Professional Press Publication

HP Professional

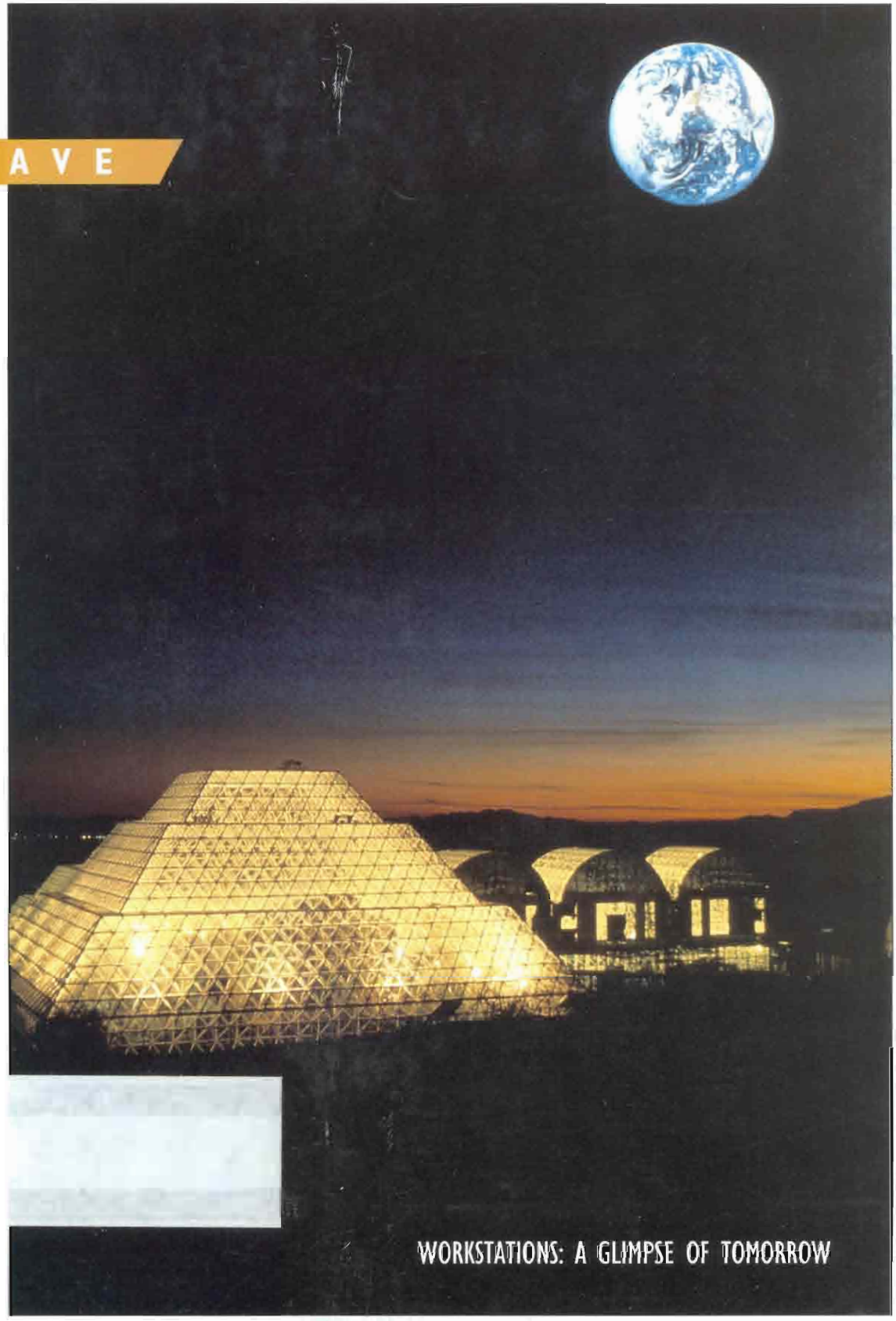
THE INDEPENDENT MAGAZINE FOR NEWWAVE COMPUTING ▲ VOL.5 NO.9

SEPTEMBER 1991 ▲

NEW WAVE

Workstations And PCs

- RISC Architecture: A Blueprint For Better Buying
- X Windows Opens Doors For MIS Managers
- Object-Oriented Programming Earns High Marks With C++
- Workstations Brave Antarctic Winds To Assess The Planet's Future



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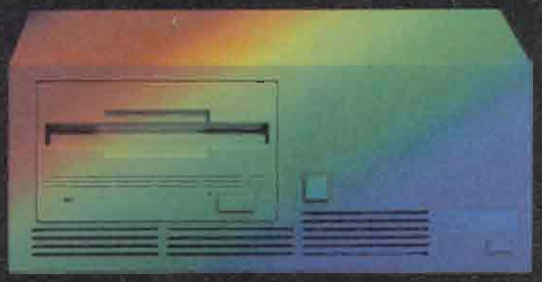

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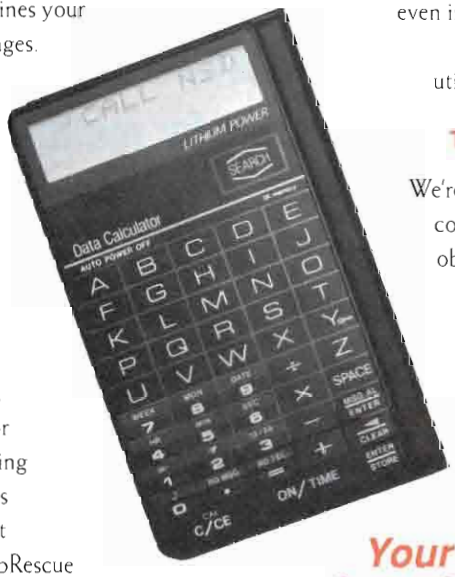

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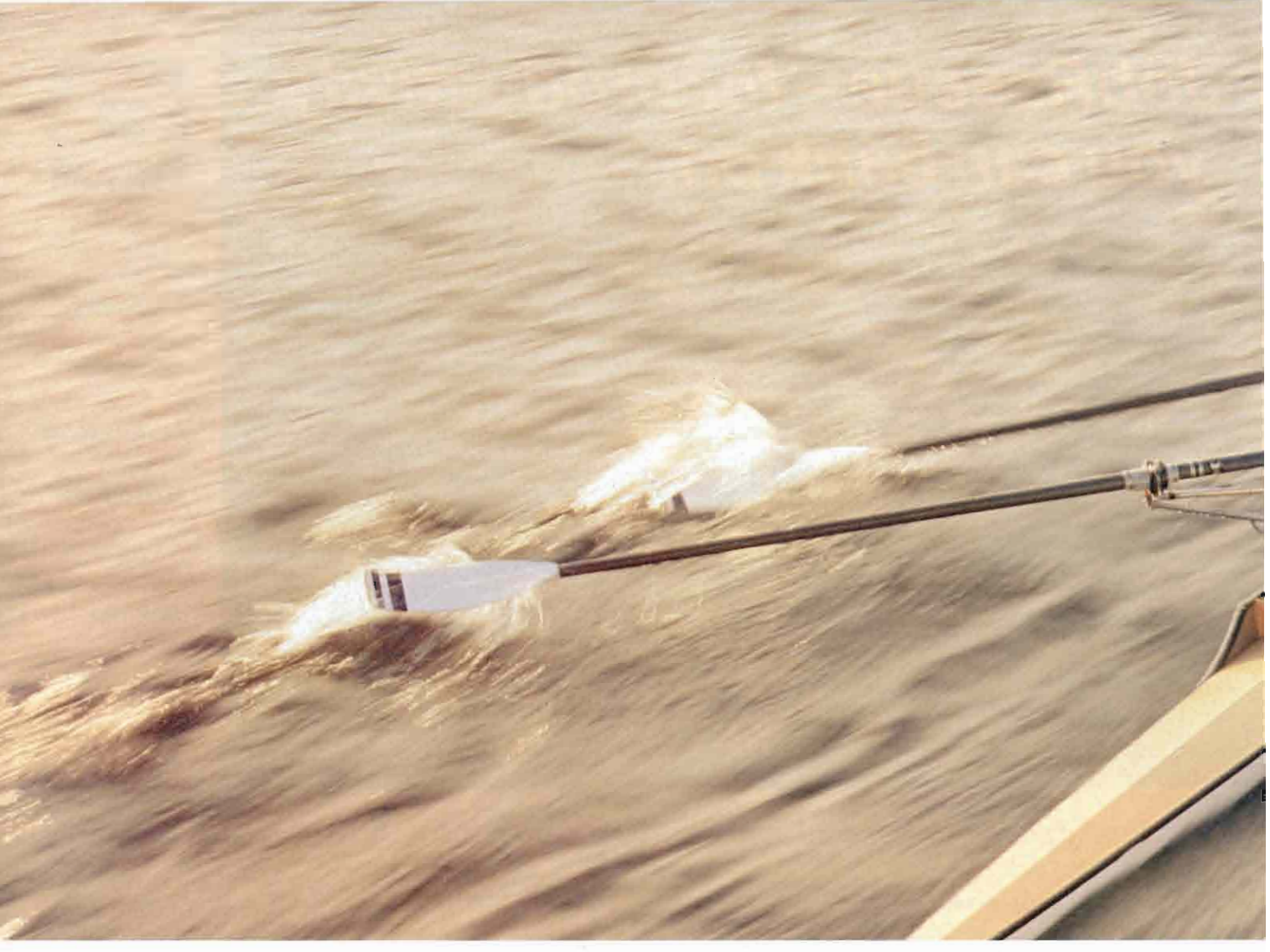

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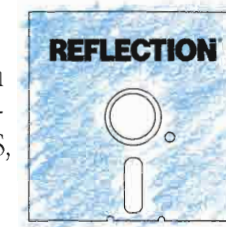

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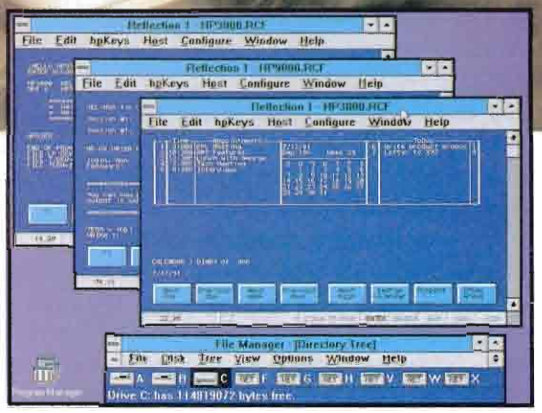

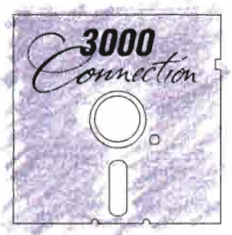

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The Choice Is Yours

By Don Marks

Any industry analyst in attendance at this year's INTEREX/ADUS show in San Diego would have to agree that HP at present sits in the catbird seat. What we witnessed by the California surf was something like a mild apotheosis. Exactly one year after a conference that was marred by miscommunication — and decidedly disconcerting to many of its attendees — HP brought its installed base a clear message of good faith and continued support. Perhaps the differences between this conference and the last could best be expressed by describing the weather. Last year, Boston was unseasonably cold, rainy and changeable. This year, San Diego was blissfully warm, placid and serene.

Just When You Thought It Was Safe...

Like the clement waters of the San Diego bay, however, the computing industry waters—including HP's newly pacified installed base—still harbor some big gray battleships. These primarily take the form of HP's competitors: IBM, Sun and DEC. Believe it or not, those old guys still lurk out there. Their sales may be drooping; their margins may be falling; they may be circling the wagons in all sorts of consortiae; but shark-like they wait for more sanguine markets to attack.

Historically, it has been difficult for HP to compete with the long arm of IBM's sales and marketing apparatus and the fanatical adherence of DEC devotees to VAX/VMS. Likewise, despite aggressive marketing, commitment to open systems and the hottest boxes in workstation history, HP has yet to unseat Sun as the number one workstation vendor in the public mind. But things are changing.

Glenn Osaka, marketing manager for the HP 3000, happily reports that the company is having very strong success at the high end of both the 3000 and 9000 lines. According to Osaka, these gains are being made at the expense of IBM, but also DEC. HP 3000 systems, he claims, are an enticing alternative to expensive IBM mainframe upgrades. For customers in search of improved performance, it's much more cost effective to offload an application or two to an HP 3000 than it is to spend $15 million on a mainframe cpu upgrade. Performance is improved, money is saved and the first step away from mainframes and from IBM is taken.

On the workstation side, HP's nemesis has been and—at least for the short term—will continue to be Sun, the company which Bill Murphy, director of marketing for HP networked systems, has cleverly dubbed, "the dark side of the Force." But truth be told, Sun may have darkened for other reasons than its bad attitude about open systems. Rumors abound that the SPARC architecture has burned out. If many Sun worshippers jumped ship when the Series 700 debuted, still more will go the HP way if long-awaited SPARC 3 disappoints.

With Sun's future looking cloudy, HP's primary workstation competitor could turn out to be IBM. In this match up, HP has several things in its favor, first and foremost being a long history with UNIX. For many in the workstation and commercial UNIX markets, Big Blue's interest in marketing AIX developed suspiciously late in the game. Another advantage for HP is code compatibility across its RISC workstation and UNIX multiuser lines. Until IBM positions the RS/6000 as a commercial system competing against its own AS/400 line, the once jolly blue giant can't offer this degree of flexibility.

A Smaller, Gentler Giant

Just last year, the usually prescient Gartner Group declared that HP's chances of emerging successful from the '90s open systems game were an iffy 50-50. Clearly, to judge from the last six months of press-choking hardware introductions and the company's revamped commitment to software and support, all previous bets are off. HP is a giant reborn.

More and more, the HP divisions with their different market segments, product lines and customer profiles look like subsidiaries of a huge multinational conglomerate. They all use the same logos, but each part of the organization earns its own keep and justifies its own future. The divisions are focused directly on the competitors within their market segment—not on HP's profit margins overall. What's more, in true, open systems, one-from-column-A-and-two-from-column-B fashion, HP supports and encourages a veritable supermarket of third-party solutions.

In short, unlike IBM or other vendors, HP isn't afraid to compete against itself or against anybody else. Although in one sense, open systems opens up a chasm of uncertainty—it is, after all, the polar opposite of single-vendor security—it will drive technology innovation in the '90s. Customers must decide for themselves, depending on their needs, what platforms they want to support and how much bargain hunting they can afford to do. Thankfully, in the HP market, the choice is yours.

Don Marks

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INDUSTRY WATCH

Bill Sharp

The Follow Through

Yo! Database dudes! Client-server sorts! Close on the heels of its announcement of new HP 3000 systems, HP at the San Diego INTEREX show raised the stakes for client-server database applications by:

- Pulling the wraps off four 4GL CASE tools and one 3GL CASE tool for developing ALLBASE database applications on HP 3000 systems.
- Introducing HP ALLBASE/SQL PC API, a PC software product that allows PC applications to connect with HP ALLBASE/SQL.
- Announcing three third-party client-server solutions for specific HP 3000 vertical market applications.

With its latest zippy new HP 3000 systems out the door, HP seems bent on following up with new tools to quickly get everyone's applications happily humming on one HP 3000 Nova or another.

"HP on the 3000 has a broader range of client-server development tools than any other vendor in the midrange," croons Adam Polson, client-server product manager for HP's Commercial Systems Division (HP 3000 products). "We captured the leading tools in the industry, and some real up and comers, too."

Polson's colleague Warren Weston, another CSD client-server product manager, adds, "If somebody is looking for client-server applications they can purchase today, they should look to HP. Vendors are committing to HP before DEC or IBM. That's significant and it's due to our commitment to open systems."

Getting a jump on the competition with the availability of these database tools may be significant. The HP 3000 now, and soon the HP 9000, will have this array of tools to make it easier and faster to get applications up and running. Weston says applications can be completed with one-tenth the effort that used to be required for a client-server database, "And I've heard results even better than that."

HP clearly hopes making the job simpler will pull new applications onto HP systems first and encourage downsizing by making the transition to money-saving HP gear even easier.

HP On The CASE

You have to believe that given the price/performance HP offers on 3000 and 9000 systems that lots of software folks are looking very seriously at moving their products to HP platforms. That means software developers need to get their hands on development tools to speed the process. They want to get the job done without having to hand-code the whole mess, and these new CASE tools are meant to be just the help they need.

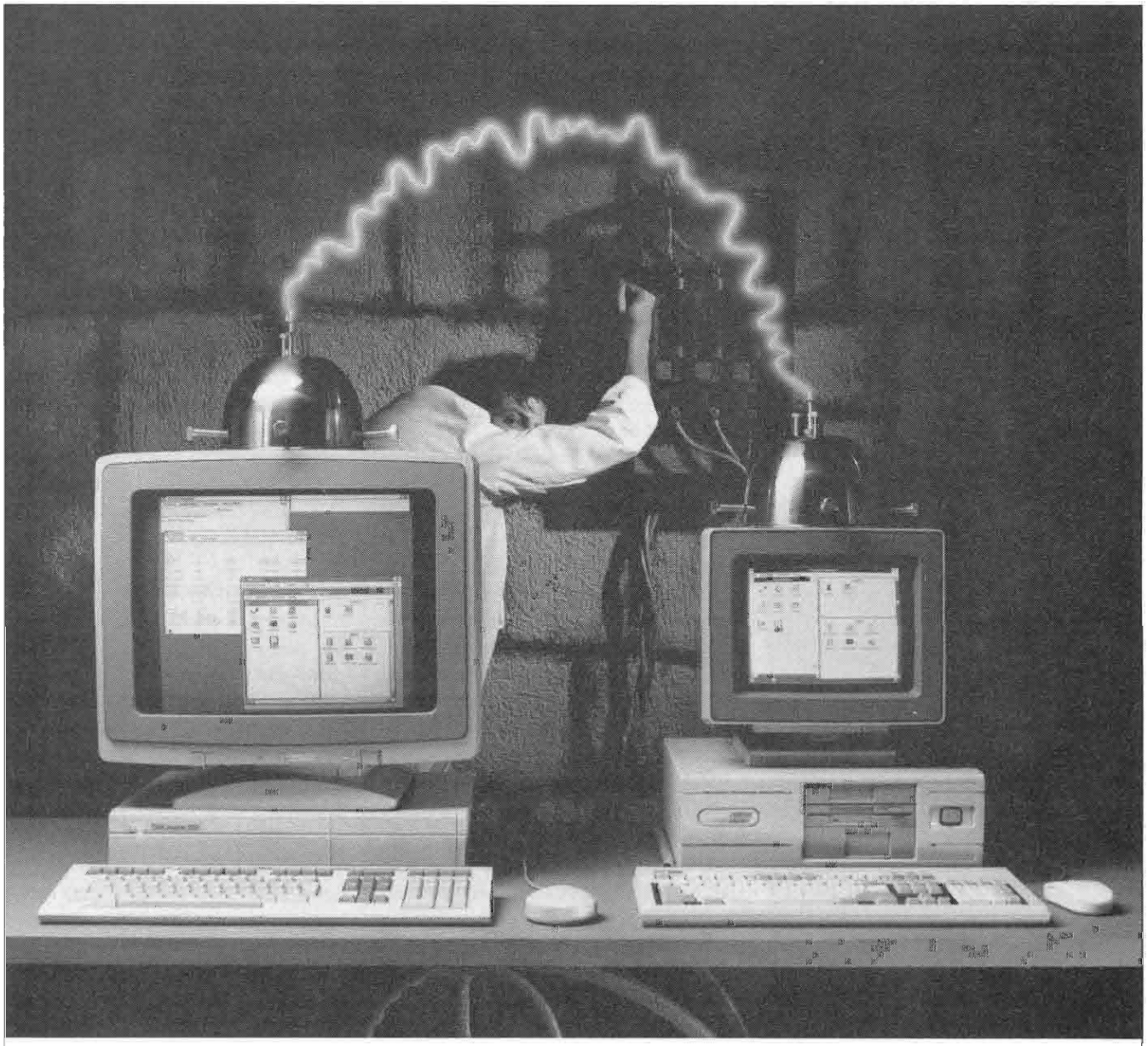
The new tools include:

- PowerHouse, Cognos—This is the

TABLE I

4GL Tools	Avail.	Price	User Interfaces Supported For ALLBASE/SQL	Networks Supported For ALLBASE/SQL	ALLBASE/SQL Support	TurboIMAGE Support	KSAM Support
Gupta SQL SQL Windows	Dec.	$1,295 per Programmer	MS Windows	NetWare, TCP/IP	Yes	ATC	No
Powersoft PowerBuilder	Dec.	$1,995-$2,995 per Programmer	MS Windows	NetWare, TCP/IP	Yes	ATC	No
Cognos PowerHouse	TBA Fall	TBA Fall	MS Windows	TCP/IP, Serial	Yes	Yes	Yes
INGRES/ Windows 4GL	Now	$9,000-$91,000 per Server	Motif	TCP/IP	Yes	ATC	No
3GL Tools	—	—	—	—	—	—	—
JYACC JAM/XL	Now	$3,260-$17,330 per Server	MS Windows Terminals, Motif	TCP/IP, Serial	Yes (December)	Yes	Yes

Open Client-Server CASE Tools. (ATC refers to HP's ALLBASE TurboCONNECT product.)



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CIRCLE 267 ON READER CARD

most widely used database development product for software to be used on ALLBASE/SQL and TurboIMAGE databases. It's compatible with DEC and IBM systems, and uses the MS-Windows user interface. It supports TCP/IP and serial networks for ALLBASE. Final price and availability were scheduled for announcement this fall. This product reportedly allows upgrading without reprogramming applications. HP proudly points out that the PowerHouse CASE tool will be available on the HP 3000 before it reaches either DEC or IBM systems.

■ SQL Windows, Gupta Technologies—Based on Microsoft Windows 3.0, this product provides a complete development environment for producing multivendor databases. Gupta uses the MS-Windows user interface, supports NetWare and TCP/IP networks. It provides support for ALLBASE/SQL and access to TurboIMAGE through ALLBASE TurboCONNECT. Available in December and priced at $1,295 per programmer.

■ INGRES Tools, Ingres Corp.—Customers using UNIX-based systems will find this a simplified programming interface that provides compatibility with many UNIX systems, as well as with DEC and IBM systems. INGRES uses the OSF/Motif user interface and supports TCP/IP networks. It supports ALLBASE/SQL and provides access to TurboIMAGE through ALLBASE TurboCONNECT. INGRES is available immediately and is priced at $9,000 to $91,000 per server.

■ PowerBuilder, Powersoft Corp.—Avoid all reprogramming, so I hear, by using this graphical product, which "paints" applications. It uses MS-Windows as its user interface, and supports NetWare and TCP/IP networks. Powersoft Power-Builder supports ALLBASE/SQL and provides access to TurboIMAGE through ALLBASE TurboCONNECT. It's available in December 1991 and is priced at $1,995 to $2,995 per programmer.

■ JAM/XL—This is the new 3GL CASE tool. JAM/XL uses MS-Windows and Motif user interfaces and supports serial and TCP/IP networks. It will support ALLBASE/SQL as of December 1991, and provides access to TurboIMAGE through ALLBASE TurboCONNECT. It is available immediately, priced at $3,270 to $17,330 per server.

Savvy Solutions

In addition to CASE tools, HP also stoked the client-server fires with several new third-party applications. Introducing these products now puts HP ahead of its competition in offering fully functional third-party client-server solutions, and the word is there's plenty more to come. The three client-server applications HP announced at INTEREX include:

■ Collier-Jackson—an accounting and human resources package and functions in both client-server and host/terminal modes.

■ Oracle Financials—accounting and management applications integrated for use across industries.

■ Datalogix—a specialized application for integrated business and manufacturing operations to determine planning solutions for process requirements. ■

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Ste. 100E
Burlington, MA 01803-5164
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3707 W. Cherry St.
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Datalogix Formula Systems Inc.
100 Summit Lake Dr.
Valhalla, NY 10595
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Gupta Technologies Inc.
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Menlo Park, CA 94025
CIRCLE 316 ON READER CARD

Ingres Corp.
P.O Box 4006
1080 Marina Village Pkwy.
Alameda, CA 94501
CIRCLE 315 ON READER CARD

JYACC Inc.
116 John St., 20th Fl.
New York, NY 10038
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Oracle Corp.
500 Oracle Pkwy.
Redwood Shores, CA 94065
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-- Mark Rossi, Food Engineering Corp.

PlotMI™ prepares HP Model Interface (MI) files for plotting on HPGL compatible output devices without having to load ME10 or ME30:

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- PlotMI runs *in the background*, does not tie up a workstation while plotting
- Provides advanced control over drawing content and page layout
- Layout multiple drawings on a single output page
- Plotting can be performed from any workstation or ASCII terminal
- Can batch process multiple drawings with a single command
- Works with the ME10 spooler and the lp spooler
- Produces long axis plots
- Customizable to use your plotter's special features
- Uses your own fonts as well as those supplied with ME10/ME30

"PlotMI and PlotMIUtil are the key to our engineering drawing reprint system. This software works, it works fast, and is easy to implement!"

-- Karl Eliason, H-C Industries

PlotMIUtil™ prints ME10/ME30 MI files on any model HP LaserJet, PaintJet, and DeskJet printers, or on a Postscript-capable printer:

- A single copy of PlotMIUtil can serve the printing needs of an entire site
- Runs stand-alone, or seamlessly integrates into any PlotMI script, HP-UX shell script, or lp spooler script
- Compresses all output data for faster downloading and printing
- Prints drawings faster than pen plotters
- Drawings may be printed on A or B size media (LaserJet 2000, PaintJet XL and Postscript capable printers support the larger media size)
- Offers extensive user control over line style, pen color and pen width

"The Drafting department uses PlotMI and PlotMIUtil extensively to produce rapid A-size check plots on a LaserJet. This saves time and money because the plot is generated in the background, allowing our draftsmen to continue working, and the output is sent to an unattended device using cheap bond paper. PlotMIView provides our Quality Control inspectors with instant access to these latest drawings."

-- Richard Barnes, M/A-Com, Inc.

PlotMIView™ displays ME10/ME30 MI files on the VGA, EGA, or CGA display of a personal computer, or on the graphic display of an HP 9000 Series workstation:

- Single keystrokes allow navigation, zooming, and panning
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- WYSIWYG: drawings appear on the display exactly as they would if plotted on paper by PlotMI
- Extremely fast display
- Low cost PC hardware may be used for view-only work
- Runs on any PC compatible, and laptops for portable *in-the-field* viewing
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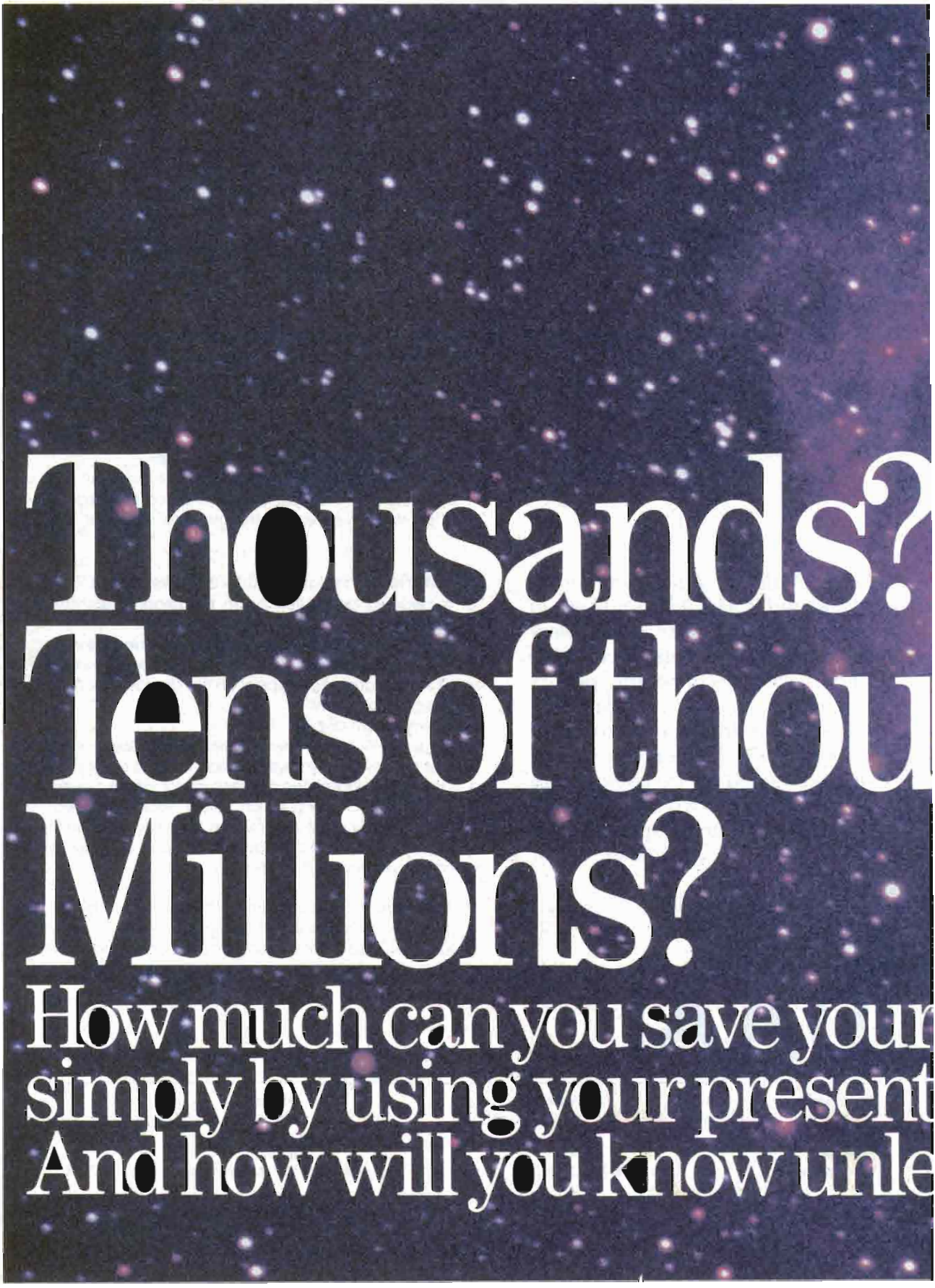
CIRCLE 461 ON READER CARD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Millions?
How much can you save your
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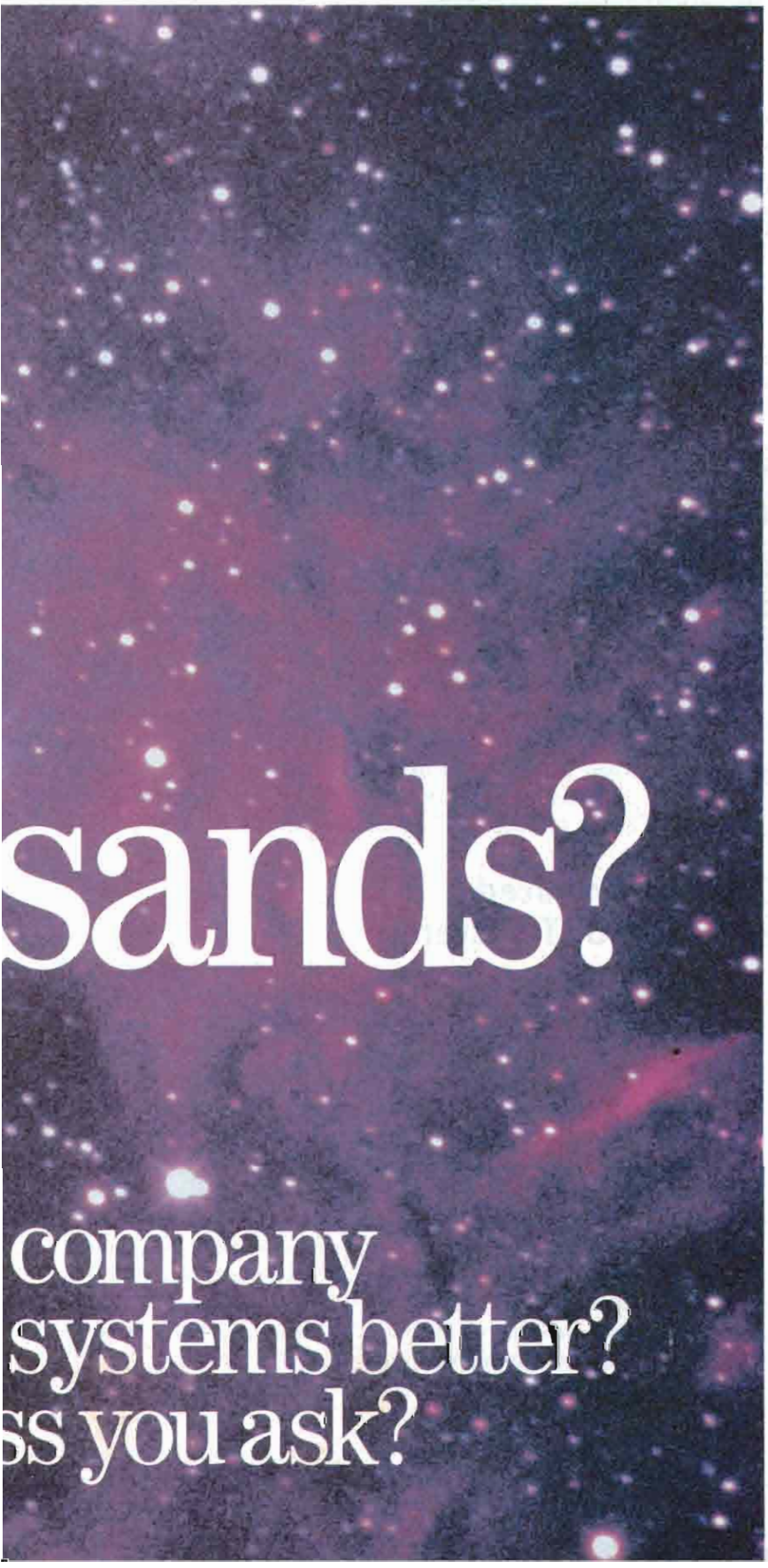
And how will you know unle



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HP Introduces SCSI-2 Mass-Storage Systems

New High-Performance Models Designed For HP Workstations And Multiuser Systems

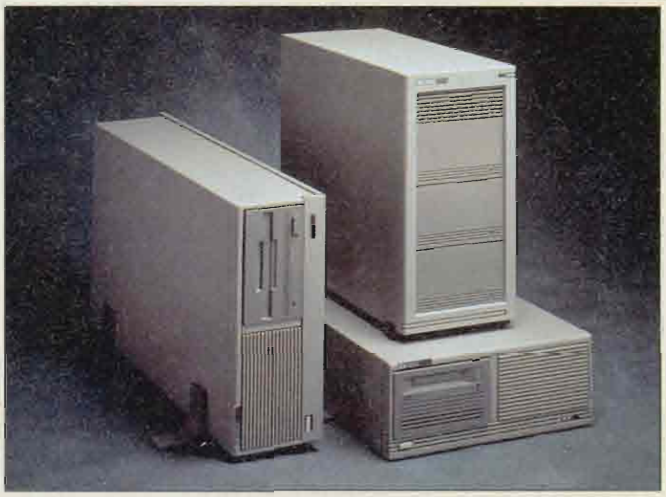
HP introduced two families of high-performance small-computer-systems interface (SCSI-2) mass-storage systems: one for HP Apollo workstations and one for HP multiuser systems.

These products offer a base configuration of a disk drive or digital audio tape (DAT). The enclosure allows the addition of mass-storage devices including: additional hard disk drives; DDS-format DAT drives; CD-ROM devices; and rewritable optical disk drives.

Models 670SE, 1350SE and 1350S are mass-storage systems with a base configuration of one hard disk drive, power supply and space for additional mass storage: DAT, CD-ROM, rewritable optical or hard disk drives. These products offer increased storage capacity, backup and data interchange. They are also compatible with the HP Apollo 9000 Series 400 and 700 workstations and the HP 9000 Series 300 workstations.

Models 670SX and 1350SX were designed for HP Apollo 9000 Series 700 workstations. The Models 670SX and 1350SX feature a 10-MB differential SCSI-2 interface, that offers superior I/O performance.

Benchmark results for the Models 670SX and 1350SX demonstrate up to 8 MB system throughput in commonly tested configurations. With storage capacities of 677 and 1,355 MB in the base configuration, these expandable disk-only models can be upgraded to more than 4 GB of storage capacity per cabinet; and up to 38 GB on the HP Apollo 9000 Model 750.



The HP Series 6000 Models 420F, 420R, 670F, 670R, 1350F, 1350R, 1300D F and 1300D R are the new SCSI-2 multidevice mass-storage family for multiuser systems. These models are for the HP 3000 Series 900 and HP 9000 Series 800 business systems and servers. The models also will be compatible with future versions of both computer families with updated operating systems. These products offer power-fail recovery to achieve high data availability.

FUSION TCP/IP Distributed On HP-Based CONSORT System

Network Research And Becton Dickinson Combine Efforts For CONSORT 32 Users

Network Research signed an OEM distribution agreement with Becton Dickinson Immunocytometry Systems (BDIS; San Jose, CA). By bundling Network Research's FUSION network software with its CONSORT 32 cell analysis systems, BDIS provides its users on the HP 9000 Series 300 CONSORT 32 workstations access to virtually every computer system to which they are networked. These systems can include HP-UX, Sun Microsystems and other UNIX systems, VAX/VMS systems, IBM PC and Apple Macintosh.

Under the agreement, BDIS will add FUSION Network Software to its CONSORT 32 analysis system. The CONSORT 32 is a computerized system based on the HP 9000 computer running PASCAL and BDIS proprietary software. The system is designed to provide physicians and researchers with data on diseases such as cancer and AIDS. BDIS will resell the FUSION software under the name of FACSNet as an option to CONSORT 32 users.

Contact Network Research, 2380 N. Rose Ave., Oxnard, CA 93030; (805) 485-2700.

Circle 372 on reader card

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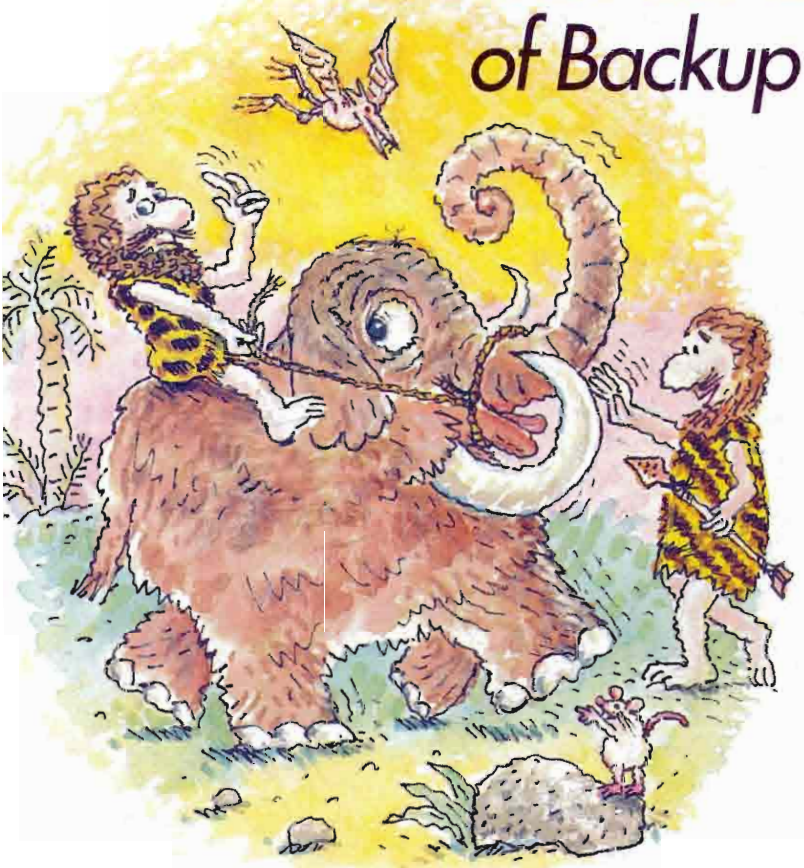
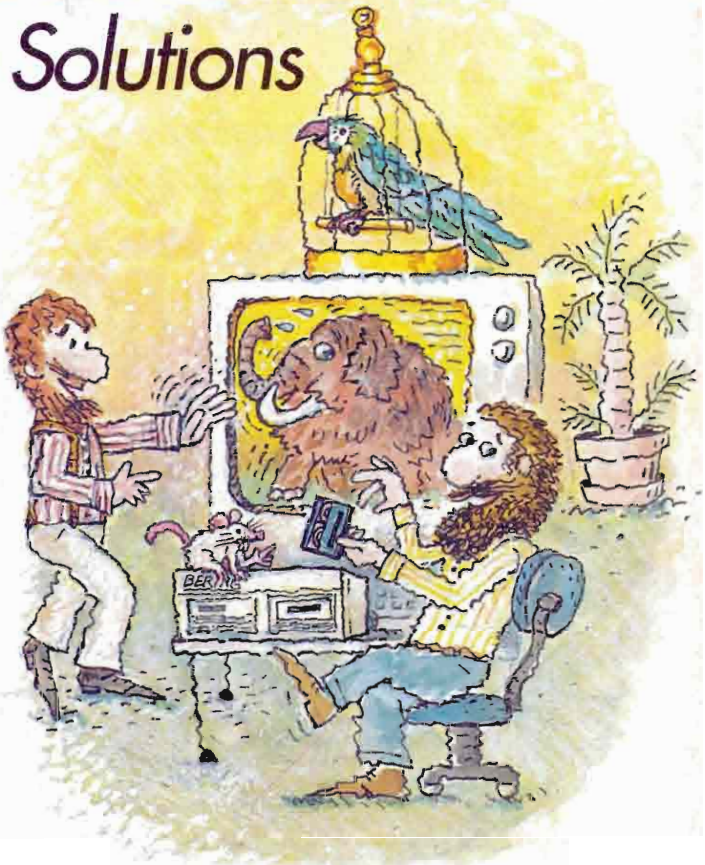
of Backup Solutions



Eeeeek! Trying to backup a mammoth database used to be a task of historic proportions.



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CIRCLE 105 ON READER CARD

HP Launches MICRO 3000 Upgrade Plan

Performance Improvements And Trade-In Values Entice MICRO Users To MPE XL

Guaranteeing vast performance increases, HP at the INTEREX show in San Diego announced a special incentive for MICRO 3000 users to migrate to new HP 3000 MPE XL systems. The program, which expires January 31, 1992, promises to provide MICRO 3000 users with minimum performance improvements of five to 10 times their current performance levels.

HP's Carol Robertson, program manager for the HP 3000, also emphasized that migration from MPE V to MPE XL is one of the easier platform migrations in the industry. Users simply store MPE V/E applications and restore them to MPE XL. The applications then can be run, without recompiling, in MPE XL Compatibility Mode. Conversion to Native Mode is not required to achieve the improved performance levels. HP is also backing this claim with a guarantee for the MICRO 3000 upgrade promotion. If for any reason users "cannot continue with daily processing within one day of system installation," HP promises to take the XL system back at no charge to the customer.

Thanks to price/performance advantages of the new Nova systems (the HP 3000 9x7 Series), HP says, customers may want to exchange multiple MICRO 3000 systems for a single system. In addition to the MICRO 3000 trade-in program, HP also instituted trade-in credits of up to $1,000 for other MICRO 3000 systems, disk drives, tape drives and communications ports. Also, according to HP, flexible service options can bring users an additional $1,000 to $3,000 dollars in credits and discounts. These service options include: additional system return credits, one year free BasicLine, six months free ResponseLine, five hours free HP SE consulting, free training for one person and a free Series 700 terminal.

Upgrade Example: MICRO 3000 GX To HP 3000 Series 927LX

Hardware And Credits	Price
Series 927LX (Turbo-only Option)	$22,000
1.3 GB Additional Disk	5,000
DTC	2,830
Ports (3)	6,000
MICRO Upgrade Credit	-1,000
Disk Trade-in	-250
Tape Trade-in	-200
ATP Trade-in	-200
Service Option - System Training	-1,120
Service Option - Additional Return Credit	-1,000
Total	**$32,060**

HP's OpenMail Ported To IBM, DEC Platforms

The year-and-a-half old relationship between HP and Uniplex, which underscores the maturity of the X.400 standard, has yielded new UNIX versions of HP OpenMail. The companies said they are currently working to establish HP's OpenMail as the de facto industry standard for multiple-platform E-mail messaging.

The agreement concerns the technological evolution of OpenMail, a native X.400 mail server that conforms to the CCITT/ISO 1984 specification. Uniplex, a supplier of office automation software, claims that OpenMail is available on more operating system platforms than any other X.400-based product.

Last month, Uniplex said it has ported OpenMail to two prominent UNIX workstations — IBM's RS/6000 and DEC's DECstation 5100 — and that it is planning to port to 20 more platforms over the next year, including AT&T/NCR, Sun, MIPS, Unisys, Sequent and Pyramid.

OpenMail, designed for client-server environments, sits on the X.400 stack of UNIX-based networks. The companies said OpenMail allows users to communicate over both proprietary and public E-mail systems, including those compliant with GOSIP, IBM Profs and Digital's All-In-1.

According to Paul Morgan-Witts, product manager at HP's Pinewood division in Berkshire, England, OpenMail is "open" because:

- It adheres to the ISO X.400 standard protocol formats while also recognizing ARPA TCP/IP sendmail.
- It is already available on a variety of UNIX platforms, including SCO UNIX, PS/2 AIX and HP-UX. OpenMail is the distribution component of HP's NewWave Office product set.
- It includes several "programmatic" interfaces.

"We focus on the server," explained Larry Warnock, Uniplex's director of marketing, "and we like to give third-party gateway builders responsibility for much of the interplatform connectivity." For example, one third-party company has developed an MHS gateway for OpenMail.

The IBM and Digital versions are expected to begin shipping next month. Both the RS/6000 and DECstation 5100 versions will be priced at $325 per user.—*Evan Birkhead, Contributing Editor*

Contact Uniplex, 150 W. Carpenter Fwy., Suite 200 Irving, TX 75039; (214) 717-0068.

Circle 374 on reader card

NOW THAT 10GB FITS ON AN 8MM TAPE, WHAT ARE YOU WAITING FOR?

You don't need to wait hours to change tapes.

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One 8mm tape drive will already deliver more than they promise.

It's the digital CY-8200, now with optional data compression. And you can get it exclusively from Contemporary Cybernetics Group.

With data compression, the CY-8200 can quadruple the amount of data you can load on an 8mm cassette that fits neatly in your shirt pocket. Meaning the already tremendous savings in man hours, media costs, storage and shipping are multiplied by four.

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Apollo	DEC TU/TA81	NCR	Pyramid
Arix	DEC Unibus	Novell	Sequent
AT&T	Gould	PC 386/ix	Sun
Convergent	HP	PC MS-DOS	Unisys
Data General	IBM RT	PC Xenix/Unix	Wang

and more...

Our data compression option allows you to write up to 10 GB per tape at up to 60 MB per minute. Completely unattended.

Of course, the data compression feature is switch-selectable, so you can turn off data compression to read and write standard 8mm tapes.

Plus it's a simple upgrade for the best tape drive built: our CY-8200. Offering a complete range of standard interfaces, a 2-line, 40-column display option, and optional security card encryption. And assuring you of full support and a 12-month warranty from the leader in advanced 8mm helical scan technology.

The CY-8200 with data compression will remain the best value in data storage for a long time to come. So now you've got many good reasons for calling us today at (804) 873-0900 and no good reason for waiting.

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CIRCLE 112 ON READER CARD

HP Introduces Mainframe-Class Printer

New Peripherals And Multiprocessing PA-RISC System Expand High-End Initiative

As part of its strategic program to provide mainframe-class, enterprise-wide computing solutions, HP has introduced a high-end 100 page per minute printer and outlined plans for both a three-way multiprocessing HP 3000 and an ultra-high capacity mass storage device. The new product announcements indicated HP's further encroachment into markets that have traditionally been the province of IBM and other mainframe vendors.

The new printer is targeted at very high-volume printing markets such as direct mail, insurance, manufacturing, government, distribution and other services that produce 200,000 to three million pages of letter-quality output per month. The HP 5000 Model F100 connects directly to all HP 3000 and 9000 systems in a variety of configurations. In client-server environments, it can function as a network print server connected to 3000 or 9000 systems running Novell Netware.

Based on PCL-4, the same language that HP employs in its LaserJet family printers, the Model F100 provides 300 dpi output capable of rendering high-quality graphics. The F100 also supports a variety of widely-available, off-the-shelf, bit-mapped fonts and formatting tools, including many PC-related products designed for the LaserJet series.

In a related announcement, HP also released plans to offer a new mainframe-class PA-RISC system capable of delivering twice the performance of its high-end HP 3000 980/100. The company estimates that the new system, which will be available later this year, will supply performance in excess of 150 transactions per second—tops in the minicomputer industry. However, according to insiders at HP, this is only the first of several mainframe-class PA-RISC systems yet to come. An even higher-performance system, possibly based on Gallium Arsenide technology, could be announced as early as first quarter 1992. Such a system would bring high-end mainframe performance levels to minicomputer systems.

In addition to the multiprocessing system, HP also outlined plans for introducing a mass-storage server based on disk array technology. The server will make use of numerous 5 1/4-inch disks bundled into a single 5-GB disk array device. According to HP, these devices can be deployed in very large numbers to provide hundreds of gigabytes of on-line storage to ensure high-availability for mission-critical applications. HP is expected to announce pricing and availability for this product later this year.

For Your Information

- HP was awarded an OEM agreement to supply optical autochanger mechanisms to Laser Magnetic Storage International. (719) 593-7900.
- Wellfleet Communications has been chosen by BellSouth Telecommunications as part of BellSouth's Switched Multi-Megabit Data Service (SMDS) trials of the Wellfleet routers. (617) 275-2400.
- Frame Technology Corp. announced that its FrameMaker publishing software has been chosen as the documentation standard for the U.S. Army's new light helicopter development program, the RAH-66 Comanche. (408) 433-3311.
- Cadre Technologies announced support of its Teamwork family of CASE products on HP 9000 Series 700 workstations and servers. Pricing starts at $12,000. (401) 351-5950.
- Wind River Systems Inc. was accepted as a member of the X/Open Independent Software Vendors Council. Wind River is the first real-time software company to join X/Open. (415) 748-4100.

Saber Enters Cooperative Agreements With ICS And Object Design

Marketing And Product Integration Strategies Target C Software Developers

Saber Software Inc. announced a cooperative marketing and product integration agreement with Integrated Computer Solutions (ICS) to target C software developers.

The two companies will jointly market Saber's Saber-C programming environment and ICS' Builder Xcesory (BX), a graphical tool for the creation of OSF/Motif-based user interfaces on the X Window System.

In addition, ICS will offer Saber-C integration in the next release of BX. By expanding the View mode in BX to include a Saber-C mode, ICS will allow software developers to toggle back and forth between the two environments to develop and test their entire application.

Saber Software also announced the integration of the Saber-C++ programming environment and the Object Store object-oriented database management system (ODBMS) from Object Design Inc.

This integration gives users the tools they need to retrieve, debug and graphically browse objects in a variety of ways and quickly create database applications.

Contact Saber Software, Corporate HQ, 10 Fawcett St.., Cambridge, MA 02138; (617) 876-7636.

Circle 371 on reader card

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International Insights

VisionWare Targets Japanese Market

Kanji Version Of X Server Available For Distribution By CSK

VisionWare Ltd. announced a distribution agreement with CSK Corp. (Tokyo, Japan) for the X server for Microsoft Windows, XVision.

According to the agreement, CSK will translate XVision's media and documentation to the Japanese Windows environment. CSK will hold exclusive distribution rights worldwide to the Kanji version of XVision. CSK also may sell the English version of the product, but only within Japan.

In addition, CSK will undertake marketing of the product, with the goal of establishing XVision as a core technology within the Japanese OEM market.

Contact VisionWare Ltd., 57 Cardigan Lane, Leeds, U.K. LS4 2LE; (44) 532-304676.

Circle 367 on reader card

Open Software's OpenUI Upgrades Computer Hardware

User Interfaces Look And Operate Like An MS-Windows Display

Open Software Associates (Melbourne, Australia) announced OpenUI, an advanced user interface management system. OpenUI provides professional programmers with a fast and simple means of developing user interfaces for their business applications that can immediately be run on multiple different hardware platforms and display devices, regardless of the graphical windowing system used, and without the need for redevelopment to suit each different GUI. And it does this regardless of the computer operating system for the program language that is used.

A user interface that has been developed with OpenUI will maintain its overall configuration regardless of the display device on which it is used. So, for example, on a PC which uses MS-Windows as its GUI, a user interface developed using OpenUI will look and operate like a typical MS-Windows display. The same user interface, if run on a workstation using OPEN LOOK or OSF/Motif, will look like a typical OPEN LOOK or OSF/Motif display and will function accordingly.

Contact Open Software Associates, P.O. Box 401, 29 Ringwood St., Victoria 3134, Australia; (03) 613-871-1666.

Circle 364 on reader card

Dataproducts' APR Protects The Environment

LZR 1200 Developer Cartridges To Be Recycled

Dataproducts' Imaging Supplies Division, Americas-Pacific Rim (APR) announced an OEM factory program to remanufacture the LZR 1200 series laser printer developer cartridges.

Remanufactured LZR 1200 developer cartridges help protect the environment by reducing solid waste. Each once-used cartridge is inspected, cleaned and filled with new developer. The cartridge is then placed into a new environmentally-friendly package built entirely of recycled cardboard. Each cartridge comes with new main and separator chargers and ozone filter.

The remanufactured LZR 1200 cartridges cost 25 percent less than a new cartridge, and the division will pay $5 for every returned one-time used cartridge.

APR is a part of the worldwide Dataproducts Imaging Supplies Group that consists of two sister divisions: Dataproducts Imaging Supplies Division, Echodata (Norcross, GA) and Dataproducts Imaging Supplies Division, Europe-Middle East-Africa (Dublin, Ireland).

Contact Dataproducts Imaging Supplies Division, APR, 2390A Ward Ave., Simi Valley, CA 93065; (805) 582-4206.

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Acucobol Opens U.K. Subsidiary

ACUCOBOL-85 Market Expanded In United Kingdom Countries

Acucobol UK Ltd. will be the sales and support office for ACUCOBOL-85 to serve the United Kingdom countries of England, Scotland, Wales and Ireland.

ACUCOBOL-85 is used by software developers for portability across nine different systems, including AIX, AOS, MS-DOS, NETBIOS, OS/2, ULTRIX, UNIX, XENIX and VMS—without recompiling.

Other features include help screens, pop-up/pull-down menus and context-sensitive messages. In addition, ACUCOBOL-85 has a Display Window Verb with extensions for boxed, reverse-video and pop-up color windowing features.

Contact Acucobol Inc., 7950 Silverton Ave., Ste. 201, San Diego, CA 92126; (619) 689-7220.

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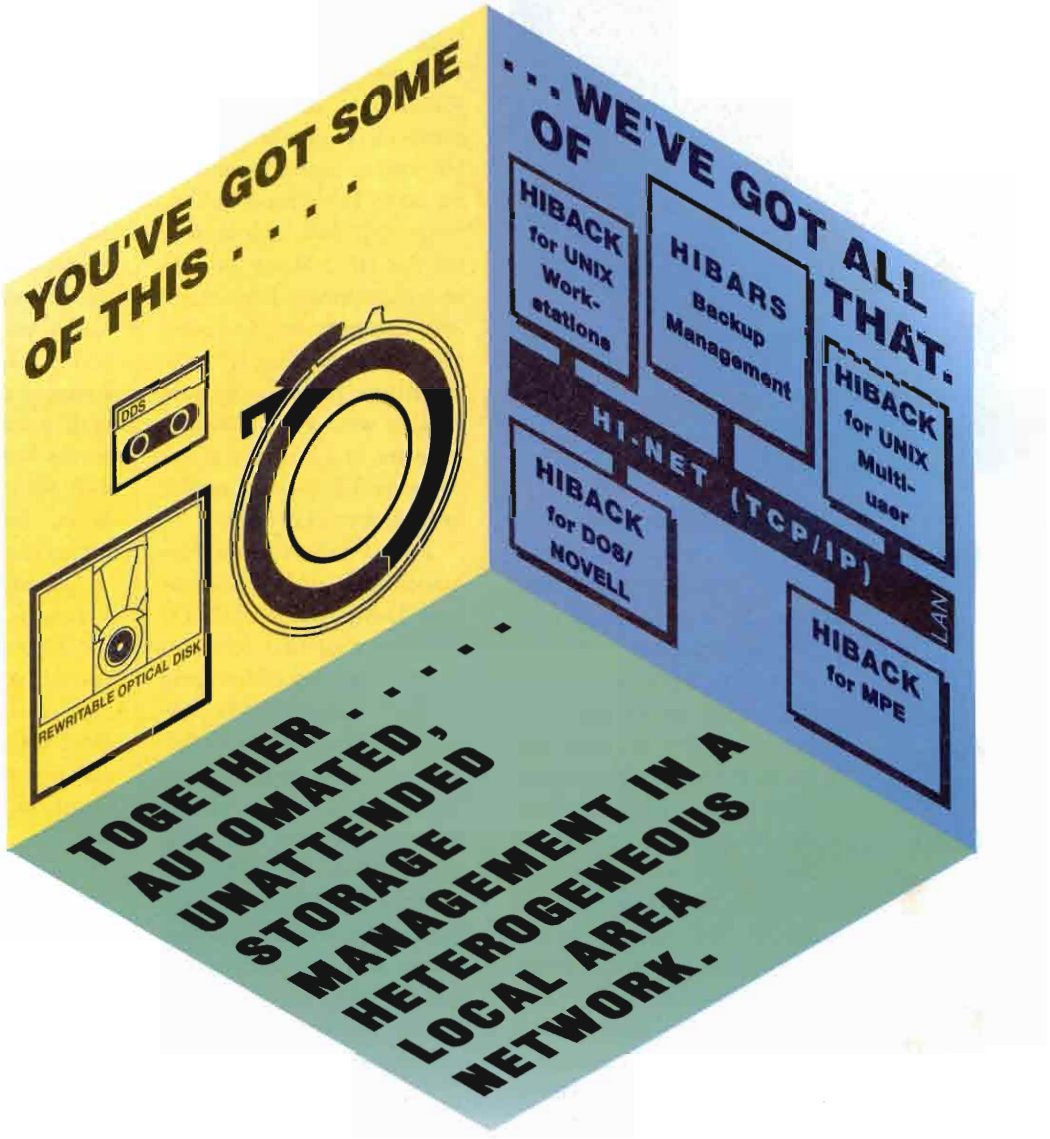

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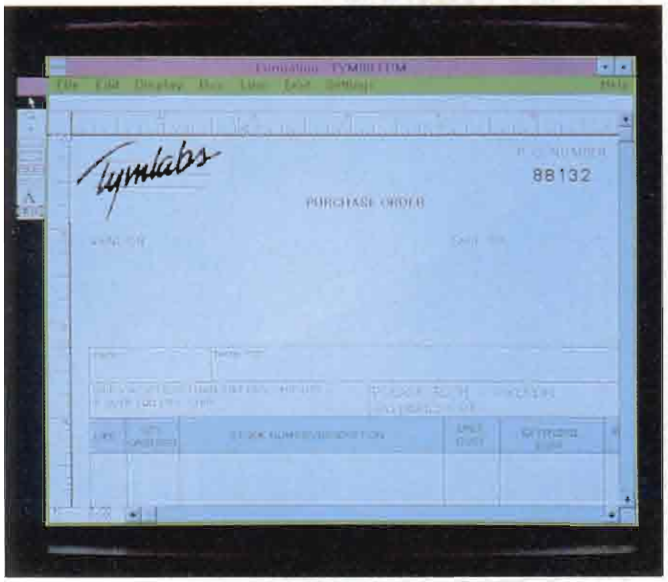
CIRCLE 120 ON READER CARD

Forms That Function



Design And Print Your Own Electronically Generated Forms With Tymlabs' Formation For The HP 3000

Using a forms generating software package to create your own forms is nothing new. In fact, in many cases it's more economical to print your own rather than pay the high costs associated with preprinted forms. And, because preprinted forms require time to print, costs can also be measured in terms of time as well as dollars.

Now there's good news for HP 3000 users who use and rely on preprinted forms. Formation for the HP 3000 from Tymlabs (Austin, TX) is an electronic forms generator that allows forms and data to be merged electronically and printed on centralized or departmental laser printers.

With Formation for the HP 3000, users create electronically-generated overlays. These overlays then can be printed on plain paper simultaneously with other data, including text, barcodes, signatures, pictures, etc.

Formation for the HP 3000 is currently offered in two versions. The first version, Formation, lets you print forms electronically from an HP 3000 to an HP LaserJet or HP 5000. The second version, Formation/2680 adds support for the HP 2680 or 2680/88 laser page printer. Formation/2680 also provides the ability to translate existing HP 2680 electronic forms, originally created with HP's IDSForm software, to a format that can be used on low-cost LaserJets or high-speed HP 5000s.

Both Formation and Formation/2680 include Formation Design, a WYSIWYG drawing tool that lets you create or modify forms using an IBM-compatible PC running Microsoft Windows 3.0.

Using Formation Design, you can design a new form in a matter of hours and make changes to an existing form in as little as a few minutes. Formation Design includes rulers and a configurable layout grid calibrated in inches, millimeters or lines and characters.

Once the initial design or your design change is complete, you upload the form to your HP 3000 and run the Formation Environment Manager to compile it into an environment file. You then set a file equation for your application's output file, and run the application. When the application opens its output file, Formation sends the forms descriptions to the printer. Your application data follows.

The printer automatically adds the form image to the printed output. Your forms with data then are generated on stock, blank sheet paper.

"The advantage of using electronic forms (forms made with a laser printer on plain paper) varies from one business to the next," says Pat Kurks, vice president of sales and marketing. "The most common is the ability to deal with constant changes to the forms that are critical to daily operations like invoices, W-2s, checks and government claims forms."

Formation Environment Manager is a menu-driven HP 3000 program that lets you define character fonts for data (including bar codes), characteristics of the physical and logical pages, form placement on page and form sequence. Formation Print Services allows for the inclusion of IFS-compatible procedures in host applications for sophisticated forms handling.

Formation for MPE V and MPE XL systems is cpu priced, and starts at $2,800. — *George T. Fruch, Technical Editor*

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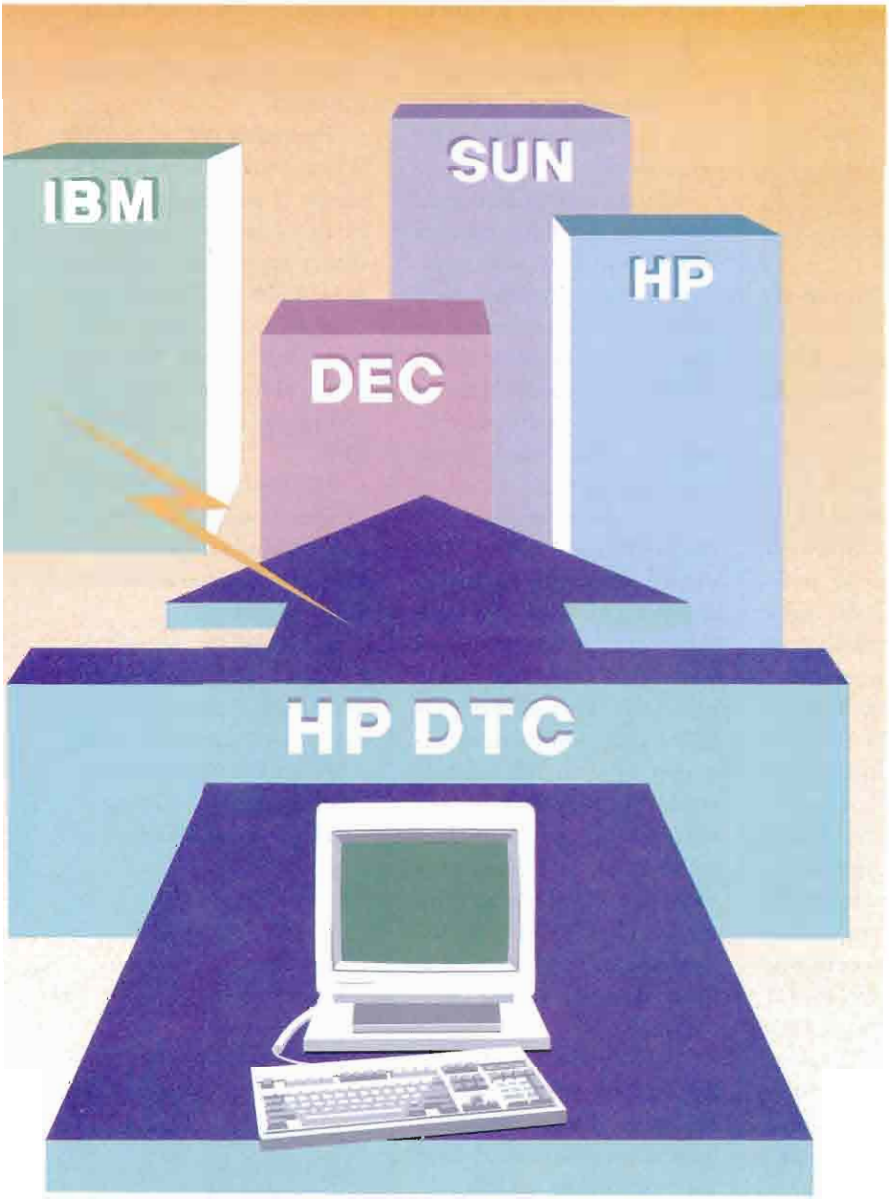
CIRCLE 302 ON READER CARD

HP Consummates Merger With SUN, DEC & IBM.



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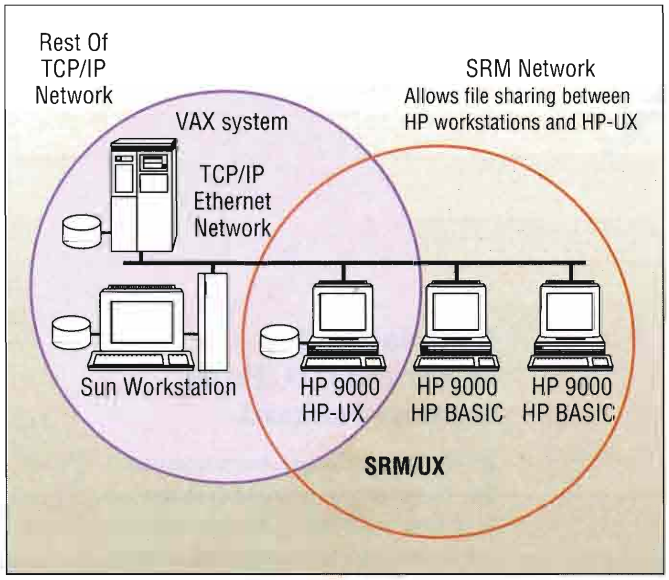
Giant Steps



FUSION Network Software Supports Rocky Mountain BASIC And PASCAL On TCP/IP Ethernet Networks

Software updates almost always mean good news for end users, but for programmers and software developers they frequently mean bad news as well. Fortunately, with Network Research Corp.'s latest update to its FUSION Network Software product line, both the ordinary end user and the high-powered software developer will be pleasantly surprised.

Network Research Corp. updated its FUSION Network Software product line for HP 9000 workstations to support HP's Rocky Mountain BASIC (RMB) 6.0 operating system. This support provides RMB users upgrading from version 5.0 with TCP/IP network connectivity. FUSION for HP also now coexists with HP's Shared Resource Management/UX (SRM/UX) software product for HP 9000 workstations running HP-UX.

Network Research also recently certified Eventide's newly released Ethernet board interface for HP 9000 200/300 workstations as completely compatible with FUSION for HP BASIC and PASCAL.

FUSION for HP BASIC 6.0 also provides HP 9000 200/300 users file transfer protocol (ftp) and virtual terminal (TELNET) capability between their workstations and systems anywhere on the TCP/IP network.

File transfer protocol allows users to send or retrieve files to and from other systems on the network as well as list directories and remotely delete and rename files. TELNET lets users log on to other systems on the network and run applications as if they were local users.

The release of SRM/UX from HP lets FUSION Network Software for HP BASIC and PASCAL share the same Ethernet LAN Interface Card with HP's proprietary SRM protocol. This allows FUSION and SRM to work together in a complementary mode. FUSION TCP/IP provides log-on and file transfer capabilities, and SRM provides file sharing and print sharing for HP 9000 BASIC workstation users, as well as other resource sharing capabilities.

This network capability lets HP 9000 workstations that are either diskless or have a limited amount of hard drive space store files on the HP-UX systems.

"This provides the best of both worlds for the BASIC user—being able to share HP-UX resources using the peripheral and file sharing capabilities of SRM, while also having virtual terminal and file transfer capabilities of HP-UX via the industry-standard TCP/IP protocol over the same Ethernet connection," says Dennis Bordelon, director of marketing for Network Research.

Eventide's WLZ-320 Ether Board, which Network Research is packaging with its FUSION for HP software, is a direct replacement for HP 98643A and HP 9817A boards. The WLZ-320 Ether Board has both Thick-Net and Thin-Net (coax Ethernet connections) and is priced at $995.

FUSION for HP BASIC is provided on 3 1/2- or 5 1/4-inch diskettes and is priced at $995 per machine and $1,495 with the API.

FUSION for HP BASIC packaged with the Eventide WLZ-320 Ether Board is priced at $1,595 and $2,095 with the API. Site licensing is also available.—*George T. Frueh, Technical Editor*

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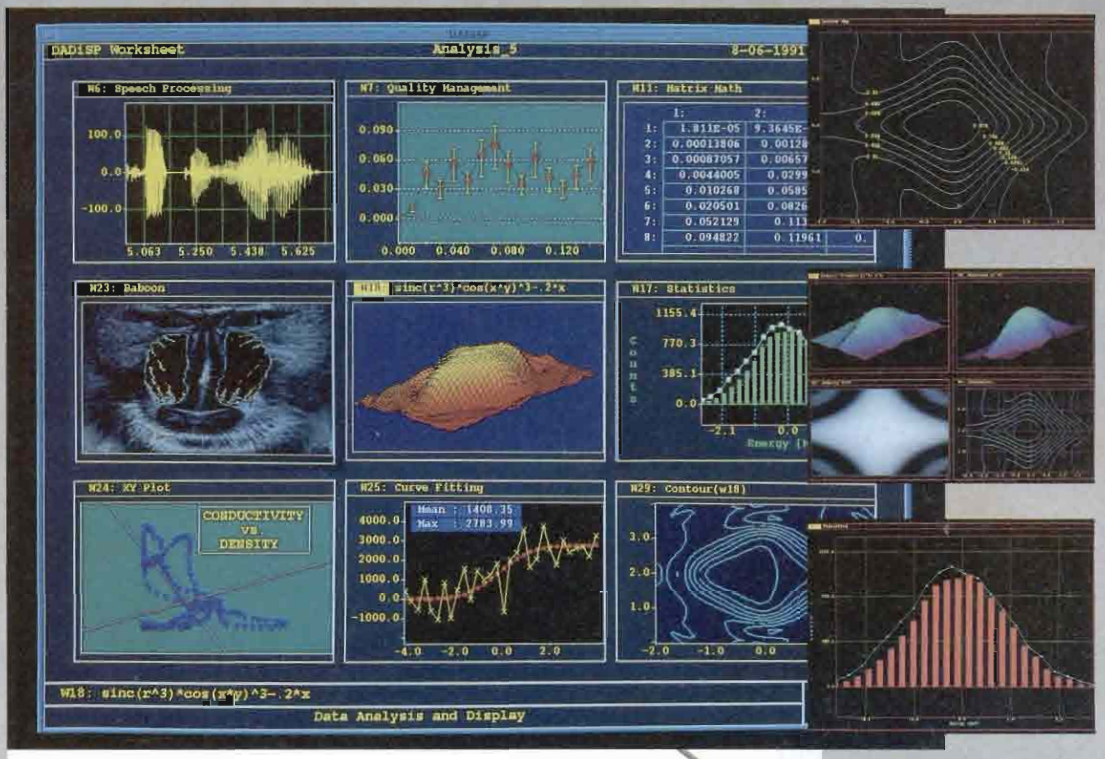
CIRCLE 301 ON READER CARD

The Big Picture Just Got Bigger!



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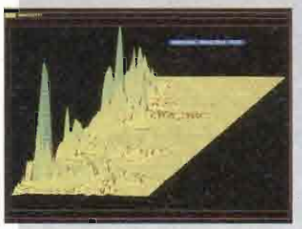

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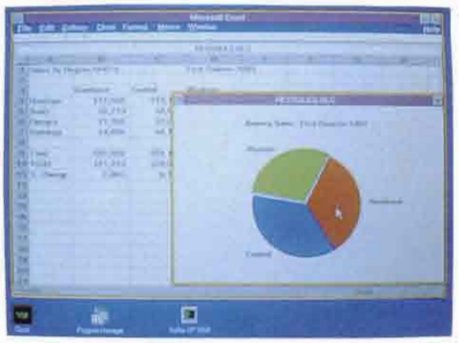
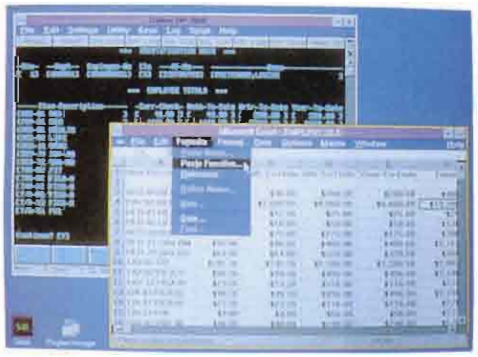
CIRCLE 110 ON READER CARD

Hosts and PC's have

Your sales department needs frequent, easy-to-interpret snapshots of sales by region. Session provides the data needed, and Excel presents that data graphically. With Session's full implementation of DDE and DDE templates, no changes are needed to the HP 3000 or HP 9000 application previously used.





Your financial department needs an easy way to extract data from the HP host and manipulate the data in a spreadsheet for analysis. Session and Excel, working together, can do this automatically every morning, providing up-to-the-minute data for crucial financial decisions.

Are you tired of listening to users complain about how difficult and time-consuming it is to get host computer information into their PCs?

Session for Windows makes it easy.

Using Business Session® for Windows, scripts can be created that automatically retrieve host data and pass it to Windows applications. Because Session supports Microsoft's Dynamic Data Exchange (DDE), Session can talk to programs like Microsoft Excel™ and Word™ for Windows, with no involvement on the part of the user. This puts information where it's needed, when it's needed, and allows easy analysis using your PC applications.

Automate repetitive tasks.

Session's scripting capabilities can be used to automate many repetitive tasks, such as log-ons, printing files, and creating and deleting files. And Business Session for NewWave takes task automation even further, allowing users to transfer files or run scripts with a simple drag and drop. Better yet, they can let their Agents do the work.

Session lets PCs emulate a variety of terminals, including HP 700/94, HP ANSI, and DEC VT100.

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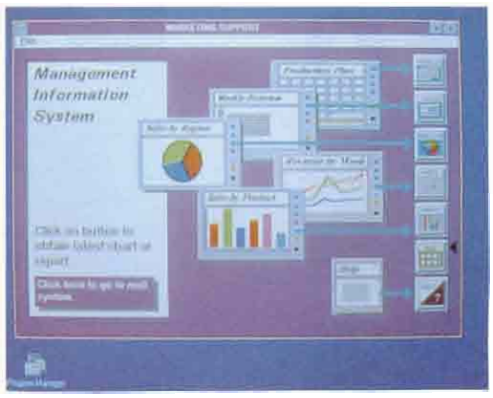

Your senior management needs easy access to critical information stored on the company's network of computer systems. Using other Windows-based products like Asymetrix Toolbox™, a custom interface can be created that allows host data to be accessed by simply clicking on an area of the screen. Windows applications extract data from the network with Session, making it available for analysis with Excel and report distribution through electronic mail.

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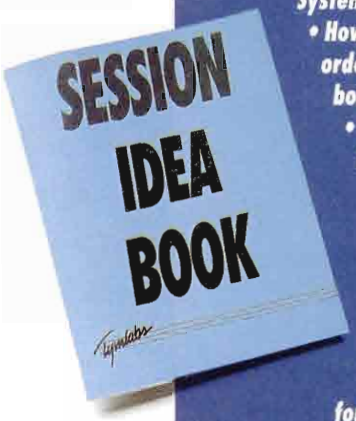
If your users are retrieving host information by displaying the data on their PC screens and copying it over bit-by-bit, or by downloading the files to PC disks and converting them, it's time you discovered Session. Call today and ask for a free copy of the Session Idea Book. And while you're at it, order a test copy of Session. If you're not satisfied after seeing Session in action, we'll gladly refund your money.



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Beyond The Basics Of Object-Oriented Programming Lies The Brave New World Of C++

BY GORDON MCLACHLAN

When we had to flip switches to jam machine code into the iron, programming was an engineering feat. Big, complex systems couldn't be described very effectively in terms of ones and zeroes, so we didn't even try, but each new generation of languages has abstracted the hardware a little more, and programming has become increasingly more problem-oriented and less concerned with the machine itself.

This has allowed us to build larger and more complex systems, which have placed further demands on our languages to allow even more abstraction, which will allow us to build larger and more complex systems which place more demands on our programming languages ... You get the idea.

To its backers, object-oriented programming is just a natural step in our progression from machine language through as-

Good

semblers, procedural languages and 4GLs. Every step of the way has been marked by increasing abstraction and separation of programming from the underlying system. Our focus has moved from the computer system to the business problem. Taken to a logical conclusion, OOP seems to lead to the pinnacle of programming perfection: limitless abstraction.

OOP's benefits are widely heralded. Better system modeling, reusable code, more reliable systems and faster prototyping and development make a lot of sense. How can you refuse a package like that? Although there's little doubt that OOP is a technology to be reckoned with, successfully adopting it takes a lot more planning and work than we might have hoped.

The emergence of C++ and its promise of becoming a de facto standard have given OOP a full head of steam, but a language change won't be enough. OOP requires a change in the way we think about applications design and programming.

The keys to OOP are data abstraction and language extensibility. In an ideal world, the computer platform and programming languages shouldn't define how you model a problem, or how you program the solution. To fulfill this lofty goal, it's generally agreed that an OOP language must provide the following capabilities: data abstraction, data encapsulation, inheritance and polymorphism.

Abstract Reasoning

DATA ABSTRACTION IS A fancy way of saying that you can define your very own personal data types and then hide the details of them from prying eyes and busy fingers. Abstraction, as its name implies, removes unnecessary details from the programmer's view of the data.

As well as hiding detail, abstraction frees the programmer from the confines of the small handful of default data types recognized by a compiler. Being able to add new data types provides significant extensibility to the language.

The idea of abstraction isn't new. Any language that can handle records or structures already provides data abstraction and some degree of language extensibility.

C allows you to roll your own variable types via **typedef** type synonyms and **struct** definitions. *Figure 1* shows the declaration for the ubiquitous FILE struct in the stdio.h header for Borland C++. Any C implementation will have a similar FILE definition, but fortunately for us, we can use just the FILE without worrying about what's under the kimono. Some things look better with their clothes on.

As long as we can open, read, write and close the FILE, we don't have to pay much attention to the data items that make it up. It's the file object that we're interested in, not the underlying data structure. For most purposes, hiding the data structure is a benefit. That's the point of object-orientation: looking at the big picture instead of the minutiae; the forest instead of the trees.

In Capsulized Form

ENCAPSULATION IS NOTHING more than the grouping of data objects with the code that works on them. The functions associated with a data structure are called its methods.

In our FILE example in *Figure 1*, we could think of FILE as an object, and of its associated I/O functions as methods. The problem is that the data and code are still logically separate.

There's nothing to tie the data structure to the function. You could call one of the FILE I/O functions and pass it any kind of garbage and it would try to do something.

How many times have you changed a structure and then spent days tracking down all the bugs that crop up when some forgotten function doesn't work any more? When code is encapsulated, it's much harder to do silly things like that. The only way you can get at a method is through its object. C++ also makes it harder to pass bad data by insisting on tighter parameter checking. C is notorious for its promiscuous parameter passing, and no matter how useful that feature is to the brute-force school of programming, it's a hazard.

Problems are minimized by strongly associating functions with the data structures they act on, and by enforcing strict type checking. If you change a structure in a way that isn't compatible with a method, you'll find out about it real quick—at compile time—rather than two weeks down the road.

Let's take a quick look at a C++ class declaration to get an idea of what's going on. The point class is an abstract data type consisting of two integers: x and y. What makes it more interesting than a mere struct are the **private** and **public** keywords and the **set-value** method embedded in the class.

By making x and y private members of the object, we completely hide them from the programmer. He can't touch them even if he knows where they are. The only way to change their value is through the set-value method. If we made that method private, he wouldn't be able to do anything to the object. That wouldn't be very useful, but it illustrates the point that C++ can hide its object members well enough even for the purists.

```
typedef struct {
        short           level;          /* fill/empty level of buffer */
        unsigned        flags;          /* File status flags */
        char            fd;             /* File descriptor */
unsigned char           hold;           /* Ungetc char if no buffer */
short                   bsize;          /* Buffer size ******** */
unsigned char           _FAR *buffer;   /* Data transfer buffer */
unsigned char           _FAR *curp;     /* Current active pointer */
unsigned                istemp;         /* Temporary file indicator */
short                   token;          /* Used for validity checking */ }
FILE;                                   /* This is the FILE object */
```

Figure 1: A FILE definition in Borland C++.

```
class point   {
private:
      int x;
      int y;
public:
point()    {
    x=0;
    y=0;
    }
   ~point()  {}
void set_value (int x_val, int y_val) {
          x = x_val;
          y = y_val;
    };
};
```

Figure 2: Constructors and destructors are automatically executed when an object is instantiated or destroyed.

Objects are instances of classes. A class is just a prototype for what an object will look like, just like any other variable type. The object isn't instantiated until it's defined using the class type. The definition for a point object could be simply: point screen coord;.

Constructors and destructors are methods of an object automatically executed whenever the object is instantiated or destroyed. Because a constructor is the first method run against a new object, it can be used to allocate dynamic storage or do other housekeeping needed to get the object off to a good start.

Similarly, a destructor is the last method that will be used on an object, so it can fluff the pillows and tuck the object in before it goes to the big sleep. Constructors always are given the name of the parent object. Destructors are given the name of the object preceded by a tilde (see *Figure 2*).

Inherited Traits

ANOTHER KEY FEATURE OF OOP is inheritance. That is, a new class can be created by inheriting the characteristics of other classes and slapping on a little new chrome. For example, a circle class could be created by adding a radius to a point to create a new object (see *Figure 3*).

C++ actually allows classes to inherit from multiple ancestors. This is called multiple inheritance and is accomplished by specifying a list of ancestor classes instead of just one.

Inheritance is where OOP's code-reusability comes from. When an object inherits, it not only gets the parent objects' data structures, it also inherits their methods. If the parents' code works, so will the new object's.

If the changes between objects are slight, it's quite possible that only a small bit of new code will be needed to implement the new object. The isolation of code allowed by encapsulation makes side-effects from the new methods on existing objects virtually impossible. The only problems you'll run into are in the new method code you write, and those methods can only affect the new object. The old methods neither know or care that there is a derived object out there.

Polymorphous Perversity

POLYMORPHISM, THE LAST CRITERION describes the ability of same-named operators and methods to act on objects differently depending on their class definition/data type.

In many programming languages, arithmetic operators are routinely overloaded to produce limited polymorphism among

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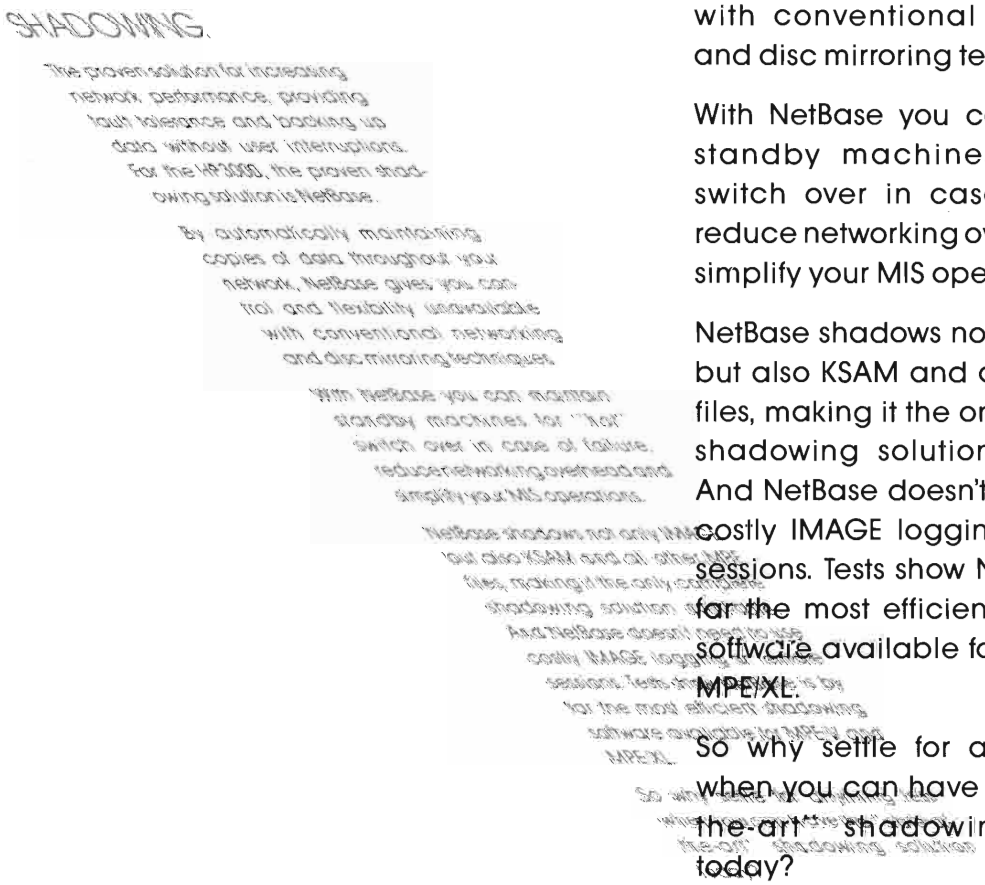

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the default data types recognized by the compiler. An addition, multiplication or division operator works differently depending on whether its operands are float, integer or a combination of types. C++ extends this capability by allowing you to define your own operators and overloading them according to your own rules.

Method functions with the same name can also be overloaded, allowing, as in *Figure 3* the use of **set_value** to assign values to either the point or circle objects.

Because C++ wants to resolve overloaded function calls at compile time, it wants to have unique parameters for every different method. True polymorphism, however, requires the ability to use exactly the same arguments for overloaded functions. When you force it to—by using the ***virtual*** keyword in a method declaration—C++ will defer binding of the proper method until run-time. This is known as late-binding, and in other OOP implementations, such as Smalltalk and Microsoft's OO Pascal, late-binding is the default.

Still More Pluses

ALTHOUGH WE'VE COVERED some of the basics, a number of other features have been added to C++ to make it acceptable for OOP work. Among these are:

- C++ requires that each function be formally defined in the header. It then performs checking to make sure that the number and type of parameters passed in function calls correspond to the function prototype. ANSI C also supports function prototyping.
- A function declared without any parameters denotes an empty parameter list in C++. In ANSI C, an empty argument list will allow any number and type of arguments to be passed. The parameter list may be passed as (void) to avoid any confusion. Both ANSI C and C++ support this form.
- C++ also supports inline functions as a substitute for preprocessor macros. For small functions, where the argument passing and return code are bigger than the function's code, C programmers tend to use macros to cut code size. The trouble with macros is that they don't perform any error checking. Inline functions provide the code-savings of macros, but provide C++ function parameter type-checking.
- C++ provides named typed constants and pointer references for circumstances when macro defines and generic pointers would cause parameter type-checking errors.
- Default arguments—C++ functions can be supplied with default arguments. For example: void foo(int i=0). If the function were called without a parameter, the integer value zero would be substituted.

```
class point  {
private:
     int x;
     int y;
public:
     point()   {
          x=0;
          y=0;
     }
     ~point() {}
     void set_value (int x_val, int y_val) {
          x = x_val;
          y = y_val;
     }
};

class circle : point { // derived from point
     float radius;          // private by default
public:
     void set_value (int x_val, int y_val, float radius_val) {
          point::set_value(x_val, y_val);
          radius = radius_val;
     }
};
```

Figure 3: A new class can be created by inheriting the characteristics of other classes.

C++ is a decent compromise for those of us who fear to tread in the waters of the Smalltalk environment, or experiment with such oddities as the Eiffel language.

More Pluses Than Minuses

ALL-IN-ALL, C++ IS A PRETTY creditable attempt at putting together an OOP platform. Combining the widespread popularity of the open systems language with a healthy dose of OOP capability, it's a decent compromise for those of us who fear to tread in the waters of the Smalltalk environment, or experiment with such oddities as the Eiffel language.

Specialized OOP environments like Smalltalk tend to frighten off programmers used to the procedure-oriented approach of traditional languages. This is a major reason why OOP didn't really take off until rather recently, depite having been around in one form or another since at least the mid 1970s.

Although embedding OOP technology in existing languages like PASCAL or C has really boosted OOP, the tendency for programmers using those tools is to keep on doing things the same way, with only a few changes. There's still a big learning curve and if you give a C programmer a C++ compiler, he'll probably just write C code. It's hard to lose old habits.

Still, it's even harder to force the kind of paradigm shift that something like Smalltalk demands. As my friend Ron Fisher, a UNIX/DOS C programmer from Ann Arbor, MI, who'd rather be coding Smalltalk on Macs puts it, "A FORTRAN programmer will say (regarding C++), 'That's close enough to FORTRAN that I call deal with it.' "

Fisher continues, "Smalltalk's concepts are very different, but once you can deal with them conceptually, you can write much better programs. Smalltalk is a whole environment, not just a language. To me, C++ is a kit car, and Smalltalk is an Acura NSX. C++ wasn't thought out thoroughly as an object-oriented language. It exists because C exists. You can do a lot more low-level stuff in C than you can with Smalltalk. C lets you get at the iron much better, but if it wasn't for C, C++ wouldn't have much of a following."

The point is well-taken. The availability of good class libraries is critical to establish a good starting point for OOP, and C++ is still weak in that area. C++ class libraries are just starting to flow, and standardization is a big issue. Library code for graphical user interfaces, database operations and the like is still in a primitive state compared to the specialized OOP environment. C++ just hasn't been around long enough to amass anything like the support libraries C has.

Another gripe is that C++ doesn't force OOP principles on programmers. That's a question of taste. The hard-core knuckle-draggers in the C community think C++ is already too rigid in its parameter checking and function prototyping. They don't like having to rewrite all those nifty multi-purpose pass-me-anything-and-I'll-process-it functions. I guess we've got to show them a little compassion for all their hard work. —*Gordon McLachlan is a consultant with National Tech Team in Dearborn, MI.*

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AN EYE FOR Architecture

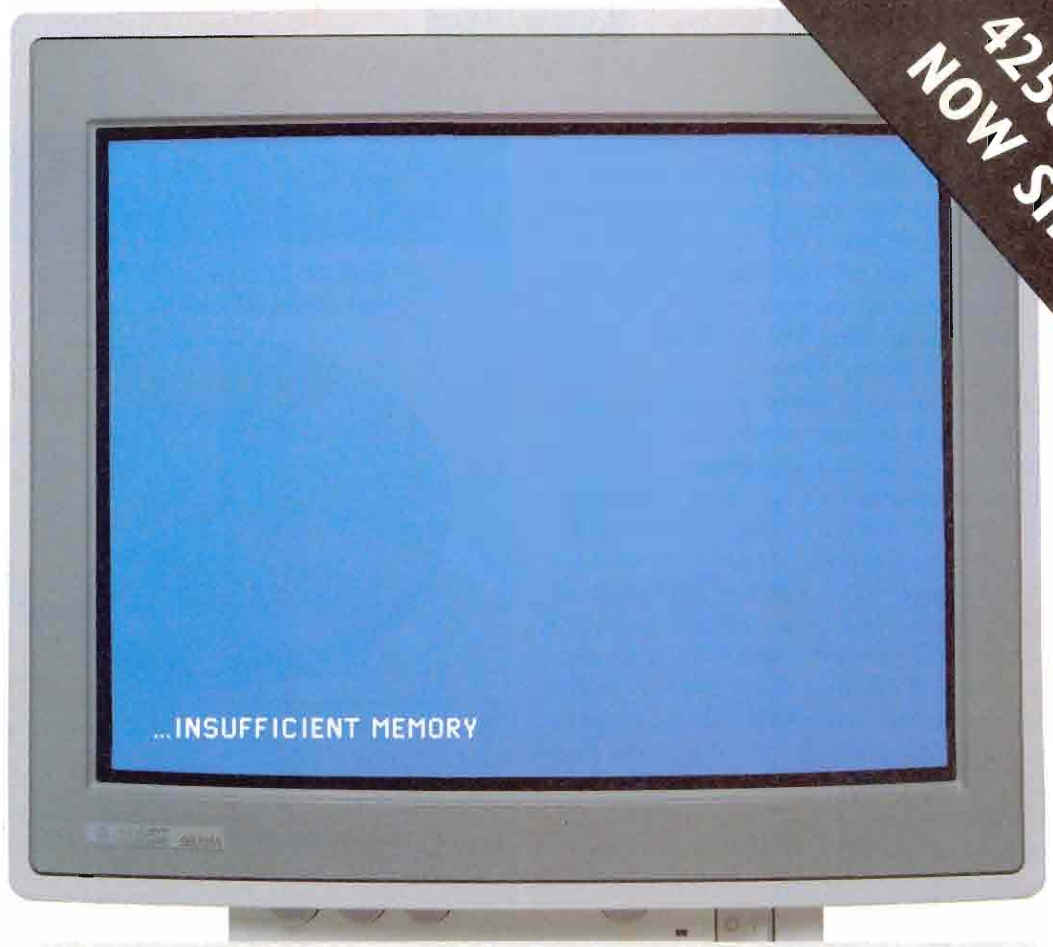
An Inside Look At The HP 9000 Series 700 Shows That System Design Means More Than Mips, Mhz And Mflops

BY MARTY PONIATOWSKI

The architecture of the computer you are about to buy is probably the aspect of the system you least understand. Some computer buyers are convinced mips, MHz, and mflops were created solely for the purpose of confusing customers so they wouldn't be able to make informed decisions. If, however, you understand the fundamentals of computer architecture, you can take the high ground in any computer related discussion and focus on the architectural aspects of the system as opposed to the numbers game of mips, MHz and mflops.

One reason mips, MHz and mflops ratings are confusing is that different users have different performance requirements. Knowing all these little facts about a computer (the clock frequency, chip set, mips, etc.) is only part of what you really need to know to make an informed purchase decision. You should also know the fundamentals of computer architecture.

At first, it might seem intuitively obvious that if one computer has a higher mips rating than another, that the one that's higher is the one you should buy. Well, maybe. What's high performance to a C programmer isn't the same thing as high



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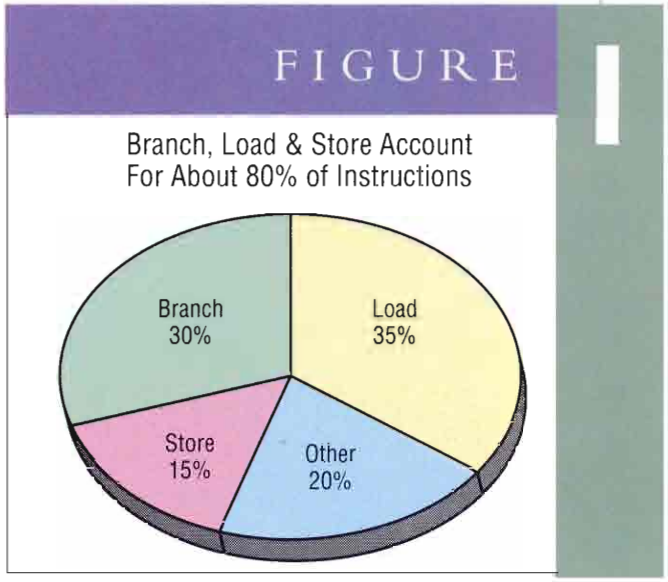
performance to an information systems manager. The C programmer wants a computer that will compile his program in less time, but the information systems manager wants a system that completes more jobs in an hour.

These two users simply have different needs. A C programmer is interested in reducing response time—the time between the start and completion of an event. The information systems manager wants to increase throughput—the total amount of work done in a given time. An increased mips rating doesn't help the information systems manager nearly as much as the C programmer, thus illustrating the *illusion* of mips.

There are also other problems with evaluating workstations according to mips alone: First, mips is dependent on the instruction set of a particular computer. The mips of different computers will be measured with a different instruction set thereby making a comparison of mips a comparison of apples to oranges. Comparing two different instruction sets removes the common denominator of the comparison—instructions (the "i" in mips). Another problem with mips is that you can get a different result if you run two different programs on the same computer. This may be the reason you'll want to see your program run on the computers you're considering purchasing.

From the standpoint of computer architecture, perhaps the biggest problem with the mips rating is what it tells you, or rather doesn't tell you, about your system's future. The mips

FIGURE 1



Research showed that many complex instructions were seldom used.

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rating is a quick and dirty way of getting a snapshot of the performance of your computer. It tells you nothing about the potential performance of your system's architecture. If a system has a high mips rating, but the architecture has reached its limit, you may be stalled. The next performance increase you see could come in the form of a new architecture, and that may create problems for your existing applications.

New performance measurements have been developed that produce more meaningful numbers. The Systems Performance Evaluation Cooperative (SPEC) is a non-profit consortium that developed such benchmarks. The SPECmark is a speed test that the C programmer would be interested in and the Systems Development Multitasking (SDM) is a set of benchmarks that characterize multitasking throughput that the information systems manager would find helpful. The numbers produced in these performance tests, however, are only meaningful if you know which numbers to look at and what the numbers mean.

If you decide that mips and mflops ratings are too confusing to deal with and you just want to see how fast your C program runs on two different computers, you're comparing response time. You find that your C program compiles on one system in 60 seconds and another system in 90 seconds. How much faster is the first system than the second? Is it 50 percent faster or 33 percent faster? The following equation will help you determine this:

$$\text{percent Increase} = \frac{(\text{Execution Time A}) - (\text{Execution Time B})}{(\text{Execution Time B})} * 100$$

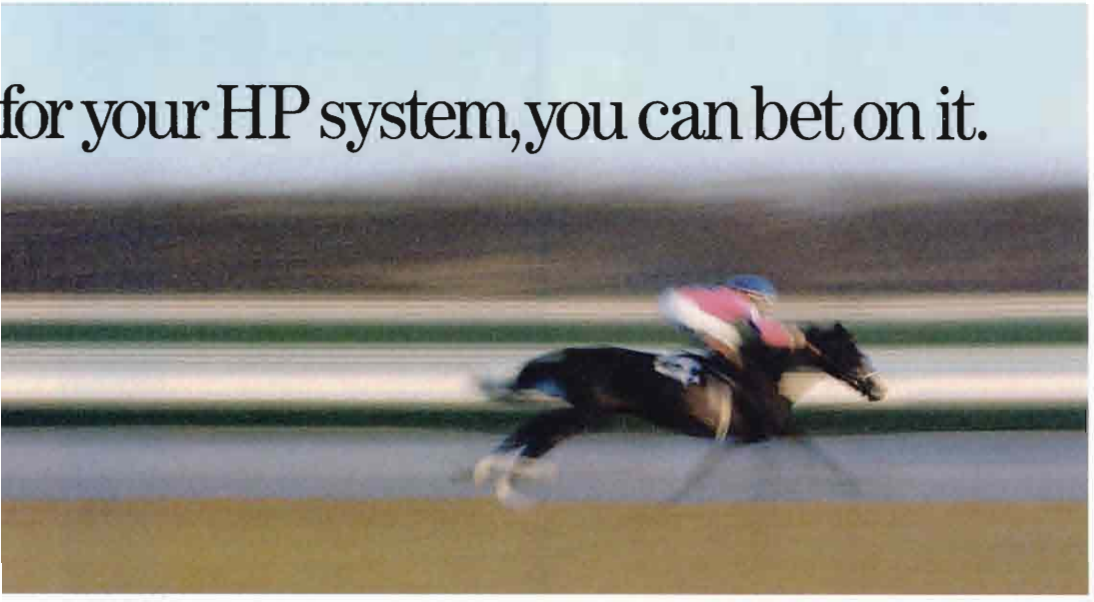
$$= \frac{90 - 60}{60} * 100 = 50 \text{ percent increase}$$

Some of this confusion can be reduced if you take a step back and place less emphasis on the numbers and more emphasis on the more abstract topic of evaluating the architecture.

Modern Architecture

YOU COULD SPEND A lifetime evaluating a computer architecture, but nobody has time for that. There are some aspects of the system that can be very revealing, probably more so than just mips, MHz and mflops. Four specific topics are instruction sets, processors, memory and I/O.

Instruction Set. The instruction set of a computer, to a large extent, defines its architecture. It defines the basic functions the computer performs in the same way the keys of a calculator define the functions the calculator performs. The first 20



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years of computer development saw instruction sets become more and more complex with virtually all computers being complex instruction set computers (CISC). Every time a CISC chip executes an instruction it must be decoded and broken down into smaller, more manageable parts. The processor in a CISC system executes many microinstructions per macroinstruction.

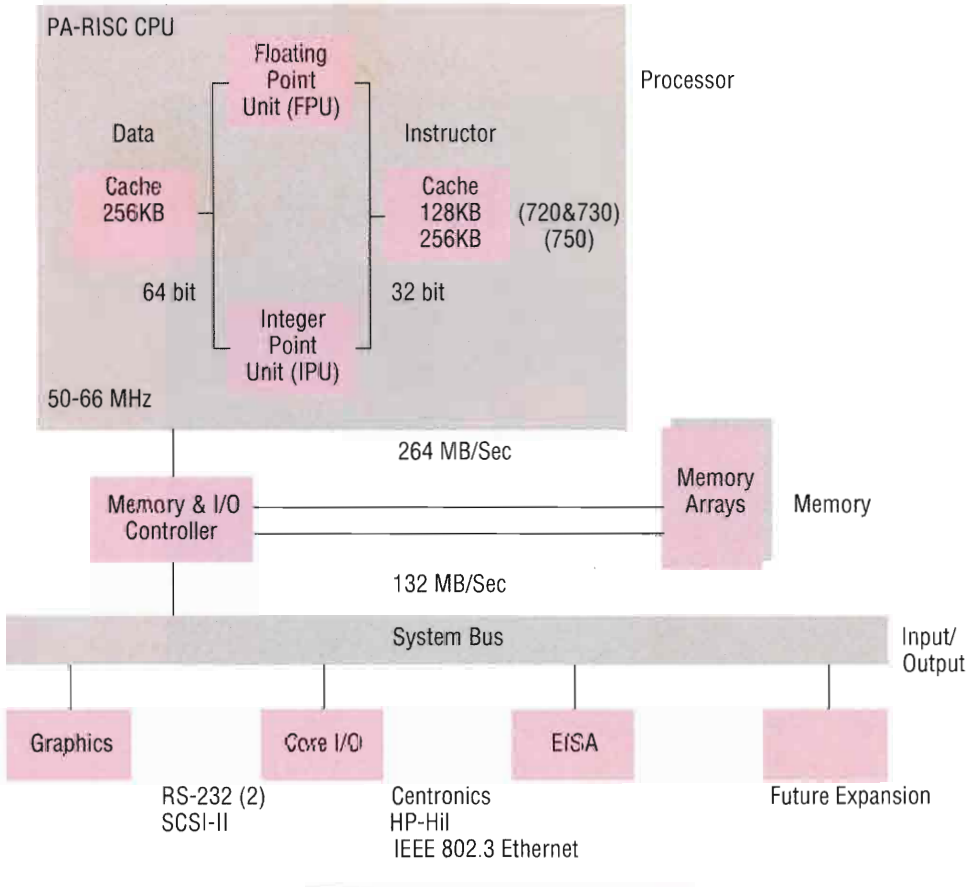
Complex instructions were assumed to result in the highest possible performance until research showed that most complex instructions were seldom used. *Figure 1* shows that Branch, Load and Store operations were the most often executed. Reduced instruction set computing (RISC) was a direct result of this research. With RISC there's no need to decode complex instructions, because instructions are built into the hardware of the computer. Every time the hardware speed is increased the speed at which instructions are executed is increased.

RISC and CISC systems have different approaches to solving the same problem—executing instructions. The following equation describes execution time for any computer:

```
Execution Time = N * S * T
 where
N = number of instructions
S = average number of steps per instruction
T = time to perform one step
```

By reducing any or all of the values of these parameters the speed of execution will be increased. A CISC system would reduce the number of instructions executed (N) in an effort to increase execution speed. A RISC system would reduce the number of instructions (N) and the time to perform one step (T). Pipelining, to be described later, plays a big role in RISC systems. In RISC systems, an instruction can execute virtually every clock cycle. The clock (remember MHz) in a RISC system also can run at a higher speed because of the simplified electronics in a RISC system. When evaluating architectures, keep in mind the differences between complex and reduced instruction sets.

FIGURE 2



Block diagram of HP 9000 Series 700 processor.

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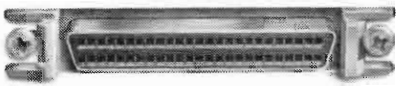

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Block Diagram. It is a good idea to look at the block diagram of a computer as you begin to evaluate its design. *Figure 2* shows the block diagram of the RISC-based Series 700 workstation. There are three categories of blocks shown which are part of every computer: processor, memory and input/output.

The processor is the core of the computer and contains everything except memory and I/O. The processor of the Series 700 shown in *Figure 2* consists of two chips: an integer point unit and a floating point unit. There are large cache memories (discussed later) attached to the processor to support 32-bit instructions and 64-bit data paths. There's both an integer and floating point chip to insure these types of instructions are optimized.

The instruction set and processor work together to get the job done. As mentioned before the vast majority of instructions executed are branch, load and store. Because we can expect these instructions to be executed often, it stands to reason that the way these instructions are executed can be defined as somewhat regular, and we could work on these regular instructions at the same time.

Pipelining is a technique in which multiple instructions have overlapped execution. One instruction can begin to execute before the previous one has finished. This overlapping allows a set of instructions to be executed much faster. An instruction pipeline is much like an assembly line. Each step in the pipeline completes a part of the instruction. By having instructions that are the same length and format, the pipeline can be optimized to insure instructions are executed in the most efficient possible way. *Figure 3* shows a conceptual pipeline as it might exist on the Series 700.

The load/store operations shown in *Figure 3* represent memory access. A "load" transfers data from memory and a "store" transfers data to memory. The Load/Store technique is consistent with the simpler instruction sets of RISC architectures.

Although you may never see the way a pipeline is implemented in a processor design, you can evaluate the instruction set for a sensible group of instructions, for advanced technology—such as the closely coupled integer and floating point chips of the Series 700—and for the size of the cache employed.

Memory. Memory, in its many forms, plays as important a role as the processor in the performance of a computer. Memory comes in many different forms and sometimes leads to a lot of confusion when discussing computer architecture. The three types of memory you'll always want to consider are main memory, cache memory and virtual memory. Different types of memory are necessary for the way programs are stored and accessed. There are two ways that data in memory is viewed by the computer architect:

- Temporal locality: If an item is referenced, it will tend to soon be referenced again.
- Spatial locality: If an item is referenced, nearby items will soon be referenced.

Why would someone who is planning to buy a computer care about the way data is referenced? The way in which data is accessed greatly affects the performance of the computer.

Programs and the data they operate on are held in main memory during execution. If you don't have enough main memory to hold the programs and data you're using then your program, data, or both will overflow into secondary storage.

Secondary storage is usually a hard disk that's substantially slower than main memory and will therefore cause your program to run slower because it takes longer to access information. Virtual memory bridges the gap between the main memory in your system and secondary storage. That is, although you may have only 16 MB of main memory your secondary storage acts as virtual memory giving you substantially more memory capacity. You pay a substantial performance penalty for using secondary storage when you run out of main memory.

You want to take a close look at the maximum main memory supported by the computer you're evaluating. Although you may not need the maximum memory supported

FIGURE 3

EXECUTE	LOAD/ STORE	FETCH	EXECUTE	LOAD/ STORE	FETCH	EXECUTE	LOAD/ STORE
FETCH	EXECUTE	LOAD/ STORE	FETCH	EXECUTE	LOAD/ STORE	FETCH	EXECUTE
LOAD/ STORE	FETCH	EXECUTE	LOAD/ STORE	FETCH	EXECUTE	LOAD/ STORE	FETCH

Pipeline executing several instructionsat one time.

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- Rename fields, items, datasets
- Change primary path definition

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- Characteristics of datasets
- Paths
- Schema

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- Rename databases

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- Data items to databases
- Fields to datasets
- Datasets to databases
- Paths between masters and details
- The sort feature to paths

Delete:
- Data items from databases
- Fields from datasets
- Datasets from databases
- Paths between masters and details
- The sort feature from paths

Change:
- The characteristics of data items (and their fields) in all datasets
- The characteristics of fields in a specific dataset
- The type of datasets (i.e. automatic, manual, detail)

Shuffle:
- The order of datasets
- The order of fields within dataset entries

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initially, you may later require more memory and find this isn't supported. This is a number that no benchmark can provide yet may be more important to the performance of your application than a mips rating. The Series 700 units support 64 MB of main memory in the models 720 and 730, and 192 MB of main memory in the model 750.

Just as there's a size gap between main memory and secondary storage that's bridged by virtual memory there's a speed gap between main memory and the processor that's bridged by cache memory. As shown in the block diagram of *Figure 2*, cache memory is closely coupled with the processor. Main memory accesses go through the memory and I/O controller. Cache accesses don't have to go through this controller resulting in much faster access. Cache memory holds frequently accessed data so the processor can retrieve this data without going to main memory.

The caches shown in *Figure 2* are large to support the type of data found in workstation applications. The data cache is 64-bits wide, which greatly improves floating point performance. The depth of the data cache is 256 KB. The instruction set cache is 128 KB in the Models 720 and 730 and 256 KB in the Model 750 to support commercial transaction processing applications. Although all users don't necessarily need cache memory to be as large as that of the Series 700 systems, you'll want to be aware that large cache memories are available because of the large performance gains they can achieve.

If the data you wish to access isn't in cache memory, a miss is experienced which means you have to go to main memory to get the data. You want to keep the miss rate as low as possible. Consider the following example of the gains you can realize from cache memory:

```
Average Memory Access Time =
Cache Time + (Miss Rate * Main Mem Time)

Assume the following:

Cache Time = 20 nanoseconds
Main Mem Time = 200 nanoseconds
Miss Rate #1 = .10 (data in cache 90 percent of the time)
Miss Rate #2 = .15 (data in cache 85 percent of the time)

Average Memory Access Time #1 = 20 + ( .10 * 200 ) = 40 nanoseconds

Average Memory Access Time #2 = 20 + ( .15 * 200 ) = 50 nanoseconds
```

This means that by increasing the miss rate of the cache memory by only five percent the average memory access time is increased from 40 nanoseconds to 500 nanoseconds or 20 percent. Although you may think cache memory is buried in the dark side of a computer, it has an important impact on overall performance of any system you buy.

Input/Output (I/O). As shown in *Figure 2*, the Series 700 uses the memory and I/O controller to interface between the processor, memory and I/O subsystem. There are many I/O considerations when evaluating a computer, and the ones you focus on should depend on your needs. Some of the more common I/O considerations are graphics, networking, and standard interface buses such as EISA.

System performance in any computer is limited by the slowest part of the path between CPU and I/O devices. System performance can be limited by any of the components in the system. The key word in system performance is balance. If the system isn't balanced the high performance of some components can be diluted by the low performance of others. The memory and I/O controller of the Series 700 enables it to achieve this performance balance and insure that memory and I/O accesses take place at the fastest possible rate.

One important factor to consider, regardless of your requirements, is the amount of processor time the system spends performing I/O related functions. Accesses from disk drives (such as SCSI-II devices on the Series 700), the parallel ports, and LANs should be able to take place without interrupting the processor. All these devices should be able to move information to and from main memory without the aid of the processor (direct memory access, DMA).

What Good Are Numbers?

IF I'VE SAID IT ONCE I've said it a thousand times: mips can be deceiving. Yet if everyone uses them, they must be good for something. The best use for mips is to get a view over time of the overall effectiveness of an architecture. Some architectures run out of gas. That is, they post big performance numbers initially but because of intrinsic architectural limitations can't sustain substantial performance gains.

The performance rating of PA-RISC from its initial introduction in 1986 as the first commercially available RISC architecture to systems introduced in the first half of 1991 increased at almost 100 percent per year. This long history of performance increases indicates this is a sound, well-researched architecture that will enjoy performance increases as advances in technology take place. — *Marty Poniatowski is a computer-aided engineering consultant for Hewlett-Packard, Darien, CT.*

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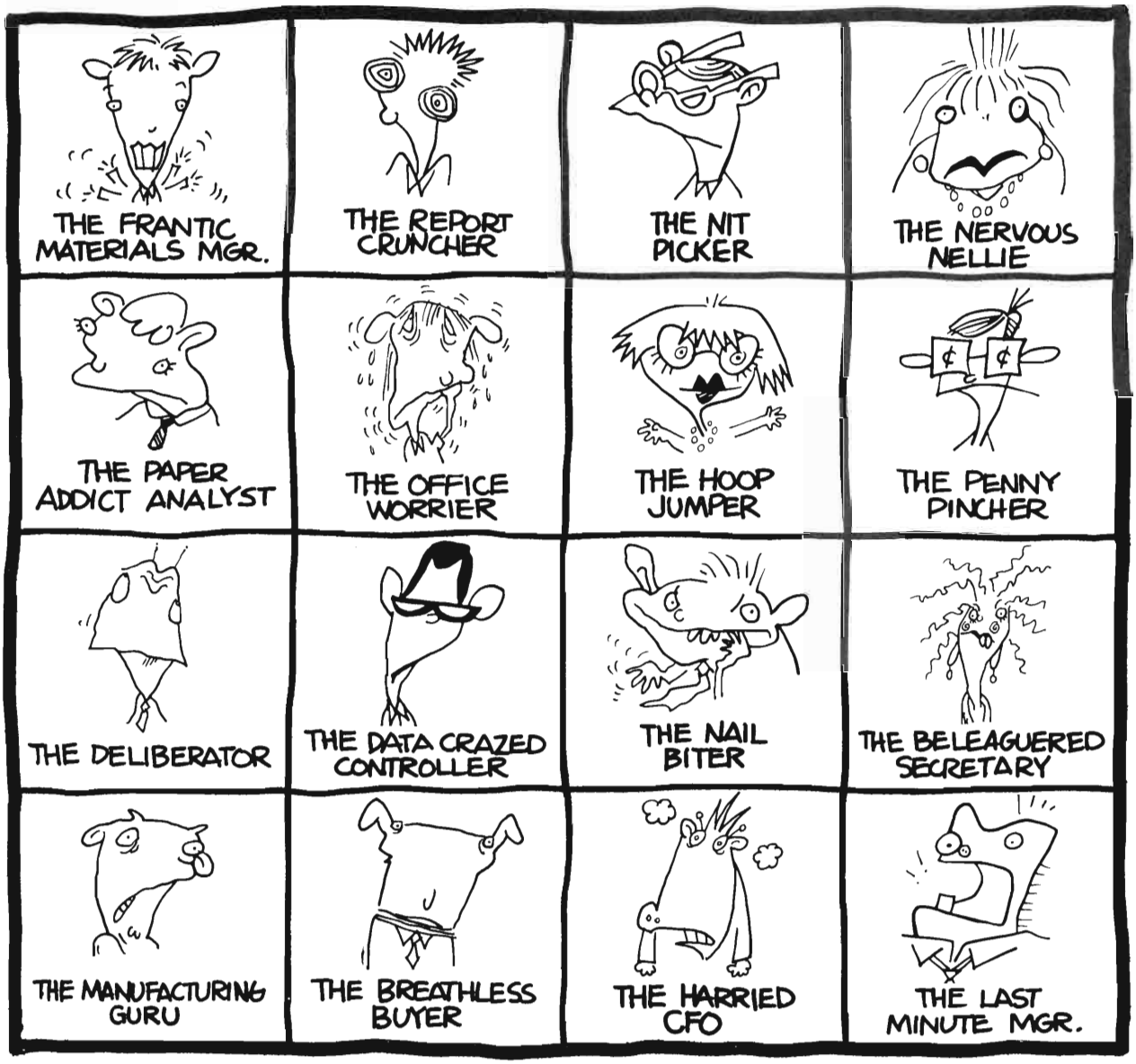

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MiXed Blessings

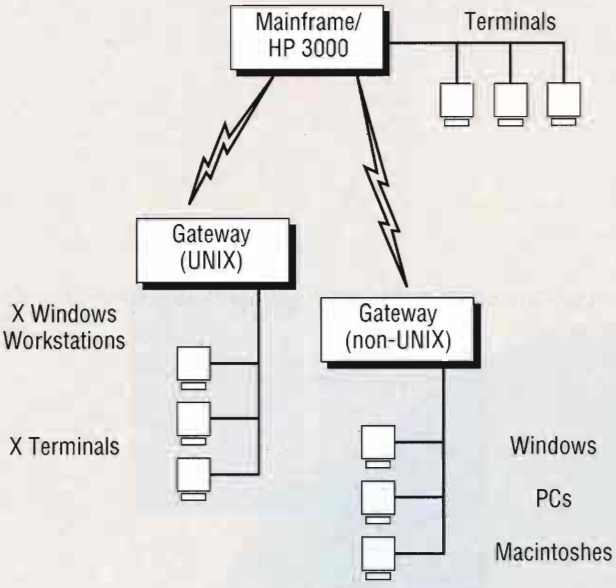
X Windows Opens The Way For Client-Server Computing, But The Task Of Integrating PCs, Workstations And X Terminals Falls Squarely On The Desktop Of MIS

BY DR. JOHN R. PORTERFIELD

The desire to share information in a heterogeneous computer network is forcing MIS managers to adopt a client-server model. The client-server model is supported by the X Window System. In theory, X Windows allows you to run different applications on different computers with different operating systems on one screen at the same time with a common user interface (that's called interoperability). Although HP and other vendors provide the basic tools to achieve this goal, the task of putting everything together ultimately will fall on you. Once you get a working system put together, however, your users will benefit from a system that's less cumbersome and more efficient.

Today, many computing environments are so diverse that achieving interoperability is difficult. As a result, users are usually locked into one hardware platform and don't benefit from interoperability. Therefore, the first task is to get a list of the applications that the users are going to be using. Typically, X Windows is installed with a workstation-based application. However, users probably still will need to access their applications on mainframe or minicomputer hosts. You'll probably need to make the X Windows display device—be it workstation, X terminal or PC—emulate the terminal that the application was originally running on.

FIGURE



A current network computing environment that makes use of X Windows.

One problem that you'll encounter here is keyboard translation. The program xmod-map will allow you to map your display device's keyboard. However, you can expect keyboard mapping to be a difficult process, because different types of products have different keyboards. There's also the problem of the translation of multikey escape sequences by the gateways into the mainframe. Make sure that you have a compatibility suite for testing keyboard input on the X Windows display device, and expect to do some retraining if your users are changing keyboards (see *Figure 1*).

Although X Windows doesn't necessarily denote UNIX, it certainly implies it. When preparing for X Windows, be sure that you have resources available to understand the rudiments of UNIX system administration, particularly in networking and security. Although UNIX is relatively standard, each workstation or operating system provider has its own dialect of UNIX. Typically a vendor advertises one form, but supports some utilities from another. HP-UX is typical in this regard. Be sure the utilities you need to serve your users are portable from one type of UNIX to another.

Also, you need to consider how the emerging LAN standards are going to effect your system. In particular, look at OSI, FDDI, token ring, Novell Netware and Microsoft's LAN Manager. Your older networks also will tend to be covered with protocol converters. You'll want to think about devices that have modularity, so you can snap in LAN standards as they come up. Many X Windows display devices have built-in Ethernet support and can't be easily changed. However, there are well-funded public efforts currently underway to make sure that X is going to be compatible with OSI and FDDI.

GUI Solutions

THE OTHER GREAT benefit of X Windows, besides interoperability, is the ability to use a standard graphical user interface (GUI). However, X Windows provides the basis for multiple GUIs, the most common of which is OSF's Motif. HP VUE (Visual User Environment) is a graphical environment built around Motif, but HP VUE can run on any X Windows display device. Other graphical environments also are available from other workstation providers as well as third parties. The immediate advantage of HP VUE is the ability to easily move back and forth between six desktops, i.e., full screens of windows.

Although your users will probably take to GUIs very easily,

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you can expect complaints about performance to be close behind. For example xterm, the standard X Window telnet emulator, uses approximately 32 bytes to send a character to a host computer, but regular telnet uses only one byte per character.

Before choosing one of the X Windows GUIs, you may want to consider the interaction between Microsoft Windows and X Windows. Software and hardware solutions are available for running both environments together. The problem with software-only emulations on PCs is that performance isn't competitive with X terminals or workstations. This is because the 16-bit ISA bus on most PCs makes fast graphics extremely difficult and requires expensive graphics coprocessors. PC/X terminals with 32-bit graphics buses now are available.

Because of their ability to connect to multiple hosts, X Window display devices offer more opportunities to break into different computer systems. Three tools are available to increase security under X Windows: xhost, xlock and XDMCP. Xhost allows access control for individual X Window display devices, but this system is decreasing in popularity. Xlock allows the individual display to be password protected and locked. XDMCP (X Display Manager Control Protocol) allows screens to be remotely managed with a login screen. The login ID and password are controlled by the same password file that controls normal logins. Another advantage of XDMCP is seen when the user terminates the last application. The X display device automatically terminates the session.

Hardware SeleXion

THE ALLOCATION OF YOUR hardware budget is perhaps the most difficult challenge. Most people upgrade hardware for one of two reasons—to make maintenance easier or to increase performance needed for applications using a GUI. This second reason is the complicated one. When purchasing equipment, the cost of the device alone shouldn't be the determining factor. The cost of the entire system needs to be considered. For example, a significant number of X terminals can easily overload the network and the cpu power of a file server. The system simply gets bogged down by providing application processing for the X terminals because when using a GUI, the load on the system is increased.

Experimental data has shown that a text editor such as vi runs with much less network overhead using telnet than using an xterm. If you use a desktop publishing application, however, you can expect the overhead per character to be significant. This is because a telnet session is a non-graphical display, while an xterm is the X Windows emulation of telnet. Network traffic is affected by mouse motion, and the variety of possible actions that it can generate. The more graphic-intensive the display, the more measured system load increases; this is simply the performance cost of going to a GUI.

Local processing can be beneficial in that it decreases the dollars-per-mips cost. This is because there's less outlay for file server processors. For local processing to truly be interoperable, it must be heterogeneous. Different operating systems run on different processors, and emulator technology provides a partial solution that will always compare unfavorably to a native solution in terms of performance. However, for users who are using applications on remote, non-UNIX host, local processing isn't necessarily an advantage. You may want a device that has the option of local processing, but doesn't require it (i.e., diskless workstations or PC/X terminals).

Response time, not mips, is the truest measure of workstation performance in today's networked environments.

Windows And Performance

APPLICATION SOFTWARE must run interactively. Response time, not mips, is the truest measure of workstation performance in today's networking environments. This is because the bottleneck is the overall system load—the combination of network, cpu and I/O performance. The total number of mips on the network doesn't necessarily determine the performance of a given application. The ability to provide interactivity and improved response time is the reason behind increasing mips. System load is the result of running many types of applications in GUI environments on the various networked machines. The same arguments can be applied to xstones, a rough equivalent to mips for gauging performance in X Windows. Although in general more xstones are better, xstones don't always accurately predict the performance of the device.

The reason that measuring the performance of an individual display device isn't enough is that true performance in a client-server system is based not on the number of devices on the network, but on the number of people using devices on the

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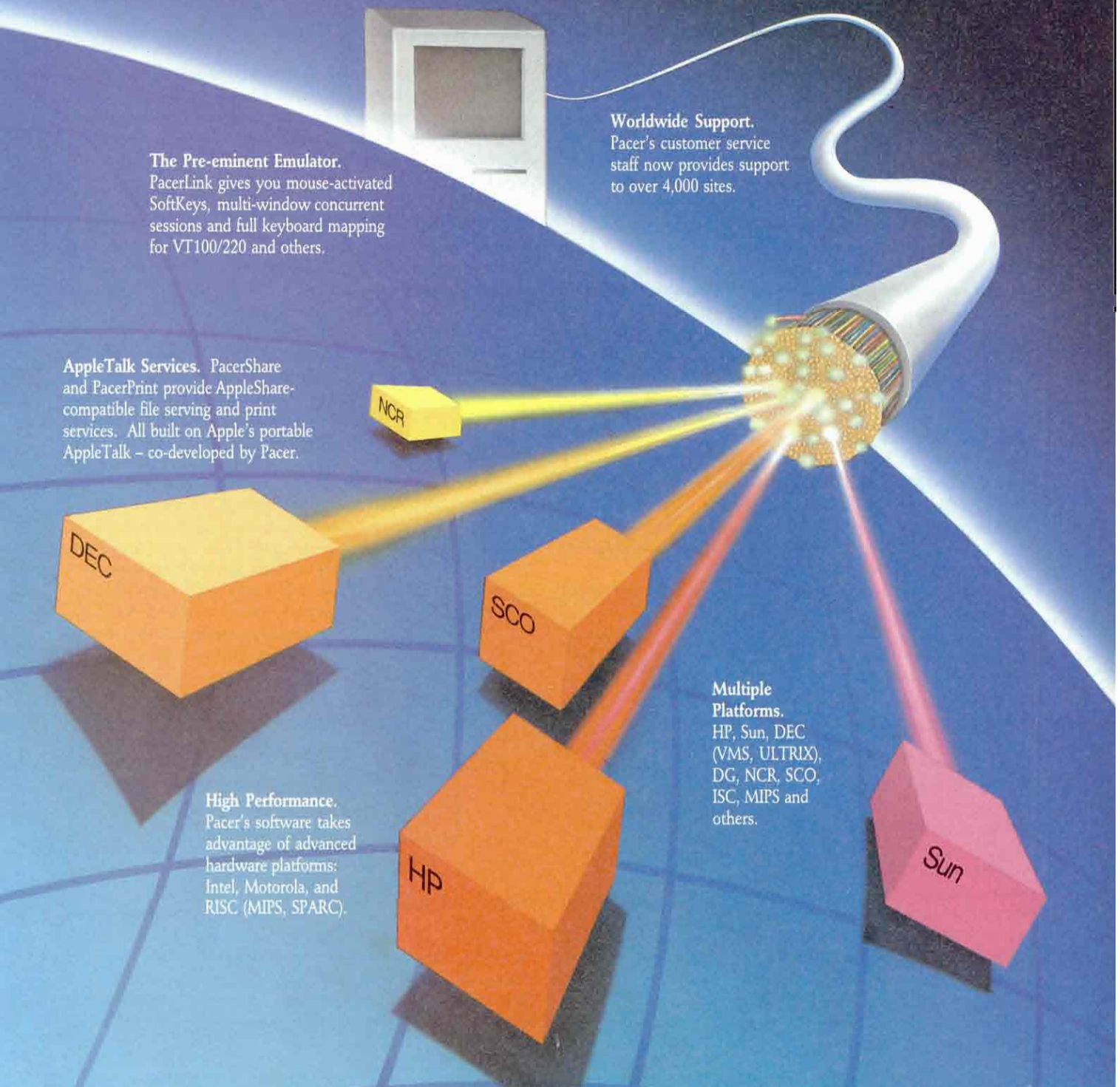

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network and the way in which they're using those devices. Therefore, when selecting hardware, the criterion should be delivered performance of the system.

The best method for measuring the performance of your system is to devise benchmarks based on your own application mix. X Windows contains a mechanism for "playing back"

[HP SHAREDX: THE X WINDOWS CUTTING EDGE]

Collaborative environments are rapidly becoming commonplace in today's companies. People that need to work together can't always be at the same location. Concepts like concurrent engineering—doing the work in parallel instead of serially in order to shorten cycle times—are easy to talk about but quite another thing to implement. HP SharedX, which allows several users to share applications and windows each using their own display device, provides MIS managers with a basic tool for making collaborative environments a reality.

For a group of users to truly share an application, each user must be able to view and manipulate the application. The application must be displayed on multiple workstations or terminals, accept input from multiple devices and update displays for all users simultaneously. In the X Window System, this means presenting display windows in such a way as to give the users the notion that the same application is available at the same time to each user. In effect, users at different display devices need to share the same window.

A Framework For Sharing

To understand the architectures for application sharing, you need a basic knowledge of the X Window System architecture. Sharing can either take place on the application side, as it does with sharing-capable applications, sharing libraries and replicated architectures, or on the system side, as in a centralized pseudo-server or an integrated sharing system. How sharing takes place has a profound impact on what windows are shared. If it takes place on the system side, any window or group of windows can be shared as a unit, thus allowing shared root windows or shared virtual roots. If sharing takes place on the application side, the users are limited to collectively sharing the windows owned by the application.

HP SharedX is based on an integrated sharing architecture for X Windows. In this design, an integrated sharing server retransmits the X protocol stream to remote X servers. Meanwhile, applications displaying on the local user's display can run at full speed because the protocol is sent directly to the X server and not through an additional process. *Figure 1* shows the architecture of an integrated sharing system.

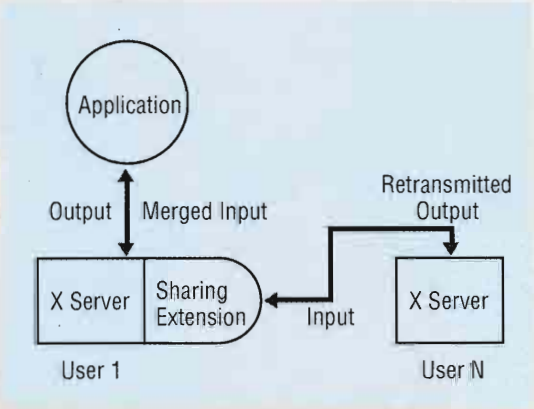

Figure 1: The X Windows integrated sharing architecture that supports HP SharedX.

HP SharedX was designed mainly for collaboration and consultation with a small number of participants. To support this use, HP SharedX supports an input policy called delayed dynamic input, that allows for input changes dynamically among the participants after some user inactivity. Delayed dynamic input policy allows multiple users to input to an application without their input getting intermixed (an advantage of floor passing) and without the need for explicit action to change the active user (an advantage of free-for-all input).

Workgroup Advantages

Research with potential users of a sharing capability within the X Window System reveals that there are many benefits that can be realized through sharing, but certain requirements must be fulfilled in order for the benefits to outweigh the costs.

Customers using an early version of HP SharedX recited many benefits. Enhanced collaboration occurred when software developers were able to jointly develop code, resolve bugs and define algorithms without having to be located at the same site. Manufacturing engineers thousands of miles away from design engineers could make changes to mechanical CAD drawings that increased the manufacturability of their products. Customer-support personnel gain instant approval from their managers for unique customer requests, thereby allowing them to answer more customer calls.

In all these examples, teamwork was made easier through the use of a sharing capability within the computer environment. In addition, better decisions were made faster. Users were able to access the right people to resolve issues and problems. When one user had a problems with his system he shared his window with the system administrator. The system administrator understood the error messages, and through input given, he resolved the problem and sent the user on his way. Another early user was completing electrical design reviews with members of his company without having to fly them into a central location. Others are integrating this sharing capability into their training for both employees and customers.

By allowing the sharing of live graphical information, computer networks can provide a new way of completing work faster and better. This allows workers to improve communication with each other without making changes to the organization. —*Randy Branson is a product marketing engineer for HP in Fort Collins, CO.*

events (mouse clicks and keystrokes). If you record your users keystrokes and then use this playback feature, you can objectively create your own benchmarks. Although you'll probably need a consultant to use this playback feature, it will be worth it.

Local processing reduces the overall system load, but choosing the right system requires sophisticated load balancing by actually measuring the application. Given the diversity and competition in both the workstation and X terminal market, you as an MIS manager should demand that vendors place systems at your company, so that you can actually measure the application's performance in-house. Even if this costs a small amount in consulting fees now, it will save you more headaches later.

Systems Integration

FINALLY, INTEGRATION is going to require hard work. Vendors will almost always say that their software and equipment is compatible with that of other vendors. Before you buy, be sure that it is. Again, insist upon an in-house demonstration for measuring purposes. Systems consultants are available and probably should be vendor-independent. Although HP provides a broad family of workstations, PCs and X terminals, you must find the right mix of these products for your price/performance needs.

The greatest benefit of the client-server model, particularly with X Windows is that it provides a vendor independent growth path. Make sure that the software you buy doesn't have vendor-specific proprietary hooks. These hooks can be very subtle (e.g., relying on a font of a particular format). It's important that you identify the applications your users want. And that you have determined which applications will be used directly, in emulation mode or in native format.

Next, make sure you know what GUI you will run and what mix of local and direct applications. Buy hardware that can support these needs and can be run with or without local processing and storage. Establish your own benchmarks for testing the usage patterns of your users. Finally, work with a systems integrator, preferably one who is vendor-independent, so that you can build a system that provides the best value, options and interoperability for both today and tomorrow. *—Dr. John R. Porterfield is vice president of advanced technology, Micronics Computers Inc., Fremont, CA.*

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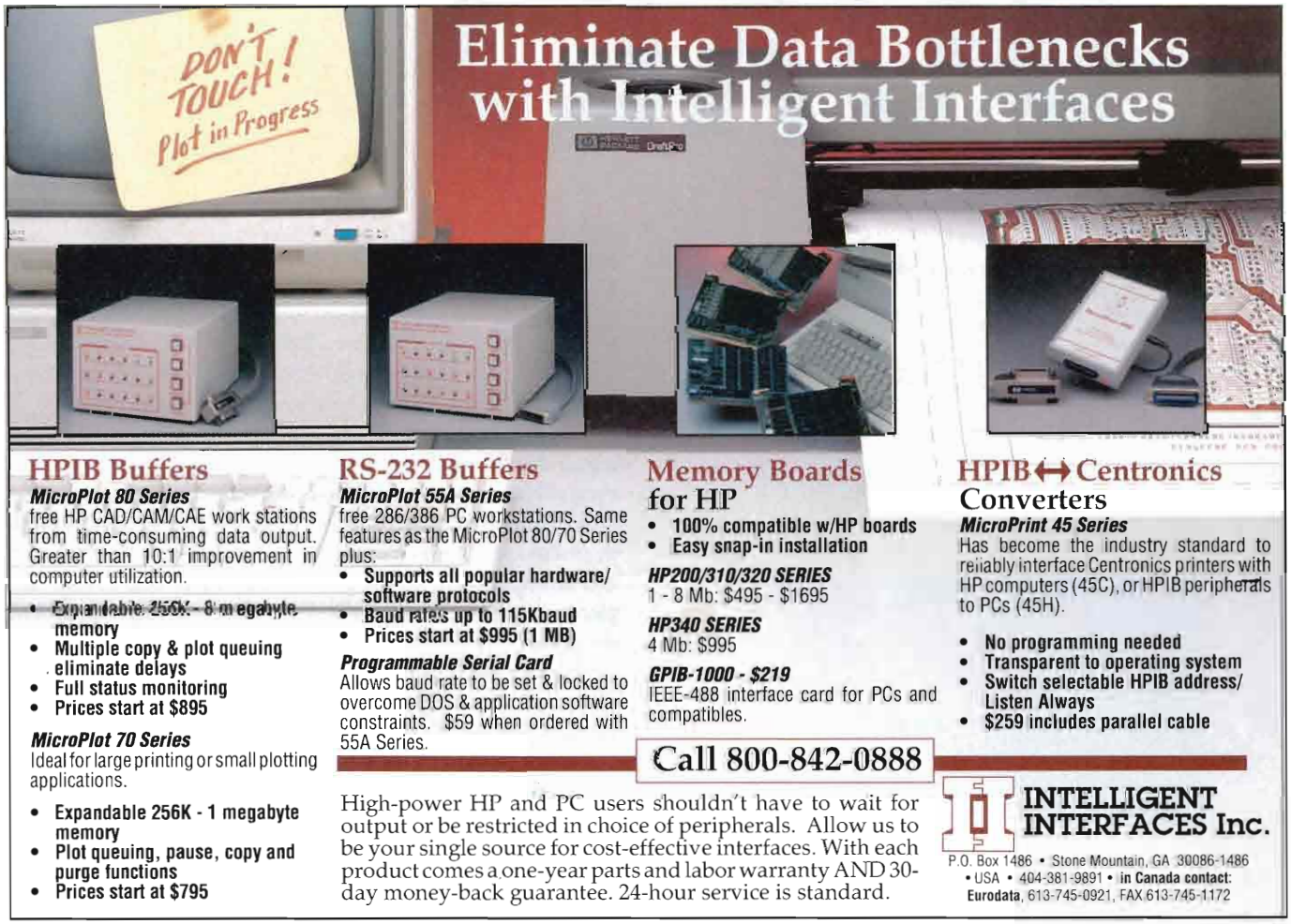

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HP Apollo Workstations Gather Cold Hard Facts About Our Planet's Future

BY BILL SHARP

McMurdo isn't a name that inspires instant recognition in the minds of millions, so let's drop a hint about where we are right now—nobody sells a lot of freezers. Too subtle? Okay, then head to a point roughly between Australia and New Zealand and turn south—way south.

Summer temperatures here soar up to somewhere near freezing in the balmy days from August to January, and we won't even talk about winter. We're in Antarctica.

McMurdo is a place of permanently frozen ground. Visibility is often zero because of ice particles whipped up by the winds and driven down from the glaciers. Cooled air falling from high places is a phenomenon that occurs in various locations around the globe.

They've got a name for winds like these, and it isn't Maria. They call these dense, driving and dangerous zephyrs the katabatic winds. They're linked to the circulation of atmosphere around our planet. Even in summer, personnel at McMurdo at times aren't allowed outside, or may only venture out tethered by a rope when the katabatic breezes blow.

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At McMurdo, as in all of Antarctica, there are no permanent human residents, only visitors. But along with animal denizens such as penguins, seals, whales and countless krill and fish, there are computers, too. While the shrimp-like krill feast on microscopic floating organisms and the fish, whales and others feed on the krill, a few computers feast on information that promises to shed light on some old dark mysteries about global warming, ozone holes and pollution.

For a change of pace, let's move midway around this continent that is half again as big as the United States. About due south of South America the Antarctic Peninsula stretches a cold arm north. Palmer is a research station much smaller than McMurdo, located here on a small island in the Weddell Sea.

Palmer enjoys what is generously termed a marine climate, with air temperatures moderated by the sea and high humidity. But those sea winds blow with hurricane force here for days on end and the sea swells in the Drake Passage reach storm heights of 50 to 60 feet between the peninsula and the tip of South America. Still, there is summer, which is milder here. Temperatures sometimes climb all the way up to 40 degrees Fahrenheit, making penguins pant.

Just as the winds from all points of the compass gather here, so too do the currents of the seas. Around Antarctica are the richest waters in the world, with more abundant sea life than in any other place on the planet, and a delicately balanced ecosystem. Antarctica is also a reservoir of truly global proportions. Some 98 percent of the land mass here is covered with ice, and that frozen water is often thousands of feet thick. The antarctic, where none of us live, is believed by many to be the key to how well and how long we will live in the future.

Satellites Probe The Pole

GATHERING INFORMATION in and around a continent the size of Antarctica would be an arduous task even under ideal conditions. Although several nations man research stations year-round, coverage of the region from ground-based installations just isn't practical. The seas around the continent can be brutal, flying conditions are poor and humans and their equipment take a beating any time of year. For these reasons, study of the huge polar area necessary to help determine global climatic patterns only can be effectively gathered using satellites. Ground data can validate it and provide meaningful detail, but crucial information for many studies must come from positions thousands of miles over our southern pole.

On stunning cliffs overlooking the Pacific Ocean just north of San Diego and shaded by huge wind-swept pines sits the Scripps Institution of Oceanography, part of the University of California. This is home to Bob Whritner, the man who milks the satellites for all they're worth. He's a specialist with the Physical Oceanography Division of Scripps and director of the Institute's Antarctic Research Center.

A NOAA-II satellite image of winds above the Palmer research station.

Whritner deftly pulls up an image on an oversized high-resolution color screen linked to his HP model 835 PA-RISC system. His database includes information taken using different light wavelengths. He shows progressions of images that clearly portray surface temperatures, ice movements, cloud cover and other data. He can provide this to other researchers on digital tape, color slides or large color prints to serve the varying needs of research projects.

"It's absolutely not possible to get this kind of data without satellites," he states. He uses workstations at the two ground stations to take data from weather satellites as they pass over the southern pole. The National Oceanic and Atmospheric Administration (NOAA) and the Defense Meterological Satellite (DMS) systems both provide data for Whritner.

Desirable Data

WHAT CAN YOU LEARN from looking at pictures of our planet's most fantastic freezer? In answer to that silly question, Whritner rattled off a list so long that we'll just record a sampling of what he studies:

- Movements of the ice edge, even through cloud cover.
- Wind circulation studies and links with global circulation.
- Polar atmospherics and links with ozone depletion.
- Atmospheric and ocean temperatures (global warming).
- Meteorites preserved in ancient ice.
- Geology studies, including plate tectonics and vulcanism.

Data from Palmer and McMurdo is stored on DAT or cassette tapes and shipped to Scripps for cleaning up and preparation for online availability. Whritner maintains a data archive at Scripps for researchers who want to dial up the database, and also sends out data in response to individual requests. The University of Wisconsin, Ohio State University and the Scott Research Center (Cambridge, England) all have complete copies of the archive.

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Satellite image processing started at Scripps in 1979, based on HP 3000 systems, says Whritner. "When the decision came to put systems in the Antarctic, I made it very clear I wanted HP because of the conditions. Diesel power doesn't generate the cleanest electrical power in the world and we had to be concerned about static electricity that could produce six-inch sparks." By 1989, McMurdo, Palmer and Scripps all had HP 9000 Model 835 systems running at 13 to 14 mips and "getting the job done." Considering the task at hand, the 500-MB hard disk drives they have are now archaic, says Whritner, who is certain that upgrading to higher performance systems will take place at some point.

Even the Antarctic is an open system these days. McMurdo's own open system consists of a LAN linking two HP Model 835 systems and one Sun SPARCstation. Sun handles DMS data while the HP gear looks after NOAA. Normal UNIX file protocols allow raw or processed data to be moved back and forth between the systems as needed.

Significant Figures

YOU MIGHT THINK that just getting an important satellite into space and functioning well is all the accomplishment that an important space effort needs, but you'd be wrong. Right up there near the top of the list is predicting and if need be correcting the position of a satellite so that it's precisely correct. If a spacecraft in Earth orbit isn't precisely located, much of the data it collects also will be imprecise.

Peter Breckheimer is software supervisor for navigation systems at NASA's Jet Propulsion Laboratories (Pasadena, CA). His efforts with the Global Positioning System (GPS) enable NASA to determine precise locations of spacecraft anywhere from Earth orbit to the outer planets. Because the system is designed to function for a number of different applications, the software is very complex. How complex is it? More than 1.5 million lines of FORTRAN 77 code, that's how complex.

Dealing with such a massive program takes a few adjustments for each application, so the software has various inputs to take these factors into account. How many data inputs? Roughly 60,000, says Breckheimer. Adding this data to the model for a particular use is called "tuning" the software. Tuning up the system for a big mission such as a Mars orbiter or an important Earth satellite requires some time. How much time? Months. This allows integrating for spacecraft position and velocity and solving for gravity fields.

This means lots of excruciatingly difficult computations to ensure that positioning is precise. And oddly enough, some highly regarded, very powerful computers can't do the job. "We have Cray computers, but they aren't very well suited for this kind of work," says Breckheimer. "We need full double precision, 16 significant figures on all computations, and that is our minimum. Some calculations are very sensitive to that level of precision. The Cray has 14.4 significant figures."

Breckheimer's program started out using six HP Apollo DN 10000 systems as compute servers, and just recently arranged to move over to the new Series 700 systems. By next month, he expects to have the software recompiled and relinked onto the 700 systems. "This will probably keep us happy until at least the mid 1990s," he says.

One of the important projects to be aided by the GPS system will be the joint U.S./France TOPEX/POSEIDON satellite, that will measure the precise topography of the sea surface for three to five years. It's goal is to provide precise studies of sea surface changes to within 10 centimeters or less. This data will contribute new accurate data on ocean circulation, how the oceans transport heat and nutrients and how the oceans interact with the atmosphere to influence weather and climate.

Datal Visions

MEANWHILE, BENEATH THE ocean's surface a starfish is on camera, eating krill. The film sequence will be stored in a database, along with superimposed information on date, time of day, water temperature and salinity when the starfish was observed.

The carefully annotated video doesn't yet exist in that database—but it will. It's the vision of Bruce Gritton, database administrator at the Monterey Bay Aquarium Institute (Pacific Grove, CA). He's working to build a scientific information system to effectively integrate data capture, analysis and interpretation and store it in an easily available format.

Originally started as a project for data collection in Monterey Bay only, the project now will collect oceanographic data worldwide. "We'll have data from all the oceans and bring them into pertinent data sets," says Gritton. "We'll have the ability to bring data into an active window and then move it out to archival storage and retrieve it when somebody wants it."

This sounds simple until you consider the scope of scientific data. Historically, it has been kept on paper and stored wherever the researcher thought to put it. Later, magnetic media came into play as computers took an ever increasing role in science. But data generally hasn't been brought forward into new archival systems as technology has moved ahead.

The result of this is that lots of valuable data is unavailable for study, or worse yet, lost. Big deal? Data documenting the ozone hole was recorded years ago, but thrown out of a study automatically as too far out of the expected data range to be valid. Later, the archived data was used to independently verify the existence of the hole.

Data storage and availability is every bit as important as the research work that produces that data. This may be a factor in scientific use of computers that differentiates it from commercial use, where old data tends to lose its value rapidly.

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CIRCLE 140 ON READER CARD

The U.S. General Accounting Office recently charged NASA, NOAA and the U.S. Geological Survey with failing to archive important and irreplaceable data and allowing poorly stored data to be damaged. And the problem will get rapidly worse without careful planning. Scientific studies planned over the next few years, such as the Earth Observing System will produce a barrage of data that may reach a terabyte or more per day, according to NASA.

Gritton's plans are in a more modest range. He hopes to build a system that can assimilate and distribute hundreds of gigabytes of oceanographic data. The institute's 3Com Ethernet LAN connects a central HP 9000 Model 850 database server with a collection of more than 60 HP 9000 Series 300 workstations, PCs and Macintosh systems. A real-time link is on the way to connect the Institute's research vessel with the server for data storage.

Gritton sees a need to include an even greater variety of systems from other vendors such as Sun. "Like everybody else, we need a multivendor system to get all the software we need."

Sybase provides the crucial database software that is the basis for the evolving system. But this is just the starting point for the vision. "My dream is a high-level interface that is independent of all the bits and pieces in the underlying technology," says Gritton. "We may not have direct access to all the data, but the system will tell us where the data sets are and may refer us to other related data that may be of interest."

Making sense of scientific research is no longer the task of some thoughtful doctorate, musing for hours with furrowed brow and worn pencil. Making sense of the numbers requires copious computation if we're to better understand our planet and its future.

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[Biosphere II: The Cybernetic Jungle]

(SunSpace Ranch, Oracle, AZ)—In the burnished foothills of the Santa Clara Mountains, scientists work on an experiment the likes of which humankind hasn't seen since Noah—Biosphere II. Soon, scientists will finish populating this two-and-a-half acre vivarium with 3,800 species of plants and animals creating a rain forest, marsh, ocean, savanna, desert, agricultural area and human habitat. Their hope is to replicate Biosphere I (the Earth) amidst a landscape as seemingly impoverished of life as the Great Sonoran Desert.

The true test of this closed biological system begins this winter, when eight research scientists enter Biosphere II to live off the fat of this indoor land. These "Biospherians" will reside in a five story tower, complete with computer-controlled command center and online library of books, magazines and newspapers. They plan to till the soil, raise chickens and goats and manage wilderness areas. Barring medical emergency, they will not leave the Biosphere for two years.

Once the Biospherians enter their earth capsule, they will be cut off from the outside except for electricity, light and communication. Neither the air they breathe nor the water they drink nor the food they eat will go to waste. They will exhale carbon dioxide that plants will convert to carbon and oxygen nurturing the plants and replenishing the air. Fresh air will carry water that evaporates from the ocean to the rain forest where it will cool, condense and fall as rain providing a source of drinking water. Waste water will spill into aquaculture tanks nourishing algae that will help purify water and replenish the air. Together, plants, animals and the elements will create a balanced biological system.

"Within Biosphere II we will be able to monitor the consequences of what we do," says Linda Leigh, scientific director for the project and one of the four women who will live inside the project. "In the real world, it's hard for people to see the effects of their individual actions. I expect that if we cut down a tree we're going to see a blip on one of the computer monitors. We will be able to measure the effect of one action on the rest of the ecosystems we are living in."

Across the road from this 21st century cathedral, scientists and engineers track conditions inside Biosphere II over a ten-megabit-per-second IEEE 802.3 fiber-optic local area network. An HP 3000 running MPE XL in Mission Control retrieves data from 2,000 sensors located inside Biosphere II. Twenty HP 9000 Series 300 workstations located along the network give the Biospherians, engineers and research scientists a window on their biological world.

G2, an expert system used for controlling industrial processes, from Gensym Corp. (Cambridge, MA), supervises the monitoring of data and analysis of conditions inside the Biosphere. The software contains rules which govern system ecology, and the operation and maintenance of Biosphere II. The program keeps track of the computer network and guides the experiment away from crises that could threaten its survival.

"G2 will alert the scientist to such things as runaway carbon dioxide, something you'd want to detect immediately," says Lowell Hawkinson, chairman of Gensym. Engineers at Gensym wrote G2 in LISP for a number of UNIX workstation platforms.

When Biosphere II closes this winter, the combination of HP gear and G2 software will monitor and control two-and-a-half acres of land and seven million cubic feet of atmosphere. The systems will sample thousands of environmental variables each second.

Norberto Alvarez-Romo, director of cybernetics for Biosphere II, admits that the HP systems will handle the critical work in monitoring the environment. "The challenge," concludes Biosphere II consultant Carl Hodges, "has been to design Biosphere II so that it doesn't work the Biospherians to death."—*Tom Ulrich. Ulrich is a senior writer for Hewlett-Packard, Cupertino, CA.*

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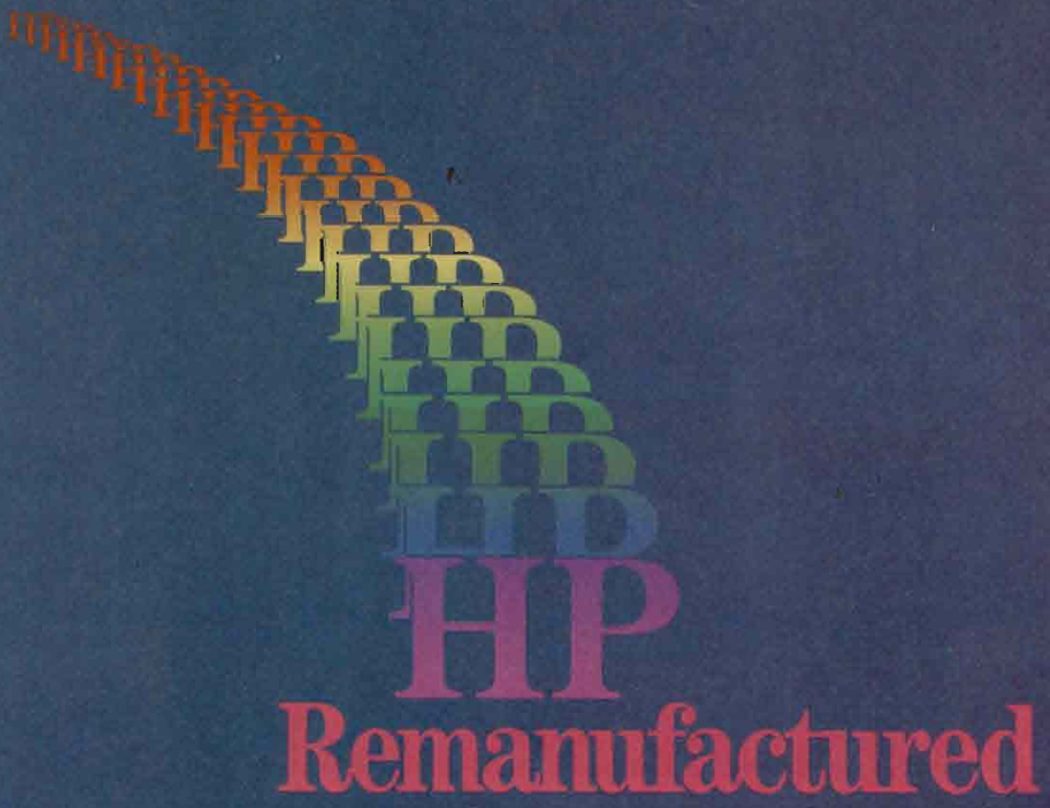

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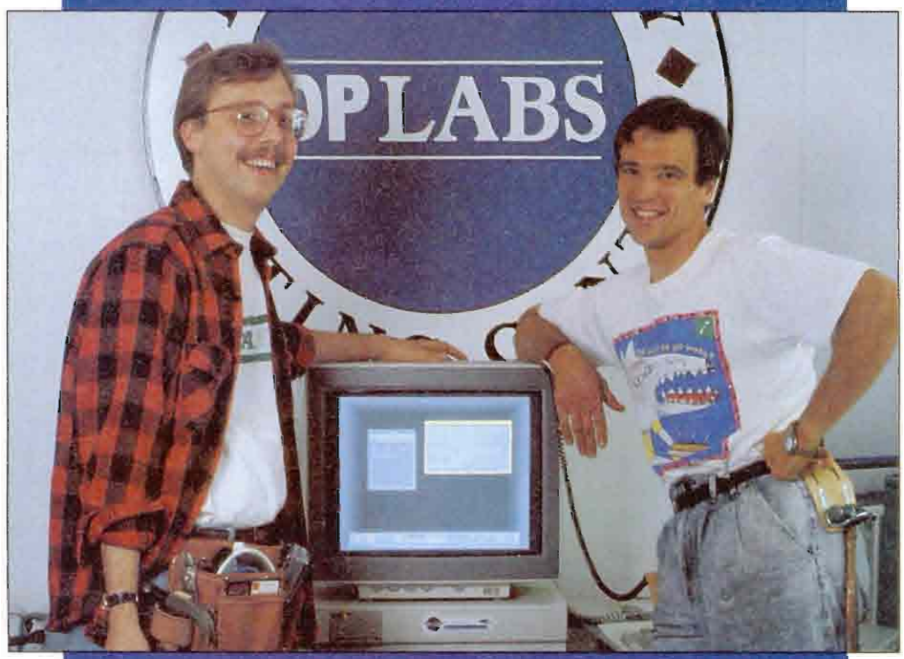
This Old Workstation



Tonight's Episode: A Do-It-Yourself 68040 Upgrade For The HP 9000/400t

Editor's note: Here's a rare look at some up and coming, top secret projects in Professional Press' DP Labs where we're always trying to make product testing more entertaining, yet also informative, for you.

What follows is an original script and some still shots for an episode of *This Old Workstation*, the Do-It-Yourself series for computer professionals. You've done it all ... taken a course in Lotus, learned BASIC, even read the Time/Life series *Understanding Computers*. Now, we've got the program that will make you a confident computer jockey in no-time flat. So, sit back, kick your feet up and enjoy the show.—*Don Marks, Managing Editor*

[Script for Episode 2 of *This Old Workstation* (formerly—*Workstation Adrenalin* —*HP Professional*, December 1989).]

[Intro music, scenes of Dave and Don hard at work, upgrading workstations

By David B. Miller

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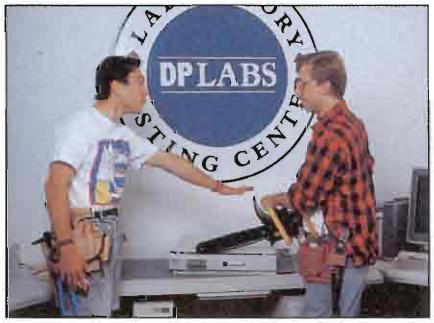
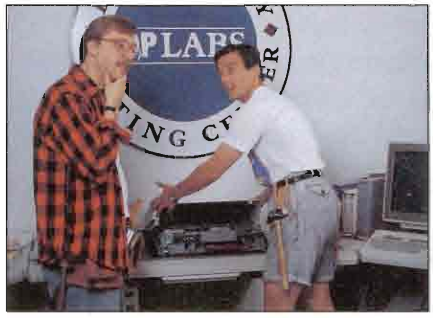
CIRCLE 113 ON READER CARD

This is the last time you'll see this 400t running this slow.





Opening the cabinet (chain saw not required).

Remove the daughter board carefully (not like a floor board).

across the country ... then, a shot of Don and Dave in DP Labs ...]

Don: Welcome, everyone, to another episode of *This Old Workstation*! Today, we have a project lined up for you folks interested in maximizing your investment in HP hardware. We're going to upgrade an HP Apollo 9000/400t workstation to a 425t using the standard HP upgrade kit. As usual, DP Labs Manager Dave Miller will assist me in this process, so without further adieu, let's get to work!

[Fade to black, then to a shot of the 400t, up and running ...]

Don: Dave, what do we have here?

Dave: This is our current 400t, still running, as you can see. Great machine, but HP's upgrade kit will make it better.

Don: How are we going to do that?

Dave: Basically, we're going to replace the 68030 processor with a 68040 and a faster crystal. We're going to need to replace the old boot ROM as well. Let me bring the system down, grab an antistatic mat and wrist strap and the well-written HP supplied instructions and get started.

Don: OK, Dave, the system's down. I'll just take the front cover off with my trusty chain saw ...

Dave: Hold on, Don! These cabinets can be feisty, but they're not *that* bad! Just gently remove the front panel and lift off the top cover, thusly ... be careful of the ON/OFF switch also.

Don: Oh, sorry, Dave.

Dave: Why don't you allow me to remove the video card and store it in a safe place for now? I've got the wrist strap on anyway ...

Don: Well, Dave, according to the instructions, the daughter board has to come out first. I'll get it.

The board comes up easily after loosening the screws.

Socket for 68040 processor. Note empty crystal socket right next to the 68040 socket.

Press the 68040 chip in the socket firmly, but gently.(A hammer would be overkill.)

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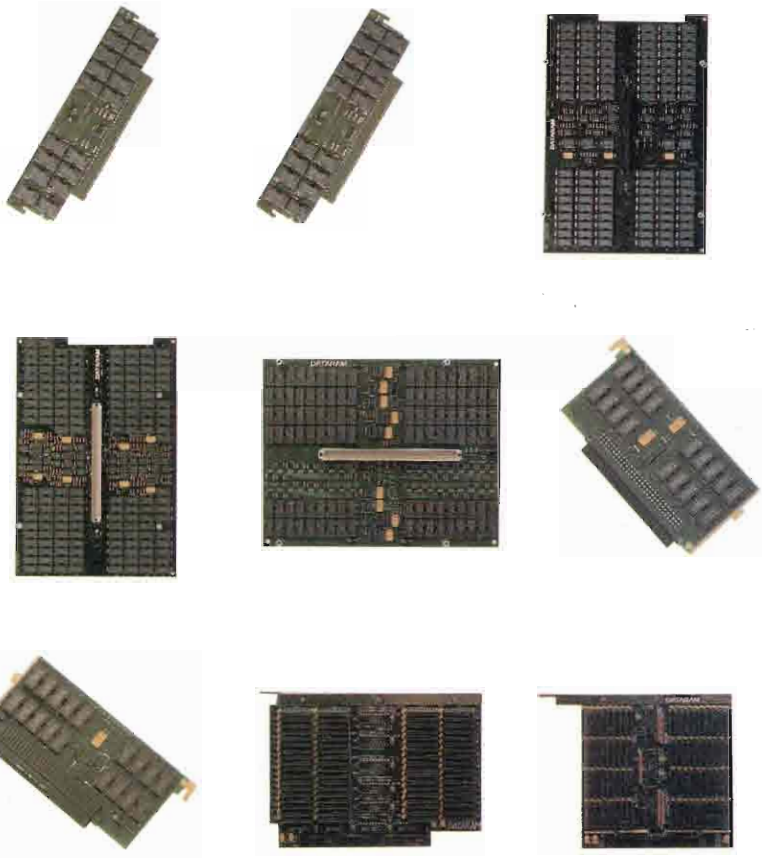

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CIRCLE 240 ON READER CARD

Gently pry the old chip loose and carefully insert the new one.

You need to move this jumper over so the 68040 can be used.

The cover goes back on as easily as it came off.

Dave: Hey, Don, what's with the nail puller? I don't think that'll do. Be gentle, like this. Loosen the five screws first. Then, the board comes right up.

Don: Yeah, Dave, I can tell by your hands that you don't exactly do much dangerous manual labor.

Dave: Very funny. Moving right along, we can put the daughterboard aside because we won't be putting it back in the box. Now, we need to install a few pieces of hardware ...

Don: That 68040 chip is awesome! Looks like it goes right in that socket there. Shouldn't be too hard. Got a tool for every job, you know? Let's see, line her up ... a few taps with this ball-peen and ...

Dave: Here we go again, Don. You're about to make that 68040 into a RISC chip with that hammer! Here, let me show you how it's done. Orient the chip according to the markings ... then, a couple of thumbs ... gentle pressure, click! ... and it's in!

Don: Well, Dave, I guess this is one case where being all thumbs is a good thing.

Dave: Don, why don't I take it from here and show the viewers what's left?

[Installing the new Boot ROM]

Dave: OK, we gotta' replace the old boot ROM. Gently pry out the old chip, noting its orientation on the board. The new chip looks exactly the same. The new boot ROM kinda just slides right in place. No hammer needed.

Next, we have to install a new crystal. Did you happen to notice the empty socket right next to the 68040 socket?

Don: Sure did, Dave. I suppose that one square edge on the crystal is there to make orienting it a bit easier.

Dave: Couldn't be easier, Don. So how are we going to install this new crystal?

Don: Just, orient it correctly and push down with *gentle* pressure.

Dave: You're catching on Don. We'll have you ripping memory boards out of Crays pretty soon!

Don: Dave, we've run out of parts and almost out of time. Guess it's time to close 'er up and let 'er rip?

Dave: Almost, Don. One more thing to do. There's a jumper that needs to be moved. Just need to move it from its current position to the next. After that we'll put the video card back in, slap the skins back on and see what happens.

[Replacing the cover]

Don: Need to really seat that cover with this, Dave?

Dave: No, thanks, Don. I don't think I'll need that hammer. Let's see, this is another easy one ... got it. Okay, let's give it a try.

Don: Great Dave, what should we expect to see happen here?

Dave: Well, first things first. Let's hope it boots ... success! Well, never doubted it for a minute! Good thing HP builds tough machines.

Don: Glad to see you so pleased with yourself, Dave. I thought I noticed a sense of relief come over your face when the 400t booted. You *do* do this sort of thing all the time, don't you?

Dave: Yes, Don, of course. But naturally, there are always the butterflies in the stomach to deal with when you start pulling and pushing chips. But, fortunately, HP's instructions are superb, so there's every reason to make this a do-it-yourself project.

Don: OK, you've done the upgrade. But is the 400t *really* faster?

Dave: Well, first, Don, it's not a 400t

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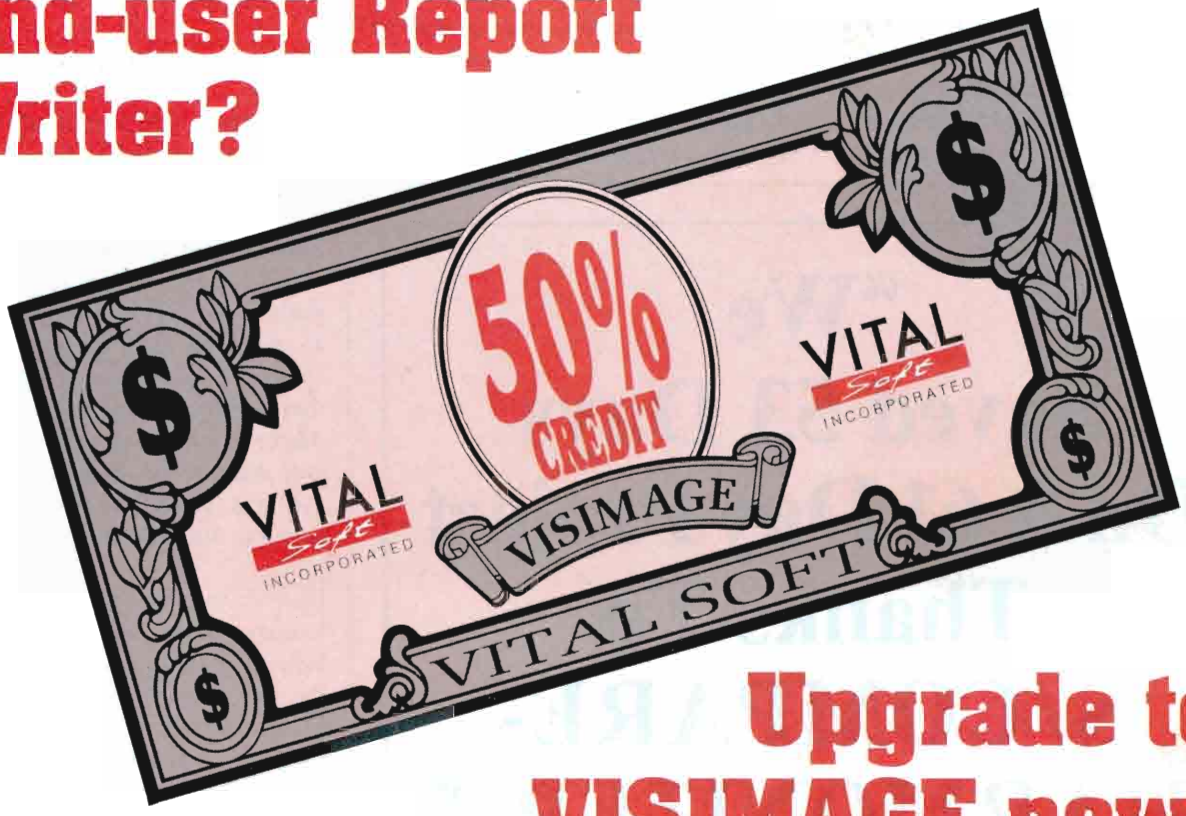

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CIRCLE 143 ON READER CARD

anymore. It's a 425t. That's the second time you said "400t."

Anyway, I was hoping you'd ask me about performance. Don, this upgrade project has given me the opportunity to use the Remote Terminal Emulator and benchmark script software provided to us by Neal Nelson Associates. One of its suites is designed to thoroughly exercise an entire system. We won't go into all the particulars here; that's a whole other episode. But, I ran the tests before we did the upgrade. Let's run them again and see what improvements can be realized.

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CIRCLE 163 ON READER CARD

Don: Sounds good, Dave. Well, folks, we'll be back in a few minutes.

[Public service announcement]

Don: Dave, did you finish the Neal Nelson benchmarks? Hope it's good news.

Dave: Sure it's good, Don. We realized about a 25 percent performance increase running the same tests after the upgrade as opposed to before. Naturally, everyone's applications are different and they'll realize varying degrees of performance increases, but we're pretty happy with what we got. Besides, we saved the $165 that HP needs to charge to have an engineer come out and do this for us.

Don: Saving money and increasing performance at the same time. That rarely happens in this industry, you know? By the way, are you sure the performance boost wasn't more like 23.5434682039%? I know how you like to be accurate.

Dave: "About 25 percent" is good enough. Don't push the accuracy thing, Don.

Don: Hmmm ... moving right along ... This upgrade was a good idea, Dave. Another successful project, I'd say! Well, that just about wraps it up for another episode of *This Old Workstation*. Hope we've been of some assistance. Next week, we'll show you how we turned a DEC Rainbow microcomputer into a dynamite disk drive cabinet and power supply. Gotta do something with those MS-DOS/CPM machines!

Until then, remember: take all the RISCs you want, but keep your static to yourself.

[closing music, Don and Dave shaking hands ... fade to public service announcement ...] ■

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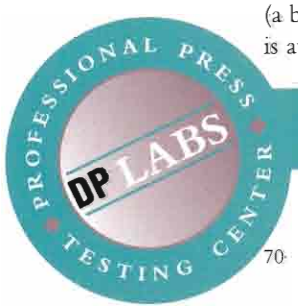
XPRESS YOURSELF

Get Your Message Through With Robelle's Xpress, An Electronic Mail Facility For The HP 3000

Last year, at a conference in Cambridge, Massachusetts, Andrew Grove, CEO of Intel Corp., called electronic mail the killer application that would drive the growth of local- and wide-area networking in the same way that word processing and spreadsheet software drove the growth of the personal computer industry. Should this turn out to be true, Robelle Consulting Ltd. (Surrey, BC, Canada) hopes to share in that growth with Xpress, its electronic mail package for HP 3000 minicomputers and IBM-compatible PCs linked to HP 3000s.

Beyond the essential facilities for composing, sending and reading mail, there are many significant features in Xpress. An electronic date book, or tickler file (a bring-forward file in Xpress parlance), is available to each Xpress user. A bulletin board function allows the posting of notices to all the members of a single mailing group or department. Xpress has facilities for transferring MPE or MS-DOS files from one user to another via the HP 3000. (The mailing of MS-DOS files from a PC requires the use of a third-party terminal emulation package.)

A mail administrator can create mailing groups that mirror the departments within your organization, and individual users can create distribution lists to facilitate the sending of messages to several individuals simultaneously. Each Xpress user also has an electronic filing cabinet in which outgoing messages, received messages, copies of bulletin board notices, tickler file information or text of standard reply messages can be stored. Xpress even includes software to perform



By Joel Martin

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CIRCLE 119 ON READER CARD

capacity changes and other simple maintenance on its IMAGE database. And finally, Xpress can manage the receipt and transmission of mail across a network of HP 3000s and provide facilities for relocating Xpress users from one CPU to another.

Get Xpress Up And Running

I installed Xpress on our MICRO 3000 XE running MPE V. If you're already a Robelle customer, installing Xpress may require extra care.

The demo software is installed in the ROBELLE account, which is also the home of Robelle Consulting products you may have previously purchased. By itself this wouldn't be a problem, but the demo tape includes trial versions of all of Robelle's other products. Though the installation won't overwrite any products you've purchased, it will overwrite the help files and documentation for those products. This could cause a problem if you receive a new demo of Xpress and are a release or two behind on another Robelle product, such as Suprtool.

Adding mail users and groups is done by the mail administrator HELPMAN, using the CONFIG program. Xpress mail users must have a unique identifying number in addition to their name, and Xpress supports, yet discourages, the use of the MPE session name or user and account name as a mailing name. Users can belong to one group that shares a bulletin board. Changing user or group characteristics is straightforward, and the manual provides helpful guidelines to best take advantage of Xpress' facilities while minimizing the need for future maintenance as users and groups change. Each user can in turn create his own distribution lists for commonly grouped mail recipients.

Drop Me a Line

When run, Xpress prompts for a mail username and password, and then presents a choice of eight functions (see *Figure 1*). There are no Send Mail or Receive Mail functions. To send mail, choose function 3, Out Basket, by typing 3 or by pressing F3. Typing 3 brings up seven more functions to choose from: 1 - Exit, 2 - Read, 3 - Write, 4 - Move, 5 - Copy, 6 - Edit and 9 - Files (7 and 8 are used in a different basket). To compose and send mail, choose 3, Write. If you initially had pressed F3, Out Basket, you would've skipped to the Write function without having to make a second menu choice. The identical labeling of the menu choice and the function keys doesn't suggest a difference in their operation.

At this point you're placed in a mini text editor to compose your message. The minieditor is not very fancy, but it does support word wrap when you reach the end of the line and should be sufficient for most messages. Your installed HP 3000 text editors are also available from Xpress, and a later release of Xpress will include a mini full-screen editor. Following the composition of your message (a lone carriage return signals the end of the message, so don't try to include any blank lines), you'll be shown a list of the users in your group. Choose one or more of the group members to be recipients of the message by typing their user numbers separated by a space or comma.

Xpress then prompts you with the message, "Copy mail from the Out Basket to [7 - Waste Basket]:". This is its way of asking if you want to send the original memo to the trash for later disposal by the janitor. The janitor isn't a background or nightly jobstream as might be expected. The first time you use Xpress, the following day you'll be asked by the built-in janitor if it's OK to empty your waste basket. Alternatively, you can incinerate the original at that time, copy the message to another user, edit the message and then copy it to another user, print it on a system printer, post it on the bulletin board or file it in your filing cabinet. Eventually, you'll return to the out basket options at which point a carriage return brings you back to the highest level as shown in *Figure 1*.

Read Your Mail

Reading Xpress mail messages is more intuitive than the composing and sending of messages. As expected, Xpress informs you of the number of messages you have waiting when you start the program. Choosing In Basket from the

FIGURE 1

```
S37#XPRESS

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(Version 2.7 Expiring) Expires in 26 days

Enter Your Mail User Name: JOEL MARTIN
Enter Your Mail Password:

Welcome to Xpress, JOEL MARTIN

There are no outstanding messages

Mail Menu

1 - Exit Mail System      4 - Bring-Forward File    7 - Waste Basket
2 - In Basket             5 - Bulletin Board        8 - Organizer
3 - Out Basket            6 - Filing Cabinet

What is your choice (enter a number between 1 and 8):

Exit Mail | In Basket | Out Basket | Bring Forward | Bulletin Board | Filing Cabinet | Waste Basket | User Options
```

highest level menu and the Read function from the second menu displays a list of the waiting mail messages including the name of the mail sender, the date and time the message was sent and the message subject. Several messages can be selected for reading at one time, and you can reply to a message immediately after reading it. Incoming messages also can be filed for later reference.

Xpress allows you to move messages from one basket to another, including moves that retrieve your message from its intended destination back to your out basket. This feature can be particularly helpful if the recipient has enabled autoforwarding of his messages to another user higher up the food chain. The other major facilities of Xpress, the bring-forward file, bulletin board and filing cabinet, work similar to the mail facility. Messages can be posted on the bulletin board for a user specified length of time and a retention period can be placed on messages sent to the filing cabinet as well. Xpress supports any text editor running under MPE, and each user can configure Xpress to use his favorite editor.

XPRESS (Version 2.7)

SYSTEM REQUIREMENTS: HP 3000 running MPE-IV through MPE XL.

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There are a few common mail facilities missing from Xpress. There are no reports to monitor mail traffic volumes, though some measure of mail traffic could be created by measuring the changes in dataset capacities of the mail database or by analyzing the database log files with a tool such as Flexibase (Proactive Systems) or DbAudit (Bradmark). There are no facilities for generating return receipts or for flagging a message as confidential and preventing it from being automatically forwarded. Unfortunately, there's no HP-UX version of Xpress, so mixed CPU HP shops won't find it to be a complete solution.

All in all, Robelle Consulting's Xpress is a MPE-based electronic mail package with a strong suite of electronic office features and few idiosyncrasies. If you need inexpensive E-mail for MPE and MS-DOS systems, take a look at Xpress. Robelle's pricing policies make Xpress an especially good buy for companies with multiple large HP 3000s. ■

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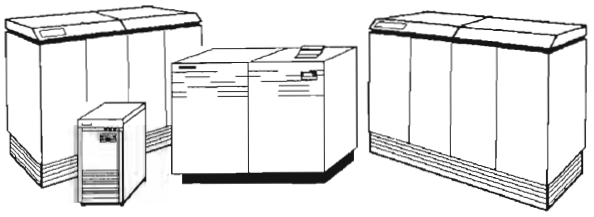

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CIRCLE 170 ON READER CARD

MANAGING YOUR HP 3000

John P. Burke

Do HP's Nova Systems Signal A New Beginning For The HP 3000?

An Educated Guess

Computer vendors are understandably reluctant to discuss strategic plans because of the effect they might have on the current marketplace. When you're selling proprietary systems into an open systems marketplace, you have to be careful what you tell prospective customers. By the same token, if you plan to keep the customers you already have, you've got to satisfy the needs of your installed base. That in a nutshell is HP's dilemma with the HP 3000.

As a system manager, you need to think about what the next few years will bring for the HP 3000, MPE XL and, of course, TurboIMAGE. If you aren't thinking about HP's direction and its plans for the systems you manage, then you're guaranteed to encounter unpleasant surprises. Unfortunately, this type of speculation seldom amounts to more than an educated guess.

Nova's Bottom Line

The HP 3000 has been made anew with the Nova systems as a tightly integrated, factory preconfigured, system-in-a-box. Designed to be plug 'n' play, and equipped with "instant ignition" to use HP's phrase, they're just the kind of systems that VABs love. With PA-RISC 1.1 plus advanced disk and DAT technology, HP again has a position of technical and price/performance leadership in midrange systems. No doubt about it, the Novas are killer boxes. Whether in the 9000 (807S to 857S) or 3000 (917LX to 967) configuration, they compare favorably with anything available from any vendor—at least for the time being.

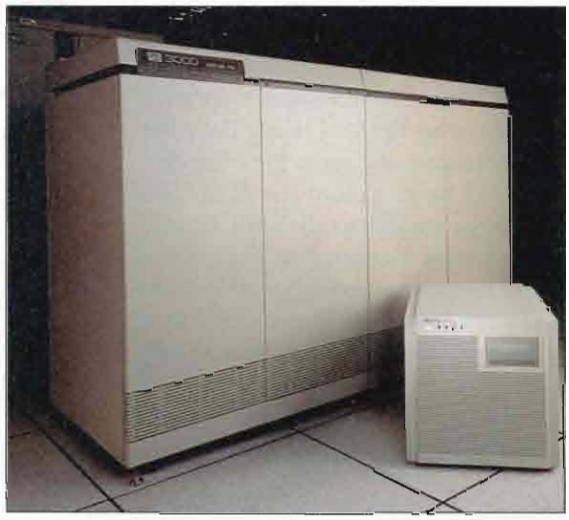
What does this mean to the installed base? For many, it will mean the end of the Classic era. If you currently have a Classic 3000, ownership cost alone could force you to migrate. For Classic systems, maintenance costs are only going to escalate. What you're paying now is already high compared to the new systems, and as time goes by those support costs will only increase. For example, for support of a Series 58, my company is paying two to three times as much as the cost of a completely configured Nova system.

Also, with HP talking about four years MTBFs (mean time between failures) for the Nova systems, you can bet that maintenance costs are going to be very low compared with maintenance costs on your existing Classic systems. Even if you feel you have adequate capacity, it's time to examine the cost and expected pay back time for a move to PA-RISC. Remember, HP has set a standard for ease of migration to a new architecture. Educated guess: Fall 1991 will be the last best time to migrate to PA-RISC.

Hard Software?

Software used to be virtually given away when computers occupied crystal palaces. Not so long ago HP gave away the RAPID products with certain hardware upgrades. Now the reverse is becoming true as hardware increasingly becomes a commodity market. Many organizations now have more money invested in purchased software than in hardware.

I still believe that HP isn't yet a software/services company. However, it not only thinks it's a software company but believes that software and services are where it will make its money in the future. So guard your wallets. We're already seeing HP join other vendors in advertising low hardware prices as comeons with the software costs relegated to the fine print. The unbundling of TurboIMAGE and then ALLBASE/SQL was driven more by the desire to break



software off from hardware and realize the revenue separately than by HP's oft-stated desire to "give the customers what they want."

There has been a lot of discussion recently about an SQL shell for TurboIMAGE. Forget it. It could have, perhaps should have, been done five years ago, but it wasn't and now it won't be—at least not by HP. ALLBASE/TurboCONNECT is it. HP can't afford to be a maverick in the marketplace. Navigational databases just don't sell today. For obvious account control reasons, HP would prefer everyone use TurboIMAGE, but the relative technical merits of navigational versus relational don't matter. And anyway, relational requires more iron for comparable performance in OLTP, so why should vendors fight it?

This doesn't mean you have to convert your existing TurboIMAGE applica-

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CIRCLE 129 ON READER CARD

HP is following the only strategy that will give the HP 3000 and MPE XL a chance to survive as a viable computing platform.

tions. That would be stupid. Surely you have better ways to spend your time. TurboIMAGE will be viable for many years—it's just a tough sell to new accounts.

Creative Mathematics

The official line is that an HP 3000/957 with TurboIMAGE costs only 26 percent more than a HP 3000/957 with ALLBASE/SQL ($145K vs. $115K). True enough. Of course, if you compare the incremental costs of TurboIMAGE vs. ALLBASE/SQL on that same 957, you would say that TurboIMAGE costs three times as much ($45K vs. $15K). The phrase "charging what the market will bear" comes to mind. Clearly, HP doesn't expect to sell much TurboIMAGE into new accounts.

Note that the pricing of the new Nova systems makes explicit and formalizes tiered, cpu-based (and also user based in the case of MPE XL) software pricing in the HP 3000 market. When databases were bundled into MPE, this fact was easily overlooked. It will now cause some teeth gnashing as people upgrade systems. The trend is clearly to unbundle everything, to present a customer with the largest possible menu of choices to configure a system. You only pay for what you want.

Educated guess: What we're seeing now with TurboIMAGE and ALLBASE/SQL is analogous to the battle that raged in the IBM world a few years ago between IMS and DB2 adherents. And, will have the analogous result. IMS was IBM's strategic mainframe database system for many years and DB2 was just some lab toy that you wouldn't use for "real" applications. The argument is largely academic now. AD/Cycle is a cornerstone of IBM's future strategies. At the heart of AD/Cycle is the Repository. What is the Repository built on? DB2.

The HP 3000, Dead Or Alive?

You heard it here first. The HP 3000 is dead—at least as a general purpose computer system for small- to medium- sized businesses. Note the prepackaged nature of the new systems. Perfect for VABs in vertical markets. With POSIX support, HP will push the HP 3000 as *the* open, client-server, OLTP platform.

The very reason that HP is in good shape relative to other minicomputer vendors is that it realized the futility of pushing the traditional proprietary system in a general purpose computing environment.

Educated guess: The era of roll-your-own applications with 3GLs is over for small-to medium-sized organizations. GUIs and client-server applications are too complex for traditional methods. Shrink-wrapped applications will include the server hardware (HP 3000) that you just snap onto your network.

No one can see into the future with certainty, but I think HP is following the only strategy that will give the HP 3000 and MPE XL a chance to survive as a viable computing platform in the year 2000. There will be some pain for current users and third-party software suppliers, but I would rather have a modified HP 3000 MPE system than none at all. What do you think?—*John P. Burke is the system manager for Construction Computer Center, Philadephia, PA.*

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[1]Computerworld, 9/24/90. [2]The Sierra Group, 1990.
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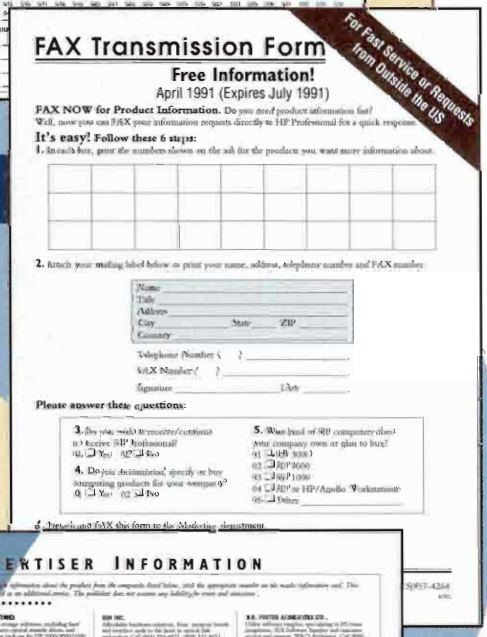

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CIRCLE 109 ON READER CARD

HP-UX

Andy Feibus

Half-Truths And Marketing Hype Warrant An Occasional Reality Check

Lies, Damn Lies

I woke up on the wrong side of a stack of press releases this morning. Press releases, once you get past all the "powerful" and "easy-to-use" adjectives, are sometimes informative and sometimes filled with half-truths. It's time to dispel some myths, clarify some half-truths, and otherwise anger some marketing people.

My first target is the "UNIX Trinity": Unix International (UI), Unix Software Laboratories (USL) and AT&T. What is the real relationship between these organizations?

In a few words: UI is a corporation that advises USL about what certain members would like to see in future releases of UNIX System V and when the members would like to have these features. USL is the corporation that actually decides and implements the feature set of UNIX System V and decides when these features will be implemented. AT&T owns 80 percent of USL and about a dozen other corporations own the remaining 20 percent.

So, in other words, when you read press releases from UI, you might as well ignore them. UI has no power to affect the direction or timing of future UNIX features; they only advise. USL decides what to implement and when, but it's guided by what AT&T (now AT&T and NCR) wants. The other USL owners are just there to make people think that USL is really independent of AT&T.

What's pretty amusing is that all the folks who complained when AT&T invested in Sun Microsystems aren't complaining so much about AT&T acquiring NCR. The old complaint went like this: AT&T makes UNIX. Sun Microsystems sells a lot of UNIX boxes. Result: unfair market advantage for AT&T and Sun.

Of course, not much materialized from this "advantage." However, now the story is that AT&T still controls UNIX through its almost-wholly owned subsidiary USL. NCR sells a lot of UNIX systems although not nearly the number that Sun sells. AT&T bought NCR. Why isn't there an unfair market advantage now? Is everyone so sure that AT&T will fail again? Is it possible that a communications/cash register/computer firm can fail?

ACE should be awarded the Vapor Marketing Idea of the Year Award. Ignore ACE press releases.

A postscript: AT&T originally acquired a stake in Sun in 1987. Sun still doesn't ship an operating system based on UNIX System V. Of course, it took Sun almost three years to incorporate the POSIX 1003.1 specification into SunOS.

Heck, let me debunk some Sun myths while I'm on the subject. The biggest myth is that Sun is committed to open systems and standards. The trouble with this is that open systems is strictly a marketing term meaning almost anything that a marketeer wants. Ask 10 people what "open systems" means and you will get 10 different answers. HP claims that MPE will be an open system once it becomes POSIX-compliant. DEC is claiming the same thing about VMS.

And, what standard is Sun presently shipping? Hardware based on the SPARC chip (which they created), the Sbus (which they created), SunOS (which they created and which isn't UNIX System V-compliant except at the subroutine level), the Open Look GUI (which very few vendors use), and so on.

ACE In The Hole

Next on my list is a huge marketing target: the Advanced Computing Environment (ACE) consortium. ACE, for those of you who haven't heard, was initiated by Microsoft, Compaq Computer, MIPS Computer Systems, DEC and the Santa Cruz Operation (SCO). As of this writing, at least 35 other companies have joined ACE.

So far, ACE has vowed eternal love for two different processors (the MIPS RISC chip and the Intel 80x86 chip), three binary standards (one for the Intel chip and two for the MIPS chip), two operating systems (Microsoft's planned OS/2 3.0 and SCO UNIX System V), two different GUIs (Microsoft Windows and OSF/Motif), and two backplane standards (EISA and DEC's TURBOchannel). Are you reminded of the movie *Sybil*?

ACE should be awarded the Vapor Marketing Idea of the Year Award. Not only isn't there major unifying reason for any company to become a member of ACE (other than to screw Sun, HP and IBM), but implementations of many of the standards that ACE is espousing don't exist and probably won't exist before late next year. Ignore ACE press releases.

But let's not leave HP out of this discussion. The new HP 9000 Model 817S supposedly supports 368 users and starts

at a mere $20,000? The first question that pops into my head when I read something like this is: What are these 368 users actually doing? Typing a letter into a text editor? Staring at their shell prompt?

Reality check! A multimillion dollar supercomputer struggles to handle 368 users running 368 separate, concurrent, complex compilations or cpu-intensive applications. Let's hook up 368 X terminals to this computer and see how fast it runs when we try to do some real work.

Less Than Meets The Eye

Here are a few more hot topics that are receiving an inordinate amount of marketing hype compared to their actual value.

Pen-based Computing—Other than checklists for which the technology is way too expensive, or storing images of forms filled in by consumers for which the technology is still too immature (it can't interpret most people's handwriting) what's the average computer consumer going to do with a pen-based computer? We already have Etch-A-Sketch.

The IBM RISC System/6000—An overpriced, difficult to learn, use or administer, average computer system. Why is the "conventional wisdom" that IBM is going to give Sun and HP a run for their money in the UNIX workstation/server market? Because the system has the IBM logo on the outside? Please.

Diskless Workstations—Actually, HP is one of the primary perpetrators of this hoax. Sure, you can have a diskless workstation. Sure, it has a fast cpu. Sure, it's less expensive than a workstation with a disk. Sure, you have a problem if your operating system server or your network acts up (as they always do just when you have to get some work done). If your tasks aren't demanding, you probably can get away with purchasing an X terminal instead; if not, buy a disk for about $8 per megabyte.

X terminals—Has anyone noticed how really slow these toys are for performing X graphics? If you need your graphics to run fast, buy a workstation instead. It may cost more, but at least the cost is fixed (as opposed to an employee's time).

4GLs—Why does the "next generation" language have to look a lot like COBOL?

Will the silliness ever stop?—*Andy Feibus is an independent UNIX and porting consultant based in Atlanta, GA.*

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CIRCLE 214 ON READER CARD

EUROPEAN WATCH

Marsha W. Johnston

Home Grown UNIX Servers Help HP Europe Build On Expanding Markets

German Engineering

They did it. It may have taken some time to convince headquarters, but HP Europe's success is mirrored in the low-end models of the new HP 9000 Series 800 systems. HP Europe, says Bernard Guidon, general manager for HP commercial UNIX in Cupertino, and Robert Aydabirian, general manager for HP France, had requested entry-level UNIX systems from the corporate organization over the last 18 to 24 months.

"They were the first organization to recognize and clearly articulate the need to have those products," says Guidon. "They were first to say, 'Hey, HP, you're missing an opportunity here. You have all of these low-end VARs, these people running out of gas on DOS, who will have to evolve into UNIX.' And they were very critical in getting those products designed."

The result? The new HP-UX Series 9000 Model 800 includes two, the 807S and the 817S, that sell for $12,895 and $20,000, respectively. The 807S supports up to 16 users with 64 MB of memory and 10.9 GB of disk storage and an estimated rate of 15 transactions per second(tps). At 30 tps, the 817S supports up to 32 users with 192 MB of memory and 28.5 GB of storage. In price/performance, HP's data show the two entry-level models comparing more favorably to their competitors.

The Series 9000 Model 807S was developed by the research and development staff in Boeblingen, Germany along with the processor boards for the LX products in the 3000 line.

"Two things have happened in the last few years," says HP France's Aydabirian. HP gave the R&D charter to Grenoble for PCs and it's now the worldwide center, and the German (Boeblingen) factory has taken over low-end UNIX system R&D."

Though it has been only about a year ago that HP placed low-end UNIX systems R&D in Boeblingen, the 807S isn't the first HP system developed in Germany. That honor belongs, apparently, to the HP 260. "The expertise was there," says Rudi Schmickl, marketing manager for multiuser products, Europe. "One of the reasons the 807S was developed here is that the market requirements for low-end UNIX systems are here; it's one of the faster growing markets in Europe (and) that's where the 807 is shooting.

Europe Leads In UNIX

"The key difference between the U.S. and European markets is simply structure," says Schmickl. "In Europe, you have many more small or highly distributed companies which require low-end servers than in the U.S. The second point is that Europe is one to two years ahead in picking up on UNIX. When you combine both of these factors, you come to the conclusion that the European market is ready to take low-end (UNIX) servers."

Schmickl's statement is backed by statistics. For one, sales of UNIX systems are higher in Europe than in the U.S., says Aydabirian. And, while HP Europe represents about 38 percent of the company's total business, it sells 45 percent of the low-end servers, he says. Thus, says Aydabirian, "The market in Europe is much more mature to accept low-end UNIX systems than is that in the U.S."

The fact that an entry-level, affordable UNIX server represents something perfectly tailored to the needs of European users "doesn't mean the only place we need them is in Europe, and now that they're available, that they won't be applied on a worldwide basis," says Guidon.

That need is just part of a burgeoning world phenomenon, he says. "I think that the low-end, under $25K system has much, much more volume than the $27K and up range," says Guidon. "The significance of the under-$25K range is the same throughout the world. There are thousands and thousands of small VARs all over the world, developing DOS applications, who want to move their applications up and use UNIX to do it. This isn't geographical stuff.

"The new opportunity for HP is that it's now in a strong position to leverage that; whereas before we were above the $20K range, now we're under it and we can tap into new opportunities," he says.

In Europe, HP is positioning the 807S, for instance, against the high end of the multiuser PCs, says Aydabirian. Putting

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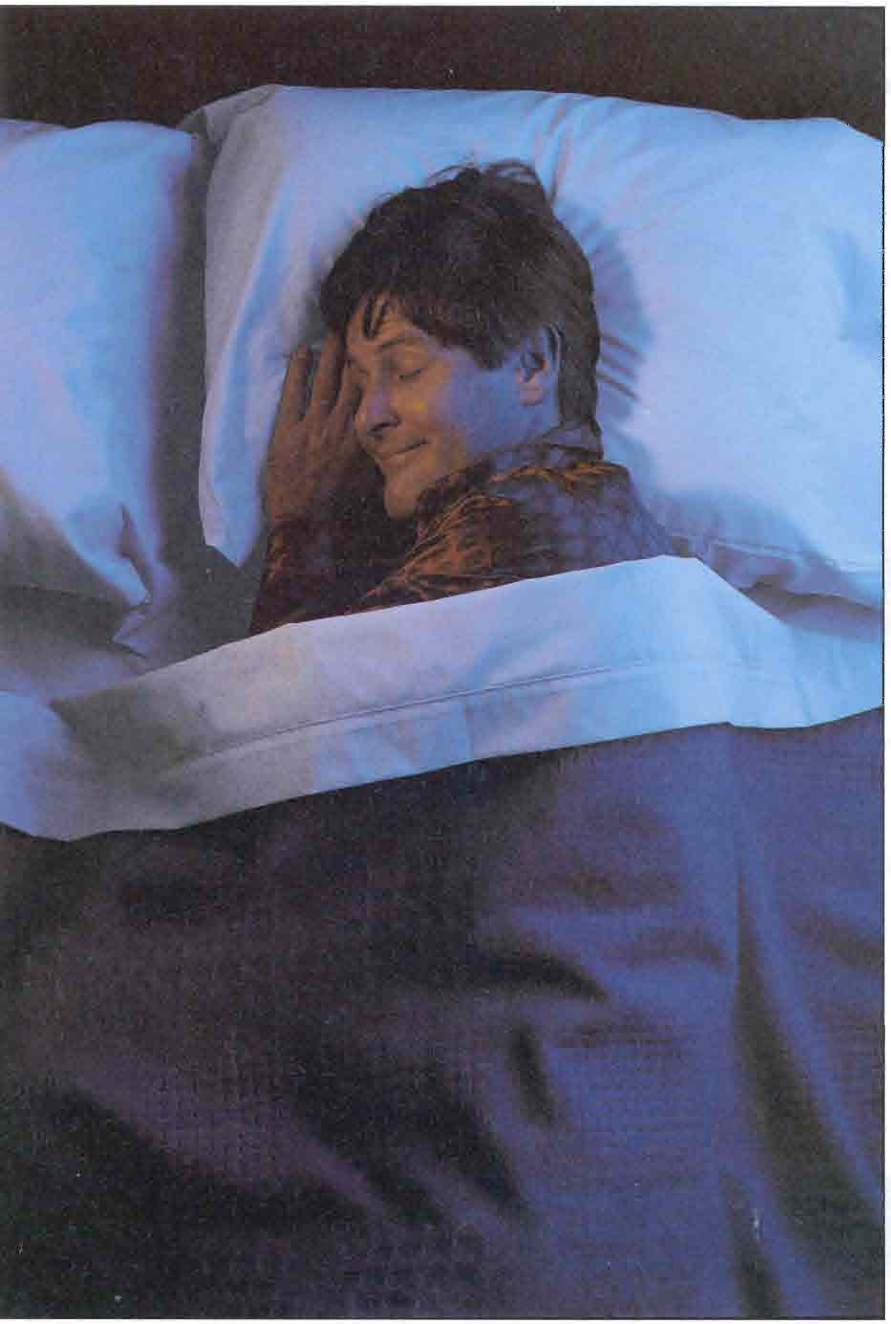

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HEWLETT PACKARD

the 807S in head to head competition with 486 PCs, says Schmickl, opens a whole new market for the 9000—that of low-end servers.

"I would say it's a professional server. It not only has UNIX, but all of the commercial features, such as power fail and the quality from an HP developed product," says Schmickl. "Another major point is that it's not the high-end of a family, but the low end, so customers who want to extend their mixture of servers beyond the 807 can do so. It's for customers with potential to grow and the need to have a professional server for mission critical applications."

Elephants Abroad

To fully capitalize on the opportunity in the low-end market that was first presented by HP Europe, HP had to change its distribution pattern, says Guidon. So, in announcing the new products, HP also announced that for the first time it would entrust the commercialization of the HP 9000 and 3000 to distributors.

Considering the company's size, HP is to be congratulated that it didn't take too long to be convinced of the low-end opportunity. Schmickl uses a favorite analogy: "In my opinion, among the large elephants IBM, DEC and HP, HP is the elephant moving the fastest. This low-end thing, how we got it going without any internal fighting, is just an example of that."

Several factors surely contributed to HP Europe's ultimate success. Over the last three years, HP Europe grew at a 21 percent compound yearly rate and HP France by 25 percent, says Aydabirian, while the company as a whole grew at 17 percent and the U.S. at about 10 or 12 percent.

"Europe is bound to represent 40 percent of HP's business in the next three to five years," he says. "In the last six months, it represented 37 percent, compared to 27 percent five years ago."

Thus, says Schmickl, "As a worldwide operating company, you make decisions based on worldwide conditions and, if markets outside the U.S. are gaining in importance, those are fundamental business decisions you would make."

Aydabirian also attributes it to something more personal. "Now, in the systems group in the U.S., we have more Europeans, such as Wim Roelandts and Bernard Guidon, and they're taking into account European requirements. HP is really becoming a transnational company, taking Europe into consideration at a higher level." —*Marsha Johnston is based in Paris, France.*

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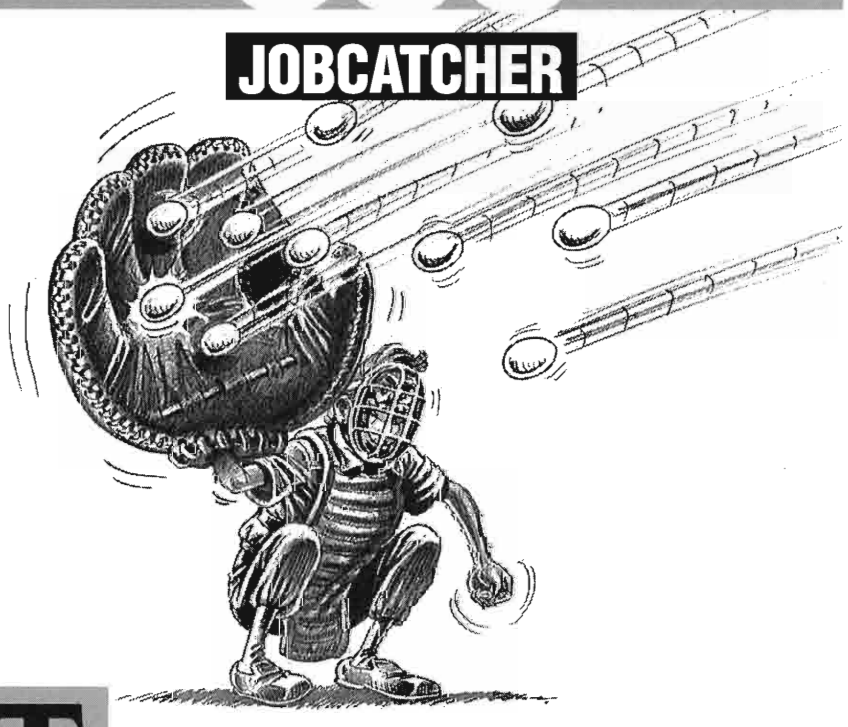

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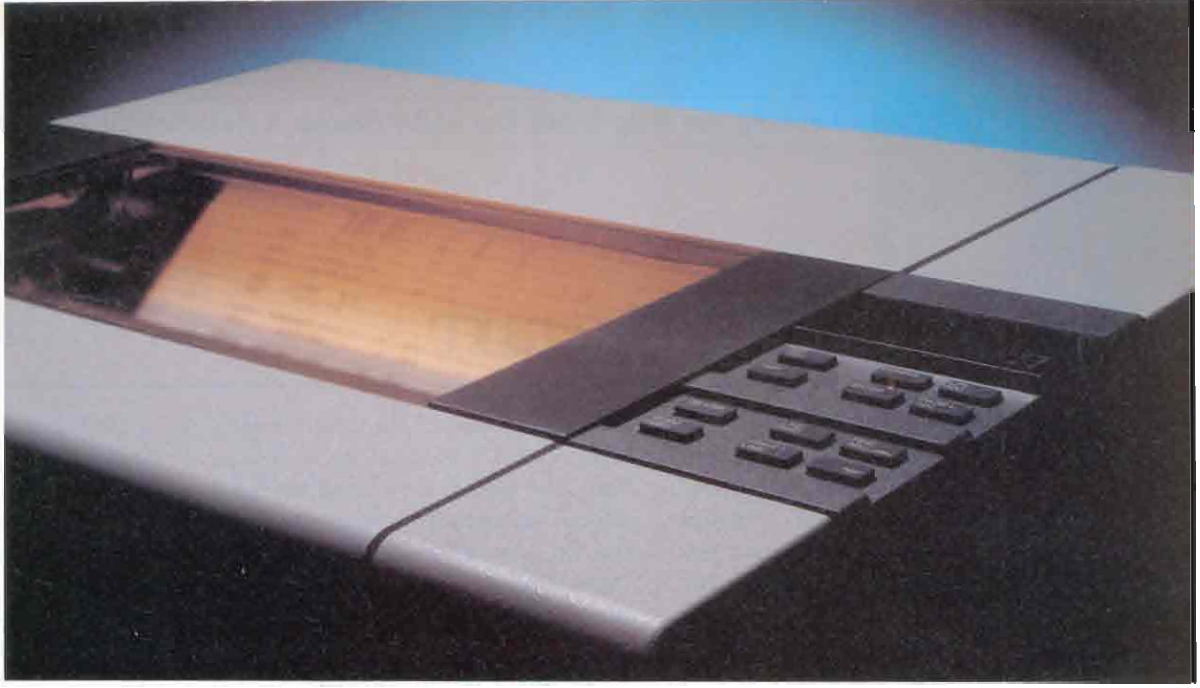

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PDQ costs only a fraction of what it takes to add or upgrade QUIZ. With prices ranging from $1,800 to $7,800 for the compiler, and from $1,300 to $5,500 for the run-time library, it will probably cost less to buy PDQ than you pay every year for QUIZ support. So before you buy additional copies of QUIZ, try PDQ. It might just be all you need.

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CIRCLE 265 ON READER CARD

NETWORKING

Tim Cahoon

Get Smart

A college professor taught me an important lesson once. "Son," he said, "I don't expect you to remember anything I teach you, but I do expect you to know where to find it when you need it." With that thought in mind, my goal, as always, is to help you find the information you need when you need it.

Reference Materials

There are a variety of reference materials that will assist you in understanding, designing and maintaining your network.

Internetworking with TCP/IP: Principles, Protocols, and Architecture by Douglas Comer is published by Prentice Hall. This book is a must for those beginning to learn about Internets and TCP/IP. Each topic is explained clearly with examples. Internet Requests For Comments (RFCs) are referenced when appropriate. The book has proved to be a great primer and reference aid. *An Introduction to TCP/IP* by John Davidson, published by Springer-Verlag, is similarly useful.

Another good set of reference books is the three volume *Handbook of Computer-Communications Standards* by William Stallings, published by Howard W. Sams & Co. These three volumes are written as both a textbook and a reference aid. Volume 1 is titled, *The Open Systems Interconnection (OSI) Model and OSI-Related Standards*. Besides explaining the OSI Model, the book compares it with current and past standards and the comparison gives the reader an appreciation of OSI developments.

Volume 2 is *Local Area Network Standards*, which covers the standards for LANs. Other topics discussed include: IEEE 802.2 (Logical Link Control), IEEE 802.3 (CSMA/CD), IEEE 802.4 (Token Bus), IEEE 802.5 (Token Ring) and FDDI (Fiber Distributed Data Interface). Note that the title of this volume refers to "Standards" with a capital S. If it isn't a true standard, you won't find it in this book.

Volume 3 of the *Handbook* series is entitled *Department of Defense (DOD) Protocol Standards*. The DOD funded the development of TCP/IP and this "standard" is used by the military. The MILNET part of Internet connects military locations together using the TCP/IP protocol. This book gives you the specifications as required by the government. It's important to realize that TCP/IP on the Internet is constantly changing with a few little enhancements added here and there. Many times these little enhancements aren't suitable or approved for use by the DOD. Lately you also may have heard about something called GOSIP. These are the newest requirements for computing systems purchased by the government. The DOD specifications will remain in use by the military until replaced by systems conforming to GOSIP.

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One last book on OSI is by Marshall T. Rose of The Wollongong Group Inc. Called *The Open Book: A Practical Perspective on OSI*, it's published by Prentice Hall. This book covers the nuts and bolts of OSI from a person who has implemented the protocols.

SRI International, the Network Information Center (NIC), is where you go to find the Internet RFCs. The RFCs are used to suggest changes to the TCP/IP protocol or to the Internet itself. There are several groups of RFCs bound into softcover collections. These are the Internet Directory Services RFCs and the DOD Protocol Specification RFCs. You can get copies of individual RFCs free using Internet mail or for a small fee through regular U.S. mail directly from the NIC. The bound versions are only available for purchase through the mail.

Home Shopping

You can also get networking and product information using your modem. There's a wide range of resources available, so just pick up the phone.

For those with HP software maintenance, you can use HP Supportline. This service lets you access a computer system filled with problems and solutions direct from the Response Center's database. The information in the Supportline database isn't the current working copy used by your Response Center engineer—those calls can contain proprietary information about your company. Every call going into the Supportline database goes through a sanitation process to protect your company's privacy and competitive advantage. Nonetheless, the problems and solutions remain the same, only the names are changed to protect the innocent.

CompuServe is a computer information network that has something for everyone. Much of the PC software available from major companies is supported via CompuServe forums; Microsoft, Borland, Lotus and Novell are just a few of the companies available online. Customer support techs dial in daily and re-

view messages. Responses, fixes and sometimes upgrades are posted for everybody's benefit.

Areas of interest also can become forums. Recently, a TELECOM forum was started to discuss our industry. Voice and data are equally important. There are also forums for HP, IBM and Mac. These forums also can be the site of online conferences. Experts in a particular subject may be scheduled to be online during a particular time. The forum SYSOP will generally put the transcript in that forum's library within a few days.

CompuServe E-Mail lets you communicate with members outside of forums and to the world. FAX, Telex, US Postal Mail, MCI Mail and Internet mail are just some of the ways you can communicate to the world. MCI Mail and Internet mail also are bidirectional. The Internet mail function only allows text to be transmitted.

With the Internet mail feature you now can do several new things. The first is request RFCs from the NIC. The second is to send mail to *HP Professional's* magazine columnists. If you are a CompuServe user, the following mail address will route your message through Internet to me.

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To get RFCs from the NIC, use the automated mail service. Send an Internet E-Mail message to:

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or, if on Compuserve:

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In the subject line, type HELP and add a blank message line. The automated mail software at the NIC will then send you a help file on getting information from the NIC. Other entries you can use in the subject field are:

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HELP
RFC INDEX (RFC Index listing)
RFC ####
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where #### is the number of an RFC you wish to read.

The data will be sent back to you in one or more files. A file larger than 50K is split in to smaller pieces. If you want to learn more about the Internet, request RFC 1118, "The Hitchhikers Guide to the Internet." —*Tim "Ollie" Cahoon provides wide area network and HP technical support for the manufacturing operations of a Fortune 500 company in Detroit, MI.*

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NP NEW PRODUCTS

IEM Offers QIC Drives For HP 9000 Series 700/400

IEM Inc. released sequential access Quarter-Inch Cartridge (QIC) tape drives for the HP 9000 Series 700 and 400 running HP-UX. These drives allow users to transfer data to and from Apollo, Sun, DEC, IBM and other UNIX platforms.

IEM's model CT-4210S uses the QIC-150 format and can store up to 150 MB of information on a DC 6150-type cartridge or 250 MB on a DC 6250-type cartridge. The CT-4250S uses the QIC-525 format and can store up to 525 MB on a DC-6525-type cartridge.

The CT-4210S has read and write compatibility with QIC-120 and QIC-150 formats. The CT-4250S has read and write compatibility with QIC-120, QIC-150 and QIC-525 formats. Both models have read-only compatibility with the QIC-24 format. Contact IEM Inc., P.O. Box 8915, Fort Collins, CO 80525; (303) 223-6071.

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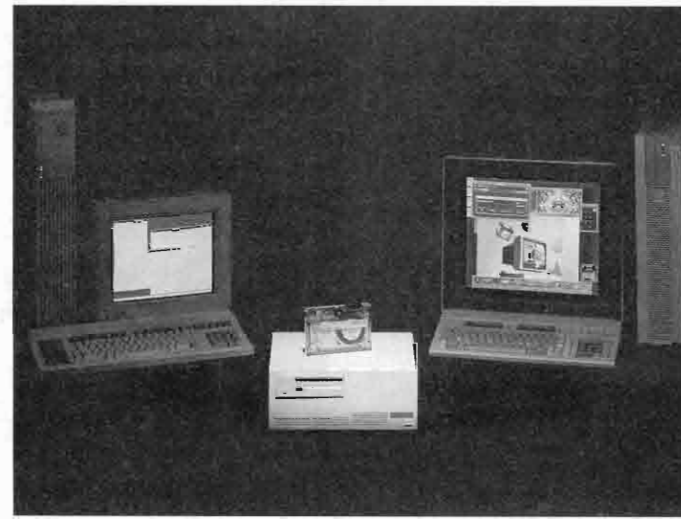

IEM released QIC drives for the HP 9000 Series 700/400.

Kelly's 32 MB RAMDisc Eliminates I/O Bottlenecks

Kelly Computer Systems announced the availability of its 32 MB RAMDisc and memory arrays of the 920 through 958 family of HP 3000s.

The RAMDisc/XL uses the 32 MB arrays as a solid state disk to eliminate I/O bottlenecks from the system. I/O is fed immediately to the requesting program in less than one microsecond instead of 15 to 20 ms for traditional hard disks. Thus, subsecond user response becomes attainable.

The memory subsystem uses 4 Mbit dynamic RAMs with an access time of 80 ns. System features such as single bit error correction, double bit error detection, memory error logging and battery backup are fully supported.

Contact Kelly Computer Systems, 1101 San Antonio Rd., Mountain View, CA 94043; (415) 960-1010.

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Clearpoint Provides Memory For Apollo DN 5500

Clearpoint Research Corp. introduced the HPME-DN5 16-MB density memory board for Apollo's DN 5500.

The HPME-DN5 is designed with 4 megabit DRAMS that are surface mounted for high density and reliability. The HPME-DN5 16 MB memory board is compatible with 4- or 8-MB DNX4RAM memory modules.

Apollo Domain 5500 workstations' high performance graphic applications such as CAD/CAE are memory-intensive and therefore have the ability to recognize up to four HPME-DN5 16 MB expansion boards. Contact Clearpoint Research Corp., 35 Parkwood Dr., Hopkinton, MA 01748; (508) 435-2000.

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Kingston Technology Announces Data Silo

Kingston Technology introduced Data Silo, a SCSI-based peripheral expansion subsystem for PCs and workstations.

The Data Silo is available in either a half-height version—the DS100-S1, or full-height version, for either two half-height peripherals—the DS100-S2, or one full-height peripheral—the DS100-SF.

The Data Silo includes all internal wiring and power for the user's peripheral. Optional SCSI-1 or SCSI-2 cables, SCSI terminators and disk drives also are available.

Price is $440 for the DS100-S1, $650 for the DS100-S2 and $640 for the DS100-SF. Contact Kingston Technology Corp., 17600 Newhope, Fountain Valley, CA 92708; (714) 435-2600.

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JYACC's JAM Helps Build Windows Applications

JYACC announced its 4GL, JAM, for Microsoft Windows. JAM/Presentation interface for Windows allows developers to build MS-Windows applications with an authentic Windows look-and-feel.

JAM's Windows GUI provides full support for those features unique to Windows, including the Windows multiple document interface, extended memory, pull-down and pop-up menus, radio buttons and checklists, dialogue boxes and clipboard support. Additionally, the application's individual windows as well as the application itself may be iconified.

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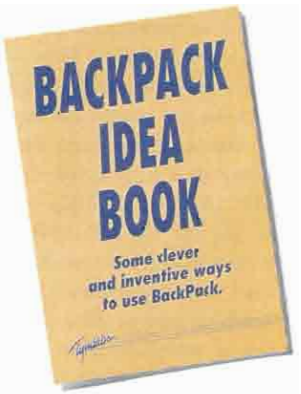

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Contact JYACC, 116 John St., New York, NY 10038; (212) 267-7722.

Circle 394 on reader card

UNISPOOL/PC Supports HP LAN Manager/X

Holland House released UNISPOOL/PC for the HP LAN Manager/X version of NS (2.0 for MS-DOS). UNISPOOL/PC now supports Starlan, LAN Manager/X and serial connections.

UNISPOOL/PC is used to transfer spoolfiles in both directions between HP 3000 and 9000 systems and PCs. The transfer takes place in background mode, and the PC user can continue running PC applications while the spoolfile is printing or being transferred to the HP 3000.
Contact Holland House, P.O. Box 91027, Austin, TX 78709-1027; (512) 288-7540.

Circle 393 on reader card

Proactive's LASERDESK Supplied For HP Desk Users

Proactive Systems announced LASERDESK for HP Desk users which improves the quality of output messages printed on HP LaserJet printers. Output documents are reformatted, automatically typeset or have form overlays applied. You can print company logos or other graphics on the output documents or otherwise enable a standard coherent company output style to be invoked.

LASERDESK automatically picks up output from the HP Desk Print command and formats each document type based on a preconfigured user environment. It then prints the resulting output using Proactive's Fantasia software, transparently to the user.
Contact Proactive Systems, Four Main St., Los Altos, CA 94022; (415) 949-9110.

Circle 392 on reader card

O'PIN Systems Enhances Sales And Marketing Software

O'PIN Systems released Pursue version 2.5, its sales and marketing software application for the HP 3000.

Pursue combines two previous O'PIN products, Prospect 3000 and Prospect Lead Fulfillment into one fully integrated software solution. Marketing events are tracked and results are analyzed by the Marketing Module that also automates the fulfillment of large volumes of inquiries.

Pursue then assigns qualified leads to the appropriate sales representative. Version 2.5 includes new capability to enable sales organizations to track multiple selling events within each customer/prospect and to guide reps through a tailored selling process.
Contact O'PIN Systems, International Plaza, Ste. 635, 7900 International Dr., Bloomington, MN 55425; (612) 854-3360.

Circle 391 on reader card

IDE Adds Modules To C Development Environment

Interactive Development Environments Inc. (IDE) introduced the new C Development Environment. IDE added reverse engineering and code generation modules that provide the capability to synchronize code and design. IDE also has improved facilities to query the shared repository and navigate easily through designs, code and documentation.

Using the C Development Environment, developers can reverse engineer existing C source code into designs in the form of specifications and graphical representations, or start with designs and generate C source code. The C Development Environment maintains consistency between designs and code by incrementally updating one to reflect changes in the other.
Contact IDE Inc., 595 Market St., 10th Floor, San Francisco, CA 94105; (415) 543-0900.

Circle 388 on reader card

Island Write, Draw & Paint Ships For OSF/Motif

Island Graphics Corp. shipped Island Write, Draw & Paint Color Version 3.0 for OSF/Motif. Island's word processing and desktop publishing software features easy-to-use tools for creating color presentation, handouts, reports, proposals, letters and memos. Write features mailmerge, footnotes, endnotes, and the ability to import spreadsheet files.

Links between the individual programs—Write, Draw & Paint—let users select a vector Draw image within their Write document and have Draw appear automatically for additional vector graphics editing. When using Draw, users can select any color or monochrome TIFF image contained within their Draw graphic and have Paint appear automatically for further raster graphics editing of the TIFF image.

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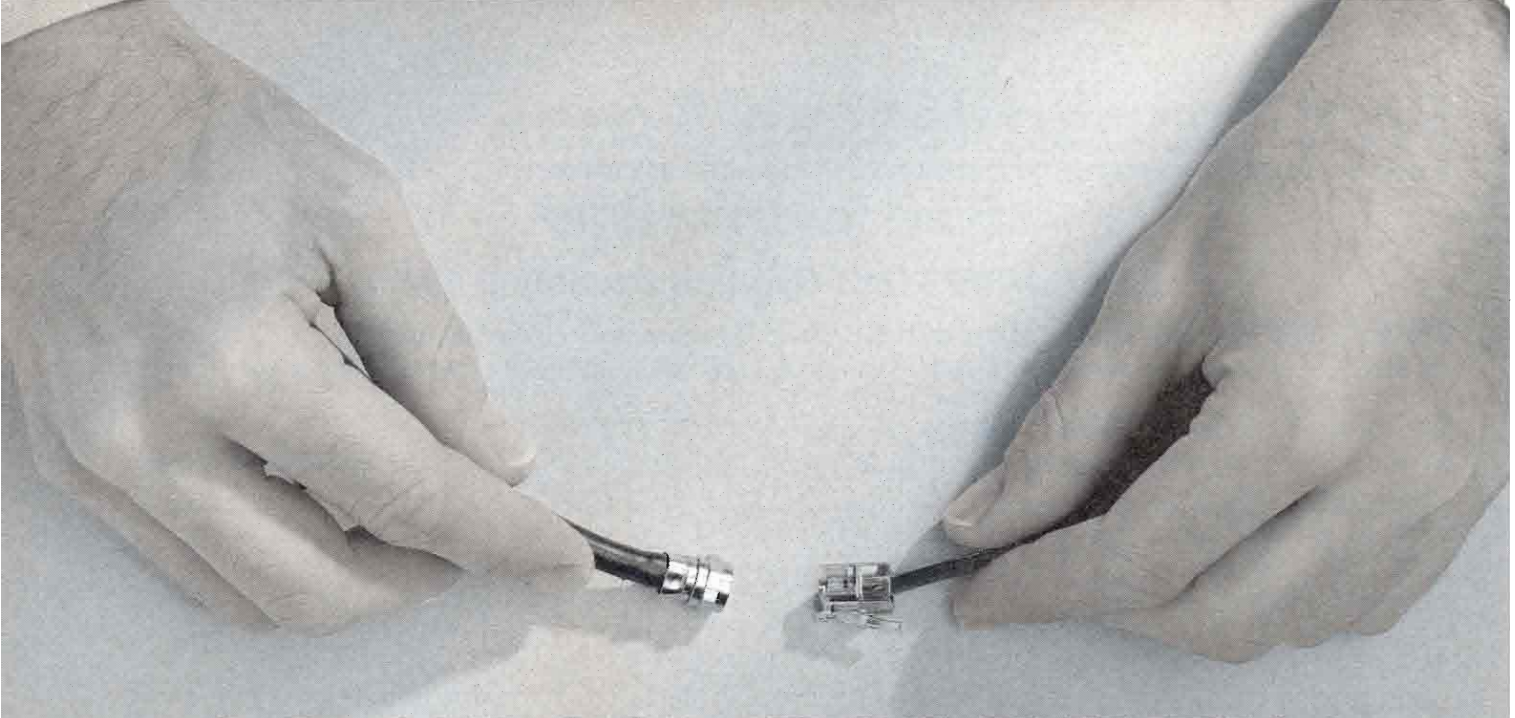

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Topics include the significant issues involved in designing and building corporate networks. Network Management. Security. Client-Server Computing. High-Speed Transport Options. LAN/WAN Interconnect. Distributed Databases, and many more. Speakers include Ellen Hancock, Richard Caruso, Nick Lippis, Scott Bradner, Dr. John McQuillan, and Dr. Douglas Comer.

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Version 3.0 for OSF/Motif runs on Sun 3 and 4, and SPARC-compatible workstations and on HP 9000 Series 300, 400, 700 and 800 workstations.

Contact Island Graphics Corp., 4000 Civic Center Dr., San Rafael, CA 94903; (415) 491-1000.

Circle 383 on reader card

SWITCHmate 2000 Provides Connection To HP LaserJet

Gold Key Electronics announced the SWITCHmate 2000 designed to connect DEC systems and networks to the HP LaserJet IIISi.

The SWITCHmate 2000 supports the HP LaserJet IIISi's 17 pages per minute printing and helps it keep up with DEC's LPS20. The SWITCHmate handles all the print modes of the IIISi and automatically detects and switches between them. The IIISi support HP PCL, HPGL/2, PostScript, ASCII and Digital LNO3.

The SWITCHmate connects to the network via any RS-232-C serial terminal server connection. Xon/Xoff or DTR flow control are supported. Baud rates to 38.4 K also are supported.

Prices start at $1,295.

Contact Gold Key Electronics Inc., 18 Lamy Dr., P.O. Box 186, Goffstown, NH 03045; (603) 625-8518.

Circle 387 on reader card

Infotek Systems Offers Memory For HP Apollo 700s

Infotek Systems announced high-density memory modules for the HP Apollo 9000/700 Series workstation.

The EM700 line will be available as 16 MB module sets. These modules are ECC (error checking and correcting). Infotek's EM700 line of memory is based around industry-standard 4-megabit chips and is fully compatible with HP's RAM.

Contact Infotek Systems, 625 S. Lincoln Ave., Ste. 204, Steamboat Springs, CO 80847; (303) 879-1184.

Circle 379 on reader card

Tigre Ships Multiplatform GUI Application Builder

Tigre Object Systems Inc. shipped the Tigre Programming Environment. Tigre implements the capability to build graphical user interface applications, for instant use on multiple computer platforms and heterogeneous networks.

Color applications created by Tigre run without modification on HP 9000 Series 300 and 400, Apollo Series 2500, 3500, 4500, Windows 3.0, Macintosh II, Sun/3, Sun SPARCstation, IBM RS/6000, Digital DECstation, Sequent superminis and on mixed networks of these systems.

Price is $3,500.

Contact Tigre Object Systems, 3004 Mission St., Santa Cruz, CA 95060; (408) 427-4900.

Circle 381 on reader card

CDS/Scan Reduces Paper Consumption

Chestnut Data Systems announced a new release of CDS/Scan, an online report display system designed for HP 3000 computer systems and sites looking to reduce paper consumption and report printing.

Features include an automatic load facility that loads reports into CDS/Scan with no JCL changes required. Also a new search facility highlights located strings in inverse video. A file download to MPE or PC can be performed specifying selected pages and special formatting options. Supplementing the archiving and data compression features, CDS/Scan now uses DAT technology to increase the amount of CDS/Scan report information archived on a single volume.

Pricing for CDS/Scan starts at $2,500 depending on cpu size.

Contact Chestnut Data Systems, 6981 North Park Dr., Ste. 613, Pennsauken, NJ 08109; (609) 662-1611.

Circle 385 on reader card

WRQ Enhances HP Terminal Emulation Software

Walker Richer & Quinn (WRQ) announced version 3.6 of Reflection 1 Plus and Reflection 3 Plus, its HP terminal emulation software for the Macintosh.

It includes features such as a new user interface, color, support for Apple's Communications Toolbox and support for 132-column mode. The new version is System 7-compatible.

Reflection 1 Plus emulates the HP 700/92 and the HP 2392A terminals. Reflection 3 Plus emulates those two text terminals, plus the HP 2393A and HP 2326A graphics terminals.

Single copy retail price is $299 for Reflection 1 Plus and $399 for Reflection 3 Plus. Current users of Reflection for Macintosh products can upgrade to version 3.6 for $125.

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Contact WRQ, 2815 Eastlake Ave. East, Seattle, WA 98102; (206) 324-0350.

Circle 382 on reader card

Logicraft Servers Increase Workstation Performance

Logicraft Inc. announced an MS-DOS and an OS/2 network server designed to open the PC application world to all UNIX systems.

Logicraft's 386ware/486ware and Omni-Ware product lines can run MS-DOS, OS/2 and SCO UNIX applications on HP Apollo 9000 Series 400 workstations, DECsystems, DECstations, VAXes, Sun 3 and 4 workstations, SPARCstations, Intel model 302 or 402 workstations, IBM workstations and Intergraph workstations.

The servers also can function as MS-DOS, OS/2 or SCO UNIX gateways to PC LANs, including Novell NetWare. Logicraft servers connect via Ethernet, providing all users on the network with access to PC applications. The PC files are stored on the host disks, ensuring data back-up and security.

386ware/486ware, based on the Intel 80468 or 80386 microprocessor, supports Hercules and CGA graphics and up to 16 simultaneous users. Omni-Ware is available with an Intel 80486, 80386 or 80286 microprocessor and supports Hercules graphics; EGA/VGA graphics support is optional.

Contact Logicraft Inc., 22 Cotton Rd., Nashua, NH 03063; (603) 880-0300.

Circle 380 on reader card

AutoSIGHT's HP2DXF Converts HPGL Plot Files To CAD DXF

AutoSIGHT Inc. released HP2DXF Version 1.3 which converts HPGL plot files to CAD DXF format on the HP-UX systems.

AutoSIGHT's HP2DXF supports both HPGL-I and HPGL-II. HP ME10 and AutoCAD users now translate plot files into the DXF CAD file format for import into their ME10 CAD systems. HP2DXF allows free movement of any graphic software file in HPGL format to any other product, such as ME10, that supports the DXF format. The DOS version of this product currently has an extensive user base on IBM PC and compatible systems.

Priced is $995 per system license.

Contact AutoSIGHT Inc., P.O. Box 362086, Melbourne, FL 32936; (407) 242-5865.

Circle 378 on reader card

GEC-Marconi Software Introduces SIZE Plus

GEC-Marconi Software Systems announced SIZE Plus, a program used to estimate the size of software projects. SIZE Plus is based on the software sizing method know as Function Point Analysis (FPA).

Available on UNIX and VMS platforms, SIZE Plus runs on HP 9000/300, Apollo SR/10, Sun 3 and 4, SPARCstations, IBM RS/6000, DEC VAX/VMS workstations and PCs running SCO UNIX.

SIZE Plus provides five different FPA methods supporting both data processing and real-time applications. The program caters to

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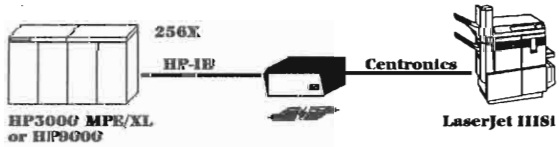

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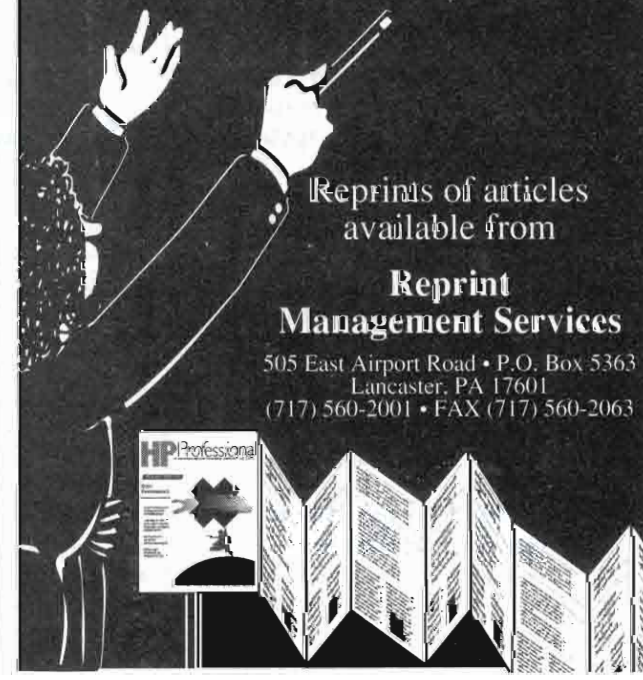

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all languages from assembler to 4GLs and permits projects using more than one language. SIZE Plus takes into account reused code and supports the same incremental model of development as the COCOMO estimating model.

SIZE Plus runs in a graphic environment based on X Windows and OSF/Motif.

Price ranges from $2,800 for a single user to $7,300 for unlimited users.

Contact GEC-Marconi Software Systems, 12110 Sunset Hills Rd., Ste. 450, Reston, VA 22090; (703) 648-1551.

Circle 377 on reader card

Dataram Announces DR-9425 For HP 9000 Model 425e

Dataram Corp. introduced memory upgrades in three different capacities for HP 9000 Model 425e workstations.

The DR-9425, is available in 4- , 8- and 16-MB capacity pairs. The pairs can be installed in any combination up to the workstation's maximum capacity of 48 MB, thus providing users with flexible configuration options to handle a wide variety of applications, including CASE, CAD, finance and desktop publishing software programs.

The DR-9425 is priced at $700 for the 4 MB version, $1,400 for the 8 MB version and $2,800 for the 16 MB version.

Contact Dataram Corp., P.O. Box 7528, Princeton, NJ 08543-7528; (609) 799-0071.

Circle 375 on reader card

Martech Offers Memory Boards For HP 9000/700

Martech announced a low cost alternative to HP Apollo's 9000 Series 700 workstation memory (RAM).

Martech's memory boards provide a high quality, affordable equivalent to HP memory for the new 700 workstations. The memory boards also provide a lifetime warranty, 24-hour replacement, extensive testing and a 90-day return privilege.

Martech is shipping a 16-MB and a 32-MB module. List prices are $3,360 for the 16-MB module, and $6,720 for the 32-MB module.

Contact Martech, 1151 W. Valley Blvd., Alhambra, CA 91803-2493; (818) 281-3555.

Circle 363 on reader card

Danford Delivers SEU-4870 For HP Apollo 9000/700

Danford Corp. introduced the Serial Expansion Unit 4870, featuring on-board cpu, high-speed buffers, and intelligent UARTs, supporting speeds up to 38,400 baud. The SEU-4870 interfaces through the industry-standard EISA bus and adds eight asynchronous serial ports to HP Apollo 9000 Series 700 workstations.

Also announced were the Serial Expansion Unit 4716, Serial Parallel Port Expander 4722, and Tape Drive Interface 4710.

Contact Danford Corp., 350 W. 5th St., San Pedro, CA 90731; (213) 514-9334.

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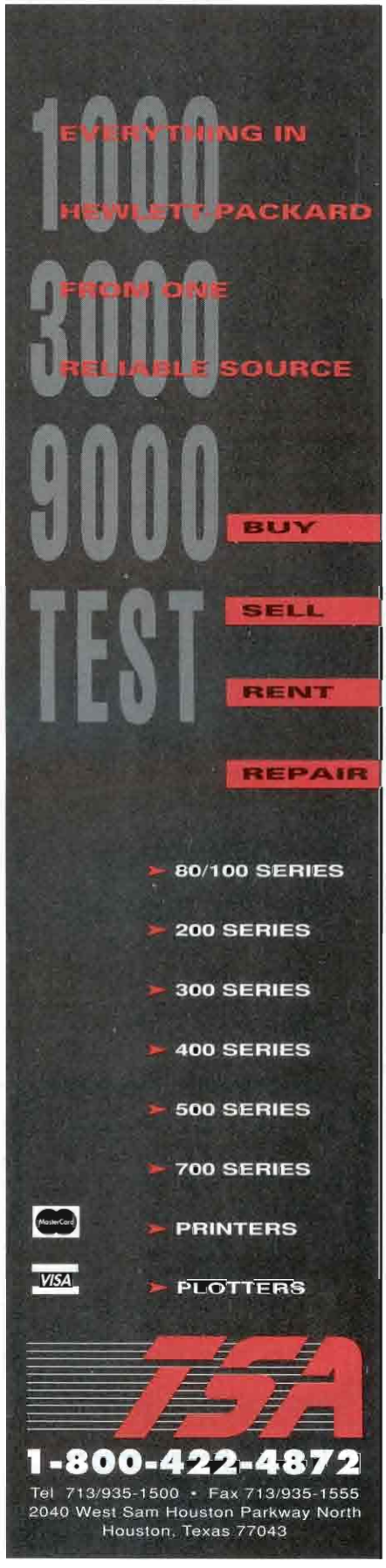

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[OCTOBER]

4-7: CENIT Asia' 91, Hong Kong's Information Technology Fair is being held at the Hong Kong Convention and Exhibition Center, Hong Kong. Call Monica Kan, (408) 379-1711.

13-15: NTRUG, GHRUG, STRUG, BRUG and CENTEXRUG are holding their 2nd annual All-Texas Conference at the Radisson Hotel, Austin, TX. Call Terry Floyd (512) 345-3963.

[NOVEMBER]

11-13: BIS Strategic Decisions is sponsoring EUROFAX, the conference and exhibition for all fax-related products and services at the Swissotel in Dusseldorf, Germany. Call Carol Le Plar 0582 405678.

11-13: The 18th annual computer security conference and national exhibition will be held at the Fontainebleau Hilton Hotel in Miami, FL. Call Philip Chapnick (415) 905-2267.

[DECEMBER]

9-11: Meckler Conference Management is sponsoring DIA (Document Image Automation) '91 at the Sheraton Washington Hotel, Washington, D.C. For exhibit information, call Marilyn Reed, for a conference program call Kim Devan at (203) 226-6967 or (800) 635-5537.

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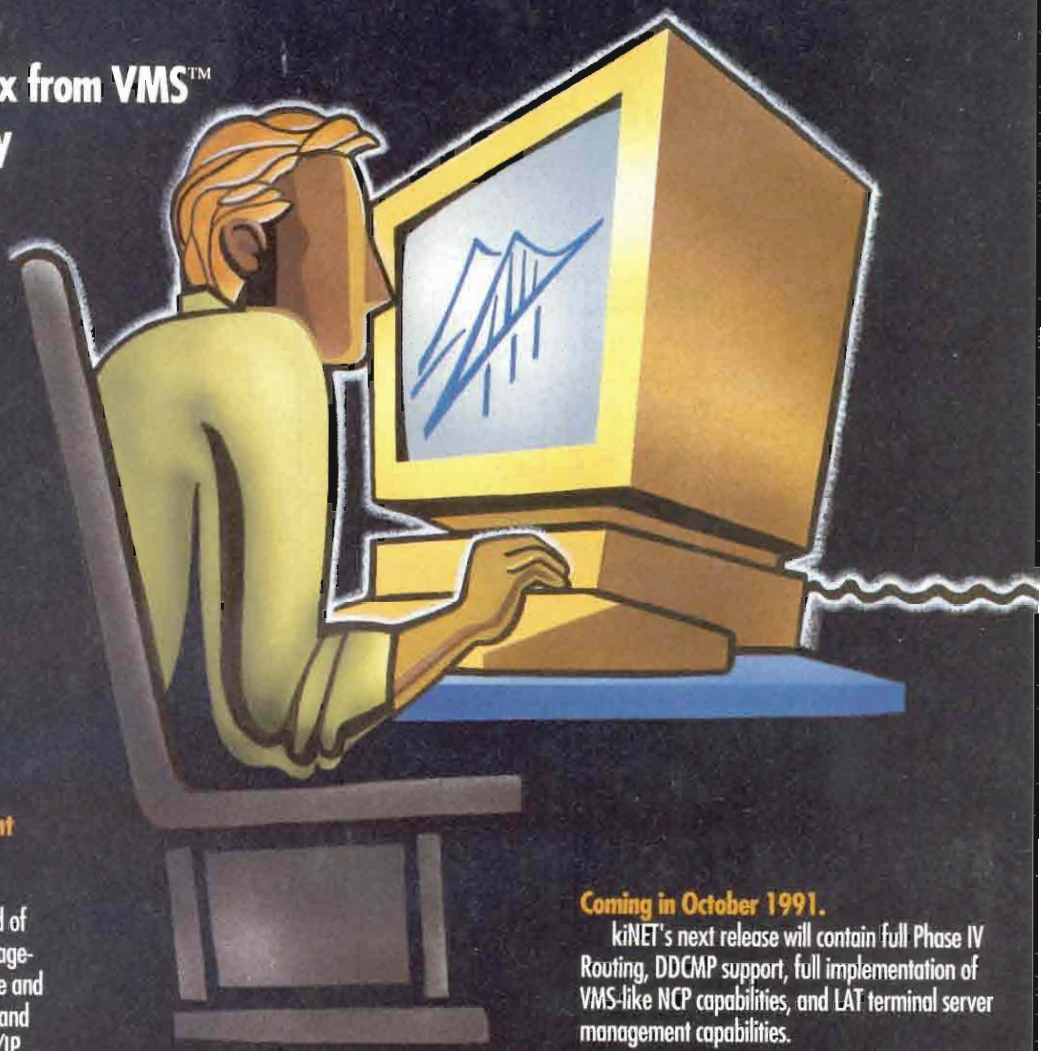

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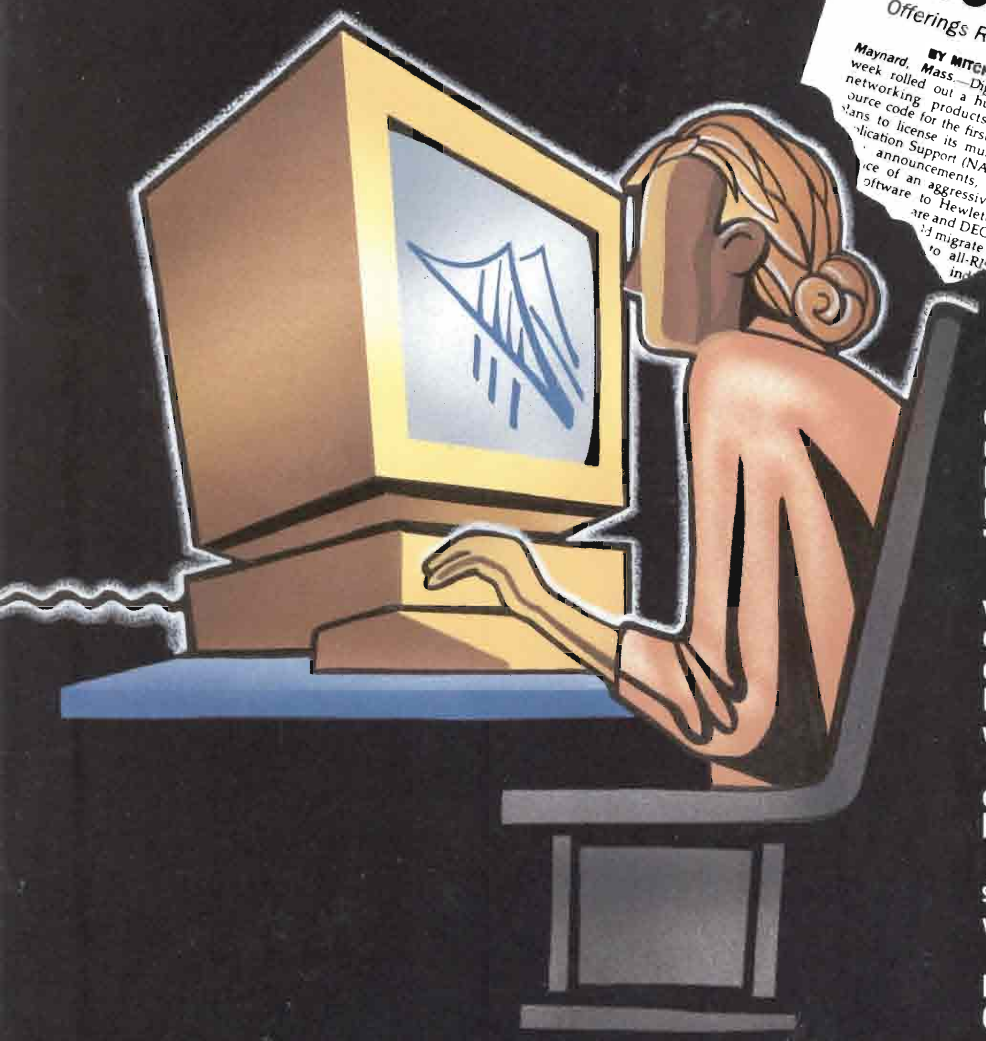

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Offerings Reflect Deeper Commitment To Open Systems

BY MITCH WAGNER

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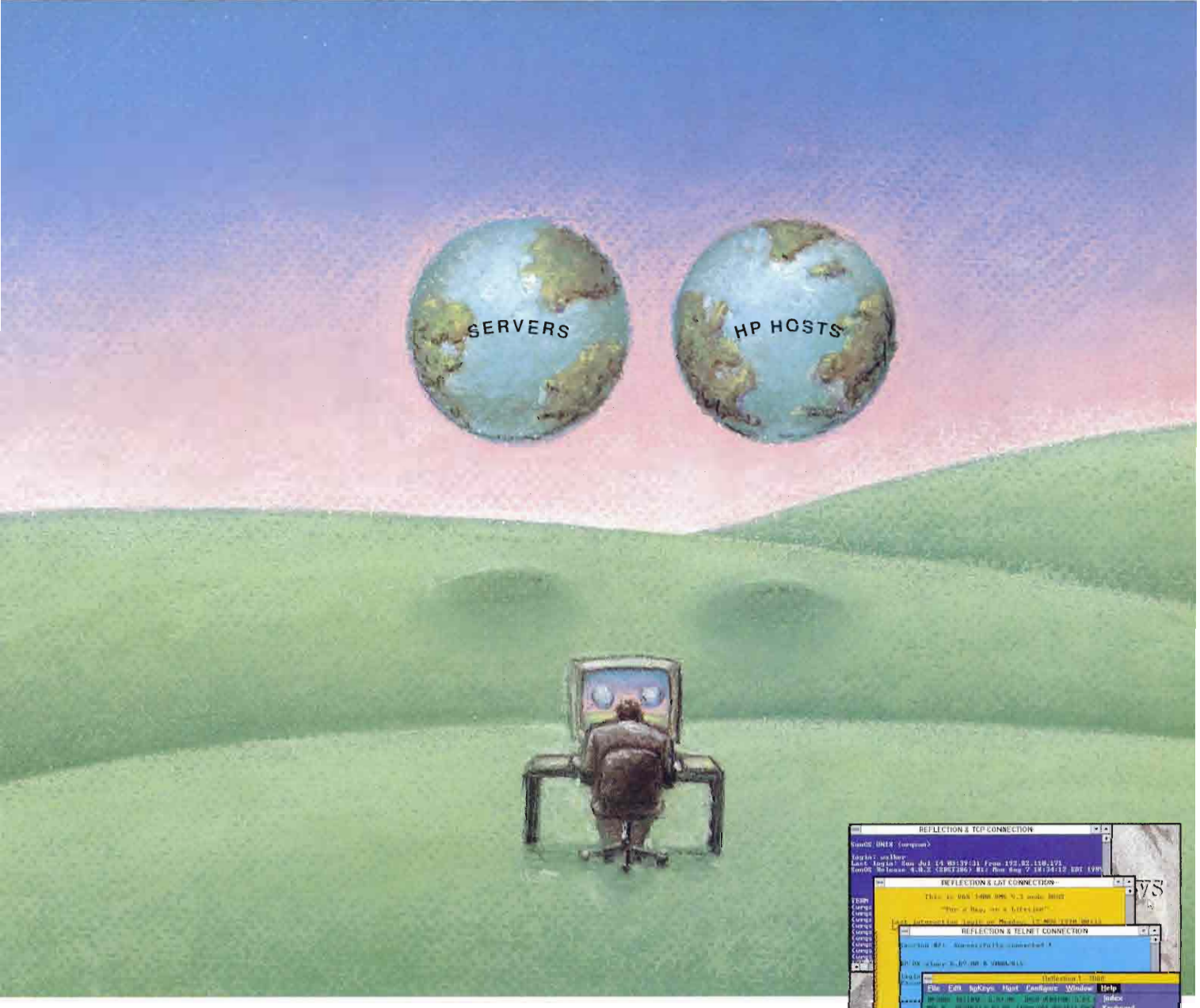

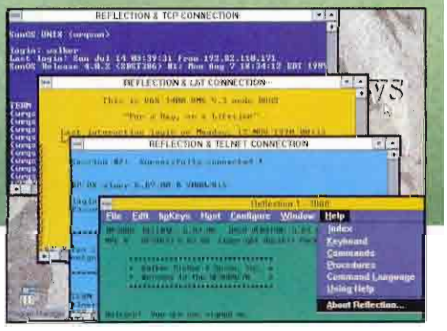

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