these products do not provide an elegant, simple and total solution, they offer more than enough to make the practical integration of office systems readily available to those users who really want it.

An excellent example of this is the Keyword 7000 Document Translation System from Keyword Office Technologies, Inc. of Calgary, Alberta.

Including both hardware and software, the Keyword 7000 could be described as a specialized expansion chassis for the IBM Personal Computer, Personal Computer XT, AT and compatibles with supporting software that makes it very easy to translate. See PRACTICALITY page 23

Zachman is vice-president of research at International Data Corp.

Oracle's SQL*Calc makes a relational DBMS as easy as 1-2-3.

Oracle Corporation has developed a Lotus 1-2-3 compatible spreadsheet and integrated it with its ORACLE® relational database management system (DBMS). The new product, SQL*Calc® is the first to combine a mainframe-class relational DBMS with an easy-to-learn and familiar PC spreadsheet user interface.

SQL*Calc® is designed for 1-2-3 users who run out of memory, flexibility and patience. SQL*Calc allows you to put SQL database commands into spreadsheet cells...just like formulas. This permits you to access large amounts of data directly from your spreadsheet.

Like all Oracle Corporation products, SQL*Calc runs identically on mainframes, minicomputers and PCs.

SQL*Calc's foundation is the ORACLE relational DBMS, which provides users with a complete set of SQL commands through which they can create, retrieve, modify and otherwise control their data. SQL is the industry standard database command language for large computers. The SQL commands available in ORACLE are identical to the SQL commands in IBM's premier mainframe relational DBMS products, SQL/DS and DB2.

Built on this powerful DBMS foundation is a Lotus 1-2-3 compatible spreadsheet that allows users to put SQL commands into spreadsheet cells in the same way as they enter formulas. When a SQL command for data retrieval is entered into a spreadsheet cell, information is automatically retrieved from the database and placed into the spreadsheet. SQL*Calc also permits users to modify the database--and even create new database tables--directly from the spreadsheet.

SQL*Calc is easy to learn because its menu and command structure are compatible with those of Lotus 1-2-3. And SQL*Calc's ORACLE DBMS requires no supplement; it is vastly more powerful than the database components of 1-2-3, Symphony, Framework, dBase II, dBase III, or any other PC DBMS.

SQL*Calc is available immediately for IBM PC/XTs and ATs for $995.* SQL*Calc will be available on a wide variety of systems, including IBM mainframes, DEC, DG, and other superminis, and most UNIX systems.

For further information, or to order your copy of SQL*Calc, call 1-800-345-DBMS. Or write Oracle Corporation, Dept. CS, 20 Davis Drive, Belmont, CA 94002.

* Please inquire about our "Corporate 50" program for quantity licensing.
Leading Edge ups PC RAM

Expandable to 768K bytes on motherboard

BOSTON -- Leading Edge Hardware Products, Inc. has enhanced its Model D Personal Computer.

The machine, which still sells for $1,495, now comes with 512K bytes of random-access memory (RAM), up from 256K bytes. In addition, the machine is expandable to 768K bytes of memory on the motherboard, according to Leading Edge.

The Model D Personal Computer includes the Leading Edge Model 1,200 bit/sec. internal modem, a spreadsheet and Leading Edge word processing software.

According to the vendor, the original Model D with 256K bytes of RAM and two floppy disk drives will now sell for $1,256 and will include Leading Edge word processing software. Both systems come with a 15-month warranty and include a monochrome monitor.

Micros share peripherals via switch

EUGENE, Ore. -- Crosspoint Systems today announced a line of products that allow personal computers to share peripherals.

The Crosspoint 8 is a $796 software-controlled data switch for personal computers that allows up to eight PCs or peripherals to be connected and to share or add peripheral devices. The $465 Crosspoint AB+ allows up to seven peripherals to be added to a single PC.

The products can be configured through pop-up menus, and each PC can handle up to 16 applications.

BIM gets it out of your system

BIM presents a line of proven programs that maximize your system's capabilities, saving you labor and expense. These program products help get the most out of your system and people.

BIM WINDOW -- Multiple terminal sessions concurrently at CRT under DOS or VTAM

BIM-EDIT -- The editor with more than 25 significant features that ICCS can't match

BIMPOOL -- Print output in POWER/VE spooling queue on local or remote 3270 terminal printers. (Received ICP Million Dollar Award 1982)

BIM-PROM -- Users can burn programs from CICS application programs into the POWER spooling queue.

BIM-PDG -- POWER Dynamic Queuing performance enhancement. Eliminates 90% of the IDQ is heavily used POWER queue

BIM-ODIS -- Comprehensive problem analysis and display of operational CICS system. DOS and OS

BIMTEXT -- Word processing, document composition system.

BIM-FTX -- System to automatically send spool files to remote hosts, includes a BMS on-line map generation

BIM-FMAP -- CICS BMS on-line map generation

BIM-M浓厚 -- On-line Job Edit and Submission facility.

BIM also performs systems programming consulting, with consultants based in Minneapolis and Washington, D.C. Computer time services are also available on our 4331-2 system, on-site or remote.

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BIM presents a line of proven programs that maximize your system's capabilities, saving you labor and expense. These program products help get the most out of your system and people.
Again, a sales leader.

That leadership was recently reconfirmed by the keynote speech delivered by our president, Mario M. Morino, at the inaugural conference of the U.K. Computer Measurement Group (CMG).

It's a paper you need to read if MVS is now your organization's primary operating system. Or if you plan to migrate to MVS. It provides a practical, and proven, approach to Establishing an IS Management System—the basis for managing IS as a business. And you know the problems inherent in that task!

Yes, the speech covers the potential pitfalls. Success factors, too. Plus definitions, requirements, and recommendations. All these and more are included, and a copy is yours for the asking. Just send us your written request. Or better yet, give us a call at (703) 734-9494. Well also be happy to send you information on the upcoming presentations for our three IS management products—MICS, TSO/MON, and PAS.

It's at these presentations that you can learn firsthand why our slogan continues to be: "Don't take our word for it; ask our users." And why we continue to be ranked among the "Top 200" and the "Top 50." Year after year.
Gold Hill to broaden line

From page 19

Gold Hill will market Acorn as a microcomputer-based alternative to developing expert systems on expensive, dedicated symbol-processing machines. One target market will include domain experts such as engineers, doctors and financial analysts interested in developing an expert system based on their own knowledge.

A step-by-step, on-line tutorial is provided for beginners to introduce them to expert system development. Acorn's open architecture includes a complete LISP environment with interpreter, compiler, an inference engine, knowledge representation language, graphics module, interface building facilities and browser.

Technical features include forward and backward chaining, frame-based knowledge representation, power-screen graphics, mouse support, hooks to PC tools, certainty factors and an explanation facility.

Open architecture

Acorn's open architecture allows users to directly access data from products such as Ashton-Tate's Dbase II and Dbase III and Lotus Development Corp.'s 1-2-3. Acorn is scheduled for first-quarter 1987 availability and will be priced at $5,000.

In addition, Gold Hill will announce a product developed jointly with AI Architects Inc. of Cambridge, Mass. Dubbed the 386 Hummingboard, the product is intended to help software developers, value-added resellers and OEMs develop and deliver large AI applications. The board comes bundled with Gold Hill's GCLisp 386 Developer and as much as 254M bytes of on-board memory.

According to officials at the two companies, the 386 Hummingboard cost-effectively converts a personal computer into a high-end LISP machine. Built around a 16-MHz Intel 80386, the board enables a PC XT or AT to run GCLisp approximately five times faster and greatly simplifies the critical edit-compile-debug loop.

"The 386 Hummingboard offers an unprecedented level of LISP machine price/performance," claimed Richard Mark Soley, president of AI Architects. "Running GCLisp, the 386 Hummingboard is the first affordable engine powerful enough to run the most demanding applications. The 386 Hummingboard is also an excellent productivity tool for program development."

LISP applications require large memory spaces for development, said Eugene Wang, Gold Hill marketing vice-president. Therefore, the Hummingboard uses either 256K-bit or 1M-bit dynamic random-access memory chips (RAM) to bring memory up to 6M bytes or 24M bytes, respectively.

The board's 32-bit memory supports and high-speed cache memory yield a processor/memory cycle time typically seen in superminicomputers, according to Wang.

When the board is used, the host PC's processor becomes an I/O processor. Included in the package is an interface for sharing memory with the host processor according to the Lotus/Intel/Microsoft Expanded Memory Specification.

Using the GCLisp Network TCP/IP that is set to be announced this week, developers can integrate their existing applications with other systems and develop distributed AI applications.

Machines expected to be included in such networks include those in Symbolics Inc.'s 3000 family, Texas Instruments, Inc.'s Explorer line, Digital Equipment Corp.'s VAX systems and Sun Microsystems, Inc. workstations.

GCLisp Network TCP/IP will be available in the fourth quarter for $495 per node.

---

IBM ASCII terminals:

The case in black and white.

Introducing a somewhat more colorful member of the family.

Meet the IBM 364 ASCII Color Display Station. It gives you eight foreground and eight background colors. On a 14" screen.

And because of its 8 x 16 character matrix, the 364 gives you crisp, clear characters in color.

But is color any reason to buy IBM's 364? It is, according to studies that indicate the use of color increases productivity, decreases errors and promotes user satisfaction.

Color, of course, is far from the sole reason for choosing the 364. To appreciate the others, you should get to know the rest of our ASCII family.

Emulation

Another side of the family.

Our ASCII terminals are designed to fit into existing systems. Even if the systems aren't ours.

Emulation Capability

<table>
<thead>
<tr>
<th>Features</th>
<th>3616</th>
<th>3613</th>
<th>3614</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screen size</td>
<td>12&quot;</td>
<td>12&quot;</td>
<td>16&quot;</td>
</tr>
<tr>
<td>Lines x characters</td>
<td>25x80</td>
<td>25x80</td>
<td>25x80</td>
</tr>
<tr>
<td>Character matrix</td>
<td>8x16</td>
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<td>Displayed characters</td>
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<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Line drawing characters</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Vertical scroll</td>
<td>Jump</td>
<td>Smooth Jump</td>
<td>Smooth</td>
</tr>
<tr>
<td>Definable function keys</td>
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<td>24</td>
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</tr>
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<td>No</td>
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<td>Yes</td>
</tr>
<tr>
<td>Characters in buffer</td>
<td>1920</td>
<td>7680</td>
<td>7680</td>
</tr>
</tbody>
</table>

For example, our basic ASCII Display Station, the IBM 3613, emulates up to six terminals. And the advanced-function 3616 emulates a number of higher level ASCII data streams.

What's more, every one of our ASCII terminals can operate in its own function-rich native mode.

Our family is flexible.

Our unique plug-in cartridges allow for considerable flexibility in your operation. For example, simply by switching cartridges you can shift a terminal from one data stream to another.

And, in many countries cartridges are also available that go beyond emulation to let you operate your ASCII terminals in several foreign languages. Appropriate foreign language keyboards are also offered.

Enhanced ergonomics.

Another family trait.

All our ASCII terminal keyboards have 102 keys. But that's not all they have in common. Every keyboard also has a low profile, gentle contour and typewriter touch.

And our keyboards have programmable function and editing keys so they can be custom-tailored to fit your application needs. The 3613 and 3614 models also have redescendable and rekeyable keys.

Superior ergonomic design isn't confined to the keyboard, however. All three displays tilt and swivel for maximum user satisfaction. And, of course, by making the display easy to read, we made it easier on the eyes. In addition to the 8 x 16 character matrix, we gave it an advanced non-glare etched screen, cursors, and character and field attributes like blink, reverse video, underscoring and dual intensity.

High standards. Competitive prices.

Quantity discounts are offered, too. And financing is available through the IBM Credit Corporation. Best of all, each terminal comes with the quality, service and support you'd expect from IBM.

Contact your IBM marketing representative, or call 1 800-IBM-2468, Ext. KC/90, for the IBM Authorized Distributor nearest you. And we'll present more evidence in the case for IBM's ASCII terminals.

It may be all you need to color your view.

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"Report on Chromium Dioxide" is a copyrighted, independent study. All names and opinions are editorial. Your copy is available by return mail. Send check (US bank) or money order for $350,000 to NTX Consulting, 2800 Fm 528 Drive, Arlington, Texas 76018.
Practicality in integration

From page 19

documents from one format to another.

The Keyword 7000 hardware includes a controller card and expansion chassis with its own power supply that can be configured to hold up to two 514-in. floppy disk drives along with two 8-in. floppy drives.

The software is a collection of translation routines that run on the PC and compatibles and take advantage of the hardware to offer document conversion among different formats on different media.

Keyword has succeeded in providing a practical way for user organizations employing a variety of word processing systems and software to exchange documents. The product supports a multitude of formats, including AES/Lanier, DEC Deccmate, IBM Displaywriter, Displaywriter OS/6, DCA and 0520, NBI 054-in. and 8-in. formats; and Wang PC MS-DOS and CP/M formats.

Conversions

Of course, conversion between different IBM and compatible PCs' 514-in. Microsoft Corp. MS-DOS floppy disk formats is available.

In addition to conversion routines built into many personal computer word processing systems, there are conversion tools available from third parties. Keyword itself offers Softpak, a $449 software-only alternative.

What these alternatives don't do, and what Keyword does very well, is provide conversions between physically different media.

For example, I do much of my writing on PCs, either in my office or at home. The main tool at International Data Corp., however, is an older word processing system that uses 8-in. disks.

The Keyword 7000 provides a very convenient way to move documents back and forth between the various personal computers I use and the office system.

The Keyword 7000 isn't exactly sold at giveaway prices. The product starts at around $4,000 and can run to some $10,000 for a four-drive system with all the bells and whistles.

Still, if getting back and forth between different logical and physical disk formats is a requirement for your operation, the Keyword 7000 is worth considering.

In the real world, there is seldom a need for everything to talk to everything else. On the contrary, the real need is generally for a relatively limited number of specific document conversion paths, along with the ability to easily add others as required.

This reality was recognized in the configuration and pricing of the Keyword system.

You do not have to buy the everything solution at the everything price. Variable configurations make it possible to get just as much as you really need to solve the problems you really have. Additional capabilities can be added later if necessary.

HP rolls out voice manager for the office

PALO ALTO, Calif. — Hewlett-Packard Co. recently announced Office Talk, a $995 voice communications manager for the HP Vectra, IBM Personal Computer AT and compatibles.

Office Talk is based upon a software application and an I/O card and provides voice messaging, telephone management, a memo pad and an appointment diary. The system can answer the telephone, greet callers, take and forward messages and make calls.

The Office Talk software was developed by HP, and the hardware was developed by Natural Microsystems Corp. of Natick, Mass.

**Series/1**

- Custom Software & Systems
- VPS Specification
- All types of communications
- Async + SNA + LU 2.2 + CM
- In-house Series 1 development laboratory

Applied Management, Inc., 1106 Piccard Drive, Suite 200
Rockville, Maryland 20850
301-670-4220
Fourth Generation Software
with a Blueprint for Productivity

To build productivity, you need a solid foundation. It’s yours with the SAS System... designed by the leading architect of Information Center software.

Here, in one system, are integrated tools for any computing task. For any environment, from personal computers to mainframes. For seasoned professionals and new users alike.

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The SAS System runs on IBM 370/3000, 43xx, and compatible machines under OS, TSO, CMS, DOS/VSE, SSA, and ICCF; on Digital Equipment Corp. VAX 6000 and 1175/xx series under VMS; on Prime Computer, Inc. Prime 50 series under PRIMOS; on Data General Corp. ECLIPSE MV Sage under AOS/VS; on IBM AT/370 and XT/370 under VM/PC; and on IBM PC AT and PC XT under PC DOS. Not all products are available for all operating systems.
One thing about smart cookies, they can spot each other a mile away. While they don't flaunt their derring-do, they quietly know they're the best at what they do. Because substance shows through. Every time.

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All of which brings us to our smart cookie: SyncSort DOS. A cut above the rest if you ever saw one. Check these delicious advantages.

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And performance features such as:

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- **Multiple Output** — From a single sorted file, you can create multiple files and reports. Each can include the same or different data as determined by INCLUDE, OMIT, OUTFIL or OUTREC parameters.

**BETTER CUSTOMER SERVICE**

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The moral to this story: smart cookies are quick to reject half-baked solutions in favor of SyncSort DOS. Call us for a demonstration. Once you get a taste you will be hungry for more.

SyncSort DOS
One smart cookie deserves another.
Three-schema path to future

Much is being said and written about three-schema architecture. What is architecture in this context, and how does it contribute to database management system (DBMS) design?

In the software context, architecture is a statement of general approach, principle and design philosophy. Architecture is also the layered structures and framework of software. This framework is defined in terms of standards, basic rules and functions, formats, protocols and software interfaces.

Software architecture is a relatively constant point of reference that guides software developers and insulates applications and users from the negative impact of change. The prime example of an architecture and its impact on third-party developers is IBM's Systems Network Architecture, which was announced in 1974.

In this context, then, schema means data view. Three schema suggests three views of data in a given DBMS architecture. The three-schema architecture was defined in 1977 by the American National Standards Institute/Standards and Requirements Committee Study Group on Data Base Management Systems.

In 1976, the study group was formed to investigate data base management systems to determine what DBMS aspects were candidates for the development of an industry standard. The

DEC hopes VAX CAE tools open mainframe door

By Charles Babcock

MARLBOROUGH, Mass. — Digital Equipment Corp. has teamed up with independent software developers to offer computer-aided engineering tools on its VAX workstation series.

The move is intended to extend DEC's software development offerings beyond its own tools, particularly in the systems analysis and design phases.

By strengthening its product line, DEC plans to sell more VAX-based development systems to not only its own customer base but also to IBM mainframe sites.

A workstation-based development environment offers the sites the chance to move development off their mainframes, according to Michael P. Kendall, director of computer-aided engineering marketing.

The tools being offered come from cooperative marketing agreements with Nastec Corp. of Southfield, Mich.; Tektronix, Inc. of Beaverton, Ore.; and Boston Systems Office, Inc. of Waltham, Mass.

Nastec has ported its Designaid package, a structured analysis, structured design and data modeling tool, to the DEC workstation line.

The package was previously available on a Convergent Technologies, Inc. workstation and the IBM Personal Computer AT, according to Kendall.

Programmers using Designaid may create a graphical analysis of a new system and graphically lay out its design and interconnection before coding.

It also includes a design dictionary said to ensure consistency of elements throughout the design process, Nastec officials said.

Designaid will be available in October at a price of $9,900, according to Kendall.

Tektronix has ported its Structured Analysis (SA) tools, Structured Design (SD) and Language Development Systems (LD) to the workstation line and VAX family of minicomputers.

SA includes a set of defect-prevention tools that are said to pinpoint errors before design work begins. The tools also

Report generator develops code for D & B Nomad2

By Peggy Watt

WILTON, Conn. — D & B Computing Services, Inc. recently announced the Nomad Assistant, a report generator and front end for its Nomad2 fourth-generation language.

The Nomad Assistant provides a menu-driven system to let the user develop Nomad2 code and produce data base management system reports. The reports may be generated from the mainframe data base management systems with which Nomad2 interfaces, including IBM's IMS, SQL/DS, and DB2; Cullinet Software, Inc.'s IDMS;

*See DEC page 32*

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**DATA VIEW**

Leading software firms' stock outpaced industry average

Overall, software and services companies moved up an average 5.2% in April over March closing prices.

<table>
<thead>
<tr>
<th>Firm/Company</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>VM Software, Inc. (VMSI)</td>
<td>13%</td>
</tr>
<tr>
<td>Hagan Systems, Inc. (HDGN)</td>
<td>12%</td>
</tr>
<tr>
<td>National Data Corp., Inc. (NDTA)</td>
<td>11%</td>
</tr>
<tr>
<td>Cullinet Software, Inc. (IDMS)</td>
<td>10%</td>
</tr>
<tr>
<td>Computer Associates International, Inc. (CASU)</td>
<td>17%</td>
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</tbody>
</table>

Information provided by: E. F. Hutton & Co. Equity Research

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**INSIDE**

Henco Software announces a revision of Info DBMS to interface with Data General's CEO/32

VM Software performance monitor with expert system capability debuts/32

**NEW THIS WEEK**

- Expertware offers software development aid
- For more on this and other new products, see pp. 77-90.

**INSTANT ANALYSIS**

"In case anyone had any remaining doubts, relational DBMS are taking over the data processing world. Every major DBMS vendor has announced SQL support, with the latest being Cullinet..."

— Paine Webber, Inc.'s July 30 edition of "Software Industry Notes"

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**SOFTWARE & SERVICES**

AUGUST 11, 1986

Paul K. Winter

WINTER is the manager of standards and quality assurance of the Computer Services Division, City of Toronto.
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Three-schema path to future

From page 27

membership of the study group included representatives of Eastman Kodak Co., Boeing Computer Services Co., Exxon Corp., General Electric Co., Honeywell Inc., IBM and Cincom Systems, Inc. Significantly, the study group rejected all DBMS candidates for standardization. Instead, it published an architecture on which future DBMS development would be based. This architecture provided for full data item and data structure independence from the use of the data.

Two major areas were not addressed by the group, these being navigation and normalization. Fortunately, E. F. Codd's relational model defined a set theory-based method for navigation, and authors James Martin, C. Gane, T. Sarson and others have published works that provide useful methodologies in the domain of normalization.

Thus, these three major concepts — the three-schema architecture, the relational model and normalization — become the foundation on which DBMS designers should build.

The three-schema architecture, the relational model and normalization become the foundation on which DBMS designers should build.

which DBMS designers should build if the resulting product is expected to have a significant impact on the market and users of the 1980s and early 1990s.

There are one-schema DBMS, for example IMS from IBM, Total from Cincom and IDMS from Cullinet Software, Inc. These are all first-generation DBMS. Essentially, the one-schema architecture consists of a stored definition of the data items and structures with a suitable data manipulation language (DML).

In this environment, the programmers became data base specialists because of the overwhelming concern with navigation and serious integrity issues. Clearly, applications received less attention than was necessary. The extensive data base navigation logic was sensitive to data structure changes, and performance-driven data restructuring was common. Consequently, programs and systems became highly complex, with a significantly increased maintenance burden.

The two-schema architecture is based on a "conceptual schema," or a set of stored definitions of the logical content of the data base, and an "internal schema," which is a set of stored definitions of the physical content of the data base.

DMLs operate on the conceptual schema level. While the two-schema architecture is an improvement, programs are still dependent on the logical location of the data; that is, relational operators (such as Select, Project and Join) are still dependent upon table names. Still wanting in this system are automatic integrity, rule enforcement, data structure independence, full DML functionality and improved ease of use.

It is not surprising that the three-schema architecture comes with three schemas: conceptual, internal and external. The external schema supports derived views without limitations over the conceptual schema. The conceptual schema has the logical definition of base tables, which are independent from the internal schema. The internal schema deals with the physical data structures, including access methods (such as VSAM and BDAM), indexes, hashing, pointer access, and so on.

The significance of the three-schema architecture lies in the following:
- Full support of derived views, or data structure independence.
- Full DML capabilities (Locate/Replace for Get, Insert, Update, Delete).
- Full support of domains. (Data attribute definitions now include item type characteristics.)
- Automatic and guaranteed integrity enforcement regarding data content, structure and reference.
- An on-line directory or active dictionary.

A DBMS based on three-schema architecture has a layered design in which the first layer (first schema) includes application views is independent of the second layer, the base tables (second schema). The base tables are independent of the third layer, the physical files and access methods (third schema). In this environment, all systems and programs must access and update data through the view facilities under the control of the on-line directory.

So, this architecture with the relational model offers unparalleled structure independence, data manipulation functions and automatic integrity enforcement (entity, domain and reference). This type of architecture provides the type of innovation that would allow one to implement significant teleprocessing, direct-access storage device, access method and even corporate data model changes without requiring application maintenance.

A good grasp of a software architecture enables one to predict not just the possible but also the probable software developments in the future. A DBMS based on the three-schema architecture places its vendor and users in a strong and enviable position for years to come.
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Henco ties Info to OA system

Can interrupt DBMS, interface DG's CEO

WALTHAM, Mass. — Henco Software, Inc. is offering a release of its comprehensive electronic mail system, Info, with an interface to Data General Corp.'s office automation system, Comprehensive Electronic Office (CEO).

“Users will be able to interrupt work in Info through a single keystroke to send short messages or view their electronic mail in boxes” in CEO, said Robert Steele, vice-president of sales and marketing at Henco. Revision 9.41 also has an enhanced interface to the DG file structure, Infos II, that allows a user to read a locked record and use system variables in a key path.

With the Info interface, the following functions can be used: invoking the CEO calculator, monitoring the CEO message status from Info, storing an Info spool file in a CEO file cabinet and creating a CEO list document containing Info items for CEO List Processing.

Revision 9.41 runs on the DG Eclipse/MV series with CEO Release 2.2. It is available immediately at prices ranging from $8,600 to $40,000, depending on system size, said Paula Slotkin, Henco spokeswoman.

Real-time system monitor added to VM Software line

VIENNA, Va. — VM Software, Inc. has added VMMonitor to its product line, an expert system for evaluating VM system performance in real time. VMMonitor is said to report system variables and analyze how to improve system performance.

The System Automatic Monitor component reportedly can offer prescriptions for performance improvements or invoke system options on its own.

The monitor can also warn of impending problems before they cause a system outage, according to VM Software spokesman Gary McClain.

The monitor analyzes performance at three levels: system resources, utilization, analysis and device analysis.

At the user-analysis level, the monitor identifies users who may be contributing to performance problems or who are being hampered by them, a company spokesman explained.

VMMonitor is available immediately at a price of $7,000.

The price will increase to $9,000 after Oct. 31, the spokesman said.

DEC hopes CAE tools open doors

From page 27

perform many of the same automated functions as the Nastec line but do so in a manner typical of the Tektronix approach. DEC wanted both tool sets available for its workstations, Kendall said.

The Language Development Systems package includes tools for developing, debugging and integrating software modules and Pascal and C cross-compilers for high-level language programming with microprocessor-specific functions, Kendall added.

SA costs $6,000 on a DEC Vaxstation, and $8,500 to $10,000. Language Development Systems is priced from $5,500 to $10,000.

'The three companies make joint customer calls and share each other's expertise.'

— Michael P. Kendall

Digital Equipment Corp.
The Shape. Sharp. Sleek. And amazingly adaptable. The Genicom 1000 Series Desktop Printers. Ready for anything from business forms to spreadsheets, word processing to heavy-duty data processing. With letter quality printing at 100 cps. And data processing printing at 200 cps. Open the clamshell casing and look inside. Discover just how simple the future can be.

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Natural language query tool bows for DBMS front end

By Charles Babcock

WALTHAM, Mass. — Intellect, a natural language query system from the Artificial Intelligence Corp., is available as a front end to Digital Equipment Corp.'s relational data base management system, RDB.

The Intellect version for the VAX is written in DEC's VAX-C and runs under the VAX operating system, VMS. It is priced at $6,500 on the Microvax and $28,500 on the VAX 8800.

Users are able to specify a request for information in English-style statements to Intellect, an expert system, according to the vendor.

Intellect is then able to recognize such requests and translate them into RDB calls to retrieve the requested data and present it in a formatted report, according to Earl Martin, director of marketing at Artificial Intelligence.

Intellect is also marketed as a natural language front end for IBM mainframe query systems by IBM and Cullinet Software, Inc., according to the vendor.

Intellect has an installed base of 500 licenses, Artificial Intelligence representatives said.

Chances are you don't currently audit your operating system—even though it's ultimately in control of information used to manage your organization. And for good reason.

For the most part, you don't audit the system because the software is just too complex. Then too, certain hard data on system controls is usually unavailable. And a manual review would take weeks to perform, require outside experts, and cost too much.

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AEX2-Examine/MVS software gives you a more complete, up-to-date picture of your total operating environment—in real-time. Instead of waiting hours to get a report on system status, you can immediately check the status of system controls, key system libraries, files and tables.

AEX2-Examine/MVS software also helps your BP staff become more productive by improving their knowledge of the system, its controls, and its level of operating efficiency. In effect, it puts MVS under a constant-conscious microscope.

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For more information, contact Shawn McLaren today, at 1333 Lawrence Expressway, Santa Clara, CA 95051-3595; (415) 941-4558; Telex 357437.

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Inference upgrades ART

Expert system dumps 'garbage collection'

By Charles Babcock

LOS ANGELES — Inference Corp. has announced performance improvements in an upgrade of its Automated Reasoning Tool (ART), a programming tool for developing expert systems.

So-called "garbage collection" in ART Version 3.0 has been all but eliminated, Inference spokesmen said. Garbage collection in a LISP program is that portion of the program devoted to searching for available memory.

A LISP programmer working with ART Version 3.0 allocates and releases memory as he would in using a mainstream third-generation language, leaving the ART program free to process without memory allocation, said Chuck Williams, chief technology officer at Inference.

"Performance increases are achieved through elimination of random pauses associated with batch garbage collection and the reduced virtual memory space...associated with incremental garbage collection," spokesmen said.

Through the elimination of memory searches and through other improvements, ART Version 3.0 is up to 30 times faster than its predecessor in certain applications, Williams said.

ART Version 3.0 will be available in the fourth quarter for Symbolics, Inc., LISP Machine, Inc., Texas Instruments, Inc.'s Explorer workstation, Digital Equipment Corp.'s VAX and Sun Microsystems, Inc.'s Sun-3. It will be priced at $65,000.

Report generator for Nomad2 code

From page 27

and others.

Although the user need only make menu choices, the developing program is also displayed in an adjacent window so the user can learn the code in the process, said Robert B. Vonderhaar, senior product manager.

The Nomad Assistant is scheduled to ship Oct. 1 and is intended as an enhancement to D & B's 7-year-old Nomad2, said Frank B. Lee, senior vice-president.

The Nomad Assistant is priced at $7,500 for use with the IBM VM/CMS and MVS operating systems. Nomad2 is priced at $135,000.

The Nomad Assistant is also different from D & B's previous report generator, EZ Nomad, released two years ago, which was also menu driven, Vonderhaar said. EZ Nomad had been free to users of Nomad2 but, with the release of the Nomad Assistant, will be licensed for $7,500.

The Nomad Assistant includes a catalog that serves as an automatic log of activity for all or any part of a session. An indefinite Undo function allows users to retrace their steps. Multiple windows are available, showing different forms of the work being done. Later revisions can be made with the same screens and commands and do not require a separate editor, according to Vonderhaar.

Also, extensive integrity checks help keep the user from writing contradictory commands or other invalid requests, Vonderhaar added. The Nomad Assistant can be customized with specific menu options or with the sequence of commonly used procedures, according to Vonderhaar.

He added that the latest offering in the Nomad line is an attempt to satisfy the spectrum of fourth-generation language users, which D & B considers to range from the experienced programmer to the user who wants a simple method of solving problems or finishing projects.
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First user rates AS/XL 60

Grunman's NAS unit fares well against IBM 3090/200

By Eddy Goldberg

MELVILLE, N.Y. — The Gruman Data Systems Division of Gruman Corp. recently installed one of the first shipped National Advanced Systems Corp. (NAS) AS/XL Model 60 mainframes.

The uniprocessor AS/XL Model 60 was priced at approximately $5 million and was designed to compete with IBM's dyadic 3090 Model 200.

The NAS AS/XL Model 60 that Grumman uses is equipped with 125 MB of memory and 32 channels. It will run a network of advanced computer-aided design and manufacturing tools under IBM's MVS/AX operating system. It arrived, as scheduled, in the beginning of July and was installed quickly and without difficulty, according to Dan Larkin, Grumman's vice-president of MIS.

Larkin said the AS/XL Model 60 is performing to specification and matches the range announced by NAS. He said that the AS/XL Model 60's performance was better in some areas and worse in others compared with the IBM 3080 Model 200 in two benchmark tests and that the variation ranged about 7% in either direction. He said its price was about 15% less than that of the IBM 3090 Model 200.

When the Model 60 was announced last year [CW, March 18, 1985], NAS claimed its performance would be comparable with IBM's 3090 Model 200, which has been rated at 28 million instructions per second (MIPS). Though an NAS spokesman declined to give performance figures in terms of MIPS, he said the Model 60's performance is likely to exceed that of the IBM 3090 Model 200.

See PAGE 44

System/36 still not acclaimed as PC integrator

By David Bright

Many Fortune 1,000 companies have found IBM's System/36 minicomputer to be severely lacking as an integrator of personal computers.

Although IBM announced the upgrading of its System/36 line and OCP Support/36 products in June at the 1986 National Computer Conference, users interviewed recently by Computerworld's systems analyst, according to Computerworld's systems analyst, Linda Modiste, hardware manager at The Beacon Corp. in Boston, said that the System/36 still has a long way to go. "The System/36 is not a machine built for real heavy communication work with lots of remote connections," she said. Concerning Personal Computer integration, "IBM hasn't really done enough work to keep up with the demand," she said. "Emulation is one thing, but on making a PC an active terminal of the System/36, IBM doesn't seem to be getting there too fast." One data processing manager content with IBM's improvements is Terry Haise of Litton Precision Gear in Chicago. "With

See PAGE 42

Overtime on cartridge shift

What had been expected to be a long, slow transition may be moving much more quickly than computer industry analysts predicted as MIS departments continue to shift from IBM 3420-type reel-to-reel tapes to IBM 3480-type cartridge tapes.

Some tape conversion numbers coming out of a California consulting firm's research may surprise people. The numbers surprised the consultants.

"We thought people were going to move very slowly and gradually. But we found that once people get the 3480 technology in-house, they move a lot faster than anyone expected," comments David Buznell, director of the Santa Clara Consulting Group of San Jose, Calif. The group is a market research firm that serves the disk and tape media storage industry and maintains a data base of user companies.

Buznell's company examined how MIS departments throughout the U.S. and Canada are using the 3480, which was announced in early 1984 and delivered later that year. The research shows that in Canada, which Buznell says was IBM's test market for the 3480, companies that installed the cartridge drives converted an average of 36.11% of their tape libraries by the end of 1985.

"I would say that during the 1986 to '87 time period, you are probably going to hit 50% in the U.S. and Canada and 70% by 1990," Buznell says, noting that conversion rates in the U.S. are probably higher than in Canada and that Europe lags behind Canada.

It is that conversion pattern that surprised Santa Clara Computing, which also found that the 3480 is selling well overall. "I think a lot of people found the conversion a lot smoother than they expected, and maybe this is why it is

See PAGE 44
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<table>
<thead>
<tr>
<th>Pyramid</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of requests</td>
<td>Response time</td>
</tr>
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</table>

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Cimlinc bundles workstation, tools for CIM environment

By Rosemary Hamilton
ELK GROVE VILLAGE, Ill. — Cimlinc, Inc. announced last week that it is shipping a 32-bit workstation and application packages that when used together can create a computer-integrated manufacturing (CIM) environment.

Power CIM, based on the Motorola 68020 microprocessor, is offered with a monochrome display for a starting price of $11,990 or with a color display for $15,990.

Users can add both memory and storage modules to the basic system, which includes a separate I/O processor that is based on the Motorola 68000, 4M bytes of main memory, an 86M-byte disk drive, an 11-slot Intel Corp. Multibus card cage and a floppy disk drive.

The color system accommodates up to six 4M-byte memory modules, and the monochrome version supports seven 4M-byte modules. The modules are priced at $3,200 each, according to Cimlinc President John West.

Up to seven storage modules can be added to Power CIM. A $3,995 module includes one 86M-byte disk drive and a floppy disk drive, and a $7,995 module includes two 86M-byte disk drives.

According to West, Power CIM is geared toward those users who have wanted a dedicated system but could not justify the high cost. "We cloned the workstation standard when it evolved and can now offer it at a much lower price," he said.

Applications packages available

Six applications packages — including three new packages and three upgraded ones — and communications software are available for the workstation, which operates under the University of California at Berkeley 4.3 version of Unix.

The new software packages are CIM Solid I, a three-dimensional solids modeling tool that sells for $2,995; CIM Intelligent Documentation, a $3,995 package designed to produce text and graphics documentation; and Avatar, a tool for parametric design that sells for $2,495.

The communications software, CIM COMM: SNA 3270, sells for $12,495, and a $1,495 license must be purchased for each node. According to West, the software gives Power CIM access to Ethernet networks and IBM 3270 host. It allows the workstation to emulate either a Digital Equipment Corp. VT100 or VT200 terminal or an IBM 3270 terminal.

Upgrades will be released for CIM CAD, a computer-aided design package that sells for $3,995; CIM CAM, which sells for $6,495 and is designed for computer-aided manufacturing applications; and CIM Surf, which costs $6,495 and is used for 3-D surface modeling.

From page 37

the new processors-and PC Support/36, [PC integration] should work very well," he said.

Haise's shop has had good luck with its Model B, but it is his understanding that even a current Model C is "more than healthy enough" in most cases. For the most demanding situations, the new processors should do the trick, he said.

The extent of the dissatisfaction was revealed in a report released earlier this year by Forrester Research, Inc., a Cambridge, Mass., market research and consulting firm specializing in departmental computing. According to that report, other minicomputer companies will benefit from the System/36's shortcomings. Of 300 Fortune 1,000 sites surveyed, 35% of the respondents rated the System/36 "unworkable" as a PC integrator, while a mere 5% said it was a "good solution." Of the remaining respondents, 20% said the System/36 was usable as a PC integrator, although "not perfect," and 40% were not familiar enough with the system to comment.

Seeming to answer some of its critics, IBM at NCC announced increased throughput, memory and storage capacities within its System/36 line in addition to an enhancement of its PC Support/36 functions.

IBM's upgrades may help a little, but the real improvements are expected later this year when IBM introduces its low-end 4300 and a controller, said John McCarthy, research manager at Forrester Research.

Additionally, McCarthy pointed out that the new products generally will not be available until early next year. By that time, the "baby 4300," used with the new controller, could provide a better solution, he said.

While IBM works out its mid-range problems, minicomputers from Digital Equipment Corp., Wang Laboratories, Inc. and Hewlett-Packard Co. may gain popularity as PC integrators, McCarthy noted.

"We have found that the System/36 does not have sufficient power, ease of use or functionality to meet users' needs," McCarthy said. "Users seem to view it as just another incompatible, short-term, mid-range offering from IBM."

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System/36 still not acclaimed

EXCELLENCE IN COMPUTER POWER A SUBSIDIARY OF THE SQUARE D COMPANY
General Dynamics contracts to sell Canaan machines

By Rosemary Hamilton

TRUMBULL, Conn. — Following a joint marketing agreement announced late last year, Canaan Computer Corp. and General Dynamics Corp. last month announced a second agreement in which General Dynamics will be the exclusive reseller of the Tempest version and primary reseller of the commercial version of Canaan's IBM VM/CMS-compatible departmental computers to the federal government.

General Dynamics would not specify the value of the four-year contract, but according to the agreement, the defense contractor will resell at least 40 systems from Canaan.

A General Dynamics spokesman would not provide pricing or delivery information.

The defense contractor will resell the Tempest and commercial versions of the Canaan DCS 5400 and the commercial version of the Canaan DCS 5800.

Canaan introduced the DCS 5800, an enhanced version of its DCS 5400, earlier this year. Both are designed as IBM-compatible departmental hosts and reportedly run unmodified IBM VM/CMS applications.

The DCS 5400, introduced in November 1984, is based on a proprietary processor and can accommodate up to eight users. A basic system comes with 2M bytes of main memory, expandable to 8M bytes, and an 8M-byte disk.

The DCS 5800 has three times the system throughput as the 5400, a Canaan spokesman said. It can accommodate up to 36 users. A basic system includes 2M bytes of main memory, expandable to 12M bytes, and an 8M-byte disk, expandable to 664M bytes of storage.

The Model 5000 and 5000T run the General Dynamics operating system Multos and will be bundled with a General Dynamics relational data base and office automation package.

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In September 1985, General Dynamics said it would be selling both the Model 5000 and the Model 5000T, based on the Canaan systems, to the federal government, marking the first time the company offered what it called departmental mainframes.
Overtime on cartridge shift

From page 37

going faster. There are few glitches," Bunzell says.

However, Bunzell also notes that there have been some companies that have acquired no 3480s, leading to reports that IBM does not believe that 3480 sales are meeting projection and that

IBM is looking for ways to stimulate sales.

Some of the reluctance to buy 3480s is on the part of customers who now use reel-to-reel drives supplied by plug-compatible vendors such as Storage Technology Corp., Bunzell says. He notes that some customers are waiting for Storage Technology and other vendors to announce their versions of the 3480 in hopes that the plug-compatible manufacturer drives will be cheaper and will include more features, particularly a 6,000-cartridge automated tape library that Storage Technology has hinted will be announced this year.

Financial firms first to commit

One interesting trend revealed in Santa Clara Consulting's review of the worldwide market for the 3480 is that the banking and financial industries were among the first to commit to the cartridge drives.

But in the year-end study of Canadian conversions, banks using 3480s were slower than education and other market sectors in transferring their libraries from reels to cartridges.

Santa Clara Consulting also pronounced a finding that can be nothing but good news for users.

The researchers noticed that manufacturers new to the data storage market—companies such as video cassettes and precision plastics companies—are entering the 1/4-in. tape cartridge market.

That threat of competition already has forced companies such as IBM to lower their prices for cartridges, and it will force prices down even more between now and 1990.

The researchers estimated that costs for North American customers could fall 50% by 1990.

This fact bodes well for user companies that are seeking to convert thousands of 5-in. reels to cartridges while trying to find ways to pay for all of those cartridges.

User rates

AS/XL 60

From page 37

performance range is 1.44 to 1.81 times that of the IBM 3081 Model KX, while the IBM 3090 Model 200's range is 1.5 to 1.9 times that of the 3081 Model KX.

In other words, promised performance gains for the NAS AS/XL Model 60 are 4% to 5% less than comparable claims for the 3090 Model 200 when both are compared with the 3081 Model KX.

The AS/XL Model 60 and the more powerful AS/XL Model 80 are intended as a migration path for the NAS AS/9000 processors for large corporate customers that need more computing power. Though it is not field upgradable, it runs the same software, and the changeover is transparent, according to Larkin. The AS/XL Model 60 is replacing an NAS 9060, some of an Amdahl Corp. 5840 and with an accelerated planned growth during the next six months.

Performance, savings cited

Grumman's reasons for selecting the AS/XL Model 60 included the need for increased performance and additional capacity, plus the savings from only one software license needed with the larger machine.

Also, since the AS/XL Model 60 is air cooled, as opposed to the water-cooled IBM 3090s, no plumbing installation was required.

The AS/XL Model 60 corresponds to the M-6801 microprocessor from Hitachi Ltd., which supplies NAS's hardware. It is part of the AS/XL family, which is formed entirely of very large-scale integration circuitry and reportedly uses 2,000 and 5,000 gate/chip emitter-coupled logic (ECL) devices with switching speeds of 200 and 250 picoseconds. Its ECL chips are reportedly 3.5 times denser than corresponding ECL circuitry in the IBM 3090 series.
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Order from network chaos

Tool helps Grumman manage software code

By Elisabeth Horwitt

PALO ALTO, Calif. — A growing number of IBM Personal Computer local-area network (LAN) vendors are starting to provide a feature that analysts claim is crucial for large electronic mail installations: a store-and-forward capability that enables file servers to exchange documents and electronic mail.

Without store-and-forward functionality, most LAN systems cannot effectively handle the demands of 100 users or more, claimed PCC/Manager-Bass, Inc.'s Net/One, the limit is 32 users that can concurrently log on to the system.

The product works with all Stratus computers, including the System/88 computer, which is made by Stratus and resold by IBM. However, PC/Connect is not being released its fault-tolerant systems with PCs

By Stanley Gibson

Marlboro, Mass. — PC/Connect software, recently unveiled by Stratus Computer, Inc., allows users of IBM Personal Computers and compatibles to access and exchange information with a Stratus Continuous Processing system over a dial-up or dedicated link.

"IBM connectivity has always been part of our product strategy," said Stratus spokeswoman Anne Phaneuf. Many Stratus installations also have "a lot of PC users that need to access the fault-tolerant computers' data and resources," she added.

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The mainframe compiler uses standard IBM linkage conventions. Assembler programs, MAIN routines in other languages, and packages such as IBM's ISPF and GDDM can be invoked directly from C.

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printf("Hello, world\n");
Component use exceeds a certain level. Spikes often occur before a component is being used to full capacity, and careful tracking of utilization levels helps the manager plan for component upgrades.

Once the manager has an accurate picture of the network, including possible bottlenecks, response-time spikes and traffic patterns, he can begin tuning the network to optimize resource usage and do capacity planning.

Here the manager might make use of network modeling tools that simulate network performance under different scenarios of components and work loads. More managers are constructing a model of the network and performing "what-if" analyses: If I change this or add that, what will that do to overall response time?

The program simulates a given network configuration, including message arrival rate, message size, terminals and control units, data rates, protocols, distances, modem delays and data flow control parameters. It may also have to include network parameters such as routing, prioritization and so on.

Once the model is in place, the manager enters a proposed change. For example, what if I add or delete resources (controller, terminals, PCs, multiplexers, protocol converters, remote front-end processors)? What if I redesign the application software? What if I change routing patterns or priorities?

Using a model to simulate a new network configuration enables the manager to determine whether the change will make response time better or worse — and more important, to assign costs to proposed changes. During his talk, McDonald presented a composite scenario embodying several cases he worked on as a consultant.

A company has an IBM 4341 in Detroit, another 4341 in Dallas and an IBM 3083 in New York. A group of users in Los Angeles access the Detroit mainframe through a link to Dallas (see diagram this page).

Response-time problems develop when a new group of users in San Francisco begin accessing the Detroit mainframe via the Los Angeles-Dallas link. Monitoring shows that average response time for the San Francisco node is 6.6 seconds. Maximum acceptable response time, according to corporate MIS policy, is 6 seconds.

According to McDonald, it is not the network manager's job to figure out how to reduce San Francisco users' response time to acceptable levels. Rather, he should analyze different solutions in terms of response-time levels vs. cost and leave the final decision up to the managers responsible for balancing budget constraints against user service-level priorities.

Using modeling software, the network manager can compare different possible solutions with the problem — without going to the trouble and expense of actual implementation. He might, for example, query the system: What if we increased the number of 9.6K bit/sec. leased lines between Dallas and Detroit from two to three? The system might give the following results: San Francisco node average response time: 5.45 seconds. Increase in cost: $1500/month.

Another possible scenario the manager might try: What if we reconfigure the system so that San Francisco users access the Detroit mainframe by way of the Dallas-New York-Detroit links instead of through the (currently overburdened) Dallas-Detroit link? System's response: San Francisco node average response time: 6.15 seconds.

See ASK page 47
Software lets Mac users store files on VAX

Pacer PCLink update offers direct, remote transfer capabilities

By Rosemary Hamilton
LA JOLLA, Calif. — Apple Computer, Inc. Macintosh users can store and access files on a VAX minicomputer from Digital Equipment Corp., using PCLink Version 3.0 from Pacer Software, Inc.

The recently introduced version of Macintosh-to-VAX communications software enables users to create virtual disks on a VAX or Microvax II, then access the data as though it resided on a local disk, according to Pacer. A user can activate a virtual disk capability and create up to four 1.6M-byte virtual disk files on the VAX. The Macintosh considers the disk files to be separate storage devices.

PCLink Version 3.0 includes Version 2.0's DEC VT100 and VT200 and Televises, Inc. 850 terminal-emulation capabilities. Files can be transferred between the Macintosh and VAX systems via a direct RS-232 terminal connection; remotely via a Hayes Microcomputer Products, Inc.-compatible modem; or over Omninet, a local-area network from Corvus Systems, Inc.

The software has a command file function, giving the user the option of customizing communications applications, the vendor said. With the command file, a user can establish a predetermined time in which the Macintosh will automatically dial up a host, log on and then upload files to a designated directory.

Version 3.0, which is currently available, is licensed at a starting price of $2,000 per VAX. Only the VAX portion of the software is licensed, allowing unlimited distribution of the micro software portion.

The vendor also markets an IBM Personal Computer version of its PCLink. It has a similar virtual disk feature, allowing IBM PC users to create virtual disk files on the VAX.

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LAN servers can swap files

From page 45

This can result in access bottlenecks and delays when the system is overburdened by too many users seeking to send or access electronic mail, he noted.

For Ungermann-Bass, the 32-user limit is a function of the number of networking software features supported on a server's network card, according to product manager Mark Hawkins. The company plans to expand the number of concurrent users supported, he added. Novell, Inc. is said to have raised its limit from 32 to 100 users per Netware server.

A common way around the limitation is to "create separate post offices on different servers," Whalen noted. But if mail cannot be forwarded from one server to another, users wishing to send electronic mail must first log on to the server on which the recipient's mailbox resides. "Say you want to send the same set of five documents to managers whose mailboxes are located on three different servers," Whalen said. "You have to set up the transmission and log on to a different server three times."

Store-and-forward capabilities

PCC/Systems' latest version of CC:Mail Dialout, announced in late July, provides store-and-forward capabilities for any network system that supports the IBM PC- DOS 3.1 operating system. The product works in conjunction with the vendor's electronic mail package, CC:Mail. A dedicated PC running Dialout acts as postmaster for a group of servers, periodically scanning their mailboxes and transferring remotely addressed mail to the right server.

The older version of CC:Mail Dialout featured document exchange between servers on different LANs connected by a dial-up remote link. The newer version, priced at $995, provides that capability plus document exchange among multiple servers on the same LAN.

"Store and forward is a 'very important feature that is still missing from Novell's Netware and IBM's PC Network electronic mail systems,"' said David Terrie, president of Boston-based Newport Consulting.

With Novell, a user still has to log on to his server in order to pick up mail, even if he happens to be on the opposite side of the country," Terrie said. With store and forward, a user traveling to another company site and transferred remotely addressed mail to the right server.

"With Novell, a user still has to log on to his server in order to pick up mail, even if he happens to be on the opposite side of the country," Terrie said. With store and forward, a user traveling to another company site and transferring remotely addressed mail to the right server.

Directory management

Both Vines and 3+ offer directory management capabilities that CC:Mail lacks, however. "Inter-networking can generate some nasty problems," Terrie said. "It is not coupled with the ability to keep track of address changes without continually having to do global network directory updates," Terrie said. This is especially important for extensive installations that consist of multiple LANs linked over distance, he added.

While 3Com's 3+ also requires periodic global network updates to keep track of user relocations, it provides a way for mail to be automatically forwarded from a user's old location to the new one.

Under the Vines distributed naming scheme from Banyan, users do not log on to a particular server. Rather, they log on to the network and call up network services without having to specify which server it resides on. Servers exchange information about relocations of network resources, so access requests can be routed over remote links to the LAN where the correct server resides.

Stratus connects systems with PCs

From page 45

"It allows users to access Stratus files and send PC files to Stratus and store them under fault tolerance," Phaneuf said. Some users may want to store files in a fault-tolerant computer because they would be more secure and available there than in a PC, she added.

PC/Connect consists of PC-resident software, called Stratus PC/ Connect Term, and host-resident software, called Stratus PC/Connect Host. PC/Connect Term allows PC users to log in to Stratus' VOS operating system and operate as a Stratus terminal with access to a complete range of applications. A set of 10 PC/Connect Term diskettes costs $1,000.

PC/Connect Host enables IBM PCs to perform file transfer and other PC functions while still connected to the Stratus host in terminal mode. Under PC/Connect Host a PC can list the contents of a directory, store and retrieve PC files to VOS and display disk volume label and current directory for any disk drive while still in a VOS terminal mode.

Users can also temporarily suspend an operation taking place under the Stratus VOS operating system and run a PC application. PC/Host is priced at $3,000 per system.

PC/Connect is available under a site licensing agreement that allows unlimited copying of the diskettes for use on a single site, according to Larry Sherman, Stratus manager of product support programs. The product may be used with any Stratus system running VOS Release 5.0 or above and any PC running IBM PC- DOS Versions 2.0 through 3.1.
Information centers
Their choice: Justify existence or go out of business

By JOANNE KELLEHER

Most information centers started out with the goals of creating some order amid the chaos of unsupervised microcomputer acquisitions and educating unskilled users in elementary applications. Now that many of them have fulfilled their original calling, however, information centers are arriving at a juncture, a point that either signifies the beginning of their true vocation or the end of their organizational usefulness.

Starting up an information center is not all that difficult, says Katie Kuryla, project manager of the information center at Ryder Truck Rental, Inc. in Miami. "At least a lot of people have done it before, and you can follow their lead to some extent." The real problems crop up later, she says, when MIS is no longer selling the concept of end-user computing to management but needs to demonstrate the solid benefits time and time again.

Kuryla and her peers in information centers everywhere are meeting the challenge through a variety of means, and their efforts serve as examples for others. No guidelines exist on how to successfully manage a maturing information center, because the first generation is only now beginning to come of age. As it does, the forerunners frequently find themselves challenged operationally, economically and politically.

Operationally, mature information centers confront issues such as how to serve an increasingly divided user base and how to avoid being left in the shallows of micro installation and training while the corporation moves ahead toward the deeper waters of strategic information management.

"There are a good number of information centers today that are either being dissolved or are dissolving themselves," says Randy Casto, head of the Casto Group, Inc., a consulting firm in Lenexa, Kan., that specializes in information centers and office automation. Casto says these information centers "get caught up in a vicious cycle of installing PCs and delivering basic training and overlook the need to identify strategic corporate requirements."

Economically, information centers that pass beyond the honeymoon phase often find themselves caught between escalating user demands for resources and dwindling management enthusiasm for funding on faith.
Justify existence or go out of business

Delaney has not abandoned novice end users. She has, however, managed to branch into new areas while reducing the number of information center personnel by two.

But methods, in this case, included a heavier than usual reliance on manuals, a shift to group training for basic skills and a strong emphasis on information sharing among staff members and end users. In the future, she says, the job of supporting beginners should get even easier. "There are so many self-training aids and tutorials out there that before long, basic users will be pretty much self-supporting."

Delaney does not stand alone in her great expectations for self-training tools. The AMA's recent information center report noted an increased reliance on computer-based training (CBT), either for self-instruction or as a component in a training program. The report predicted a 16.4% increase in the number of information centers making some use of CBT and a jump of 62.6% in the number of trainees using tutorial disks during 1986.

CBT can help to free information centers from some of their training responsibilities, its usefulness will bear great significance. By all accounts, one of the keys to continued vitality of an information center is its ability to shift from production line training to support and orchestration of more sophisticated applications.

"At first you can open the doors and see a lot of people coming," says Ed Katter-son, vice-president and manager of the 3-year-old information center at Manufacturers National Bank of Detroit. "Later on you have to be more selective because, after all, there's only so much that you can do for lower-level people."

Besides reaping paybacks in productivity, information centers that put their resources behind strategic business applications also consolidate some political power. At Goodyear Aerospace Corp. in Litchfield, Ariz., for example, the information center gained four new staff members and a lot of exposure when it took on responsibility for administering a pilot project in the use of IBM's Professional Office System.

"It was a management decision to try this on a pilot basis,so when the project fell into the lap of the MIS manager, he decided to push it over to our group," explains Bob Uecker, senior information center specialist.

Until this project came up, Uecker says, the information center—which consisted of him and one other person—had spent most of its time training finance personnel to use a mainframe editor and application programs that ran in batch mode on an IBM 4341 and interacting with a few users to the operation of six microcomputers.

The new assignment, however, involved surveying work on a real project, selecting participants, making presentations to top managers and training executive managers, all of whom participated in the experiment. "All of this meant that the information center was moved into a very high-visibility role," Uecker says.

Achieving high visibility is nothing less than a survival skill for information centers, according to Faistl. "If you don't want to spend all your resources supporting someone who isn't a rising star or a department that doesn't have high visibility," he says, Faistl set up the company's information center in 1983 and

**Executive Report, Information Centers**

Continued from previous page

"The problem," says Don Faistl, manager of information resource planning at International Flavors and Fragrances (IFF) in Hazlet, N.J., "is that, as you reach the point where you almost become a utility for your users, you can't quantify the benefits of what you are doing." Unlike traditional data processing shops, he says, information centers have no tangible resources. "So there's no real basis for saying that you are saving X amount per year."

But managers of some information centers find that, after two or three years, their original platform will no longer support them.

One particularly shaky plank is the concept of using information centers to reduce the data processing backlog. "Most information centers rated that as a very high priority when they were set up," says Eric Rolfe Greenberg, project director for the American Management Association's (AMA)'86AMA Report on Information Centers, produced in cooperation with Information Center magazine.

When information centers rated their success in meeting objectives, Greenberg notes, "he wound up just about at the bottom of the list," well behind employees in training employees to use software, improving relations between DP and end users and standardizing microcomputer hardware.

Grady Livingston, of Livingston & Associates, a Lakewood, Ohio, consulting firm specializing in the development and management of information centers, sees human resource management as a major function of information centers. "The very name has become anathema to some companies that set them up too quickly and just because everyone else is doing it," he recalls.

Livingston has already been cautioned at one client company not to talk about the department being a "hotbed of job robbing," "Because those are the things that are most important in terms of corporate goals."
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who typically consider an application complete as soon as they plug in the final formula. Many errors stay hidden until they contribute to an ill-advised business decision; some remain undetected forever. If managers are to place any confidence in computer-generated results, they will need to understand the techniques for validating an application's integrity.

Continued from page 52

Continued from page 52

Continued from page 52

Continued on page 56
Utility's info center frees DP staff for sophisticated projects

Chargeback setup spurs users to solve problems

By MICHAEL SULLIVAN-TRAINOR

At San Diego Gas and Electric Co., the data processing department has not only recognized the legitimacy of the information center, but managers there use the center to free department programmers for strategic DP tasks.

"Because of the information center, the end user is able to do tasks that we had to provide in the past," says Tom Ilas, Information Systems supervisor. "We used to have to be a jack-of-all-trades, taking the applications idea, developing it and working with end users to define the requirements. Now users identify the need and develop the actual business case, as well as the detailed requirements for new systems."

As a result, the data processing staff has been freed from what Ilas calls "basic" backlog items such as reporting from the data base. Instead, programmers can spend their time on more sophisticated projects -- like refining the data base or developing a complex tracking application.

"Users understand that they pay more to have data processing develop their applications than to do it themselves."}

With the chargeback system, Information Services is required to track the computer usage for different types of computers and programs. The results of this tracking are reported back to end-user managers, who have the responsibility for cost-justifying the usage of computer services.

"We don't attempt to be the policeman, we try to be the traffic cop. We try to direct people to the services we think are consistent with our architecture and strategy," Ilas explains.

The information center's 12-person staff supports about 2,500 users who operate workstations, terminals and personal computers to run a wide range of applications from electronic spreadsheets to engineering and accounting studies. With their equipment, users can access two IBM 3081s, one of which runs the VM operating system and the other of which runs the MVS operating system.

IBM's TSO is used to allow workstations and personal computers to communicate with the mainframes. There are about 1,200 workstations and 250 IBM Personal Computers located within the company. Eighty percent of the PCs operate as stand-alone devices.

A consequence of giving the users so much freedom is that an overzealous user can spend his department's budget and the information center's resources automating a process that should not have been automated in the first place. In these cases, upper management can place the blame on the shoulders of Information Services, despite the chargeback system.

"Management sometimes looks to Information Services to say that all the systems work is cost-justified," Ilas says. "We're saying that a lot of that is now under the direct scrutiny of a line function."
Executive Report/Information Centers

Continued from page 54

the organization's survey this year showed a trend toward budgetary independence for information centers. Thirty-eight percent of all respondents indicated that their budgets were on a separate reporting line from the DP/MIS department. Independence may, however, turn out to be a mixed blessing. Despite all the grumbling that information center managers have done about territorial jealousy on the part of MIS departments, they may find that justifying themselves to corporate management is actually a lot harder than they might have imagined.

In a report based on its 1985 survey, Cwth Coursewares noted that top management's resistance to information centers actually increased with the age of the centers. The number of mature information centers reporting management resistance as an obstacle was 11% higher than the number of pilot centers making that complaint — 38% to 27%.

The response surprised the report's author, Beatrice Garcia, director of marketing at Cwth. "We had expected there would be more management acceptance of information centers as they matured and proved themselves valuable." Garcia says. But information center managers never had an easy time documenting value, a problem most likely complicated by their technical backgrounds. "Information center managers tend to come from data processing rather than business," Garcia notes, "and, as a result, don't tend to think in terms of business plans."

Two ways to justify a center's existence

To improve their chances of coming out on top in business negotiations, information center managers often transfer to end users some of the responsibility for justifying a center.

Continued on page 58
also allow users to indicate intangible improvements like increased productivity and better decision making.

Katterson summarizes information from the interviews in various ways. He totals the sums of money that each user department saves and highlights the major functions being performed with the assistance of the information center staff.

Although his immediate boss and his boss’s boss review copies of the full report and occasionally comment on it, Katterson feels that the summaries are his most useful documentation tool. Copies of the sections that deal with individual departments are sent to those departments, where managers sometimes use them to justify requests for additional computing equipment.

D ale Delaney, associate manager of the 3½-year-old information center at Cordis Corp., a manufacturing firm in Miami, prefers a different sort of documentation. She relies heavily on telephone logs that track the number and type of problems that her information center staff members solve for users.

Staff members log information in a variety of ways, depending on the seriousness of the user’s problem:

- For problems that get resolved over the phone in less than 15 minutes, staff members simply note the user’s department, the type of problem and the suggested resolution.
- For any situation that requires more extensive attention, they enter into an on-line tracking system more detailed information about the work they have performed. The tracking system runs on a central mainframe and serves all MIS groups — not just the information center.

Every month, Delaney summarizes the data entered into the on-line system according to the system involved, the type of problem, the user department and the amount of time spent in problem resolution. She presents these summaries to management to show what the information center does and how well it performs.

Such detailed reports cut both ways. They sometimes further the information center’s budgetary goals but are more apt to raise questions about why the center took so long to resolve a specific problem.

Delaney says that even with records, information centers have a hard time proving their effectiveness.

"And that," she says, "is one very good reason for concentrating on areas that are company goals. That’s how you get good visibility."

Eric Rolfe Greenberg, project manager for the American Management Association’s “1986 AMA Report on Information Centers,” says other common measures for impressing top management include the following:

- Comparing the cost of applications developed by programmers against the cost of those developed by end users who have received help from the information center staff.
- Counting the sheer number of applications that users develop for themselves.
- Tracking staff reductions that can be attributed directly to the rise in end-user computing.
- Showing increases or decreases in the amount of CPU time that end users log before they come to the information center and the amount they log afterward. Increases might indicate that the information center has chosen a software package that users like and feel comfortable with. Decreases may prove that users are becoming more efficient at a specific task.

Greenberg says he has even encountered one organization that counts keystrokes and removes equipment if users do not meet specified quotas. But, he adds, very few information centers attempt that degree of regimentation.

— JOANNE KELLEHER

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Continued from page 56

center's existence and maintaining its funding.

One of their main means of delegating responsibility is a chargeback policy, wherein user departments pay for the equipment: they use, the support and training they receive and, frequently, a share of the center's overhead. The second method is to cultivate proponents at top management levels.

Chargeback policies are gaining popularity, because information center managers regard them as a means to both shift the onus of justification away from themselves and reduce the amount of nonproductive user requests.

In its 1986 report, the AMA notes that about half of the information centers it contacted in a similar study a year earlier relied on chargeback to help cover the cost of hardware and software purchases. One-third charged user departments for installation and hookup costs, and one-fourth billed users for data storage, mainframe connect time, maintenance and repair. Some also charged user departments for overhead and consultation time. As convenient as chargeback seems, it can pose a tremendous risk: the transition from free access to fee access can be a politically tricky passage.

One information center, whose former manager requests anonymity, was quite literally killed by the backlash. In this case, the center never operated as a free service but rather began its existence as a profit center. Nevertheless, the fact that no MIS group in the firm had ever allocated costs for anything but raw computing power was enough to make the idea "political dynamite," according to the center's manager. "People were used to being charged for processing but not for development or consulting," the manager says, "and it was perceived as a strange way to operate." About a year and a half into its existence, the information center lost its toehold and "got dropped off the bottom of the list," the manager says.

The center had run popular training programs and made some decent money, with fees on the order of $85 per hour for consulting and $100 per hour for development. Considering these successes, the manager deduced that users' opposition to the chargeback system was the only possible cause of the center's demise. "At the time," he points out, "there was still considerable uproar from people who objected to being charged."

IFF's Faistl says his company's users would show the same resistance if he tried to institute a chargeback policy for information center services.

In theory, Faistl is already a proponent of chargeback. "Users should justify the information center instead of the information center having to prove its own worth," he says. "Besides, unless you can get into the mode where you are charging back, users are going to think of you as a free resource and use you accordingly."

But, practically speaking, he cannot see the concept working for the information center under his supervision—at least not yet. "If we implemented a chargeback system now, it wouldn't be regarded as a positive thing," he says. "It would be viewed as taking money out of our right pocket to put in our left."

"The best thing an information center can do to keep the heat off itself is to let the users become its proponents." — Don Faistl

International Flavors and Fragrances

Perhaps by next year, when the center will be 4 years old, Faistl says, it will have grown enough and become established enough to overcome resistance to the idea of chargeback.

Katterson at Manufacturers National Bank of Detroit was delivered from the necessity of worrying about acceptance. Just as he began to consider charging users for information center services, the bank's top managers announced a companywide policy of cost accountability.

The system has been in place since Jan. 1, and Katterson already notices a slowdown in user requests. Results are not so pronounced in the ledger books, however. Training and consulting revenues, combined with a base fee per user, still fall short of the center's original expectations. "We're still not getting enough to meet costs," Katterson says, "so we still have some tuning to do."

Another, albeit partial, solution to the problem of justifying an information center's operations is to cultivate partisans in end-user departments. "Information center managers need to get out and practice some management by walking around," says consultant Livingston. "What they want is to establish a foothold in some department and find a champion there."

IFF's Faistl calls them proponents, but the idea is the same. "The best thing an information center can do to keep the heat off itself is to let the users become its proponents," he says. "Tell them to make sure their bosses know how whatever you are working on has helped them. That
Executive Report / Information Centers

way, when it comes time to pay out some pesos, there is already an awareness of how effective the information center is. 1

By the time information centers have reached maturity, many managers discover the value of word of mouth.

Ryder's Kuryla, for example, credits end users with a large measure of her information center's success. "People in end-user departments have been pretty effective in telling their managers how wonderful it is," she says.

And Goodyear Aerospace's Uecker makes sure that both he and his staff wander around in user departments to pick up information about employees' needs and to cultivate an awareness of the information center.

Information center managers can and should apply the same principle to upper management, according to consultant Casto of the Casto Group. If the centers hope to remain vital, he says, they must find ways to foster liaisons within their companies' business units and to make direct contact with top executives.

"The risk with chargeback is that the transition from free access to fee access can be a politically tricky passage."

Casto suggests one method that not only allows information centers to gain positive visibility but also helps them decipher strategic corporate goals: hosting a series of executive seminars. These events should not focus on recitations of information center successes but should provide top managers with just what they need to know about the risks and exposures associated with end-user computing.

As a side benefit, executive forums can provide information center managers with insights into possible new markets for their services, Casto says.

He and many other observers believe that information centers are most likely to falter when they make the mistake of defining end-user computing and their charter in connection with it too narrowly. "They let themselves become so overrun with user demands," says Casto, "that they can't see the strategic view for all the users in front of them."

IFF's Faistl shares the opinion. He maintains that the information center can and should serve as the focal point and direction setter not just for micros, but for mainframe-based end-user computing, office automation and systems development as well.

His convictions, in fact, prompted him to retain control over the information center when he got promoted to manager of information resource planning. "I've known for a long time," he says, "that that's where the action would be."

Rocco Maggiatto, a vice-president and manager of information and data management services at Marine Midland Banks, Inc.'s corporate office in New York, recently reached a similar conclusion.

Marine Midland's information center, established five years ago, encompasses a broader scope than most departments that operate under that title, Maggiatto says. With a staff of 40 employees, the center handles acquisition, installation, training, decision support consulting and maintenance negotiations for personal computers, office automation workstations and time-sharing terminals and administers an extensive electronic mail system.

Although Maggiatto favors the concept of a broad charter, he says Marine Midland's information center may have gone a step too far. He feels that the time has come for the center's staff to apply its know-how more selectively.

As the center established itself as a far-reaching concern, he explains, it began to get bogged down in the piles of administrative paperwork that seem to go hand in hand with end-user computing. The bureaucracy started becoming so cumbersome, in fact, that users began to view the information center as an obstacle rather than an aid.

In turn, Maggiatto has begun to rewrite the center's charter, turning the organization into an engine for several targeted, strategic efforts. Under his direction, he says, the information center will "establish a strategic framework for engineering the workplace, establish a data management framework and provide support within a common framework to a variety of mini information centers that have sprung up throughout the bank."

The priorities now, Maggiatto says, are projects such as figuring out what users do with data and how they can do it better. He is careful to note that, because of its broad background, the information center at Marine Midland is probably more qualified than most to take on such a pivotal role.

Still, Maggiatto's plans for his company's information center closely resemble what many observers see as the inevitable route for these entities. IFF's Faistl states the matter succinctly: "The information center is changing its role, moving away from direct responsibility and toward orchestration."

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How to maintain quality as the center assumes new roles

By FRED L. FORMAN and GARY A. CURTIS

A s an information center moves into maturity, it needs to own up to the fact that it cannot be all things to all end users — that it needs to set limits as to the quality and quantity of service that it can provide.

The following four guidelines will help keep any growing information center on track:

1. Keep tabs on users' changing needs. In its start-up phase, an information center can easily satisfy the needs of the few users who want help. As the center attracts more users, however, staff members find it more difficult to meet everyone's needs.

Three concrete actions will help the center remain responsive:
   - Institute a help desk to meet the demands of the growing user base. The desk should be staffed by information center staff members who enjoy solving users' pressing problems.
   - Publish a newsletter to dispel users' technical fears and promote goodwill. Newsletters are also the perfect medium for showing off what's new in the information center: new data bases, new development tools, increased storage capacity and so on.
   - Conduct monthly meetings to bring together information center staff members and their end-user clients. Two-hour meetings — with one hour devoted to presentations from the staff and one hour free for questions from the floor — work especially well.

2. Charge users for services rendered. Like any other business sector in a company, the establishment of service bureaus and commercial service bureaus.

The two should be about the same.

3. Build everything around a strategic plan. A strategic plan sets forth the information center's mission by depicting the center as a business organization within the corporation.

As such, the plan should encompass every aspect of information center management: budgets, financial goals and projections of client needs as well as hardware, software and networking concerns.

Without the solid foundation of a strategic plan, an information center is little more than a hodgepodge of software and files and can never reach maturity.

4. Stay on the edge, but don't go overboard. New products show up all the time, and information center managers always feel tempted to load up on tools.

Users, on the other hand, invariably cling to the one or two products they like and show a reluctance to try new ones.

Managers of maturing information centers should take steps to alert and inform end users of new products and their potential benefits.

The only products approved for use, however, should be those whose capabilities can change the way users conduct their business and improve the bottom line.


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Case History

E. F. Hutton: MIS, end users unite to take on Wall Street

By ALAN ALPER

In the mid-1970s, E. F. Hutton & Co. realized that a corporatewide information system could not continue to grow haphazardly. So the 82-year-old brokerage house took painstaking efforts to plan its communications and computing architecture from the top down, creating an information systems network spanning its regional and branch offices worldwide.

In essence, recalls Bernard Weinstein, E. F. Hutton's vice-president of communications, branch information systems were patchy, the firm wanted to create "one network for information flow," enabling all 18,000 employees to have access to data relevant to their jobs.

"We didn't want a piecemeal approach — something that would put a finger in the DP dike," he notes. "We wanted an architecture for the long haul."

Moreover, E. F. Hutton hoped to increase the productivity of its account executives by 50% within three years, Weinstein adds. "We wanted the system to be used as a competitive weapon," he asserts. "Some companies just talk about it, but we wanted to do it."

In a departure from the day's prevailing wisdom, the firm established committees — groups composed of corporate users and information systems specialists — to identify long-range requirements. By incorporating the input of relatively unsophisticated users and knowledgeable professionals, E. F. Hutton hoped to avoid being saddled with obsolete equipment — a situation to be averted at all costs in the fast-track world of Wall Street.

The committees' recommendations particularly emphasized remaining flexible enough to take advantage of any technological opportunity that arose. Required was an all-encompassing system that would enable users, regardless of their location, to access a multiplicity of data in real time.

Data such as on-line stock quotes, financial news, analytical models and research reports had to be available at the stroke of a key or two. In addition, the system had to perform a variety of office automation tasks, such as word processing and electronic mail for executives and support personnel.

More control at the right time

In light of E. F. Hutton's guilty plea to U.S. Department of Justice charges last summer of inappropriately maintaining its checking accounts (see story page 66), perhaps the firm's automation strategy was too effective in helping to hone that competitive weapon.

But, like its competitors, E. F. Hutton was seeking to provide management with a better view of how to provide better control and report capabilities to give management a better view of how policy is executed," notes Marshall Caro, chairman and chief executive of Programit, a New York data processing consulting firm that has worked with many financial concerns on Wall Street, although not with E. F. Hutton.

Adds Weinstein, "We're looking to improve the time and place value of the information. It's more useful to our people if it is in the right place at the right time."

Because E. F. Hutton is a retail-oriented brokerage house, meaning much of its revenue is derived from individual investors rather than institutions, efficiency is pivotal. As the variety of financial services that brokerages offer broadens to include mutual funds, municipal bonds and money market accounts, the competition for individual investors has heated up, forcing E. F. Hutton and its peers to attempt to provide their brokers with an automated advantage.

"You can't have a broker running to the back office for a Standard & Poor's report or going to the other side of the office for news and then having to call one of our research analysts while he has a client on the phone," Weinstein explains.

"We wanted to make it easier for our people to find data within the monolith of Hutton. What we had was similar to going to the library and wanting to find something without the Dewey decimal system."

So E. F. Hutton constructed a four-level hardware and software environment tied together via a private terrestrial network and satellite communications system. Hardware consists of a host and alternate site complex of IBM 3080 and 3090 mainframes; Data General Corp. Eclipse and MV minicomputers at regional and branch offices, respectively; and soon-

Alper is Computerworld's Mid-Atlantic correspondent.
"We've sugar-coated the whole thing, so users can use as much data as they want. There's a bypass button, so if an individual wants some type of data, it will go right to his in-box. Users won't even have to look at it on the screen."

— Bernard Weinstein  
E. F. Hutton & Co.

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In Depth/ E. F. Hutton
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Source: Tony Liberoni, Manager of Operations and Systems, PPG Industries Chemical Group

MANTIS 1984
“100% of our new on-line development is in MANTIS.”
Source: Luther Perry, D.P. Director, Santa Cruz County, CA

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Source: Fred Lambrou, International Director of Information Services, General Foods International

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presentations of stock market data and will be easier to use than the Bunker Ramo terminal it is replacing. Such ease of use will not only facilitate what employees are already doing but also will open new vistas.

The workstation will enable brokers to access information, such as the Securities & Exchange Commission's listing of insider trading, that previously was technologically infeasible.

"We've sugar-coated the whole thing, so we're not asking as much of them as they want. There's a bypass button so if an individual wants some type of data, it will go right to his in hand. Users won't even have to look at it on the screen," Weinstein says. "You can do things with one button on a PC that take numerous keystrokes with the Bunker Ramo terminal."

"and will be easier to use than the
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Among the various communications sent via satellite are E. F. Hutton's "Morning Market Letter," which updates brokers on stock market conditions, and "Profitline," a pop talk covering sales strategies and economic conditions. "At 48K bit/sec., sounds real good, not like Mickey or Minnie Mouse," Weinstein says.

E. F. Hutton even uses the satellite to transmit software updates to all of its regional offices. Rather than risking sending numerous tapes through the firm's internal mail, one satellite transmission ensures that each location has received the new software, he adds.

Citing prohibitive costs, the firm does not intend to transmit video via satellite. "Although it's very sexy, it's also very expensive," Weinstein says. "If there were a breakthrough in the economics of satellite conferencing and the technique could be sold as a substitute for travel, we'd consider it. But it's obvious that people still want to go eyeball-to-eyeball.

With the system's infrastructure in place, E. F. Hutton is looking to further optimize its communications by using local-area networks within its branch offices. While a decision has not yet been made, Weinstein is leaning toward AT&T's Starlan network because of its speed, simplified cabling scheme and compatibility with software already in use, such as Lotus products and other IBM PC-compatible software. "We would like to install it when we roll out the AWE workstation in first-quarter 1987," he says.

Software and AI

E. F. Hutton employs 200 programmers, although the firm does not attempt to write all of its own code, Weinstein says. The brokerage house uses many off-the-shelf packages, some provided by small software vendors, and adapts them to meet its own requirements.

"We used to do all our own programming in-house, but now we use a lot of software vendors and some of the smaller boutiques where much of the more creative work is done," Weinstein says.

Although risky, Weinstein emphasizes that E. F. Hutton goes to all extremes with the small software houses to make sure the firm is protected in the event that a vendor goes out of business. "It would be a shame not to use them because they were small," he concludes.

E. F. Hutton is contemplating grafting expert systems capabilities onto AWE. The company is working with Palo Alto, Calif.-based Teknowledge, Inc. on an expert system that would enable AWE, without prompting, to alert brokers to market trends and breaking information that affect securities trading.

"The system would have triggers — such as heavy insider trading or a particular stock, updated market research or breaking news — that will ask the user if he wants more information," Weinstein explains. "It also would be used to lead users through the system. It would improve the utilization of the systems for experts and for those just starting out."

Implementation of the expert system, while evaluated in conjunction with AWE, probably will not occur until after the workstations are put on-line in early 1987. "We've just not looked at it in detail yet, but it probably will be available in some form sometime next year," he estimates.

Programmit's Caro contends

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that many Wall Street firms are embracing various strains of what is called AI. "People in this business are expected to make real-time decisions. They are being inundated with data and have to choose between options presented on the screen. "There has to be some mechanism to reduce the amount of data and enhance decision support to make people more effective. You can call it artificial intelligence or anything you want," Caro says.

Productivity via automation

Depth of view and commitment to an architecture is how E. F. Hutton's automation strategy differs from most companies', says Tom Kelly, a member of the DG sales team that sold the brokerage house the bulk of its computer equipment. "They knew exactly what they wanted; that's very unusual, given what goes on in the industry," he notes.

Weinstein says his firm seeks to increase its brokers' productivity without having to hire additional support personnel. Through automation, "People said that we could add seven more brokers and get more productivity from each without needing any more secretaries."

According to Caro, the goal of many brokers is to make do with fewer traders. "If you look at it in those terms, it's a classic case of labor automation, although most people don't want to call it that."
Every issue of Computerworld presents either a Product Spotlight or Executive Report. For advertisers, it’s still not too late to take advantage of the hot topics set for September!

**Manufacturing Automation Protocol (Executive Report, September 1)** Takes a close look at the manufacturing automation protocol marketplace (MAP), with a focus on General Motors’ use of MAP. Also discusses which vendors are supplying which MAP products. This report will help users determine if the time is right for implementing computer-integrated manufacturing and MAP. Closing date August 15.

**Computer Leasing (Executive Report, September 8)** Focuses on the state of the leasing industry, how vendors are reacting, why leasing can be better than buying and what to expect in the future. Also, an examination of the growth of leasing — plus, pros and cons of leasing versus buying and a look at lease negotiating. Closing date August 22.

**Financial Modeling Packages for Micros (Product Spotlight, September 15)** Examines how standalone spreadsheets are fast disappearing and being replaced by integrated programs or financial modeling packages. The main article looks at what users can do after outgrowing their spreadsheets, and presents the use of a financial modeling package as one solution. Closing date August 29.

**Communication Standards (Executive Report, September 22)** Focuses on electronic data exchange protocol (EDI), which allows for the direct computer to computer exchange of standard business forms. This report studies the value of EDI in the transmission of purchase orders, invoices and other important documents in various industries. Also, a look at how EDI is strengthening the trade relationships between customers and suppliers. Closing date September 5.

**On-line Computing (Executive Report, September 29)** Explores the fact that although on-line transaction processing (OLTP) has been around since the 1960s, the market is now heating up with IBM and some BUNCH companies battling a group of young companies for the bulk of the market. This report examines on-line computing with a look at the major players, the current state of the art, and what users want. Closing date September 12.

And it doesn’t stop there! Important and pertinent Executive Reports and Product Spotlights topics continue through October and November.

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>TOPIC</th>
<th>CLOSING DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 6</td>
<td>Hardware Roundup/Large &amp; Medium-scale Systems (Product Spotlight)</td>
<td>September 19</td>
</tr>
<tr>
<td>October 13</td>
<td>Hardware Roundup/Small-scale Systems (Product Spotlight)</td>
<td>September 26</td>
</tr>
<tr>
<td>October 20</td>
<td>Hardware Roundup/Microcomputers (Product Spotlight)</td>
<td>October 3</td>
</tr>
<tr>
<td>October 27</td>
<td>Decision Support Systems (Executive Report)</td>
<td>October 10</td>
</tr>
<tr>
<td>November 3</td>
<td><em>1000th Issue/40th Anniversary of the Computer</em></td>
<td>October 10</td>
</tr>
<tr>
<td>November 10</td>
<td>PC Graphics Hardware (Product Spotlight)</td>
<td>October 24</td>
</tr>
<tr>
<td>November 12</td>
<td><em>Computerworld Focus on Microcomputing</em></td>
<td>October 31</td>
</tr>
<tr>
<td>November 17</td>
<td>Systems Integrators (Executive Report)</td>
<td>November 7</td>
</tr>
<tr>
<td>November 24</td>
<td>Vertical Markets (Executive Report)</td>
<td></td>
</tr>
</tbody>
</table>

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MANAGEMENT

Ford seeks compatibility

Exec says unified systems approach spurred IBM pick

By Alan Alper

DEARBORN, Mich. — Ford Motor Co. picked IBM to devise a comprehensive office automation strategy for its North American operations (CW, July 28) to address inefficiencies caused by incompatible computer systems, according to a top Ford executive.

Ford said it chose IBM over archrivals Digital Equipment Corp. and Wang Laboratories, Inc. because it felt Big Blue could provide the unified systems approach needed to remedy the situation.

“We felt IBM was best able to meet our requirements,” explained S. I. Gilman, Ford's executive director of information systems. “They already have the largest installed base in Ford and are known for their support and service.”

Measuring DP efficiency, quality

By David A. Ludlum

TAMPA, Fla. — At GTE Data Services, Inc., numeric measurements of the quality of new computer systems and of the efficiency of their development uncovered several problem areas, according to a quality assurance specialist there.

The problems, which included inaccurate reporting of workers' time and a lack of reporting of defects that had been uncovered, were due to insufficient training and a misallocation of resources, said the specialist, Robert Coull.

With corporations tightening budgets and putting greater emphasis on pleasing their computer users, more and more systems development managers are turning to quality and productivity measurements such as those used by GTE.

“It's relatively new in data processing because data processing is a new area. It's part of a normal maturation of the profession,” said Diane Beal, quality assurance manager at First Data Resources, Inc. of Omaha, a service bureau specializing in transaction processing.

Data processing “is not so much an art anymore,” said Beal. “It’s something we can look at and quantify.”

A recent study by the Quality Assurance Institute of Orlando, Fla., states that numeric measurement of data processing quality and productivity is the most important tool for improving those areas.

“Management in data processing doesn’t have the same types of numbers that it has in other corporate operations. They have to make many of their decisions intuitively,” said William E. Perry, executive director of the Quality Assurance Institute. “If you don’t know your defect rate, it’s natural for you to surround yourself with men and women of greater capacity than your own. Then, and only then, will exciting things really start to happen.”


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MIS: Chip off the old block

From page 71

Information revolution.

Information systems are not and cannot be any better or worse than the organizational context in which they function. Their performance is determined by the clarity of purpose, coherence of structure and consistency of operations in the parent organization. In fact, information systems might be revealing a lack of organizational integration rather than causing one.

Various information-oriented prescriptions, such as enterprise modeling and stages of growth analysis, are put forth to improve information systems. But the insights they generate must first be used to change the business and organizational processes. Until this is done, information systems cannot be improved.

Principle and application

A few specific cases illustrate the principle and its application:

* A major corporation endured long-term frustration with the information systems function. IBM’s Business Systems Planning (BSP) seemed to address the right issues. With suitable executive involvement and appropriate fanfare, a BSP study was launched. A certain enthusiasm attended the effort and resulted in an impressive report. The executive committee responded favorably to the report and the final presentation.

  Two years later, the report remained on the shelf. The business and its information systems department went exactly as they always had, except that the information systems executive had left for greener pastures.

* Another corporation was in a similar situation. In this case, a number of people attended seminars and read books by a leading guru. Having glimpsed the promised land, top management hired a consulting firm specializing in the guru’s methods to lead them through the information and data wilderness.

  The results were even more detailed and impressive (and expensive) than in the case above. They were accompanied by enterprise models, logical data models, subject data bases and data affinity analyses. It had been hard work, but deliverance for the information systems function seemed at hand.

  Two years later, the materials were on a shelf. The business and its information systems went exactly as they had, except that the information systems department hired a data administrator and the MIS executive was forced to become a consultant in the guru’s methodologies.

  A third corporation was in a particularly frustrating situation. It had been trying to develop an information system for production planning and control for seven years. After a few million dollars, several project managers, two MIS executives and three prematurely declared successes, the project floundered.

  Because the system was so critical to the company, management persisted with the project, preferring to defer consideration of a BSP or other methodologies until the immediate need (if seven years can be defined as immediate) was solved.

  From the viewpoint of the corporate executives, the methods and the project management processes were flawed, although they couldn’t have told you how or why. The MIS people were incompetent, having once again failed, even with the involvement and support of the executives. Or, as Hardy was fond of saying to Laurel, “Here’s another fine mess you’ve gotten us into.”

  But when one applies the principle that the information systems function necessarily reflects the character of the organization it supports, a different picture emerges.

  With regard to the first case, two of the principles underlying BSP are that information systems should support corporate objectives and should, in the interest of flexibility, be designed independent of any organizational structure.

  The corporation doing a BSP did not do formal strategic planning; this resulted in cultural territorialism, and the information systems department was forced to adhere to the idiosyncracies of the MIS page 73.

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Ford looks for compatibility

From page 71

man said. "We wanted to improve communications, and we felt office automation would be more effective for Ford if there was a simplified systems environment."

Problems arise in Ford's current approach when there is a department that needs to communicate with a number of groups. "Say there is a group that has partial responsibility for sales and engineering. Should it have a Wang or a Fortune system?", Gilman rhetorically asked.

Although Ford is reasonably happy with the equipment it has installed, the bridges built to link the departments are not fully functional. "Things such as file transfer and revisability of text either can't be done or are difficult to do," Gilman said.

Constant software updates and maintenance have caused fissures in some of the bridges.

Constant software updates and maintenance have caused fissures in some of the bridges, Gilman said. "So much of our systems people's time is being taken up by keeping the bridges working. Every time a new release of software comes out, our people have to rework the bridges all over again."

Despite the magnitude of the effort and services Ford intends to procure over the next five years, Gilman said the decision to negotiate with IBM "was not the world's most important decision."

He said projects crucial to Ford's ability to retain an edge in the highly competitive automotive industry include development of a program to let engineers draft and transmit new product designs worldwide, development of a new generation of computer-aided design systems, enhancements to its telecommunication network and a recently launched effort to bring the management of all manufacturing operations under one system.

Measuring DP efficiency, quality

From page 71

rate, it's hard to improve it."

In fact, many data processing managers do not even know what they should be measuring. Perry said. "We hear the statement, 'If it's not broken don't fix it.' We perceive that management does, even know if it's broken," he said.

The goal of the institute's study, which involved 60 large corporations, was to select the five best measures of data processing quality and productivity. Culled from 120 candidates, the best were the following:

1) Functional quality — a quantitative rating by users
2) Function points per man-month — a productivity measure, originated by IBM, of functional value per man-month of development work
3) Customer satisfaction — a user rating emphasizing data center services
4) Production batch jobs processed without a problem
5) Project quality — a measure of conformance to requirements

Perry said user dissatisfaction and cost-cutting are the principal forces behind interest in such measures.

But there are others. Along with reducing costs, First Data Resources hopes to maintain the quality of its systems while growing at a fairly fast rate, Beal said.

Air Force measures for software quality

At the Grumman Data Systems division of Grumman Corp. in Bethpage, N.Y., a systems integrator dealing chiefly with military projects, software quality is being measured due to U.S. Air Force guidelines for future projects, said Roscoe Mack, the division's manager of design and product assurance.

Grumman is still researching measurements. First Data Resources is also in initial stages of measurement, classifying quality assurance costs according to whether they crop up during design or development or after delivery.

GTE Data Services, which does most of its development for other units of its parent company, GTE Corp. of Stamford, Conn., has worked with measurements for two years, Conll said.

The division's management has changed about 60% of the procedures it has investigated as a result of measures, but "whether the changes are for the better, we don't know yet," he said.

Major difficulties

One of the major difficulties in assessing system quality and development productivity is generating data on old systems for comparison, Mack said. "It takes a couple of years to get quality historical data."

Another difficulty is finding workers with strong statistical skills to do the measuring, he said.

GTE workers have been concerned that measurements could be used to single out unproductive employees, but Conll said the aim is to expose bad processes, not workers.

"If we find an individual problem we just mention that on the side to the person so he can clear it up," he said.
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Smart LPT tests LAN performance

The Smart LAN Performance Test program (LPT) has been released by Innovative Software, Inc. of Lenexa, Kan. Smart LPT allows users to compare performances among various local-area network (LAN) systems, as well as among different configurations of the same system. According to a spokesman for the company, the Smart LPT runs real business application software on each workstation and then performs the tests on the last, or Nth, network node. It measures both the throughput of the LAN and the productivities that can be anticipated in actual usage.

Outlining typical procedure, the spokesman said the test chooses an application from the menu — such as a data base, word processing, spreadsheet program — and the level of usage — whether light, medium or heavy.

The application selected will run in a loop on each station until the tester chooses to stop. After each workstation is "bussed out," the tester selects the test option, and the Smart LPT performs timed tests, the spokesman stated. The tester can also run the Smart LPT on a single-user personal computer to establish a baseline timing for comparison. During the test, the program generates a test data disk to be used later for reporting.

Once the test has been completed, the tester can print the timed test results for each LAN in spreadsheet form or in a bar chart. The single-user PC test results are included in the graph for comparison. The results of several tests may also be combined into one graph for comparison by time. The comparison can be made either in terms of seconds, minutes or a single-number rating that is calculated by the Smart LPT as a performance factor of the LAN against the single-user PC results, according to the company.

The test program can be used on any LAN operating system compatible with IBM's 3270 model. The Smart LPT costs $49.95 and comes with the test program, documentation and Smart Demo Pack.

Genicom unveils printer duo

Desktops emulate popular printers' personalities

Genicom Corp. of Waynesboro, Va., has released its 1060 series of serial dot matrix printers, which include an 80-col. narrow carriage and the Model 1025 with a 136-col. wide carriage. Both the Model 1020 and the Model 1025 have print speeds of 100 char./sec. in letter-quality mode and 200 char./sec. in draft mode. Both printers are said to contain identical performance capabilities and design features, including user-instantaneous personality and font cartridges, versatile paper handling, built-in printer stand and optional color upgrade kit. The Model 1020 is priced at $899, and the Model 1025 is priced at $699.

According to the vendor, hardware and software compatibility is achieved through the personality cartridges, which plug into the back of the computer. Cartridges are available to emulate a number of printers, including the IBM Graphics Printer and Color Printer, the Epson America, Inc. FX series, the Diablo Systems, Inc. Diablo 630 and the Genicom 3000 series. It is said that up to three plug-in font cartridges can be inserted and on-line simultaneously at the front of the printers.

Type style is user-selected and interchangeable on the same document by a software command or by pushing a button on the printer control panel.

A starter kit, containing a Courier font cartridge and choice of one personality cartridge, is available for $99. Additional font cartridges cost $35 each, and personality cartridges are priced at $85 each. Data cables are not included.

The printers offer bi-directional, emphasized, double-strike, expanded, bold, compressed, underscored and proportional printing. A paper-out sensor with audible alarm and alert light, allowing for remote location operation, is one of the user convenience features of the printers.

Each printer, rated at 55 dbA, has a standard 2K-byte buffer, with 8K-byte and 64K-byte buffers optional, according to the vendor.

Both printers feature a tilt-back clamshell design. Continuous fanfold paper is fed through the printer from bottom to top. Paper loading for bottom feed is achieved by tilting back the top of the printer.

An optional, dealer-installable color upgrade kit is available for $149.

PCs, compatibles get AST printer

AST Research, Inc. of Irvine, Calif., has unveiled its Turbolaser printer for IBM PCs, compatible Computers, Personal Computers XT's, AT's and compatibles.

The Turbolaser is said to be capable of printing both copies and originals at a rate of 300 dot/in. graphics, running most available PC-based hardware application software. The printer's Laser Printer Controller is priced at $4,995.

The printer's Laser Printer Controller features 1.5M bytes of random-access memory (RAM). Of this total, 512K bytes are used to store the printer/plotter emulations, the page description package and the printer's resident font.

According to the company, a variety of bit-mapped fonts, including fixed-pitch, proportionally spaced styles, portrait and landscape, are resident on the Turbolaser. The fonts are loaded into the RAM after host power-up and remain resident, providing instant access. An optional Bitstream, Inc. Bestseller Library of fonts is available on disk for Turbolaser.


PC/Reporter provides reporting capabilities on a personal computer using mainframe and PC data file sources. The program incorporates an open architecture that is said to allow users to create reports from a variety of data formats. PC/Reporter Release 1.1 is available now and is priced at $899.

Release 1.1 of PC/Reporter includes a direct link to Ashton-Tate Dbase III files, a pop-up menu and a user interface for creating reports from a variety of PC and mainframe file formats without having knowledge of programming languages or special protocol, according to a company spokesman.

Other data formats are supported, including data files created by Martin Marietta's Ramis II, the mainframe data base management system, and Keepit, its PC data base management system.

According to the vendor, in addition to the pop-up, menu-driven, report-building interface, PC/Reporter provides users with the option of generating requests in syntax similar to mainframe Ramis II.

When used with the company's Ramlink communications software, PC/Reporter can be used to create and test report requests on the PC to run against any mainframe data file accessible through Ramis II.

In this way, PC/Reporter is said to provide Ramis users with a method of prototyping reports using a PC or IBM 3270 Personal Computer terminal.

As a stand-alone program, PC/Reporter executes requests against data stored on the PC or data that has been downloaded from a mainframe. On-line, context-sensitive Help is provided at every step, and report output can be directed to a PC's printer, an ASCII file or a PC's monitor screen, where it can be scrolled one line or one page at a time, a spokesman from the company stated.

PC/Reporter runs on IBM Personal Computer, Personal Computer XT. AT and compatible computers and supports both monochrome and color monitors.
NEW PRODUCTS/SOFTWARE & SERVICES

SOFTWARE & SERVICES

Systems software

BMC Software, Inc. has announced Version 2.0, said to allow installations to configure IMS/VS on-line. With Version 2.0, data bases, application programs, transactions and VTAM terminals can be added or modified while IMS is running. Delta IMS Version 2.0 costs $25,000 and leases for $1,350/mo. BMC Software, P.O. Box 2002, Sugar Land, Texas 77487.

Applications packages

BBN Software Products Corp. has announced Release 2 of its RS/1 scientific and engineering data analysis software. Release 2 reportedly offers additions graph editing, a money format, and speed.

Utilities

Interlink Computer Sciences, Inc. has added two bidirectional Electronic Mail Bridges to its 3711 and 3711S Gateway VM. The first provides a link between IBM's Professional Office System (Profs) and VM Note Mail Systems and Digital Equipment Corp.'s VAX Mail. The second allows users of IBM's Profs and VM Note to send and receive mail messages to and from users of DEC's All-in-1 office package. The 3711 Gateway bidirectional Profs/VM Note to VAX Mail Electronic Mail Bridge costs $6,950. For the 3711S Gateway, the prices are $5,950 and $6,950, respectively. Interlink, 39055 Hastings St., Fremont, Calif. 94538.

BMC Software, Inc. has announced its 3270 Superoptimizer/IMS.

Superoptimizer/IMS is said to reduce the size of data streams going from IMS/VS to IBM 3270-family screens and printers and back again. It allows additional terminals and printers to be added to a single cluster controller without overload. Superoptimizer/IMS costs from $19,000 to $39,000 on the first CPU. BMC Software, P.O. Box 2002, Sugar Land, Texas 77487.

Data/Ware Development, Inc. has introduced its Model DW300 channel monitor. The Model DW300 channel monitor is a logic analysis tool for monitoring the IBM and compatible mainframe I/O channels. The DW300 is said to speed error tracing by providing multilevel triggering either by user-programmed line states or by standard preprogrammed IBM macro sequences. The Model DW300 costs $9,565, and an RS-232 option card costs $396. Data/Ware Development, 4204 Sorrento Valley Blvd., San Diego, Calif. 92121.

Aida Corp. has announced Automatic Test Pattern Generation. Automatic Test Pattern Generation is said to combine high-speed fault simulation as well as a path-tracing algorithm in order to produce high-coverage test vectors for single "stick-at" faults in scanable designs. According to the vendor, the Aida Design System reportedly utilizes the Automatic Test Pattern Generation product to automatically generate test vectors for scanable designs. Automatic Test Pattern Generation costs $45,000. Aida, Suite 340, 3375 Scott Blvd., Santa Clara, Calif. 95054.

Expertware, Inc. has introduced CMT, a software development aid. The CMT software system reportedly automates the functions of configuration control, release management, problem reporting and tracking and versions/releases documentation. The CMT development system also is said to allow the user to automate the sharing of software and documentation among different configurations.

According to Expertware officials, CMT runs on the IBM Personal Computer AT and mainframes using Unix or Digital Equipment Corp.'s Ulitrix operating systems, as well as DEC VAX machines running VMS. CMT is priced at $35,000 for the multituser version. Expertware, Suite 1209, 2685 Marine Way, Mountain View, Calif. 94043.

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<table>
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<th>Program</th>
<th>Software Digest Rating</th>
<th>Overall Evaluation</th>
<th>Ease of Learning</th>
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<th>Versatility</th>
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MICROCOMPUTERS

Systems

Process & Instrumentation Design, Inc. has introduced a kit that allows Prodoc, an off-line program development and documentation software for Allen-Bradley Co.'s and Gould, Inc. Modicon Division's programmable logic controllers (PLC), to be used on IBM Personal Computers.

The kit is said to expand the PC's capability to provide multitasking. It also provides the ability to view PLC ladder logic with full reference documentation and to edit documentation while viewing the ladder logic.

The kit consists of a coprocessor board with 1M byte of random-access memory, a Prodoc keyboard and Prodoc software, and it costs $9,995.


Software applications packages

CEO Software & Leasing has introduced Facility Scheduler software, designed for scheduling meetings at hospitals.

Facility Scheduler allows scheduling for meetings to be done on a 24-hour basis, in one-minute intervals, up to one year in advance. Room availability is displayed by time and date, along with room specifications such as capacity, physical size, location and cost.

Facility Scheduler costs $4,800.

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CEO Software, 2153 E. Juanita St., Tucson, Ariz. 85719.

Lowell Corp. has announced Computer Assisted Marketing Program (CAMP), which was designed for use on IBM Personal Computers and compatibles.

CAMP is said to provide multilevel sales lead management, media evaluation, letter writing and marketing development. It provides reports for targeting accounts and measuring selling effectiveness.

The package has three modules and includes a library said to have a capacity for more than 100 letters.

CAMP costs $495.95 per module. Lowell, P.O. Box 158, 97 Temple St., Worcester, Mass. 01613.

Software utilities

Burr-Brown Corp. has introduced PCI-20046S-2 C language and PCI-20046S-3 Turbo Pascal language support packages for data acquisition and measurement on the IBM Personal Computer, Personal Computer XT, AT and compatibles.

The PCI-20046S-2 and PCI-20046S-3 packages both interface between programmers and the PCI-2000 system for data acquisition, test, measurement and control products.

The PCI-20046S-2 and the PCI-20046S-3 each cost $225.

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Popular Programs, Inc. has introduced Pop-Up Partner, an outline processor desk tool program for IBM Personal Computers and compatibles. Pop-Up Partner features pull-down menus and intuitive commands and uses random-access memory-resident technology.

Pop-Up Partner also comes with built-in tools that work as flexible desktop tools. Included in the pull-down menus are reference files for IBM's PC-DOS commands, area codes and time zones. Pop-Up Partner is priced at $99.97.

Popular Programs, Suite 180, 135 Lake St., Kirkland, Wash. 98033.

Software enhancements

Texas Instruments, Inc. has announced that its Microsoft Corp. Xenix V-based, multiuser version of its Business-Pro computer now supports Samna Corp.'s Samna+ word processing software.

Samna+ combines word processing capabilities with a fully integrated spreadsheet. It provides capabilities such as data interchanged format, file translation, floating cells and the ability to print to multiple printers. Samna+ for the Business-Pro costs $1,295.

TI, Data Systems Group, P.O. Box 809063, H-869, Dallas, Texas 75380.

Communications

Corporate Microsystems, Inc. has released Version 5.0 of its Mlink communications system.

Added features in Version 5.0 include application script development, session capture, Digital Equipment Corp. VT100 terminal emulation on the IBM Personal Computer, the Kermit protocol, the vendor's own sliding frame protocol and enhancements to the Mlink script language.

Mlink was designed for asynchronous data communications for IBM PC-DOS, Microsoft Corp. MS-DOS and Xenix, Unix and Digital Research Inc.'s CP/M-based systems. It is priced from $195 to $2,500.

Corporate Microsystems, P.O. Box 277, Etna, N.H. 03750.

Data storage

Tailgrass Technologies Corp. has added the TG-1020e and the TG-2025e hard drives as external units to its line of mass storage subsystems.

The TG-1020e is a 20M-byte tape drive backup system. The TG-2025e is a 25M-byte hard disk with a 20M-byte tape drive backup system. Both utilize the DC-3000 tape cartridge and fit next to a monitor on top of a personal computer.

Both systems include Backtrack, the vendor's automatic hard disk backup system, and Xtree, a menu-driven file directory and file management software program.

The TG-1020e costs $1,295. The TG-2025e costs $2,295.

Tailgrass Technologies, 11100 W. 82nd St., Overland Park, Kan. 66214.

Printers/Plotters/Peripherals

Epson America, Inc. has introduced the EX-800, a dot matrix printer featuring a color option.

The EX-800 is a 9-pin printer. It prints at 300 char/sec. in draft mode and 54 char/sec. in near-letter-quality mode. The 80-col. printer offers an 8-button type-style selection panel and features IBM printer emulation as well as built-in serial and parallel interfaces.

There is a built-in bidirectional push-feed tractor and an automatic sheet load feature and an optional single-bin cut-sheet feeder.

The EX-800 is priced at $749.

Epson America, Suite 450, 1901 Avenue of the stars, Los Angeles, Calif. 90067.

Hanzon Data, Inc. has introduced LP-3000, a laser printer with full-page bit-map graphics.

Some features of the LP-3000 include printer status, emulation, page orientation and fonts. The LP-3000 offers fonts including Courier 10, Prestige Elite and the IBM character set. The LP-3000 is said to operate at 8 page/min, and the output is automatically collated in document order.

The LP-3000 features printer emulations for Hewlett-Packard Co.'s Laserjet and Laserjet Plus and Epson America, Inc.'s FX-80.

The 512K-byte version of the LP-3000 costs $3,980; the 2M-byte version costs $4,995.

Hanzon Data, 18732 142nd Ave. N.E., Woodinville, Wash. 98072.

Board-level devices

Kamerman Labs, Inc. has introduced Slotmachine, a hard disk drive on a card that fits in a single expansion slot of an IBM Personal Computer, Personal Computer XT or compatible computer.

Designed to support an optional second hard disk drive, the Slotmachine is shock mounted and offers low power consumption, plated media, a built-in disk testing microprocessor, a 5M bit/sec. transfer rate and an access time of 75msec.

The Slotmachine costs $490.

Kamerman Labs, 7861 S.W. Cirrus Drive, Beaverton, Ore. 97005.

STB Systems, Inc. has introduced its Serial/Parallel adapter, which provides a serial port, a parallel port and a clock/calendar option for IBM Personal Computers, Personal Computer XT's, AT's and compatibles.

According to the vendor, the Serial/Parallel adapter provides the serial port needed for interfacing with asynchronous communication de-
vices. The serial port can be used to connect a personal computer to a mod- 

em or to a serial printer.

The Serial/Parallel adapter costs $139.

STB Systems, Suite 125, 601 N. 

Glenville, Richardson, Texas 75081.

$139.

the DVME-704 serial communica-

The DVME-704 is said to support

ports and local buffer space in dual-

port memory. All memory devices are

port memory. All memory devices are

port mode.  

The 130-channel Instabus 1080 costs $5,000.

Micom Systems; P.O. Box 8100, 

1410 Los Angeles Ave., Simi Valley, 

Calif. 93062.

Network services

Western Union has announced the availability of its Memory Mail ser-

vice on the company’s Easylink elec-

tronic communications service.

The Memory Mail service is said to allow users to send messages to up to

100,000 addresses from their com-

puters and terminals. It offers text 

storage capability and hard-copy op-

tions.

Memory Mail is available for a one-
time setup fee of $45. For each con-

nect session, the first minute is free, 

and subsequent charges are 35 cents 

per minute.

Western Union, One Lake St., Up-

per-Saddle River, N.J. 07458.

Test equipment

Systems Strategies, Inc. has in-

trduced TestSNA/3270 systems 

network architecture (SNA) and 

TestBSC/3270 binary synchronous 

communications, products for 

testing the communications function 

of IBM’s 3270 series computer prod-

ucts and systems.

TestSNA has 190 programmable 

test scenarios for SNA 3270 testing. 

TestBSC/3270 has 79 scenarios that 

test control unit data link control. 

TestSNA/3270 costs $10,000, and 

TestBSC/3270 costs $8,000.

Systems Strategies, 225 W. 34th 

St., New York, N.Y. 10001.

Electronic Industries Association 

has announced EIA-455-95 fi-

ber-optic test procedure for fibers 

and cables. The EIA-455-95 test procedure de-

scribes a method for determining the total optical power emanating from 

an optical fiber.

According to the vendor, the pro-

cedure can be used for, but is not lim-

ited to, measuring such things as the 

attenuation of the fiber or cable. The 

EIA fiber-optic test procedure can 

also be used for measuring loss of 

terminating devices or methods, the 

amount of optical power coupled into 

the fiber by a source or the optical 

power at the system receiver.

The EIA-455-96 fiber-optic test 

procedure costs $8 per copy.

Electronic Industries Association, 

2001 Eye St. N.W., Washington, D.C. 

20006.

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SIM3278 is a software communications package which provides complete 3270 emulation for IBM 

PCs and over 50 different types of inexpensive ASCII terminals.

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SIM3278 installs in minutes and reduces costs through asynchronous communications, X.25 

networks and Simware’s unique screen writing techniques.

More than just a protocol converter, SIM3278 operates without any additional hardware or 

software modifications. Features such as on-line help, PC support, a multiple session manager and 

the ability to use inexpensive asynchronous communications make SIM3278 an extremely flexible 

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The new NEC APC IV. Because sooner or later, you're going to have to take it to the limit. For more information, call NEC at 1-800-343-4419 (in MA 617-264-8635). NEC Information Systems, Inc., Dept. 1610, 1414 Massachusetts Avenue, Boxborough, MA 01719.
Auxiliary equipment

Cylix Corp. has announced its MTJ line of modular telephone jack protectors. The MTJ line provides protection from transient overvoltages caused by light-torrs.

Modems, intelligent teleprotection from transient and other sources for modems, intelligent telephones, facsimile machines and other equipment utilizing RJ-11 and RJ-45.

Protection for dial-up lines is standard but can also be supplied for additional applications, including dedicated lines, BS-210 and others. The MTJ has two- and four-wire protectors. The MTJ costs from $50 to $79.

Cylix, 550 Smithtown By-pass, Smithtown, N.Y. 11787.

Comverse Technology, Inc. has released its Trilogue advanced message management system.

Trilogue enables a standard Touch-Tone telephone to access a range of applications such as voice mail; automated attendant, which provides direct extension dialing from both outside and inside voice mail; call screening; audiotex; as well as text mail integration, according to the vendor.

Trilogue is priced from $38,000 to $185,000.

Converse Technology, 400 Crossway Park Drive, Woodbury, N.Y. 11797.

Data storage

EMC Corp. has announced its Dia-MVXII off-line memory diagnostic package for use in Digital Equipment Corp.'s Microvax II systems. Dia-MVXII is said to provide complete diagnostics of all memory arrays down to the chip level. It also offers the user the ability to test individual Microvax II memory arrays and to isolate trouble spots or necessary repairs.

The Dia-MVXII is priced at $750. Dia-MVXII is free to charge to existing EMVAX customers.

EMC, 12 Mercer Road, Natick, Mass. 01760.

Honeywell, Inc. has added an Event Precursor recorder function to its line of VP 151 Versa print report etcers.

The Event Precursor recorder is said to permanently acquire and store data in solid-state memory. When an event-triggering condition occurs, the recorder downloads onto the chart the last process data with the accompanying page number, line, range markings and channel markings. The recorder, a removable chart cassette, carries all mechanical and electrical assemblies for printing.

The Event Precursor recorder is priced at $2,900. Honeywell, 1100 Virginia Drive, Fort Washington, Pa. 19034.

Printers / Plotters

BDT Products, Inc. has announced its three-bin Laserfeeder.

The Laserfeeder provides four paper bins and has the ability to automatically feed envelopes. Users who desire an automatic collator can purchase an optional automatic collator from BDT.

The Laserfeeder is compatible with Hewlett-Packard Co.'s Laserjet and Laserjet Plus and Canon U.S.A., Inc.'s LBP series. The Laserfeeder costs $4,650. The automatic collator costs $200.

BDT Products, 17152 Armstrong Ave., Irvine, Calif. 92714.

Sperry Corp. has introduced the Sperry 0767-II printer for its 1100 series computer systems. Continued on page 90
There's a lot more to data communications than just buying equipment or services from a vendor. That's exactly why you need Tymnet.

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Our resources can make the most of yours.

Tymnet
2710 Orchard Parkway
San Jose, CA 95134
(408) 942-5254 ext. 68
 Continued from page 88

Key features include 2,000 line/min. printing, reduction in footprint to 10.8 sq ft, an internal vacuum system, front and rear operator panels and the capability to use a variety of print bands.

Available in fourth-quarter 1986, the 0770-II printer costs $60,000.

Sperry, World Headquarters, Blue Bell, Pa. 19424.

Pritware, Inc. has introduced the 720IQ laser imager printer and the 1200HD and 6000HD image processors that serve as controllers for the 720IQ.

The 720IQ laser imager delivers 1,200 by 600 dot/in. output at 8 page/min. According to the vendor, the 720IQ’s resolution is capable of reproductions of typographic fonts, imaging graphics and halftones. The 720IQ also allows users to print in red, blue or brown.

The 1200HD image processor supports 1,200 by 1,200 dot/in. resolution while executing a full set of typographic and graphic functions.

The 6000HD supports 600 by 600 dot/in. resolution.

The 720IQ laser imager costs $9,990; the 1200HD image processor costs $2,990; and the 6000HD costs $790.

Pritware, 103, 1408 Northland Drive, St. Paul, Minn. 55120.

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AUGUST 11, 1986

PRICE REDUCTIONS

Televideo Systems, Inc. has reduced the price of its Tele-286 IBM Personal Computer AT-compatible computers and its Personal Mini file server products.

The Tele-286 Model I AT--compatible computer has been reduced from $3,395 to $2,695, and the Tele-286 Model II has been reduced from $5,795 to $4,995.

The Personal Mini family of file server products included in the reductions are as follows: The PM 16T file server has been reduced to $8,995, the PM 16T/85 has been reduced to $10,995, and the PM Workstation has been reduced to $1,995.

Televideo Systems, P.O. Box 3568, 1170 Morse Ave., Sunnyvale, Calif. 94088.

Microdirect, Inc. has reduced the price of its SST 286 PC-AT.

The SST 286 PC-AT includes a 1.2M-byte floppy disk drive, IBM DOS 3.1 operating system, monochrome monitor, monochrome adapter and 512K memory, according to the vendor.

The SST 286 PC-AT has been reduced from $4,995 to $2,770. The reduced price also includes first year on-site maintenance, according to the vendor.

Microdirect, 180 Bent St., Cambridge, Mass. 02141.

Borland International, Inc. has bundled its Turbo Pascal language development system for IBM Personal Computers and compatibles with binary coded decimals and support for the 8087 math coprocessor, reducing the cost of the complete package.

The bundling with binary coded decimals allows development of business applications, such as spreadsheets, where a high degree of numeric accuracy is important, according to the vendor.

The Turbo Pascal with the binary coded decimals support for the 8087 is priced at $99.95, the vendor said.

Borland International, 4585 Scotts Valley Drive, Scotts Valley, Calif. 95066.

Goldatabase has been reduced from $695 to $124.95, according to the company.

Goldatabase, Goldata Computer Services, Two Bryn Mawr Ave., Bryn Mawr, Pa. 19010.

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So, while we thank IBM for the inspiration (and specs) for our new Model 480 Tape Cartridges for the 3480 drive, you can thank us for the major role we played in pioneering the CrO₂ medium.

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Once leader of low-end mart, NCR’s ADDS reverses course

Targets value-added terminals at end users

By Alan Alper

HAUPPAUGE, N.Y. — In 1981, NCR Corp.’s Applied Digital Data Systems (ADDS) subsidiary was considered the price/performance leader in the ASCII terminal marketplace. The company had just introduced a no-frills terminal that listed for $650 and appeared poised to overtake market leader Lear Siegler, Inc., whose Data Products Division had been the first to crack the $1,000 price barrier.

Five years later, ADDS is in the final throes of a complete strategic reversal. It no longer covets the low end of the terminals business, now characterized by steep price erosion (33% during the last three years), slim unit-shipment growth (only 7.2% last year) and little or no product differentiation.

“We’re not interested in fighting it out in the trenches with low-priced, low-feature machines,” asserts David Laws, who joined ADDS as president in 1983 after 31 years with NCR, which purchased the company for $60.8 million in 1980.

“That’s not to say we won’t have a basic-style terminal in the line, but our major thrust will be on value-added products, products that tend to be higher priced and more attuned to distributor and end-user needs.”

ADDS first lost its price-setting position to Televideo Systems, Inc. in 1982, which was summarily overtaken by Wyse Technology, Inc. two years later (CW July 7). Both competitors borrowed concepts from the evolving microcomputer and, unlike ADDS, made propitious use of offshore manufacturing to keep costs down.

Moreover, shrinking profit margins began cutting into research and development expenditures, making it difficult for ADDS to keep its product line current.

“People were wondering what happened to them,” recalls Diane Farrell, a research analyst at International Data Corp. in Framingham, Mass. “They introduced relatively few new products over the last few years, with the exception of a Digital Equipment Corp. VT220 emulator.”

ADDS, with an installed base of 750,000 units, is 95% of the marketplace without alteration, Laws claims. Laws strongly denies rumors that NCR is considering folding ADDS into its corporate infrastructure to achieve further cost savings. Noting that ADDS makes more use of NCR staff departments than ever before, Laws says the marketing advantage of ADDS’ name and reputation would be muted by a melding.

But one former executive points out that the percentage of revenue that ADDS derives from its parent is increasing.

While NCR at one time accounted for 10% to 15% of ADDS revenue, that has increased to more than 20%, he says, owing, in part, to declining orders by outside customers.

“They are a product-driven company, unless they can spur the customer side of their business, they are in danger of being folded into the parent company,” the former insider says. “They could become just another plant for NCR.”

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Ford falls prey to list of FUD

given in the first week of June, Ford found a minimal difference between the archrivals, according to S. I. Gilman, Ford's executive director of information systems. The three vendors were evaluated by three committees. One committee of gurus measured the technical aspects of the proposals; one group of purchasing and financial types looked at business terms and conditions; and an executive steering committee of high-level DP and user management assessed which company would be best to deal with.

Interestingly, all three firms graded evenly on technical issues as well as on business terms and conditions, Gilman says. Only the third committee gave IBM the edge.

"After a short but intensive review, we went with IBM by using an Ouija board," Gilman quips. In a more serious vein, he adds, "The decision was based on intangibles: the comfort level of the executives we dealt with, long-term viability and willingness and capability of support and service."

The recommendation to negotiate the Ford hierarchy to IBM's management committee, which, according to Gilman, "challenged it, questioned it and eventually accepted it." FUD strikes again.

Yet, if you were to have looked at Ford's major technical requirement — the need for department processors to exchange data with one another via personal workstations — it might have appeared that DEC had a leg up. DEC's VAX architecture runs the same software from top to bottom. IBM, with its multiplicity of mid-range architectures, seems to offer a confused approach.

"DEC's All-In-One office automation software is not that great, but it's still better than the Professional Office System or lOSS. IBM's office automation software," adds George Coiory, president of Cambridge, Mass.-based Forrester Research, Inc.

DEC also seemed to have leverage in the "intangibles" area: Its founder, Kenneth Olsen, sits on Ford's board of directors. Ford's former chairman, Philip Caldwell, has been a DEC director since 1980. But these were no match for FUD.

Plainly, Ford took the safe approach by choosing IBM. In the event of a problem, no one within the firm's management could question the choice. Selecting DEC or Wang would have allowed for too much second-guessing the minute something went wrong.

Big Blue, apparently, still has pull. Should someone check Ford's Ouija board?

Europe criticizes U.S.-Japan pact

pressure on prices elsewhere," said Jean Cailliot, president of the anti-dumping working group of the European Electronics Components Manufacturers Association.

"Europe is going to hurt," agreed Murray V. Duffin, corporate vice-president and director of strategic planning at SGS-Ates, Italy's state-owned semiconductor maker.

In a statement, European Community trade commissioner Willy de Clerq and industry commissioner Karl Heinz Narej said the Commission of the European Community accepted the parts of the settlement "(that) are intended to eliminate dumping in the U.S. market."

The two officials also emphasized their concern that U.S. firms' semiconductor products may gain favored access to the Japanese market, which would be to the detriment of European products.

The U.S.-Japan accord stipulates that Japan will help redress the semiconductor trade imbalance between the two countries, although the pact does not specify figures. But a commission official, who declined to be named, suggested that access to the Japanese market is not a major issue in Europe, because, "European manufacturers are so far behind anyway, the Japanese don't want our products."

From the Computerworld International News Service, European bureau.

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Ashton-Tate gets business graphics

many years, Ashton-Tate has reinforced its policy of buying firms with strong product lines. In the past two years, Ashton-Tate has acquired word processing leader Multimate International Corp. and Framework developer Forefront Corp.

Ashton-Tate pays approximately $15 million for Decision Resources, whose products include ChartMaster and Signmaster for the IBM Personal Computer.

Founded in 1981, Decision Resources' sales grew from $9.6 million to $10.5 million in the fiscal year ended June 30. "We were at the point where we could not generate enough capital to fund our projected growth," President and co-founder Sean O'Connor said. "I knew the company was likely to grow faster with Ashton-Tate than if we went public."

The acquisition is likely to mean the addition of enhanced graphics capabilities for Ashton-Tate's Dbase data base management system and Multimate word processing packages.
Two Comdisco salesmen barred from using ‘proprietary’ data

Sungard charges former employees

By Alan Alper

PHILADELPHIA — Two salesmen for the Comdisco Disaster Recovery Services subsidiary of Comdisco, Inc. have been barred from using proprietary information allegedly taken from their former employer, Sungard Recovery Services of Wayne, Pa.

A Philadelphia Court of Common Pleas judge has issued a permanent injunction against Comdisco and the two salesmen.

According to a complaint filed by Sungard July 11, former Sungard salesmen Ronald VanderKamp and T. Scott Rumer allegedly took documents that contained price lists, business cards and current customer lists after resigning June 30 to work for Sungard’s competitor, Comdisco Disaster Recovery Services.

The permanent injunction, issued July 17, orders the two salesmen to provide Sungard with a list and status report on all companies they contacted between Jan. 1 and June 30.

Contact restrictions

The two men are also prohibited for a period of six months from contacting current Sungard customers, their affiliates and certain prospects of Sungard Recovery Services in the Northeast.

A Comdisco Disaster Recovery Services spokesman said the firm agreed to the injunction to avoid a prolonged and costly lawsuit. “We felt we could have won, since all the information they claimed was stolen was public knowledge, but we settled for the sake of expediency,” the spokesman said.

Sungard said it filed suit against Rosemont, Ill.-based Comdisco because the two men had taken information generated while they were employed by Sungard.

“Also, VanderKamp was our top salesman in the area,” a Sungard spokesman noted.

In the game of PC-to-System 34/36/58 communications, prospects of Sungard Recovery Services in the Northeast.

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This is accomplished through an async link to the AST-5251/11 or AST-5251/11 Plus equipped PC that is connected with twinax cable to a System 34/36/38.
AUGUST 11, 1986

COMPUTER INDUSTRY

NICKELS from page 96

30 of $42.1 million, compared
share, in the previous year's
$1.8 million, or 12 cents per
li quarter, which
ended June 30. For the like
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million, or 31 cents per
re, on revenue of $52.5

Information Resources, Inc.
ended June 30 of $21.8 million,
$18.3 million
year ago. Profits were
10 cents per
pared with a loss of
13 cents per share, in the
year ago.

Gould, Inc. reported reve-
ended June 30 of $321.3 mil-
 million, compared with $355.9
year ago. Profits were
$11.1 million, compared
$261,000, or 4 cents per
ear ago.

Silicon Systems, Inc. re-
ended June 28 of
19.7 million, up 77% from
the like quarter a year ago.

Profits for the quarter were
$24.5 million, or 2 cents per
pared with $626,000, or 5 cents
ear ago.

Scientific Micro Systems, Inc.
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$8.5 million a year
ear. Net income for the
$617,000, or 8 cents per
pared with a loss of
10 cents per share, in the
period one year ago.

Avant-Garde Computing, Inc. re-
ended June 30 of $432.3 million,
67% increase over the $259.5
million reported for the pre-
year. Profits for the
year were $32.2 million, or
81 cents per share, in the
ear ago.

Valid Logic Systems, Inc. re-
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<tr>
<th>Product Code</th>
<th>Network Control Modems</th>
<th>Description</th>
<th>Price</th>
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<tr>
<td>#14404</td>
<td>SP 14.4 Standalone</td>
<td>14,400 bps</td>
<td>$2300</td>
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<td>#14424</td>
<td>SP 14.4 Standalone with 6 channel mux</td>
<td>14,400 bps</td>
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<td>#21504</td>
<td>CS 4800 Point-to-Point with 4 channel mux</td>
<td>4800 bps</td>
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<td>#21502</td>
<td>CS 9600 Point-to-Point with 4 channel mux</td>
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<td>#21505</td>
<td>CS 4800 Fast Poll Multiport</td>
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<td>CS 9600 Fast Poll Multiport</td>
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**Leased Line Modems**

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<td>LSI 4800 Point-to-Point</td>
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<td>#22992</td>
<td>LSI 9600 Point-to-Point</td>
<td>9600 bps</td>
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</tr>
<tr>
<td>#23092</td>
<td>LSI 9600 Fast Poll Multiport</td>
<td>9600 bps</td>
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<td>#24002</td>
<td>MX 2400 Standalone DDE Dual Dial Restoral</td>
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**Dial Modems**

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</thead>
<tbody>
<tr>
<td>#24044</td>
<td>MX 2400 Dial</td>
<td>2400 bps</td>
<td>$315</td>
</tr>
<tr>
<td>#40209</td>
<td>22A Data modem</td>
<td>2400 bps</td>
<td>$295</td>
</tr>
<tr>
<td>#40259</td>
<td>2213 ACU modem</td>
<td>2400 bps, auto-call</td>
<td>$325</td>
</tr>
</tbody>
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ON OCTOBER 8, WE FOCUS ON OFFICE AUTOMATION

It doesn't take a lot of insight to recognize that office automation has changed radically over the last 15 years. Typewriters are rapidly becoming obsolete. Telexes are being replaced by modems. Laser technology is finding its way into the front office.

In October's Computerworld Focus, we'll offer information on planning, product selection, technology alternatives and system implementation plans from expert users and industry analysts.

We'll look into the future to see what's in store. And we won't just look at products, but vendors, too. Complete with inside information on their evolving product paths.

Then we'll zero in on the information center.

Within the automated office the concept of the information center is paying dividends. In October, our special section will examine the IC's changing role, and the new ways MIS/DP professionals and end users are working together toward the productivity increase goal. We'll talk with an info-center manager for a firsthand view of the new functions the IC is providing. And finally, we'll profile some major IC sites, their functions and technologies.

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So if office automation is your business, you can reach your audience effectively — and efficiently in the October 8 issue of Focus.

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For more information, contact Ed Marecki, Vice President/Sales, Computerworld Focus, 375 Cochituate Rd., Framingham, MA 01701-9171, (617) 879-0700. Or call your local Computerworld sales representative.

Issue: October 8 - Closing: August 29
Intel announces layoffs, shutdowns

Intel Corp. announced layoffs totaling 1,320 employees at two California manufacturing operations. The chip maker will close its Barcelon-a, Calif., Microtek Storage subsidiary, consolidating most manufacturing of its Winchester hard disk drives in Singapore, according to a Tandon representative.

Tandon says it anticipates a "substantial net loss" for the quarter ended June 29.

Harris Corp. split its Information Systems Sector into two sectors in order to "increase market focus and improve operating results," a spokesman said.

The Systems Sector was formerly a combination of the Business Information Systems Sector, now spun off and renamed the Lanier Business Products Sector, and the Information Systems Sector, which includes the five product and marketing divisions as before, the company said. No changes in product strategy or marketing efforts are anticipated, and no layoffs are expected, the company said.

Convergent Technologies, Inc. said it will acquire two Uccel Corp. divisions selling to the accounting market. For $28.5 million in cash, Convergent will buy Uccel's Pennsylvania, Fla.-based Digital Systems Division, which supplies turnkey systems, and Open Systems, Inc. of Minneapolis, a Uccel supplier of microcomputer accounting software.

Since last November, Convergent Technologies has also acquired vendors of turnkey systems to the legal and dealer/distributor vertical markets.

Separately, Uccel said its income from continuing operations rose 55% to $3.3 million, or 19 cents per share, for the second quarter ended June 30. Revenue increased 15% to $38 million.

In a move that will result in the layoff of 226 employees and the furlough of 270 more, Tandon Corp. announced it will discontinue operations at its San Jose, Calif., Microtek Storage subsidiary, consolidating most manufacturing of its Winchester hard disk drives in Singapore, according to a Tandon representative.

Tandon says it anticipates a "substantial net loss" for the quarter ended June 29.

DEC licenses VAX to Raytheon

DEC announced that Raytheon will rebuild and market its VAX computer systems, according to a Raytheon representative. Raytheon will run under DEC's VAX VMS operating system, and they will support all of DEC's existing VAX software, according to a DEC spokesman.

The resulting computer family will consist of several VAX processor configurations, each supporting high-performance military and commercial I/O channels.

The units will run under DEC's VAX VMS operating system, and they will support all of DEC's existing VAX software, according to a DEC spokesman. Units are expected to be available in 1988. All of DEC's VAX software will be sold through Raytheon for the military systems customers, Stowell said.

Some of the new system's circuitry will be manufactured by Raytheon's Microelectronics Center in Andover, Mass., a $37 million unit opened last year to build very high-speed integrated circuit MOSIC chips.

VAR sues Burroughs over printer

By Clinton Wilder

TAMPA, Fla. — A Tampa-based value-added reseller has filed a $40 million federal lawsuit against Burroughs Corp., alleging that Burroughs fraudulently misrepresented the capabilities of its 9290-30 laser printer.

Plaintiff Megacom, Inc., seeking $10 million in actual and $30 million in punitive damages, claims the product "cannot produce the 750,000 impressions per month promised by Burroughs and that the impression quality is "deplorable.""

Megacom President John Nelson said his company essentially staked its future on reselling the 9290-30 and now faces severe financial pressures because the product does not perform as promised by Burroughs. We went public in June 1986 and included assertions of sales and representations in our prospectus as the "central focus of our business plan," Nelson said. "Now we're finding out that the assertions that they took on the printer's capability and speed. We have found the printer "far from being a substantial part of the market.""

A spokeswoman for Detroit-based Burroughs said the vendor has not yet reviewed the suit and declined to comment.
### Computerworld stock trading summary

#### Closing prices, Wednesday, August 6, 1986

<table>
<thead>
<tr>
<th>Stock</th>
<th>Sector</th>
<th>Price</th>
<th>Change</th>
<th>Percent Change</th>
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#### Computerworld stock trading index

<table>
<thead>
<tr>
<th>Date</th>
<th>Index</th>
<th>Closing Value</th>
</tr>
</thead>
</table>

*Note: The index values are approximate and subject to rounding.*

### Computer industry

<table>
<thead>
<tr>
<th>Component</th>
<th>Price</th>
<th>Description</th>
</tr>
</thead>
</table>

*Note: The price values are approximate and subject to rounding.*
Europe criticizes U.S.-Japan accord, fears chip price war

BRUSSELS — The Commission of the European Community has warned that it could take action under international trade regulations against the agreement reached July 31 between Japan and the U.S. on trade in semiconductors.

The commission said it "cannot accept that Japan and the U.S. determine prices to be paid by European users." Officials said action might be considered under Article 23 of the General Agreement on Tariffs and Trade, which are international trade regulations designed to protect trading interests.

The U.S.-Japan accord [CW, Aug. 4] calls for the creation of a monitoring system by which Japan would report price and production data concerning its semiconductor industry to the U.S. Department of Commerce. The U.S. convinced Japan to extend the monitoring system to sales made to "third countries," which would include Europe.

European semiconductor makers complained in July to the commission about alleged Japanese dumping of chips in Europe. European vendors are particularly concerned that semiconductor price fixation in the U.S. will make Europe the site of the next chip price war.

"With a rise in prices on the U.S. market, automatically, there will be a..." she says.

The DG case was initiated by Fairchild and hardware manufacturer Digidyne in 1978 after DG refused to license the RDOS operating system for the manufacture of Nova-compatible machines. The court is giving DG 60 days to comply with the terms of the order.

Dexter Kenfield, an attorney with Gaston Snow & Eyl Bartlett in Boston, says the case will require vendors to carefully structure their software and hardware sales. "Everyone is going to continue to look at their marketing arrangement to see if they pass muster in light of this decision," he notes.

Patel's decision also requires DG to make its software available on nondiscriminatory terms to all qualified applicants and to make its line of Eclipse software products available with non-DG hardware. Some observers say the "qualified applicants" wording could have critical marketing implications in the industry.

"It may shelve the decision of the companies to see who they do business..." See DG page 116

DEC licenses VAX to Raytheon, strengthens stature in military market

By Donna Raimondi

LEXINGTON, Mass. — Digital Equipment Corp. moved to increase its sales in the military market last week by signing a licensing agreement with major defense contractor Raytheon Co.

Raytheon will use DEC's VAX technology to produce computers for military use, with DEC receiving license fees plus royalties on sales. DEC has a similar licensing arrangement with Norden Systems, Inc. of Merrimack, N.H., which has been building military systems with DEC equipment for about 10 years.

"We do a considerable amount of government business now," a DEC spokesman said. "The Raytheon deal will increase our exposure in the military marketplace." Under terms of the licensing and technology transfer agreement, Raytheon will obtain DEC's VAX computer and chip technologies, including the proprietary VAXB1 bus technology, along with DEC's Ada language. Ada is the only language that meets the Department of Defense's critical software requirements, Raytheon said.

Although DEC and Raytheon refused comment on the dollar value of the arrangement, the license fees are reportedly minimal. However, DEC has the potential to gain considerable revenue from royalties on Raytheon's sales to the military.

A Raytheon spokesman said the

Ford falls prey to fist of FUD

FUD is back in the news. Not Elmer's last name, but the oft-used acronym meaning the fear, uncertainty and doubt that corporations experience when considering the purchase of non-IBM computer equipment. FUD does not seem to be dissipating as rapidly as some Big Blue competitors would like to say it is.

Ford Motor Co.'s recent selection of IBM as the designated supplier to its North American operation, for which at least $300 million worth of office automation products and services will be purchased over the next five years...[CW, July 28], serves as a striking example of FUD in action.

After invoking a 90-day moratorium on the purchase of computer equipment in April, Ford asked its three largest suppliers — IBM, Digital Equipment Corp. and Wang Laboratories, Inc. — to submit proposals to overhaul its entire North American operation's office automation and communications scheme. The operation was suffering from a weighty problem: Computer systems, purchased by its numerous departments from a variety of vendors, were incompatible and could not communicate with one another except over the crudest of bridges.

Ford hoped that, by selecting one vendor for its products spoke in a like tongue, it could bring effective data communications to an operation that, in many ways, resembled the Tower of Babel.

In evaluating the three proposals... See FORD page 95

Alper is Computerworld's Mid-Atlantic correspondent.
Some say that the major factor influencing your DBMS decision should be adherence to a true implementation of the relational model. Others advocate application development and production database capabilities. Some promote migration capabilities and others promote a 3-schema architecture and referential integrity.

While each argument has its merits, we wonder why a prospective DBMS buyer must choose between which of these functions are important to him when he can have them all in one product. CA-UNIVERSE offers a practical implementation of the relational model, a true 3-schema architecture, procedural and non-procedural application development capabilities and advanced migration facilities. The others, each has its strengths, each has its weaknesses. But none will fulfill all your needs like CA-UNIVERSE.

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