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JANUARY 1990

- Getting Started With UNIX
- HP-UX 7.0 Unites Technical Families
- Porting To A UNIX System Computer

EDITORIAL ROU

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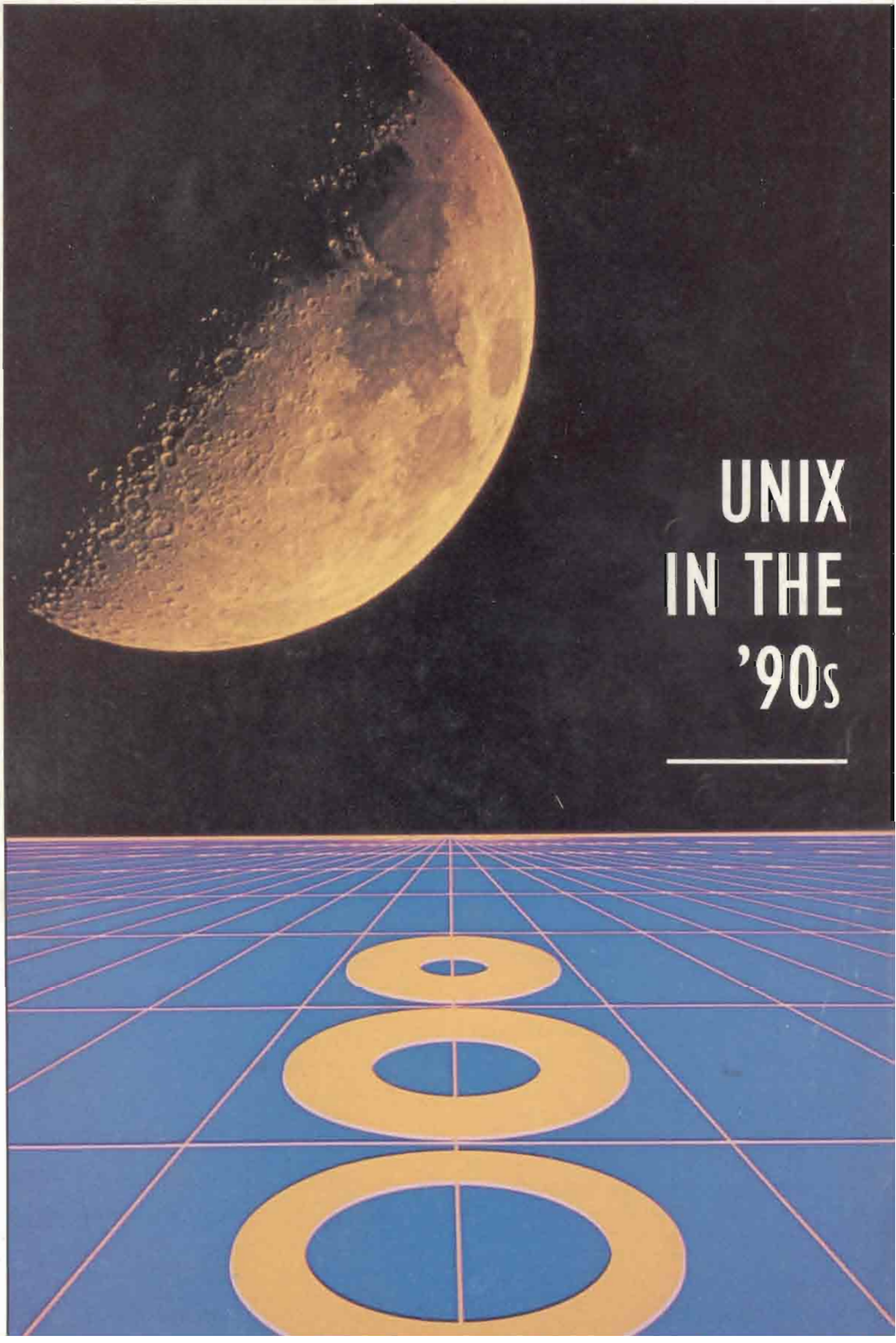

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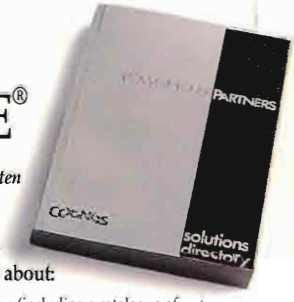

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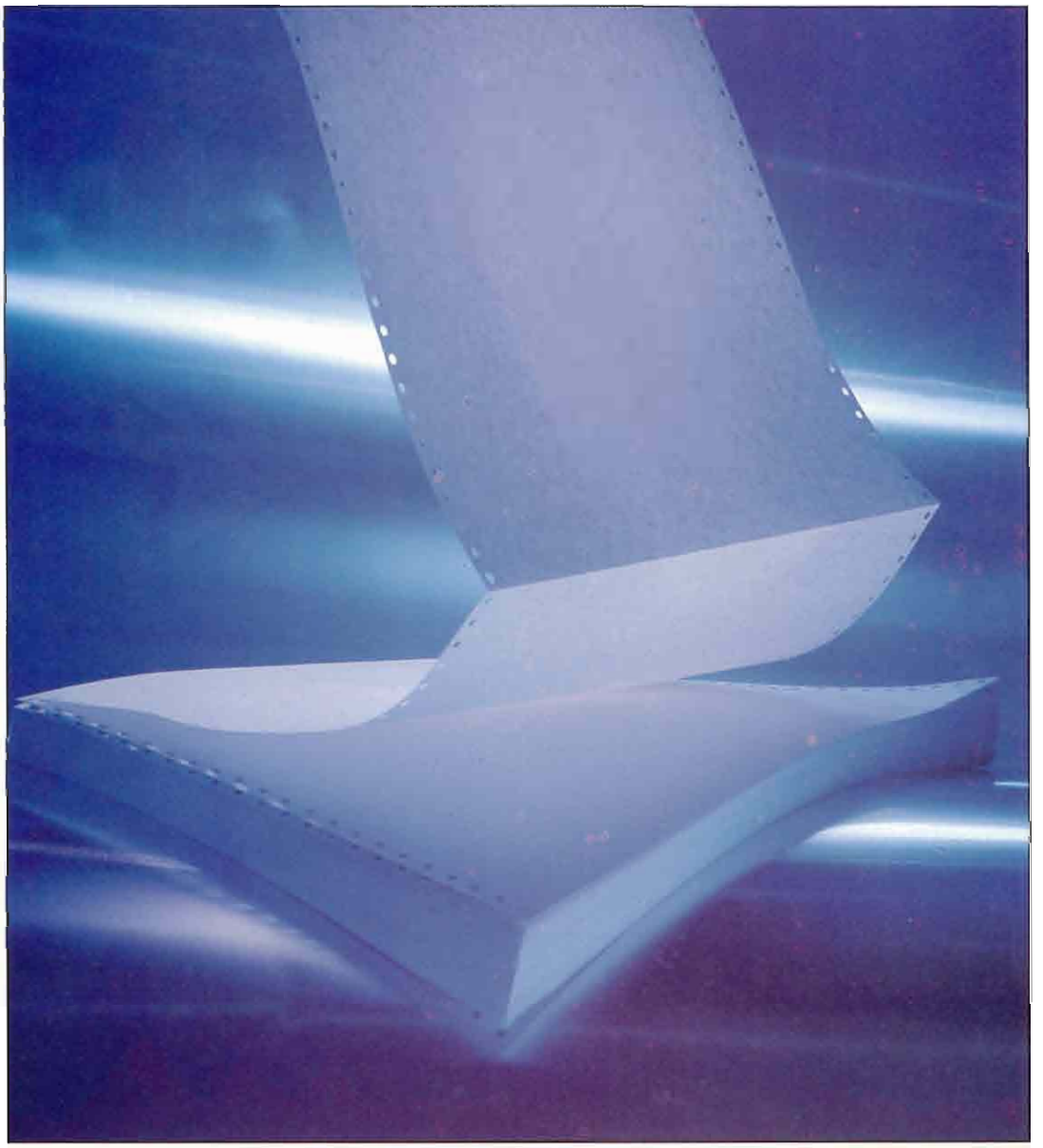

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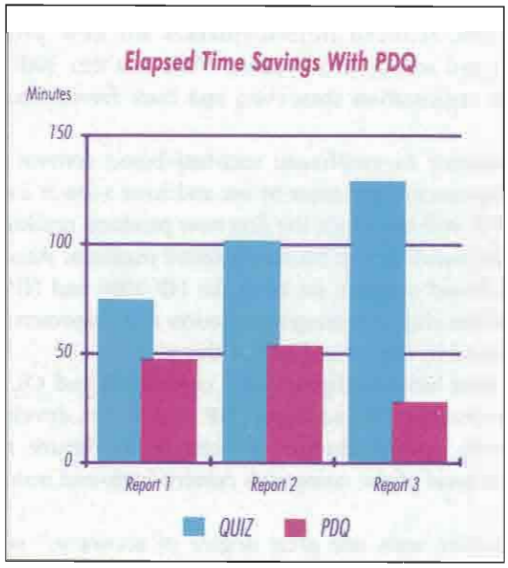

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Off We Go Into the '90s

Well, we've made it. Chalk up another decade. Goodbye Reaganomics. Hello One Thousand Points of Light. The '80s certainly ended in a bang, and the outlook for the final chapter of the 20th century looks promising. For the first time in some 40 years, we are entering a new decade where the threat of nuclear annihilation is becoming more remote, and new technologies will foster human potential throughout the world.

On that inspirational note, let's take a look and see what Hewlett-Packard has in store for you in the coming years...

For starters, this month HP will introduce new RISC-based low-end, midrange and high-end computer systems, including new superminicomputers. The announcement is being heralded by HP executives as the biggest in its history. Not a bad way to kick off the decade.

According to HP President, John Young, HP's emphasis will be on technological innovation, total quality control, reduced time-to-market for new products, manufacturing competitiveness, marketing and selling effectiveness. "We exit our 50th year a more dynamic, responsive and competitive organization than ever, and look forward to the next decade with confidence," Young said.

In the '90s, HP will continue to emphasize standard-based systems that work together in cooperative computing environments, are easier to use and have a lower overall cost of ownership.

Sometime in mid-year, HP will introduce the first new products resulting from the HP/Apollo merger. The products will be based on the Motorola 68000 platform. Also, a new chip set will be available in the future as a board upgrade on both the HP 3000 and HP 9000 line of multiuser systems. HP said a version of the chip is nearing completion and customers should expect product-specific details to be announced in the second half of this year.

Also, expect to see this year new multiprocessing capabilities and OLTP (on-line transaction processing) software enhancements. In addition, HP said it has developed advanced CMOS (complementary metal-oxide semiconductor) processors for future release that will more than double the performance level of the company's current high-end minicomputer, the HP 3000 Series 960.

"We can't predict the future with any great degree of accuracy," said Young, "but we've worked hard to prepare ourselves for its multiple variations by building on our strengths and positioning ourselves to take advantage of every opportunity."

Welcome to the '90s.

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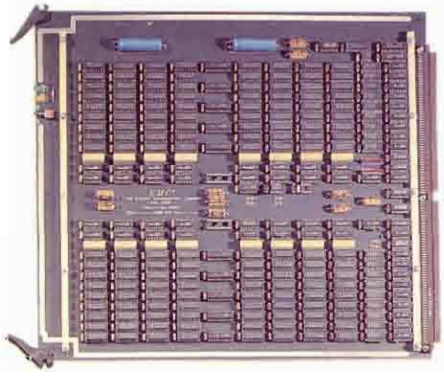

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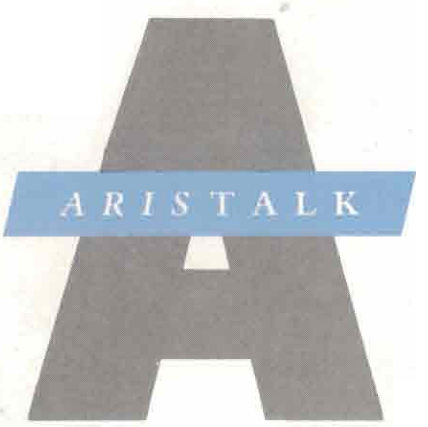

DEC TERMINALS WITH MPE/XL

QUERY:

Chuck Lewis *(SIG 32/MESS 6)*: Does anyone have experience using DEC VT320 terminals with an MPE/XL system? How well do they work? What about with full-screen editors, VPlus forms-based packages, etc.? Are there any problems with cursor movement commands, video attributes (i.e., blink, bold, etc.), function key assignment or keyboard layout? VT320s seem to be about half the cost of an HP terminal, so why not use DEC terminals instead of HP?

REPLY:

Doug Shelton *(SIG 32/MESS 7)*: Unfortunately, Hewlett-Packard created its own set of terminal escape sequence, block-mode protocol and Enqack handshaking. These protocols have no relation to the DEC or ANSI terminals I've worked with. Chances are your VT320 wouldn't work at all with MPE/XL's full-screen editor (an optional product, I think, and expensive), I really wouldn't expect it to work with VPlus. We've had success with PC terminal emulators, such as Reflection, Session or SmarTerm 2392, and you can use a PC-based editor, like Brief, for even more powerful editing capabilities.

LASER PRINTER DRIVER

QUERY:

Tom Jacomet *(SIG 27/MESS 2)*: Wanted! Printer driver for HP's LaserJet IID printer. HP doesn't have one for remote printing on its 3000. We use the generic printer driver file TTPCl18 that doesn't use status check. For example, if the printer encounters an error such as paper out, the system doesn't know it, and you lose the print job.

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The SIG categories referenced in this month's *ARIS*TALK are:

26 ..... Communications/Networking
27 ..... LaserPrinters/Font Cartridges
32 ..... MPE-MPE/XL
49 ..... Databases/4GL
92 ..... User Group Announcements

REPLIES:

Doug Shelton *(SIG 27/MESS 3)*: I've heard a nasty rumor that HP has omitted the ESC? status request sequence from the LaserJet IID's command set. If this is the case, you won't be able to have the HP 3000 do any software status checking. I know the LaserJet II and LaserJet 2000 respond correctly, but the 2000 requires "robust x-on" to be enabled. One alternative is to connect the printer to an ADCC or modem ATP port and configure the port as TYPE 32 SUBTYPE 15. This causes the system to monitor the RS232 status leads and stop the spooler if certain pins are not held high. Although you don't get complete status checks, you keep your printouts from becoming a pile of bits on the floor if the printer is powered off or its cable disconnected. Another alternative is to get a copy of HP's Workstation Configurator program. This program (once expensive, but now provided free by HP), allows you to customize your own termtype files.

Jon Broz *(SIG 27/MESS 5)* By the end of 1989, there should have been a special I/O board for the LaserJet IID that provides status checking support.

It should provide the same status checking that HP 3000 computers use with other LaserJets and serial printers. Check with your HP sales representative for further details, or call the HP Personal Peripheral Assist line at (208) 323-2551 for any post-sales support questions.

These queries have no replies. If you can respond to either of them, please dial up ARIS. We need your input. —Anne Schrauger.

QUIZ

QUERY:

Mike Bennett *(SIG 49/MESS 2)*: Does anyone know of any routines to produce standard deviations using Cognos's Quiz?

GC/MS/RTE

QUERY:

Richard McMillin *(SIG 92/MESS 4)*: Are there any HP-RTE/A or RTE/6 users doing GC/MS? We have several systems in operation using HP 1000s. ■

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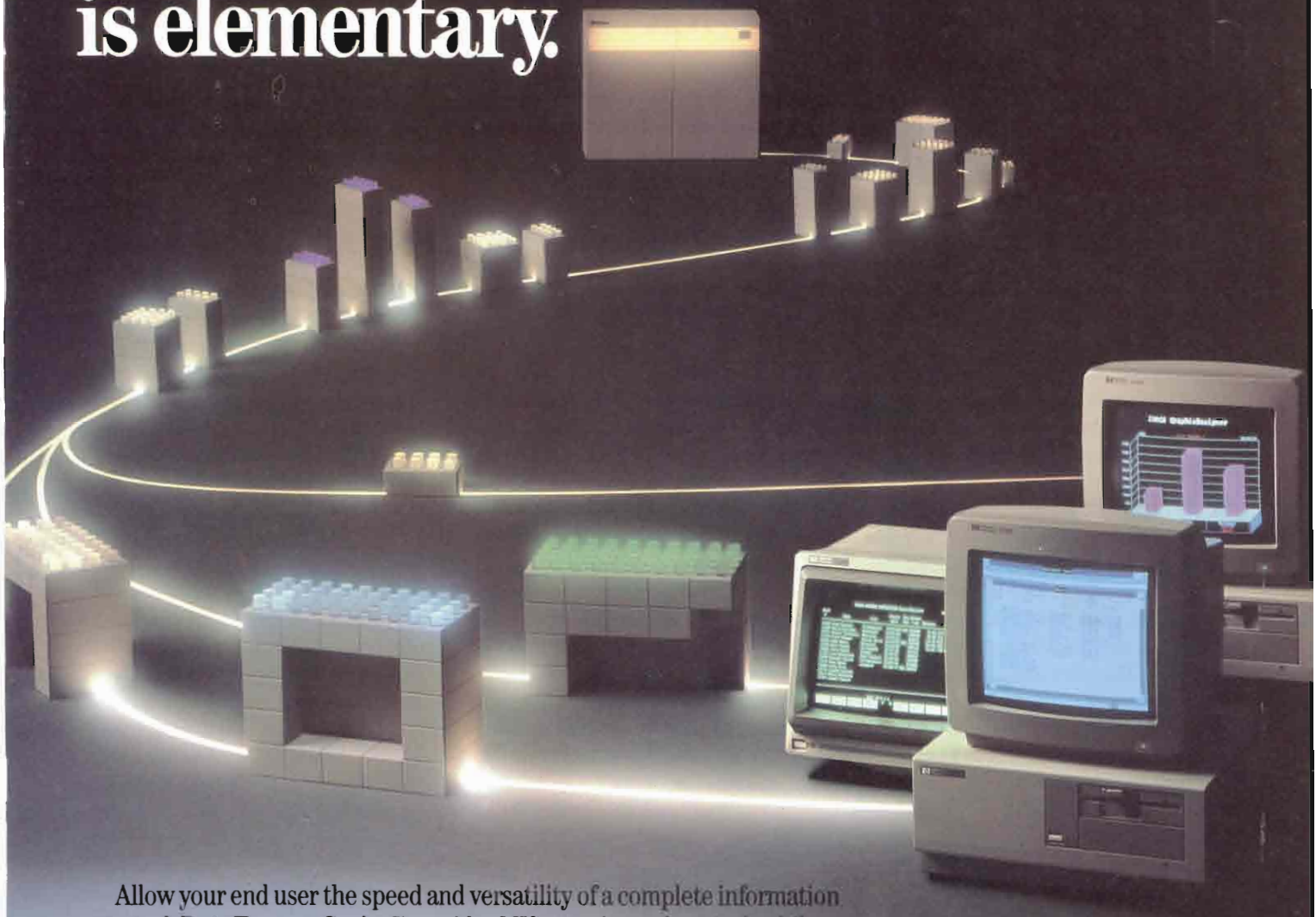

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INDUSTRY WATCH

Bill Sharp

The Decade Ahead

Just for a moment, stop and think about what has happened in the computer industry during the past decade. Ten years ago, workstations and PCs didn't exist, UNIX was strictly for nerds, and networking was something you did around the coffee pot. With that in mind, what hope do we have of projecting several years into the future and predicting accurately about HP and the computer industry? Not much. But let's take a stab at it anyway.

Minicomputers

Minis have been the great fast fade fad of 1989. Nobody knows who started this non-buying craze, but it's been very popular. In marketing terms this is explained as the "leveling off of market growth." The sales slump has hurt all minimakers, but HP has fared much better than the others because it had workstations, PCs and peripherals to keep business steady.

According to Dick Watts, marketing manager for HP's Computer Products Sector, wild growth in minicomputers is over. Rather than being the anchor in large terminal-based systems, minis will evolve into two specialized roles.

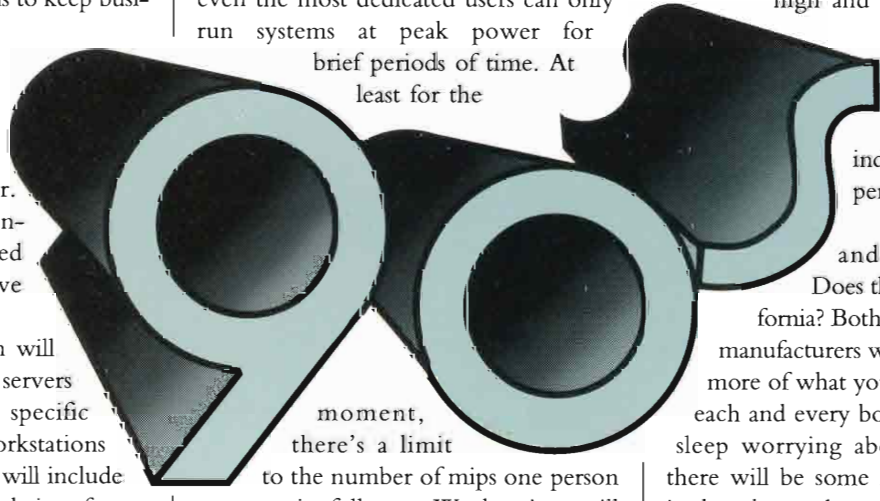
Their primary function will be as dedicated high-end servers on a network, providing specific applications to smaller workstations or PCs. These applications will include time-shared processing, real-time functions and special services such as online transaction processing (OLTP). These applications can't be well served by standalone systems lacking shared databases.

The other role will be to provide high-performance computation services on the network. When your workstation or PC can't handle a number-crunching job effectively, your system will pull in extra computation power over the network from a mini tucked away out of sight. Watts sees minis evolving into many such specialized applications.

Workstations

Workstations are the current stars of the computer marketplace. While minis slump and PCs are slowing down, workstations are flying along, and HP is doing well in the market. Watts attributes workstation growth to their rapid rise in price/performance. Manufacturers have been extending workstation power and flexibility both up into the mini range and down into the PC range in recent months.

Mips ratings of the more powerful workstations now occupy ranges where even the most dedicated users can only run systems at peak power for brief periods of time. At least for the moment, there's a limit to the number of mips one person can meaningfully use. Workstations will concentrate on what they do best, providing high-performance, leading-edge applications platforms for graphics and other performance areas. Workstation users seek a competitive edge in grabbing and analyzing new data.



The next wave of workstations will concentrate less on thundering performance that far exceeds your ability to use it and more on providing networking capabilities to allow you to take full advantage of all the power in place.

Personal Computers

PCs have been hot stuff for more than eight years now, numbering at least 25 million and still going. Growth is leveling off (10 percent per year), but HP's share of the market is growing — finally. Watts freely admits that HP's early attempts in this market "missed the mark," because HP failed to understand the role of standards or distribution channels in the PC marketplace.

HP learned its standards lessons and has adhered closely to the model of the plug-compatible PC that uses off-the-shelf, shrink-wrapped software. Over the past 18 months, HP has also learned its distribution lessons. HP's PC volume is high and dealer sales are the name of this game. As a result, HP PC sales growth is well ahead of the industry, growing at 30 percent, says Watts.

Will PCs get more and more powerful? Does the sun shine in California? Both PC and workstation manufacturers will continue to cram more of what you love them for into each and every box — don't lose any sleep worrying about this. However there will be some long- term changes in these beasts that will forever alter their nature and probably yours.

Watts sees two classes of computers emerging in the years ahead. PCs, says Watts, will remain strictly plug-compat-

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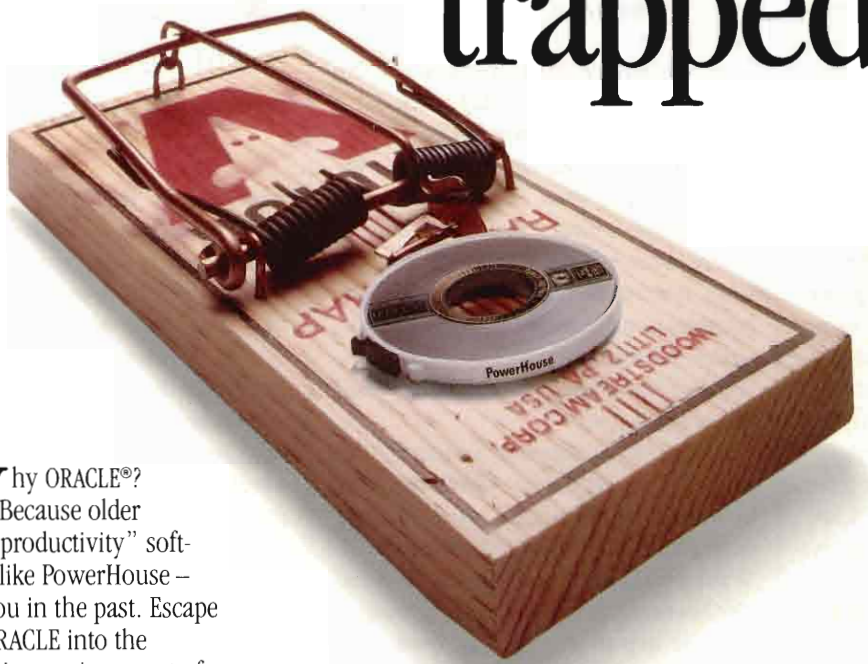

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ible and use shrink-wrapped software. They'll become increasingly easy to use. Watts calls these "pure vanilla, industry-standard machines." They will be like today's PC only in that they will be strictly based on industry standards — capabilities will change.

Also, they will require less thought to use, like a telephone, to paraphrase HP's Joel Birnbaum, vice president and general manager, Information Architecture Group. However powerful or tiny they become, Watts argues there will be this class of pure vanilla computers, available at low prices, whether we call them PCs or not.

A second class of computer will follow the pattern of today's workstations, using industry standards up to a point, then diverging to allow designers room to innovate, providing levels of performance and/or capabilities not available in the other class of computers. Naturally, the level of innovation must always exceed that of the PC class, or these generally more expensive products will fail. So the innovation level will be, as today, a continually moving target. These computers will require more knowledge of the user, as they do today.

Precision Architecture

Can a single vendor develop a proprietary architecture fast enough to stay ahead of the rest of the marketplace? No, says Watts, but by signing up strategic alliance partners, they can keep up and offer capabilities not available elsewhere. HP now has those partners, so look for PA to fit into smaller systems soon, but not PCs. Because a PC is an industry standard architecture, by definition PA can't be in a PC — you'd have to call it something else. But Watts says PA can fit into the PC price range. Stay tuned.

Networking

Got those saws handy? Let's climb out on a limb. Remember all those folks in recent years saying networking had arrived? They were early, but the '90s really will be the decade of networking.

When you have a computational job to do, your system may do all the work itself, or send the job to Mary's workstation sitting idle while she's at lunch, or run it on the computational server off somewhere on the network. You won't know and won't care because newer, more sophisticated networks will take care of it.

Integration of applications much like what you can have today with HP's NewWave gradually will become available over networks, enabling you to integrate various parts of your work and other people's work. You won't need to worry about what software was used, or what system. Rather than wasting the computational capacity of Mary's workstation while she nibbles nachos, that system can hum along on your work until she needs it again.

Network Computing System (NCS), the Apollo product that allows this kind of work sharing to take place over the network, is the first of these products. Watts notes that Apollo's NCS now has 150 licensees in the industry, placing it "a short step to getting it adopted as an industry standard." Look for NCS and its offspring to play a major role in how networking evolves.

Products like NCS and the recently announced Team Computing products from HP are the first wave of this new networking evolution. During the next 10 years, you'll learn to assume these capabilities. They will be standards underlying all systems across the industry. Fiber optics will likely replace wired communications to get the information volume up to where these systems will require it.

Operating Systems

Adhering to standards and functioning on the network will be required to exist in the marketplace, but adding functions beyond these will become easier. This will mean that using both UNIX and MPE XL will be possible for example, providing HP decides to expend the resource to make it happen. MPE XL, or for that matter, many other specific capabilities, could exist within a UNIX shell.

The message here is that operating systems will become less visible as time goes on. As with other detail issues, you'll tend not to be aware of them. Multiple operating systems will be the norm five to 10 years from now. But the largest of these, at least for the present, will be some version of UNIX. Watts points to the momentum of students, applications software and entrenched users in support of UNIX all favoring its adoption industry wide. Whose UNIX? It probably doesn't matter a whole lot. The several versions are irritatingly different, yet they adhere to many of the same standards. Look for the furor to die down, and another standard to emerge.

Remember all those folks in recent years saying networking had arrived?

Will HP Stay Strong?

The past months have seen significant troubles for nearly all of HP's competitors. Wang, Prime, Honeywell and NCR have taken it on the chin, and even IBM and Digital have stumbled. Is HP immune from these problems? "No," says Watts. "We are subject to all the same external forces. If we are hit by these things, they will affect us. We will make sure we run a very tight ship."

Watts says HP's fortunes will determine how quickly it can implement its vision. "HP seems to have its act together," he says. "I don't think we are about to fall off any cliffs. We have a strategy that has the user in mind, we understand the shifts in the market and are well positioned to take advantage of that. Execution will be the part we will have to watch closely." ■

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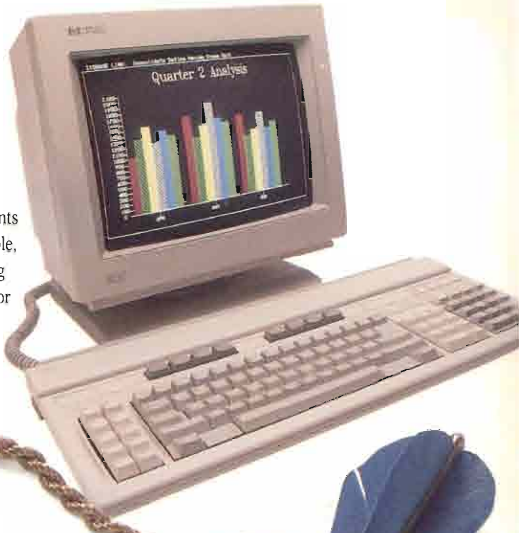

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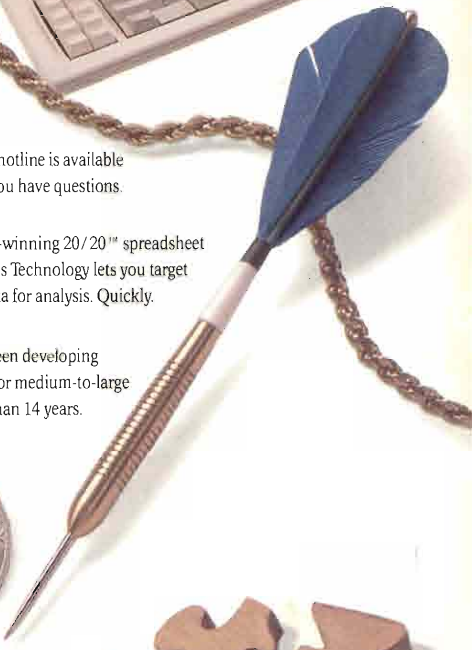

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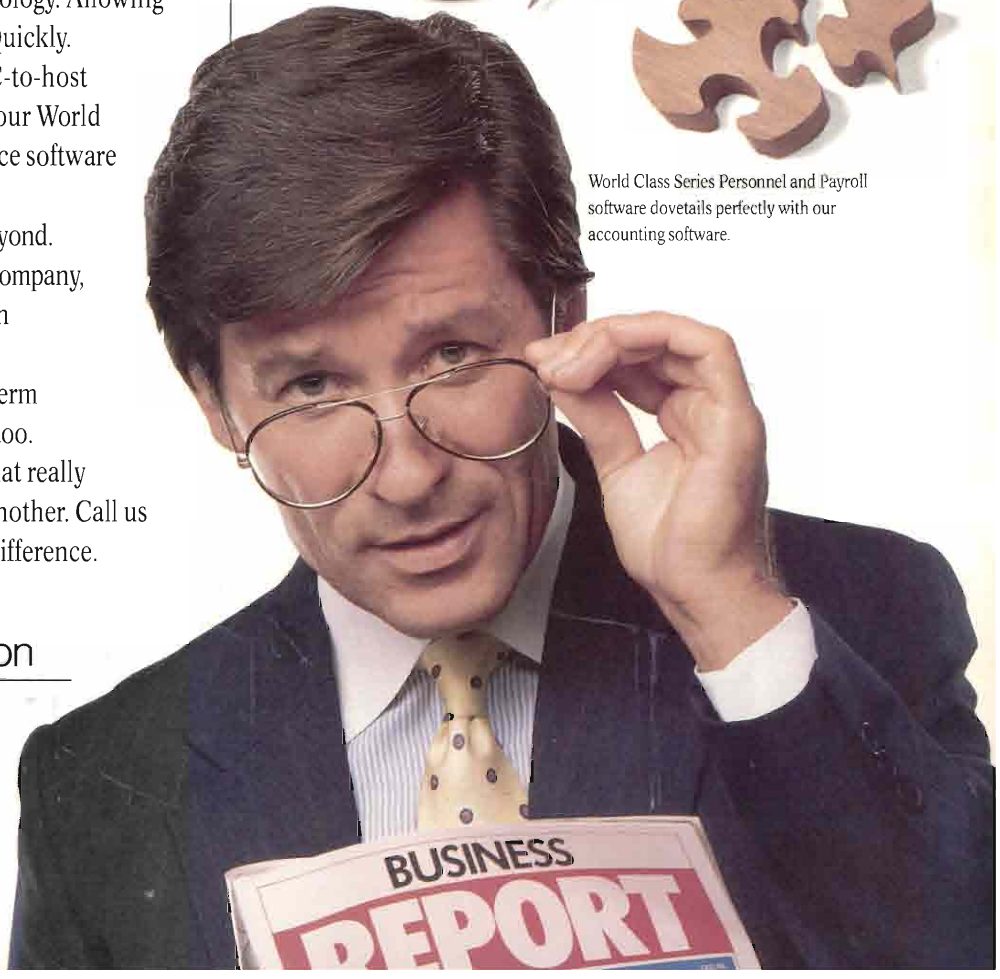

HP 3000 NATIONAL PROGRAM

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NEWS & TRENDS

HP Unveils NewWave Office

Key Foundation For Office Computing In '90s

In a press conference from New York City Tuesday Nov. 28, Hewlett-Packard unveiled its office-systems strategy and vision for office computing in the '90s.

Called HP NewWave Office, HP President John Young said the technology is a "set of services" rather than a product.

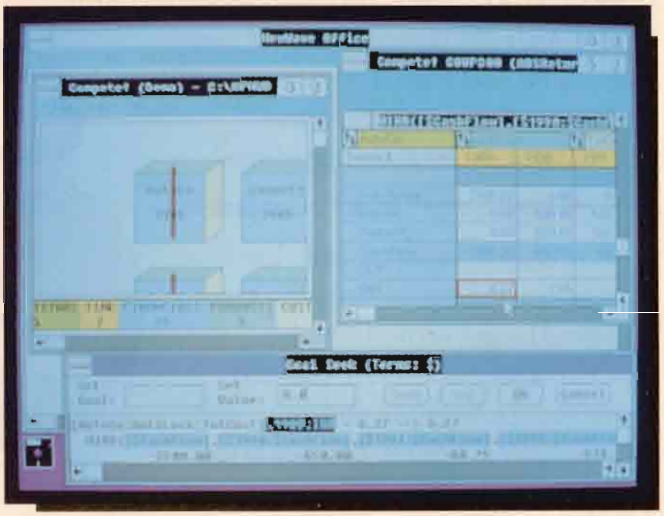
According to Young and other top HP executives, HP NewWave Office (NWO) is an integrated office system that makes it easier and faster for people to get information they need and act on it.

Based on industry standards and the client-server model, HP NWO reduces technological barriers to information sources allowing users to integrate systems and applications from multiple vendors. HP NWO fully incorporates existing applications while also providing a well-defined migration path from current applications to client-server applications.

"Information is a powerful weapon," said Young, "it is the key to becoming more productive...people today want to be able to retrieve information from anywhere on the corporate network."

With HP NWO, users will be able to better manage, store and retrieve information from a variety of forms and media.

For software developers, HP NWO offers a full set of programming tools and industry-standard application-programming interfaces to reduce application-development time up to a factor of four or greater.

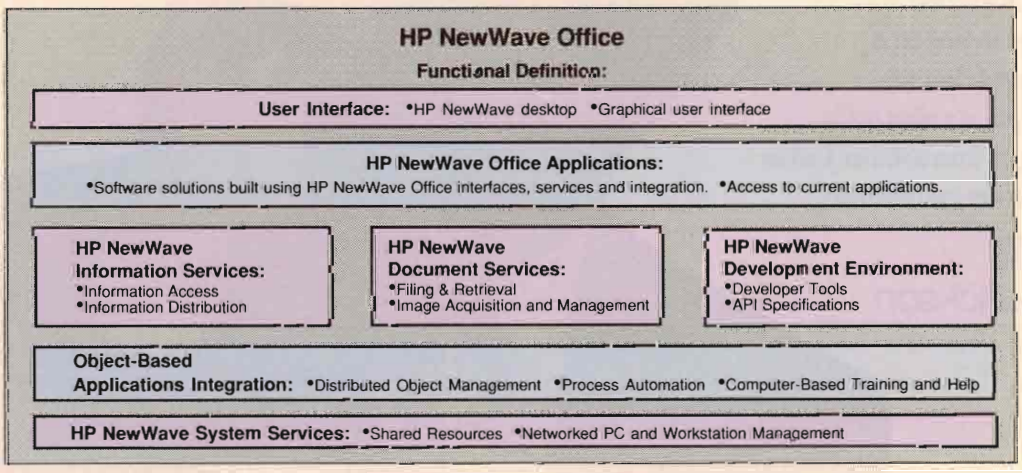


HP NewWave Office allows users to access and integrate information from different applications in one environment.

Integral to HP NWO is an object-based integration capability, a technology developed by HP that enables information to be shared and automatically updated across applications, even if they weren't designed to work together.

HP NWO capabilities are available for MPE V or MPE/XL, HP-UX and OS/2. HP NWO for HP-UX is the industry's first comprehensive client-server offering for UNIX operating systems, acccording to HP.

"Our vision is that with products like HP NewWave Office, computers will become catalysts — rather than barriers—to timely actions and decision making," Young said. "Organizations are empowered to transform their information resources into tools for competitive advantage. With HP NewWave Office, HP advances into an industry leadership position in cooperative and PC integration," he added.



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By supporting multiple operating systems and existing applications, HP NWO protects current investments, allowing customers to build on their existing systems and expand them as needs change. Users can access HP NWO services across MPE, OS/2 and UNIX systems from any industry-standard 80286, 80386 or 80486-based PC, UNIX-system workstation, Apple Macintosh or terminal.

Users also choose from a variety of software, including all MS-DOS and Microsoft Windows applications and existing applications that run on the MPE and HP-UX operating systems, which have more than 3,000 applications available.

HP NWO prices range from $1,300 for a four-user license to $84,210 for multi-user server license, depending on the services purchased and the size of the system. Customers can choose between user-based and system-level pricing. —*Tom Halligan, Managing Editor*

HP Consolidates And Enhances Support Services For Systems And Workstations

SuccessLine And ApolloLine Programs Kick Off The New Year

Hewlett-Packard has entered the 1990s by introducing SuccessLine, a new on-site hardware support program and ApolloLine, an enhanced version of the hardware and software support that Apollo customers received before HP acquired the company.

HP SuccessLine Service simplifies customers' options for support because systems, workstations and personal computers now have the same service programs. Enhancements offered to all support customers at any service level include work-to-completion where HP customer engineers remain on-site until all problems are resolved, no travel zone charges to customers within 200 miles of any of the 400 HP offices in 90 countries, and an assigned account representative for all support customers.

The following service level options are available through SuccessLine:

1. Priority Plus — calls are answered within four hours, 24 hours a day, seven days a week.
2. Priority — four hour maximum response time, but the hours for service calls are limited to 8 a.m. to 9 p.m. five days a week.

The Priority and Priority Plus options are available only to customers with sites within 100 miles of the nearest HP office.

3. Next Day — a response by the next business day.
4. Scheduled — once a week service.

In the United States, coverage times for Next Day and Scheduled support are 8 a.m. to 5 p.m. Monday through Friday.

ApolloLine also offers work-to-completion and no travel zone charges within a 200-mile radius for customers with Apollo workstations. The software support segment of ApolloLine is offered from the Chelmsford Response Center, but other HP Response Centers can be reached through linked databases so that problem resolution can continue around the clock, around the world.

ApolloMax is a support option for workstation customers who want service within four hours. Service hours are from 8 a.m. to 8 p.m. five days a week. An online information access system provides a news page and an information retrieval system. —*Peggy King, West Coast Editor*

The HP 9000 Model 834CH is an HP-PA-based workstation that operates at 14 mips.

HP 9000 Model 834CH Workstation Performs 2-D

Software Option Provides Instant Ignition

The newest high-performance graphics workstation from HP is the HP 9000 Model 834CH. Operating at 14 mips (2.02 MFLOPS), the new HP-PA-based workstation comes standard with 8 MB ECC RAM, a 19-inch color monitor driven by the integrated "CH" 2-D color graphics, keyboard and mouse.

The system has the ability to connect up simultaneously to seven human-interface devices, such as a graphics tablet or knob box. It also includes an expansion slot for increasing system capabilities. The Model 834CH system's RAM is expandable to 48 MB.

HP's new preloaded software option has the system software loaded on a 304-MB hard disc and the X Window System preconfigured to provide instant productivity. When a user turns on a Model 834CH equipped with the new option, a login screen based on OSF/Motif and the X Window System appears and enables work to begin immediately.

The software option includes HP-UX, X Version 11, OSF/Motif, NS/9000 and NS/ARPA networking services and the Starbase Graphics Library. In its standard configuration, the HP 9000 Model 834CH is available for $22,500.

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The HP 75000 System 10 provides a total package for data-acquisition applications.

Hewlett-Packard Offers Data Acquisition System

HP 75000 System 10 Collects Data Without Programming

HP has introduced the HP 75000 System 10, a data-acquisition system that doesn't require programming to collect data and provide results. The system has the necessary measurement hardware and menu-driven software to attach to a PC. For a complete solution, a PC/printer option is available to provide the user with an HP Vectra PC and an HP QuietJet printer.

Applications for the HP 75000 System 10 include mechanical, facility monitoring, biological, physiological, energy research, chemical and material test. Included in the system 10 package are a 5 1/2-digit multimeter and a thermocouple-relay multiplexer that make accurate temperature measures on up to 16 thermocouples. A quad 8-bit digital I/O card, built into the system 10, allows the system to control devices or sense whether they are on or off.

An HP 75000 B-size card-cage contains five empty slots that can be used with a variety of other plug-in measurement cards. Additional cards will be installed at the factory if they are ordered simultaneously with the System 10.

The System 10 is $5,750. The PC/printer option is an additional $4,650.

HP First To Offer FDDI Network-Controller Boards

Data Network Based On ANSI Standard

HP, through its Apollo Division, recently became the first workstation supplier to introduce fiber distributed-data interface (FDDI) network controller boards based on the ANSI standard.

FDDI is a high-speed data network with the capability to support up to 200 Mbits per second — more than 10 times the speed of commercial networking products.

The new controller board will be available initially on the Apollo Series 10000 personal supercomputer that, with processing power of up to 100 million instructions per second (mips), will allow users to take full advantage of the FDDI local area network's (LAN) high bandwidth.

The HP/Apollo environment will use FDDI as a backbone network for high-speed peer-to-peer workstations and servers. It will use FDDI to interconnect subset LANs, which are part of large enterprise wide networks. FDDI backbone networks eliminate bottlenecks and contention problems.

FDDI also provides a front-end network solution, allowing high-performance workstations to connect directly to the network's full bandwidth.

The HP FDDI implementation also will support Station Management (SMT), an integral part of the FDDI standard that allows controllers on the network to communicate with each other, track network events and provide network administrators with pertinent data and functions. HP will provide SMT software with each FDDI configured workstation. Because the HP station management software is downloadable from the host processor, any future SMT changes can be implemented without hardware modifications.

Apollo Provides Island DTP On Workstations

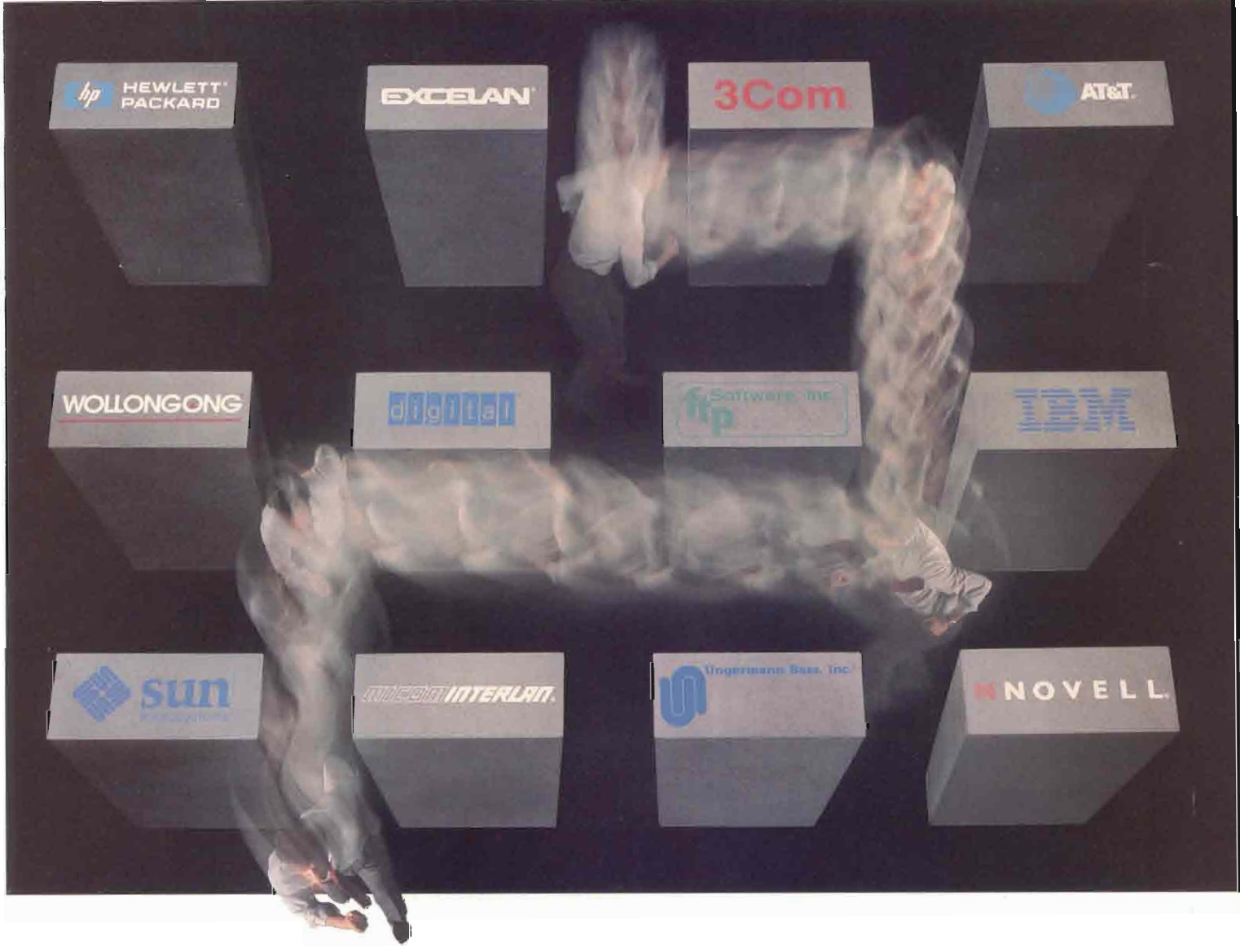
Tools To Be Integrated With OSF Motif

Apollo has announced iWrite, iPaint and iDraw, an integrated family of professional productivity tools from Island Graphics Corp. (San Rafael, CA), now available on Apollo personal workstations.

The tools provide Apollo users with flexible desktop publishing tools that take advantage of networked-workstation capabilities. They will be integrated with OSF Motif, the Open Software Foundation's user interface, and will be accessible through Apollo's Knowledge Broker, a hypermedia documentation application.

iWrite is a composition program that allows users to perform WYSIWYG word processing, importing rasters from iPaint and vector graphics from iDraw. iPaint lets users edit scanned images and create art work that can be imported into iWrite and other composition programs. iDraw generates vector-based graphics that can be sent to PostScript devices and transferred to iWrite and other composition programs.

iWrite is priced at $595; iPaint and iDraw together will be $495.



Reflection® runs through more PC-to-HP networks

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Reflection 1 PLUS ($349) emulates HP 700/92, 700/94 and VT102 terminals.

Reflection 1 PLUS for the Macintosh ($299) provides HP 2392A emulation.

Reflection 3 PLUS for the Macintosh ($399) emulates HP 2393A graphics and HP 2392A terminals.

Reflection 7 PLUS ($449) emulates HP 2627A color graphics and Tektronix 4014.

Reflection reaches even more networks and hosts with Reflection Complements, including:

TelnetManager ($99), adds Telnet protocol to Reflection on your PC for high-level terminal emulation to hosts on TCP/IP networks;

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QIC Members Ship 525-MB Tape Drives

Technology Advances Increase Storage

Four companies are shipping evaluation units of new quarter-inch data cartridge tape drives that store 525 MB of data, more than a three-fold increase over current products.

The four companies, members of Quarter-Inch Cartridge Drive Standards Inc. (QIC) are Archive Corp., Mountain Computer, Wangtek Inc. and the Tandberg A/S Division of Siemens.

QIC is an industry association that encourages and promotes widespread use of quarter-inch data cartridge tape drives and media.

The new subsystems are compatible with a variety of computer systems as well as current QIC-compatible products. The drives use a DC600-class cartridge and meet the 5.25-inch form factor.

Contact Quarter-Inch Cartridge Drive Standards Inc., 311 E. Carrillo St., Santa Barbara, CA 93101; (805) 963-3853.

Circle 365 on reader card

PRISM CPU Increases Performance On Apollo 10000

RISC CPU To Double The System's Processing Power

Through its Apollo Division, HP unveiled a program to increase the overall system performance of its Series 10000 personal supercomputer, including a new fully compatible RISC CPU that will double the system's processing power.

Over the next year, every major component of the supercomputer-class, multiprocessing Series 10000 computer will receive a substantial upgrade. A new PRISM CPU will double computer power, from 22 mips to 44 mips (12 MFLOPS) per processor; parallelizing and vectorizing compilers will increase system performance two to four times; HP will make available a specialized software-development environment for parallel programs and an interactive scientific-software-computation and visualization environment; main memory capacity will be expanded by a factor of four; disc capacity will be improved by a factor of six; and local area networking bandwidth will increase by a factor of 10.

HP, Ultimate Sign $100 Million-Plus Agreement

Ultimate To Distribute Pick-Based Solutions

HP and The Ultimate Corp. (East Hanover, NJ) announced the signing of a letter of intent to market HP minicomputers. Potential value of the multiyear agreement could exceed $100 million.

Under the anticipated agreement, Ultimate will become HP's exclusive distributor of solutions based on the Pick operating system. Ultimate will market to its dealers and end users the full line of HP 9000 Series 800 multiuser minicomputers.

The computers will run HP-UX with Ultimate's ULT/ix Pick-to-UNIX software bridge.

Electronic Publishing Packages Offer Solutions To Apollo Users

The Publisher, WordPerfect Available On Workstations

Through its Apollo Division, Hewlett-Packard has announced the availability of two electronic-publishing packages on the Apollo Series 3500, Series 4500 and Series 2500 personal workstations.

The two solutions are: The Publisher, ArborText Inc.'s publishing package, and WordPerfect, WordPerfect Corp.'s word processing system.

The Publisher electronic publishing system, priced at $4,500, is designed to support SGML, Q CALS recognized standard.

WordPerfect 4.2 for Apollo workstations, priced at $595, includes such features as snaking and parallel columns, line numbering, macros, table of authorities and a rectangular block/move feature.

Correction

In the August issue of *HP PROFESSIONAL*, the article "Need More Memory" reported on page 32 in the third paragraph that 4 MB of memory is the limit that can be added to the HP 3000 Series 37. According to EMC, it can add up to 8 MB of memory for the Series 37.

Also, in the table on page 37, under EMC Corp., the "yes" answer to the Assembly Subcontracted question was incorrect. EMC Corp. does not subcontract work. EMC Corp. owns and operates its manufacturing facility in Canovanas, Puerto Rico.

For more information on EMC Corp. products, call 1-800-222-EMC2 (MA residents call 1-508-435-1000, ext. H938); in Canada, call 1-800-543-4782.

HP Professional regrets the errors. —*Tom Halligan, Managing Editor*

MAESTRO Squeezes Every Drop of Throughput From Your Batch Job Processing

Getting the most out of your batch processing while continuing to do it manually can be like squeezing water from a stone. But with MAESTRO's automated approach you'll increase your batch job throughput by an average of 35–50%.

MAESTRO allows you to realize your full production potential because it reacts instantly to a job completion, reply to a prompt, job termination, or any other significant event. This split-second response is impossible for even the most diligent operators, because they're often busy with other things like loading paper. MAESTRO's attention to detail also minimizes costly errors.

MAESTRO automatically manages a variety of tasks which are usually performed manually, such as integrating user job requests, scheduling production, preparing job streams, and documenting job status. In fact, MAESTRO is so efficient it gives you the potential to run production completely unattended. Even if you have multiple CPU's.

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AutoCAD Supported On SCO Xenix, UNIX

PC-Based CAD Package Support On PC-Based Workstations

Santa Cruz Operation Inc. (SCO) announced that AutoCAD, a PC-based CAD package, would be supported on PC-based workstations running the SCO Xenix and SCO UNIX System V/386 operating systems. The SCI Xenix and SCO UNIX version of AutoCAD will be available through Autodesk dealers.

AutoCAD Release 10 for SCO Xenix and SCO UNIX systems is available for $3,000.

Contact AutoCAD, 2320 Marinship Way, Sausalito, CA 94965; (415) 332-2344.

Circle 372 on reader card

Microsoft, HP To Cooperate On Printer Fonts

MS OS/2 Presentation Manager Device Driver Supports Intellifont

Microsoft Corp. and HP announced that they are working to provide support in a future MS OS/2 Presentation Manager device driver for Intellifont, the font-scaling technology chosen by HP for its PCL printer language.

This will expand Presentation Manager's scalable font dexterity to provide WYSI-WYG capabilities with current and future printers in HP's LaserJet printer product line.

In a separate announcement, Microsoft described its agreement to license Apple's outline font technology as its standard font format for OS/2 Presentation Manager.

The solution for linking scalable printer fonts with the Presentation Manager display is to incorporate the device-specific printer fonts into an enhanced printer device driver. Upon installation of this printer driver, the fonts are made available to the system for use by the display when an application is composing a document intended to print on this printer. A similar enhanced printer device driver is being jointly developed by Microsoft and HP, incorporating Intellifont, a font rasterizer that will be used as part of the recently announced PCL5 language from HP, into the OS/2 Presentation Manager device driver for HP printers. The driver brings HP's printer-specific font format to the Presentation Manager screen.

Contact Microsoft Corp. 16011 NE 36th Way, Box 97017, Redmond, WA 98073-9717; (206) 882-8080.

Cadre Technologies Joins CASEdge Program

Cadre Now Supports Teamwork On HP And Apollo Workstations

As part of a new marketing agreement, Cadre Technologies (Providence, RI) took over the sales and distribution of HP Team*work* on Nov. 1, 1989. HP's Logic Systems Division sold and supported an HP version of Team*work* from Cadre Technologies since October 1986. In Japan, Yokogawa HP (YHP) will continue to sell and support its kanjii version of the product for the Japanese market.

Team*work*, is a front-end (Analysis and Design) tool for Computer Aided Software enginering on HP 9000 Series 300 workstations and on the Apollo division's DN series.

Customers who purchase Team*work* for HP 9000 Series 300 from Cadre will get support from Cadre. Customers who have purchased HP Team*work* and a support contract for it from HP will continue to get support and updates from HP.

The two companies have a new way to work together now that Cadre has become a member of HP's CASEdge program. With the CASEdge program, HP provides the integration tools and platform to incorporate Cadre's analysis and design tools as part of a customized software development environment. — *Peggy King, West Coast Editor*

Top Hat Systems Now Authorized Software Supplier

Software Firm Serves Restaurant Industry

Hewlett-Packard has accepted Top Hat Systems Ltd. as an authorized software supplier for the restaurant and food service industry.

Top Hat Systems Ltd. develops and markets IBM PC compatible software to meet the needs of the restaurant and food service industry, including table service restaurants, fast-foot outlets, cafeterias, hotels, resorts, casinos, cruise lines, private clubs and school food service. In all cases, the software is designed to fill the needs of both single establishments as well as multiple outlet operations such as chains and school districts.

Contact Top Hat Systems Ltd., 2422 Rand Morgan, Corpus Christi, TX 78410; (512) 241-6110.

Circle 366 on reader card

***Note:** If you have any questions regarding a Hewlett-Packard announcement mentioned in **News & Trends**, please contact the Hewlett-Packard sales office listed in the white pages of your telephone directory.*

Adager toll-free telephone numbers:

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Finland	**9 800 10 025**	9 800 10 026
France	**19 05 90 10 62**	19 05 90 10 64
Hong Kong	**008 7094**	008 7095
Italy	**1 67 87 40 84**	1 67 87 40 94
Japan	**0031 11 1181**	0031 11 1183
Liechtenstein	**046 05 2015**	046 05 2030
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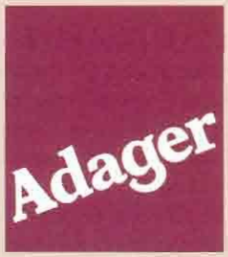
Vatican	**1 67 87 40 84**	1 67 87 40 94
West Germany	**0130 81 06 22**	0130 81 06 23



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CIRCLE 104 ON READER CARD

NEW PRODUCTS

HP Introduces Object-Oriented Portable Software Toolkit

HP, through its Apollo Division, introduced the HP Text Management Library, an object-oriented, portable software toolkit.

The kit allows software developers to produce text-based applications more easily and efficiently than currently is possible with conventional text-manipulation tools. The product's source code has been placed in the public domain and is available through the MIT X Consortium.

HP Text Management Library acts as a set of reusable application building blocks, which reduce development time and result in faster time-to-market for software products. Its library allows software developers to build interactive applications that can mix fonts and character sets and present text on both the screen and hardcopy devices.

HP Text Management Library supports UNIX, X Window System from MIT, PostScript and other operating systems and graphics environments. The source code is available for $110, which includes media and documentation. It can be ported and compiled on any standard hardware platform.

Plug-In Cartridge Delivers PostScript Compatibility

Pacific Data Products announced PacificPage, a PostScript language compatible cartridge for HP LaserJet Series II printers.

When plugged into the cartridge slot of a LaserJet Series II, PacificPage gives the user immediate access to 35 Apple LaserWrite NT equivalent font families in unlimited point sizes. It provides all PostScript-Version 47 capabilities, including reversed text, scaled fonts, text rotation, and complex high resolution graphics. No software, cables, or circuit boards are required. Only 2 MB of total laser printer memory are needed.

Priced at $695, PacificPage is compatible with IBM and IBM-compatible computers. It also is compatible with all major applications programs which support PostScript output including Ventura Publisher, Aldus PageMaker, WordPerfect 5.0, WordStar 5.5 and 2000, Word 5.0 and Harvard Graphics.

Contact Pacific Data Products, 6404 Nancy Ridge Dr., San Diego, CA 92121; (619) 552-0880.

Circle 393 on reader card

Facer Modifies CIA For XL Machines

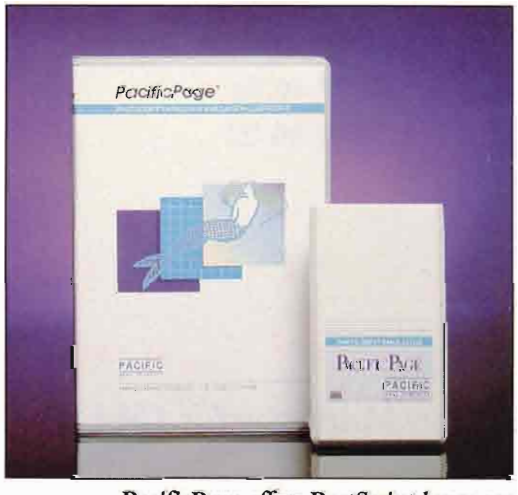
Facer released XCIA, a version of the CIA system performance product that will operate under MPE XL without accessing the Measurement Interface.

Facer is currently working with HP to produce Architected Interface access to the MPE XL Measurement Interface. The release of these Architected Interfaces will be based on the 2.1 MPE XL platform due for release in Spring 1990.

XCIA displays process and file information so that users can determine process CPU usage, what users and processes are accessing a file and what files a process is accessing. It also allows queues to be changed dynamically, allows full access to the Command Interpreter, and has the full CIA filtering system to "zoom in" on particular processes.

The product retails for $2,000 and will be credited to the price of the CIA/XL product. Contact Facer, P.O. Box 9802-231, Austin, TX 78766; (512) 440-8488.

Circle 400 on reader card



PacificPage offers PostScript language compatibility in a plug-in cartridge.

Oracle To Support NetFRAME Mainframes

Oracle Corp. announced support for NetFRAME Systems Inc.'s new family of network mainframes, the NF100, NF300 and NF400.

Oracle Server users now can develop a new generation of applications using Oracle's application development tools. Oracle Servers will be available on Netware 386 and on OS/2, Banyan VINES and UNIX 386 as NetFRAME's support expands to include these operating systems.

Contact Oracle Corp., 20 Davis Dr., Belmont, CA 94002; (800) 345-3267.

Circle 399 on reader card

Insight Development Offers Connectivity Products

Insight Development Corp. has announced the availability of MacPrint version 1.2, PrintAPlot 1.1 and LaserControl 3.3 device management software for the Hewlett-Packard Series IIP laser printer. These software packages allow the printer to be used with additional computer systems and application packages.

MacPrint 1.2 is a complete device management software system for the Macintosh. It allows a variety of non-Apple printers to be connected directly to the Macintosh and provides full text, graphic and paper handling capabilities. The new HP IIP printer understands only the HP PCL printer control language and consequently cannot be used in its basic form with the Macintosh. MacPrint translates Macintosh printer commands into

Business and technical professionals who want to print color graphics and text using a single device now can consider the new HP PaintJet XL color-graphics printer.

a format that can print on the LaserJet IIP, as well as a number of other PCL based print devices.

Laser Control 3.3 allows existing application software packages to use all the features of the LaserJet Series IIP regardless of compatibility between the application program and the printer. List price is $149.

PrintAPlot provides the LaserJet Series IIP and any other PCL compatible printer with the capabilities of a pen plotter. PrintAPlot allows software applications using the Hewlett-Packard Graphics Language (HPGL) language to work directly with the LaserJet Series IIP. List price is $199.

Contact Insight Development, 2200 Powell St., Suite 500, Emeryville, CA 94608; (415) 652-4115.

Circle 395 on reader card

PaintJet XL Offers Printer Sharing And Greater Speed

Hewlett-Packard announced the HP PaintJet XL color-graphics printer, which prints two to three times the speed of the original PaintJet and is intended for work groups that want to share a printer or for individuals who need a higher volume color printer.

The PaintJet XL offers increased speed, improved media handling, more media sizes, more fonts, better final copies and more pages per day.

A typical 8 1/2 x 11-inch (A size) page of graphics prints in 1 1/2 minutes. It also handles 11 x 17-inch (B size) paper. An automatic sheet feeder allows for unattended printing on up to 200 sheets of paper and 70 transparencies.

An optional cartridge provides 20 additional fonts and the printer will work with Type Director, a typeface scaling and font-management software program.

ASP's ServerJet Expands Capability Of LaserJet Printers

ASP Computer Products has announced an enhanced version of ServerJet that expands the capability of the Hewlett-Packard Series II and IID LaserJet printers by allowing more users instant and simultaneous access to the printer at a speed of 115,200 baud.

The ServerJet is a user installable board that plugs directly into the "Optional I/O" slot located on the back of the HP LaserJet printers. Because the ServerJet completely emulates the LaserJet's interface, all computers that can print to the HP LaserJet, such as an IBM PC or compatible, Apple Macintosh, VAX or HP 3000, can now share the same LaserJet. Each user operates as if connected directly to the printer, and no user training is required. Price starts at $495.

Contact ASP Computer Products, 1026 W. Maude Ave., Suite 305, Sunnyvale, CA 94086; (408) 746-2965.

Circle 397 on reader card

Solid Mac Interface And Spooler For HP LaserJet IIP

DataPak Software Inc., has announced full compatibility between its Printer Interface IV for the Macintosh and the new HP LaserJet IIP.

The interface is also compatible with DataPak's HP spooler allowing background printing.

Using DataPak's Printer Interface IV, Macintosh users can utilize this printer's text and graphics. Printer Interface IV, originally created for the original HP LaserJet series, provides a Chooser-selectable, Quickdraw at 75, 150, and 300 dots-per-inch, as well as full usage of the printer's built-in fonts and font cartridges.

Printer Interface IV lists for $125 for the driver only, $159 with spooler.

Contact DataPak Software Inc., 14011 Ventura Blvd. #507, Sherman Oaks, CA 91423;(818) 905-6419.

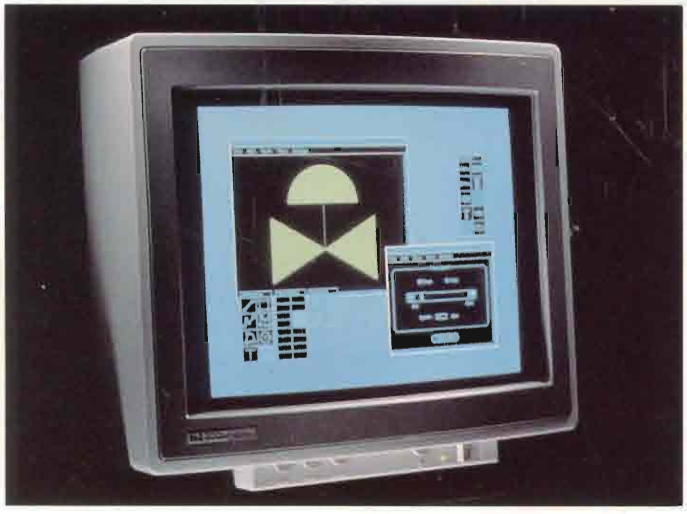
Circle 396 on reader card

POSE Added To MDSS Application Software

With the addition of Picture Oriented Software Engineering (POSE), a CASE product, MDSS, the application software package for manufacturers, now gives users the ability to change software at the design level.

This collection of tools allows MDSS to draw data flow diagrams and action diagrams, decompose a data flow and to write software substantially faster.

Advantages to MDSS customers include



HP's User Interface Platform (UIP) is a software toolkit for creating graphic user interfaces.

the ability to discuss with MDSS staff the advantages and disadvantages of customizing MDSS, integrate the MDSS design into their software addition, and modify at the design level, rather than just at the code level.

Contact Manufacturing Decision Support Systems Inc., 300 E. Ohio Building, 1717 E. 9th St., Cleveland, OH 44114; (216) 861-8100.

Circle 394 on reader card

HP Software Toolkit Creates GUIs

Hewlett-Packard has introduced the User Interface Platform (UIP), a flexible software toolkit for creating graphic user interfaces.

UIP is an optional ex-tension to the Real-Time Applications Platform (RTAP). Together, they form an integrated set of software tools designed for engineers and programmers who build supervisory-control and data-acquisition (SCADA) systems.

UIP is based on HP's toolkit concept. It means that you can build solutions to many different classes of problems with the elements of the software. This makes the product well-suited to value-added businesses. They can customize software to meet a customer's needs and connect the software with other packages. Value-added businesses can use UIP to penetrate new industries and tie into other software technologies, such as artificial intelligence.

The principal feature of UIP is its ability to create smart symbols that can change appearance based on values in the RTAP database. Symbols and schematics are drawn interactively using a mouse and palette of graphic building blocks and predefined symbols. UIP supports multiple windows allowing several monitoring screens of information to be displayed on one console.

UIP is based upon industry standards for use in a multivendor environment. These standards include the X Window System, the HP-UX operating system and ISO networking.

CSI Unveils GrowthPower Inventory Counting System

Computer Solutions Inc. (CSI) has introduced the GrowthPower Inventory Counting System, a data collection product added to GrowthPower. Inventory Counting is designed for use with the HP 3000 line of computers and is a front-end module to the existing GrowthPower Data Collection product.

GrowthPower/Inventory Counting is priced at $6,000.

Contact Computer Solutions, One Burlington Woods, Burlington, MA, 08103; (617) 229-2200.

Circle 378 on reader card

Software Research Northwest Introduces Utility Package

Software Research Northwest Inc. announced the availability of Nuggets, the first in a series of supported MPE XL utility packages.

Developed as part of a joint venture with Denkart NV (Kontich, Belgium) and Allegro Consultants Inc. (Redwood City, CA), Nuggets consist of a family of MPE XL utilities each released as part of a continuing series of collections. The first of these Nuggets is the GOLD Collection, which consists of 12 utilities, with routines to index MPE XL:STORE tapes; to alter capability sets of programs; to provide snapshots of process activity; to terminate inactive sessions; to copy files and databases quickly, to reboot the system; a library of fast substitutes for many HP procedures; as well as six others.

The GOLD Collection is priced at $1,200. Subsequent Nuggets collections may be added for a fee of $250.

Contact Software Research Northwest Inc., 17710-100th Ave. SW, Vashon Island, WA 98070; (206) 463-3030.

Circle 392 on reader card

Versatec Offers Electrostatic Plotting System

Versatec, a unit of the Xerox engineering systems division, has introduced a high-performance monochrome electrostatic plotting system — CADmate.

CADmate is designed to replace high-performance pen plotters for mechanical and architectural applications.

The Versatec CADmate provides near-laser quality, 300 points-per-inch (ppi) drawings, in 36-inch-wide format. It allows high resolution and definition without the higher data transfer rates required by 400 ppi resolution. CADmate accepts HP-GL data format and is plug-compatible with HP 7586 pen plotters. The acceptance of HP-GL data format allows existing CAD, mapping or graphics-based programs such as AutoCAD, VersaCAD, and MicroCADAM to be used without any changes.

CADmate includes a plotter, interface board, driver and software. The system is priced at $13,900. Quanity discounts are available.

Contact Versatec, 2710 Walsh Ave., Santa Clara, CA 95051; (408)748-3103

Circle 391 on reader card

QMS Enters Bar Code Laser Printer Market

QMS, Inc. has announced the MAGNUM LP15 laser printer that combines QMS's MAGNUM controller technology with a nonimpact laser printer engine for industrial graphics, automatic identification and bar coding applications.

The QMS MAGNUM LP15 printer uses the latest MAGNUM controller technology with the industry-standard QMS Code V-Versions I and II. The Code V programming language offers industrial graphics tools such as rotable fonts, box and line drawing commands, variable height and width MAGNUM characters, bar codes, logos and other

Continued on page 84.

JobRescue saves your operations critical resources

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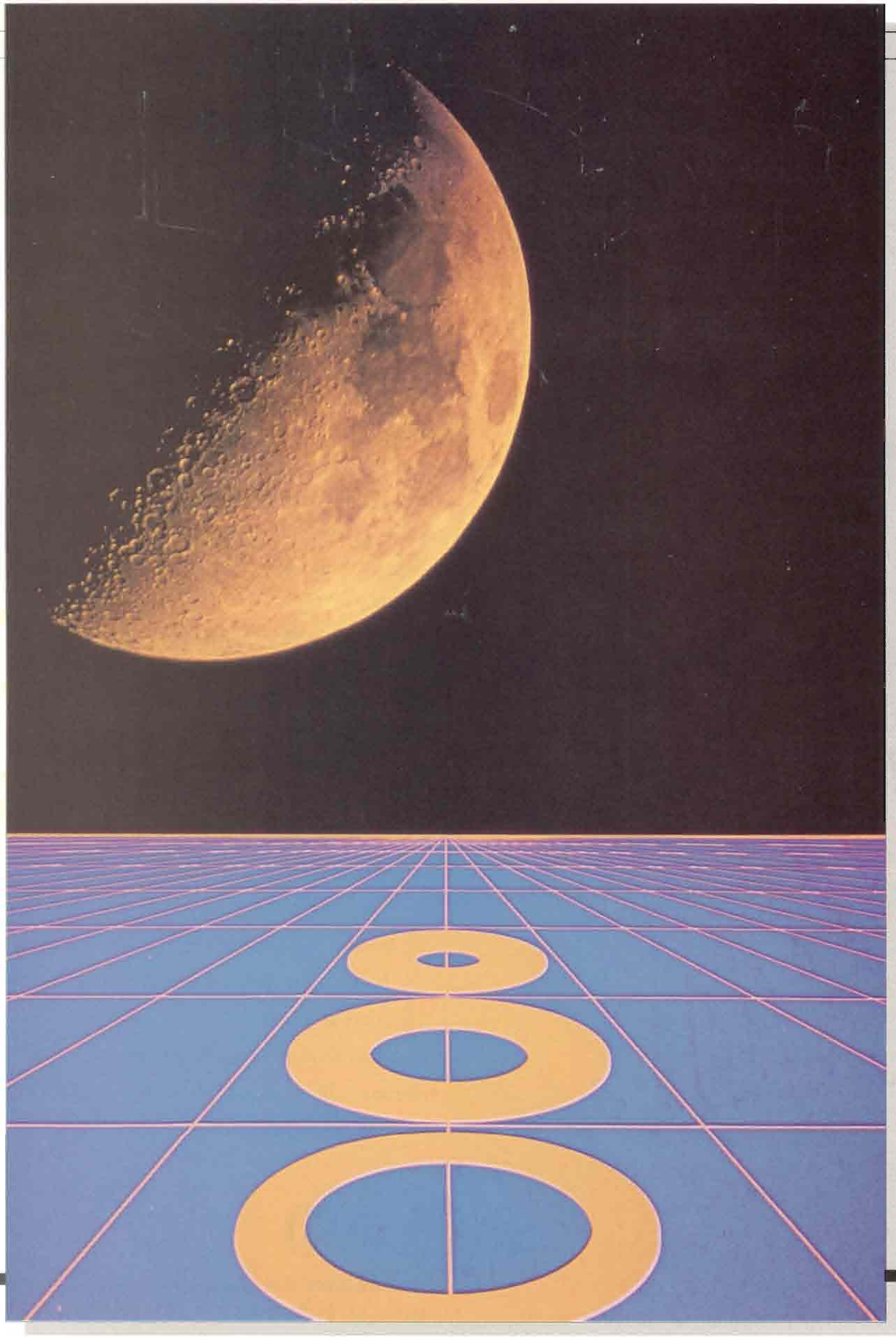

Crossing The Bridge Between DOS And HP-UX

GETTING STARTED WITH UNIX

[BY ANDY FEIBUS]

Most of us are blessed (or cursed) with a personal computer. You use your computer daily for word processing, spreadsheets, phone lists, calendars or (when no one is looking) games. You know what to do when the disc becomes full. You can start and terminate your favorite programs. You can list your files and reorganize their locations. You can get your printer to work most of the time and, when all else fails, you know where the on/off switch is located.

But now you're required to use the new HP-UX system just installed in your office. An additional terminal has been placed on your desk (or maybe your PC is expected to become a terminal for the HP-UX system) and now you're expected to use the new system. Your palms sweat as you contemplate trying to struggle with the new system. Show no fear and read on.

PCs are single-user systems and only one user is expected to access the PC at any time. HP-UX systems, however, are multi-user systems that can have many different users accessing the system at any time.

To differentiate users on HP-UX systems, each user is expected to log on to the system before beginning to use it. On your terminal is the prompt:

```
login:
```

Your system administrator created an account for you that provides you with your own area for files and security to prevent others from accessing these files. This account was given a name. Ask your system administrator for the name assigned to your account and enter this name at the **login:** prompt (press the **Return** key after you have typed the name). The computer then asks:

```
password:
```

Your administrator assigned a security password to your account to prevent other users from accessing your files. Find out what this password is and enter it at the **password:** prompt. Notice that the letters you type are not displayed. Press the **Return** key after you complete the password. If an error occurred while entering either your account name or your password, the computer will indicate this by:

```
Login incorrect
login:
```

Enter the information again. Don't use backspaces when entering the account name or password. If you don't get it right after three tries, tell your system administrator he provided you with incorrect information.

Eventually, you'll get logged into your account. The computer provides you with some messages like:

```
Welcome to HP-UX v7.0 on pw-rda          $
```

The **$** is a prompt similar to the DOS prompt **C>**. When this prompt is displayed, the computer is waiting for you to enter commands or execute programs.

Commands

SPECIFYING A COMMAND to run on an HP-UX system is the same as specifying a command to run on a DOS system. Enter the command name and any run-time arguments and then press the **Return** key.

However, the commands aren't the same. *Table 1* indicates most DOS commands and their equivalent HP-UX commands.

TABLE I

Command	HP-UX Command	Command	HP-UX Command
APPEND	None (no such concept)	GRAPHICS	None (except under X Windows)
ATTRIB	**ll** (to view)	JOIN	**mount**
	chmod (to change)	LABEL	None (no concept of disc drives)
BACKUP	**tar, cpio, tcio, dd**(depends on the backup media)	MKDIR, MD	**mkdir**
BREAK	**stty**	MODE	**stty**
CD	**cd**	MORE	**more, page**
CHKDSK	**fsck**	PATH	**set PATH=**
CLS	None	PRINT	**lp**
COMMAND	**sh, csh, rsh, ksh**(start a new shell)	PROMPT	**set PS1= (sh, ksh, rsh) or set prompt= (csh)**
COMP	**cmp, diff**	RECOVER	**fsck**
COPY	**cp**	REN, RENAME	**mv**
CTTY	< (Redirect each command using command < input)	REPLACE	None (a shell program can be easily written)
DATE	**date**	RESTORE	**tar, cpio, tcio, dd**(depending on media)
DEL, ERASE	**rm**	RMDIR, RD	**rm -r**
DIR	**ls, ll, l, lsf**	SET	**set**
DISKCOMP	None (no concept of disc drives)	SHARE	None (file sharing is command-dependent)
DISKCOPY	None (no concept of disc drives)	SORT	**sort**
EXE2BIN	None (no need)	SUBST	None (no concept of disc drives)
EXIT	**exit, logout, CTRL-D**	TIME	**date**
FASTOPEN	None (no need)	TREE	**ls -R, find . -type d -print**
FC	**diff**	TYPE	**cat**
FIND	**grep, egrep, fgrep**	VER	**uname**
FORMAT	None (no concept of disc drives)	VERIFY	Option for **tcio** only
GRAFTABL	None (no need)	XCOPY	**cp -r**

Table 1: DOS commands and the equivalent HP-UX commands.

> HP-UX, a multitasking operating system, permits multiple programs to operate at the same time. These programs may be executed either in *foreground mode* or in *background mode*.

Three standard utilities come with all DOS systems. These utilities have equivalent HP-UX commands, as shown in *Table 2*.

As with many DOS commands, only certain HP-UX commands are useful. Many of the more useful HP-UX commands are not shown in the above tables. Please refer to the *HP-UX* column in the February 1989 issue of *HP Professional* for the list of HP-UX commands that you'll use 90 percent of the time.

One major difference to note between HP-UX commands and DOS commands is that command options are specified differently. Most (unfortunately, not all) HP-UX command options are specified as **letter**; DOS command options are specified as **/letter**.

All HP-UX commands are described in the *HP-UX Reference Manual* (sections 1 and 1M). The descriptions also include the possible command options and arguments.

File Specification

WHEN SPECIFYING A FILE name to DOS commands, directory paths within the file are separated by a backslash (\). The HP-UX path separator is the slash (/). The directories . and .. have the same meanings for both operating systems. The **?** and ***** wildcards have the same meanings, however, HP-UX will interpret characters properly following a ***** wildcard (DOS cannot).

On HP-UX file systems, a file suffix (and, therefore, the .

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separator character) isn't enforced for any file. HP-UX files may contain as many as 14 (or 256 if extended file system names are used) characters; DOS restricts you to eight characters and a three-character suffix. Note: Although a file suffix isn't enforced for HP-UX files, certain HP-UX commands (e.g., any HP-UX compiler) require a file suffix to indicate the type of file.

Some examples of HP-UX file names:

```
/bin/ls
/usr/lib/lpsched
/etc/shutdown
```

These files illustrate the next concept that differentiates DOS from HP-UX: standard directory locations. DOS discs, because they're formatted by you and you load the software wherever you desire, don't have a structured file system. In other words, DOS discs are entirely unique from one PC to another (unless a standard is enforced by someone).

TABLE 2

DOS Utility	HP-UX Command
EDLIN	ed, ex, vi
LINK	ld
DEBUG	sdb (cdb, fdb, pdb), xdb

Table 2: DOS utilities and the equivalent HP-UX utilities.

TABLE 3

/bin	Base HP-UX (user and installation) commands
/lib	General HP-UX libraries (groups of routines)
/etc	System administration utilities and files
/tmp	Temporary storage directory for HP-UX
/usr/bin	Other HP-UX (user) commands
/usr/lib	Other HP-UX libraries and subsystem commands
/usr/spool	Storage area for HP-UX background system tasks (e.g., lp)
/usr/tmp	Temporary storage directory for user commands

Table 3: Each standard directory contains a specific class of files and programs.

FIGURE 1

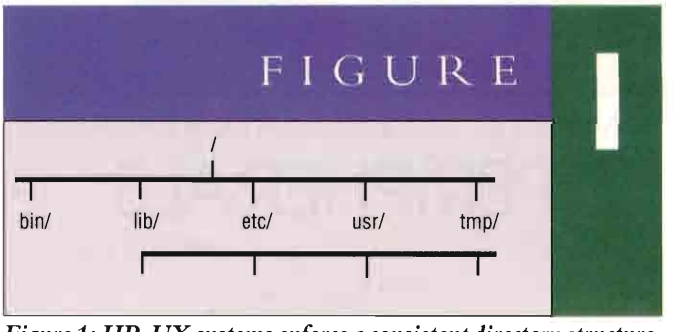

Figure 1: HP-UX systems enforce a consistent directory structure.

> The main difference between executing a program under DOS and executing a program under HP-UX is memory.

HP-UX systems, on the other hand, enforce a consistent directory structure across all systems for the operating system commands. The directory tree for this structure is similar to *Figure 1*.

Each standard directory contains a specific class of files and programs, as shown in *Table 3*.

Not all directories in the standard HP-UX installation are listed (too numerous to show here). However, as you can see, this structure is significantly different from DOS directory organization.

Executing Programs

UNLESS YOU'RE USING concurrent DOS or Microsoft Windows, you're only able to execute a single DOS program at any time on your PC. Some DOS programs are written to operate in a segment of memory and to be activated only when a *hot key* is pressed. However, most of DOS programs are written to be the only one running.

HP-UX, a multitasking operating system, permits multiple programs to operate at the same time. These programs may be executed either in *foreground mode* (the user must wait for completion of the command before executing the next command) or in *background mode* (the user may execute another command before the current command completes). You may start a program in background mode if the program doesn't require input from a terminal and output isn't expected to be written to the terminal; otherwise, start the program in foreground mode.

To start an HP-UX program in background mode, enter the program's name and arguments and terminate with an ampersand, as illustrated by the following command:

```
$ tar cf/ /dev/rct / &
```

Similar to DOS, HP-UX has the concept of a *virtual input device* (**stdin**) and a *virtual output device* (**stdout**). When most pro-

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grams are executed, these virtual devices are automatically associated with the user's keyboard and screen, respectively. Like DOS, these devices also may be *redirected* to other input and output devices by using the (redirect output) shell operators. Also, like DOS, the **stdout** for a program may be routed to the **stdin** of another program by using the pipe (|) operator.

The search path concept within HP-UX is also similar to the concept within DOS. To set the search path within HP-UX, however, involves using the **set** command to set the **PATH** environmental variable.

Program Memory

THE MAIN DIFFERENCE between executing a program under DOS and executing a program under HP-UX is memory. Under DOS, programs must execute within the 640 KB that may be addressed under DOS (unless the program is written to use *extended memory*. However, most DOS programs are written only to use extended memory as a last resort).

HP-UX, on the other hand, is a *virtual memory operating system*: All programs are provided with as much memory as required *regardless of the amount of physical memory available in the system*. All memory is treated the same under HP-UX: No concept of "extended memory" vs. "normal memory" is needed. The amount of virtual memory available to a program is only limited by the size of the area of the disc reserved for the run-time copy of the program (the *swap area)*. If a program exceeds the amount of virtual memory available, the program is aborted (as opposed to DOS, which usually will crash your PC).

HP-UX also attempts to insulate all programs from the operating system. When a program aborts because of an improper condition, other HP-UX users are rarely, if ever, affected. This insulation means that having to turn off an HP-UX system is a rare occurrence; many HP-UX systems are rarely turned off during the course of a normal year.

This information should provide a bridge for the DOS user to cross to become an HP-UX user. Once the user has gotten logged into an HP-UX account, many commands and operations are available. *—Andy Feibus is president of Processware Inc., Atlanta, GA.*

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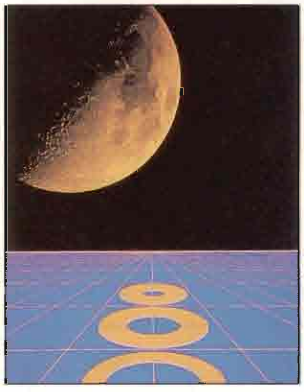
Commercial UNIX

Acceptance Is Slow, But That May Change



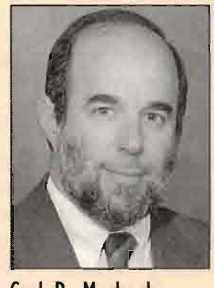
HP Professional's editorial staff and guest experts recently gathered for an editorial roundtable on Commercial UNIX. The roundtable teleconference was moderated by Managing Editor Tom Halligan and West Coast Editor Peggy King.

Halligan: How do you foresee the commercial UNIX marketplace for application software? Will it be similar to the MS-DOS marketplace, where blockbuster products such as 1-2-3, dbase and WordPerfect dominate. Or, will there be niche products for specialized commercial applications, rather than one or two standards?

McCulley: Right now, I think what we're seeing in the commercial UNIX marketplace is the integration of the PC and minicomputer or the mainframe. With UNIX, that's really an area that no one to date has defined the PC integration strategy. Things like NewWave have the opportunity to offer a network or structure into which products like Lotus could fit and, therefore, users could be a lot more productive. I see us going in the middle of what you suggested.

There will be some niche products, but the overall framework, a Motif or one step further in the NewWave environment, will really be what ties all these products together. And that, I think is going to be the glue in the commercial UNIX marketplace.

Marbach: From our prospective, Cynthia, the commercial marketplace has been very slow to



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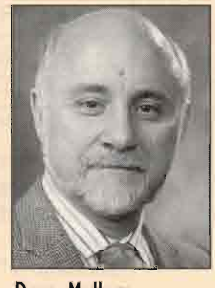
publisher,
Professional
Press



Dave Mallery
editorial director,
Professional
Press

accept UNIX. When I travel around looking for commercial UNIX sites I don't see a lot of them and I don't see a lot of generic commercial application software out there. Why is that?

McCulley: What we're hearing from a lot of the people is that UNIX does not fit into the DP centers or MIS centers at this point because it has not shown the same set of tools, and has certainly not been proven with the same performance that they've been able to get from proprietary operating systems.

People are starting to buy commercial applications using UNIX today in areas where it is sort of a standalone application. It may be networked into other areas, but only the small companies are actually putting their production systems on UNIX. The one exception is financial services. We have started to see activities going into UNIX in what we would consider production areas. For instance, the Singapore Stock Exchange is running on UNIX systems today. We sell quite a few HP systems there.

Stevens: It seems like there are probably three areas that UNIX needs to address before it will become fully functional for commercial applications. In the past, as an operating system, UNIX was not designed for transaction processing performance...that was not its intent. I don't personally see that as a barrier in the future. In fact, there are activities today by the database vendors in particular that are finding ways to work around and through the UNIX operating systems to achieve fairly high transaction rates.

The second area is just the availability of application software. It takes a platform that seems to be viable before you start to see the application software move over...and I'm talking about the commercial application software. There's certainly a lot of application software addressing technical environments. I think you'll see that commercial application software will evolve and move over to our UNIX systems.

The final area is the range of tools that surround an EDP datacenter system. Those are the tuning, the monitoring, the batch scheduling, the spooler kinds of utilities. They are being provided in many cases by third-party suppliers, and you're seeing the system vendors themselves also start to offer those kinds of utilities. Those are three reasons that I typically hear from somebody showing hesitancy as to whether or not they want to just jump in with UNIX and do commercial processing.

Florio: I'd like to add just one other thing to that set of very accurate comments. The reason why there is a demand in the marketplace for UNIX, especially to move into the commercial environments, is that UNIX represents a concept of open systems that proprietary operating environments don't necessarily offer. The

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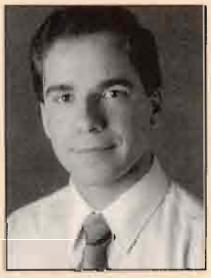

Andy Feibus,
HP-UX columnist
and president,
Processware Inc.

"I think you'll see commercial software evolve and move over to our UNIX systems."

David Stevens, Hewlett-Packard

push is coming from the experience of people in the IBM PC, MS-DOS environment, where they could get off-the-shelf software.

So, to a certain extent, you're seeing the UNIX market respond to the requests of customers that come from their experience with a quasi-open architecture kind of environment. The reason IBM PCs are an open architecture is that they're ubiquitous and they are exactly the same. The reason the MS-DOS is open architecture is that everyone runs effectively the same version of MS-DOS. Consequently, portable software products can be easily developed. The objective from the marketplace, the demand from the marketplace, is to provide a similar facility on UNIX for a new class of machines that is more than a single user, single passkey environment, but a much more complex, and comprehensive class of machines.

Feibus: What I'm hearing here is that, to make UNIX more commercial oriented, there are a lot of tools that are missing. But one of the things that's starting to appeal to people with UNIX is the fact that it is so standard. So who is going to develop these tools and get everybody to agree to use them?

Florio: There are tools available in the market to perform all those functions. The problem is getting this information out to the customer base. The major minicomputer-type suppliers of equipment like to sell their own products. They typically don't like to sell products that come through different channels of distribution.

Price: I do marketing consulting and part of my work involves talking to people who are really UNIX users. What I'm finding over and above everything else is that they love it. They think there are enough applications. They think there are enough system tools and they can't understand why people who aren't using it think that there aren't.

King: Nancy, are your customers in the multitasking environments and had they used system tools and found that UNIX provided what they needed?

Price: Yes, they had. One thing that I wanted to add is that the ones who like UNIX think that one of the reasons why others don't think that there are applications out there, or don't think that there are systems tools out there, is because they say the vendors aren't necessarily doing a good job of telling us about the solutions. They bring up the case of IBM or companies that are selling in the IBM environment. And they'll say they are bringing us solutions; they are bringing us a way to handle our business.

Why aren't the UNIX vendors doing the same thing? There are all these catalogs out there and there are a lot of products in those catalogs and I don't know why they are not getting sold.

Feibus: Part of it could be advertising. The MS-DOS products that are out there are so inexpensive and yet they are advertised everywhere. You can pick up any magazine and find some MS-DOS tool being advertised. But UNIX, for some reason, as the price goes up the advertising goes down. You don't find tools on UNIX being advertised nearly as many places as the MS-DOS ones.

McCulley: We keep referring to the PC. I think there's going to be an environment where people want a small multiuser UNIX system. And they would be willing to look at a number of third parties and try to get tools and really package the system themselves for a small number of users. However, if you look at the datacenter, they don't want to have to buy tools from multiple people to put together a system that's going to run their business. If they are betting their business on it, they want to be able to go to an IBM of the UNIX world and buy a datacenter system that will provide the performance they require, the capacity they require and any growth that they will require in the future, and be guaranteed that their business isn't going to fall because of the choice they made. I think that's really the heart of the commercial UNIX question. Most of the people we're talking to are looking at UNIX in the datacenter — and that's where it has not gone, because the vendors have not pulled those tools together in a package in a system.

Florio: I would agree emphatically with just what Cynthia said. It is exactly right.

Halligan: How robust is HP-UX in today's marketplace compared to the other versions of UNIX operating systems?

Stevens: It goes back to the three areas that I identified earlier. I wouldn't pretend that HP-UX is all the way there in all of those areas. I think we are making a lot of progress in those areas. In our current release (version 7.0), we're seeing some very good numbers for transaction processing rates. While I don't

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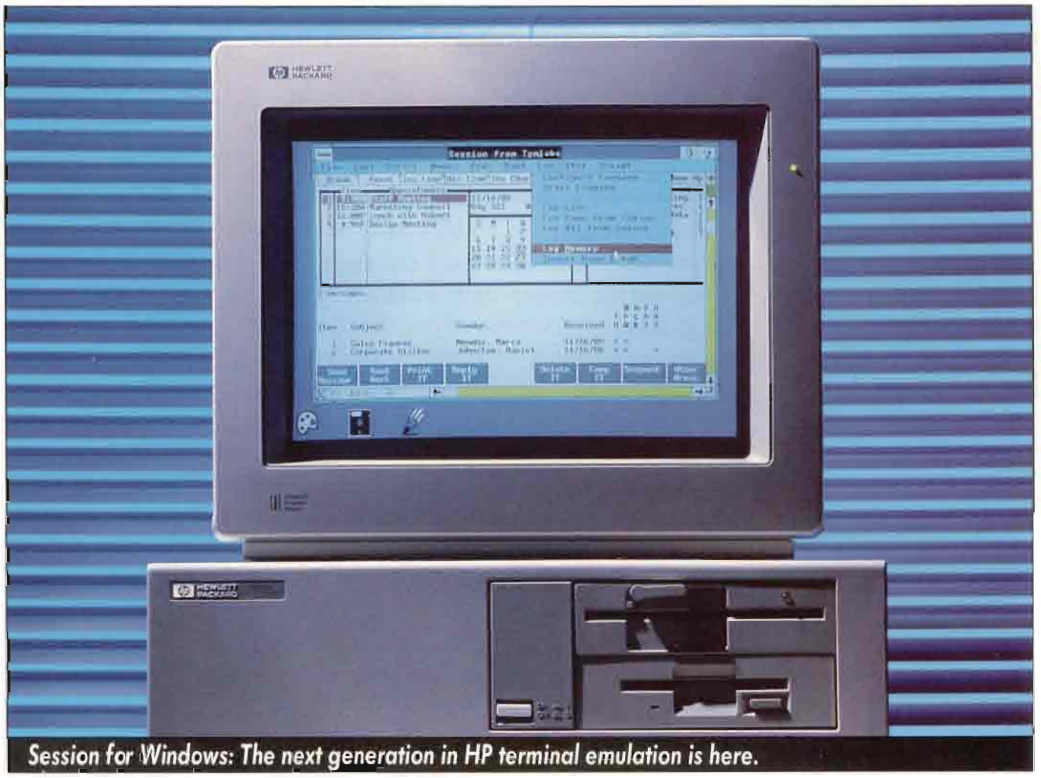

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Business Session for Windows was developed jointly by HPS Software Developments Ltd. and Tymlabs Corporation.

"One of the things that's starting to appeal to people with UNIX is the fact that it is so standard."

Andy Feibus, Processware Inc.

think we would claim that we're to the end of what we want to accomplish, in terms of commercializing HP-UX for commercial environment, we've made a lot of progress.

There are many applications yet to be moved into the environment to make it a more viable solution and there is certainly fine-tuning to take place as a part of the kernel of HP-UX. And, there are tools and utilities that HP, as a vendor, wants to supply around that operating system. But I don't think there are reasons today to avoid HP-UX commercial environment for any real shortcomings.

King: If the OSF version of the UNIX operating system becomes the industry standard, do you think it will be essential for vendors to drop their proprietary systems and only promote the OSF version?

Feibus: It won't happen. And not to sound terribly pessimistic about the whole thing, but even in the OSF standard there are still POSIX and X Open and all the other standards that are emerging around UNIX. There are still a lot of areas for extensions and improvements and ways to make things easier. I just don't see vendors with an installed base doing anything other than supplementing their versions with the OSF standards. I just can't see it happening. They have too much of a vested interest in making sure all their customers are compatible.

Marbach: Do you see a situation where a customer of HP-UX will think of it as a superset of the OSF version, is that reasonable?

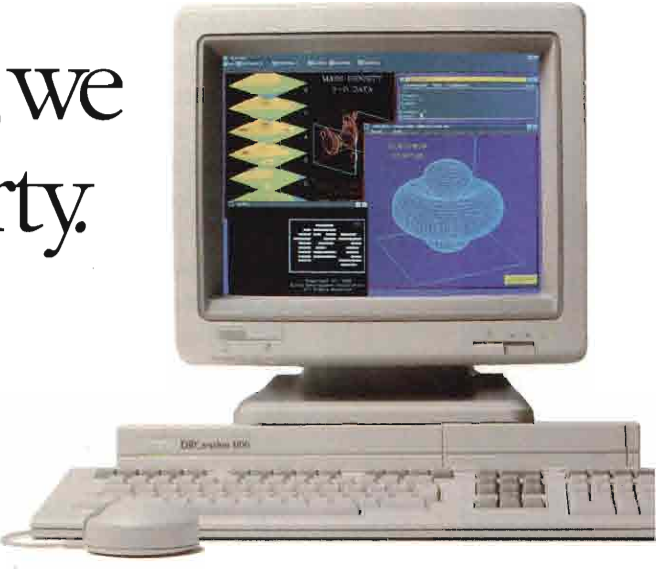
Feibus: Yes.

Marbach: OK, so if we consider that UX is going to be a superset of OSF, then a customer spends four or five years intertwining himself around UX, has he lost his ability...some of the freedom he had because he went to the UNIX standard to begin with? Isn't he as much tied to a proprietary UX as he was tied to any other proprietary operating system?

Feibus: If he's not careful, it just makes the port harder. It doesn't restrict you because given enough time and money you can take any application and move it to another platform.

Florio: You know, in the old days in mainframeworld we had the same argument about

On January 10th, we had the first party.



COBOL programs. It was virtually impossible to implement a COBOL application on a Sperry, Burroughs or IBM mainframe without implementing some of the features proprietary to that specific operating environment. Yet, COBOL remained probably one of the more portable environments and was chosen by MIS directors because of the portability. Portability is not a binary issue, it is a scalar issue. Some things are more portable than others.

I have a phrase for this whole OSF/UNIX international war. My open system is better than your open system and I have the proprietary features to prove it.

Feibus: That's it.

Florio: And everybody's shooting themselves in the foot, I think, around that particular issue. But the issue is if you write an application in the style of UNIX, as opposed to the style of another modern operating system, it will tend to be more portable then an application written, for example, on a modern proprietary operating environment to another modern proprietary operating environment. Does that make sense?

Feibus: Yes.

Marbach: It does, but do you think it would be possible then for vendors to produce a product that takes advantage of those enhancements to the standard and yet be able to go across many different operating platforms?

Florio: I'm going to make a projection now... I think the situation is going to boil out a slightly different way. Twenty years ago we sold hardware and gave away software. If the operating system becomes the same for everyone, we're effectively back into that same domain. You see, if the underlying operating system becomes exactly the same for everyone, then we're giving away operating system software, and operating systems cease to be a differential advantage in the sales environment. Then your features become a differential advantage in the sales environment. Customers don't buy machines with operating systems. Customers buy solutions.

Feibus: Yes, but that again assumes that you can get IBM and DEC and everyone else to agree

"Customers don't buy machines with operating systems. Customers buy solutions."

Michael Florio, UNIX usr/group

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DECstation 3100 workstation

It was a day for celebrating.

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No wonder January 10th was a day everyone celebrated.

"A lot of vendors are talking about how they would love to sell commercial UNIX into the Fortune 1000, into the mainframe sites."

Nancy Price, Price Associates

that there will be one operating system and everybody's version is going to look the same.

Florio: To the extent that we got everybody to agree that there was one COBOL and everybody's COBOL was going to look the same.

Feibus: Yes. There are always going to be extensions to the standard and the hardest thing is writing your code and knowing ahead of time whether your violating the standard. And if you don't violate the standard, then you have a good chance of being able to port your product in a very quick time.

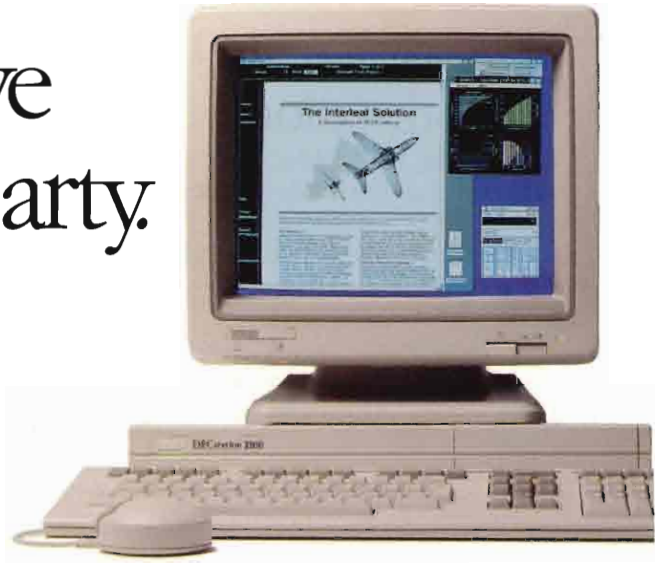
King: Now that OSF/Motif is out in prototype, do you think that this will really get the ball rolling with commercial applications systems developers, once they have the feeling that there is a stable graphical user interface standard?

McCulley: I think that I have seen X window activity on the technical side evolve as the client-server distributed computing model has evolved. I have not seen that become as prevalent on the commercial side at this point. Again, the one exception will be financial services, the broker's workstation that has made a move into high-performance graphics workstations with servers and extensive use of X Windows to reduce the workload or the clutter on a broker's desk. I see the commercial marketplace moving towards that but perhaps slower than we might want.

Halligan: Nancy, in what market do you see the short-term and long-term growth of the commercial UNIX applications?

Price: Actually, I see most of the growth, especially the short term and moving into the long term, in more of what we were talking about earlier, the mini side of things. I think that a lot of vendors are talking about how they would love to sell commercial UNIX into the Fortune 1000, into the mainframe sites. People don't want to change their mainframe applications. They are into CICS, IMS, and now they're getting into DB2. They don't want to change the way they are running their businesses. But many of them are willing to talk about some of their new applications, their smaller applications moving onto a different

On July 11th, we had the second party.



environment. They're very excited about that.

McCulley: I'd also add that they are offloading some of their mainframe applications; they don't want to buy another mainframe but this is not critical to running the business. They are also using it to tie in their user interface machines, whether they are terminals, a PC network or a workstation, or a graphics workstation where they could have a user interface, if you will, in the future. If we are looking toward the future and running a number of applications with the minicomputer as the server environment, therefore you have a central application with access to it from the user interface or from the user terminal or machine.

Price: But I think that everybody's doing that and moving slowly toward it.

McCulley: The people who are doing that more are the ones with branch offices who need to put some sort of application ability and computing ability down in the branch office. And rather than hook them back to the mainframe they might break off part of the mainframe into a minicomputer running UNIX and hook into the branch office via that minicomputer.

Mallery: Do you know what would sell an awful lot of UNIX at Professional Press? The advent of Aldus Pagemaker ported to workstations.

McCulley: Text processing — actually that's an area where UNIX has grown quite quickly and we have very good text processing tools. Desktop publishing has been very strong and it has sort of been an outgrowth of some of the engineering workstations application.

King: Mike, because you are a UNIX software vendor, do you find that your customers come to you for a UNIX solution or do you have to sell them on the advantages of the platform? Do they have to buy the hardware first or how does it work?

Florio: My customers are major OEMs both domestically and internationally and we bend a subsystem that supports document images in an X or ANSI terminal environment. Those customers don't ask about it, they demand it. They want TCP/IP, TCP/UDP support for image manipulation, image movement around a net-

"Once somebody gets a chance to use UNIX and sees the flexibility and the power of UNIX, you end up converting a lot of people."

Cynthia McCulley, Hewlett-Packard

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The DECstation 3100 workstation on January 10th.

The DECstation 2100 workstation on July 11th.

Party. Party.

"Are you getting many converts from MPE? Are you convincing any of them that UX is the way to go?"

Carl B. Marbach, Professional Press

work. We don't have any choice. If you were to go down the list of the 15 top computer companies in the world, most of them would be the guys that we are talking to and they demand UNIX.

Marbach: Why?

Florio: Because they intend UNIX to be the platform. The document image processing marketplace, which is the superset, in fact, of the document creation marketplace .... it's this notion of handling document images as a data type. It's kind of like Wang/Wyse. Wang/Wyse is a closed document image processing system. In that marketplace every major vendor has chosen UNIX to be the platform for that application. It requires a client-server model, it requires a powerful host to house databases and it requires very powerful workstations to handle the document images because they're a very large data type and they just demand UNIX.

Halligan: What are some of the obstacles in the acceptance of commercial UNIX within the HP community today?

McCulley: Well, I think some of the things Dave (Stevens) mentioned up front. People have the perception that MPE is a closed operating system and you open it up where you want it and UNIX is an open operating system and you close it off where you want to restrict access, and that makes a lot of people nervous. UNIX has come up very quickly. It's been considered an engineering operating system written for engineers by engineers. And, therefore, people seem concerned about how friendly it is. Certainly people who are used to RTE and the HP environment see UNIX as more friendly than RTE, but certainly not where you need to be, compared to MS-DOS. So there has been some reluctance. But I find, as Nancy mentioned, once somebody gets a chance to use UNIX and sees the flexibility and the power of UNIX, you end up converting a lot of people towards UNIX. I think they fall short of running their business on it, unless they are a very small company and they have one computer that does it all. But, I think a lot of it is just the hype in the marketplace has left a lot of people thinking "I need to look at UNIX...but

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what is it really going to give me?" It sounds like a panacea, but I know there's no such thing.

Marbach: Are you getting many converts from MPE? I could understand somebody who doesn't have a lot of experience with a real mature multiuser operating system looking at UNIX and saying it's terrific, it's wonderful, but how about the loyal installed base that HP has of MPE users? Are you convincing any of them that UX is the way to go?

McCulley: I think the people who are looking at UNIX as an alternative are the VARs who see the movement towards UNIX and see it as an alternative operating system and a new opportunity for people who buy UNIX solutions. I think the major accounts are looking at UNIX for particular applications to tie in their engineering efforts and their manufacturing efforts. But no, we don't have companies who are throwing out MPE and saying that they want UNIX instead — nor do we want them to.

Price: I really think that a lot of it has to do with people's perception of what is out there. There really are things out there — application products, systems products, good databases, good hardware...fantastic hardware. But people have this perception that it is very very difficult to use. I think one way that that perception could change, and I think that is starting to happen now, is that the press is getting more and more interested in user stories. That helps people who are potentially users or who are beginning to say "Hey, so and so is doing this, I can do it too." And I think we need to have more and more of that.

Editors Note: *HP Professional will be publishing users experiences with their UNIX operating system throughout the year. If you solved a problem, uncovered some new UNIX mysteries, or just want to share your tips with our readers, please send your story ideas to HP Professional, 101 Witmer Rd., Horsham, PA 19044; Attn: Tom Halligan, Managing Editor.*

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HP-UX 7.0 Unites Technical Families

New Release Links Series 300 And 800 Systems

Last month, Hewlett-Packard began shipping HP-UX 7.0, a new version of its implementation of the UNIX operating system. With its new release, HP now has linked the company's two families of technical computers.

According to Dave Stevens, software planning manager for HP's General Systems Division (Cupertino, CA), a major goal of HP-UX 7.0 was to converge operating systems for HP's Motorola 68000-based Series 300 workstations and HP's RISC-based Series 800 systems.

"If you're a Series 800 user, you may find it odd that your last release was 3.1 and you're jumping to 7.0," Stevens said, "We've converged the numbering of the Series 300 (operating system), whose last release was 6.5. The new version marks the first operating system upgrade since the spring."

While the two product lines are not object code compatible, they're essentially source code compatible. Because of the underlying architecture, there is not a binary standard. According to Stevens, Version 7.0 reflects a major effort toward converging source compatibility for the different architectures. The remaining differences are essentially tied to configuration of the system — architecture-dependent issues.

[BY SHARON FISHER]

"Consequently, users who write applications for one product line should be able to port them to the other fairly easily," Stevens said, adding, "As long as you're writing in various ANSI-standard languages and making standard system calls and commands, you should see compatibility across those two architectures."

System administrators also will find that managing products from the two families will be easier. According to Stevens, the System Administration Manager (SAM) packages that come with HP-UX have previously been available only on the Series 800. Now, they are available on the Series 300.

Similarly, this is the first release to provide Series 800 discless node support. For example, users can run a Series 800 as a server with either Series 300s or a Model 815 as a discless client. Previously, users were required to use a Series 300 as a server for discless Series 300 workstations. "This brings 'mixed clusters' or the ability to mix Series 800s and Series 300s in a discless environment," Stevens added.

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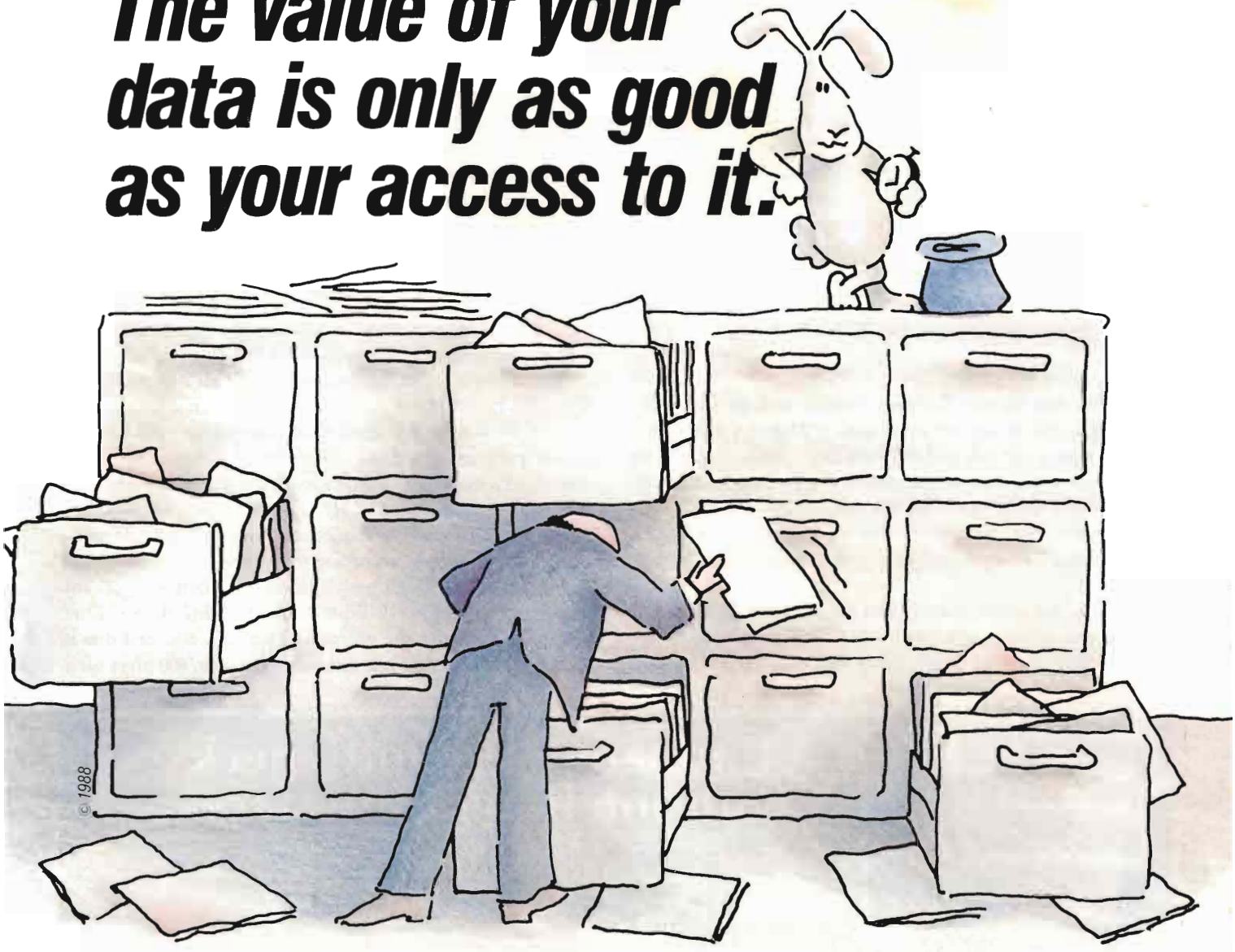

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[1] *"The Three Pillars of EIS" by David Friend, August 1988*
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Moreover, applications written for previous versions of the operating system will continue to run on the new version.

IN ADDITION TO PROVIDING compatibility with other HP-UX products, HP-UX Version 7.0 is compatible with other UNIX implementations as well. HP-UX always has provided a combination of AT&T System V UNIX and selected features from Berkeley UNIX. "There are pieces of Berkeley, but not the entire system," Stevens pointed out. Version 7.0, for example, is based on UNIX System V.3 (though not the recently announced V.4) and passes AT&T's System V Interface Definition (SVID) 2.

HP-UX also includes Berkeley features, such as the fast file system, long file names and the C shell. "There's a high correlation between HP-UX and the Berkeley systems, but it's not 100 percent ... with Sys-tem V, there is a test suite you can comply with, and we do that," Stevens said.

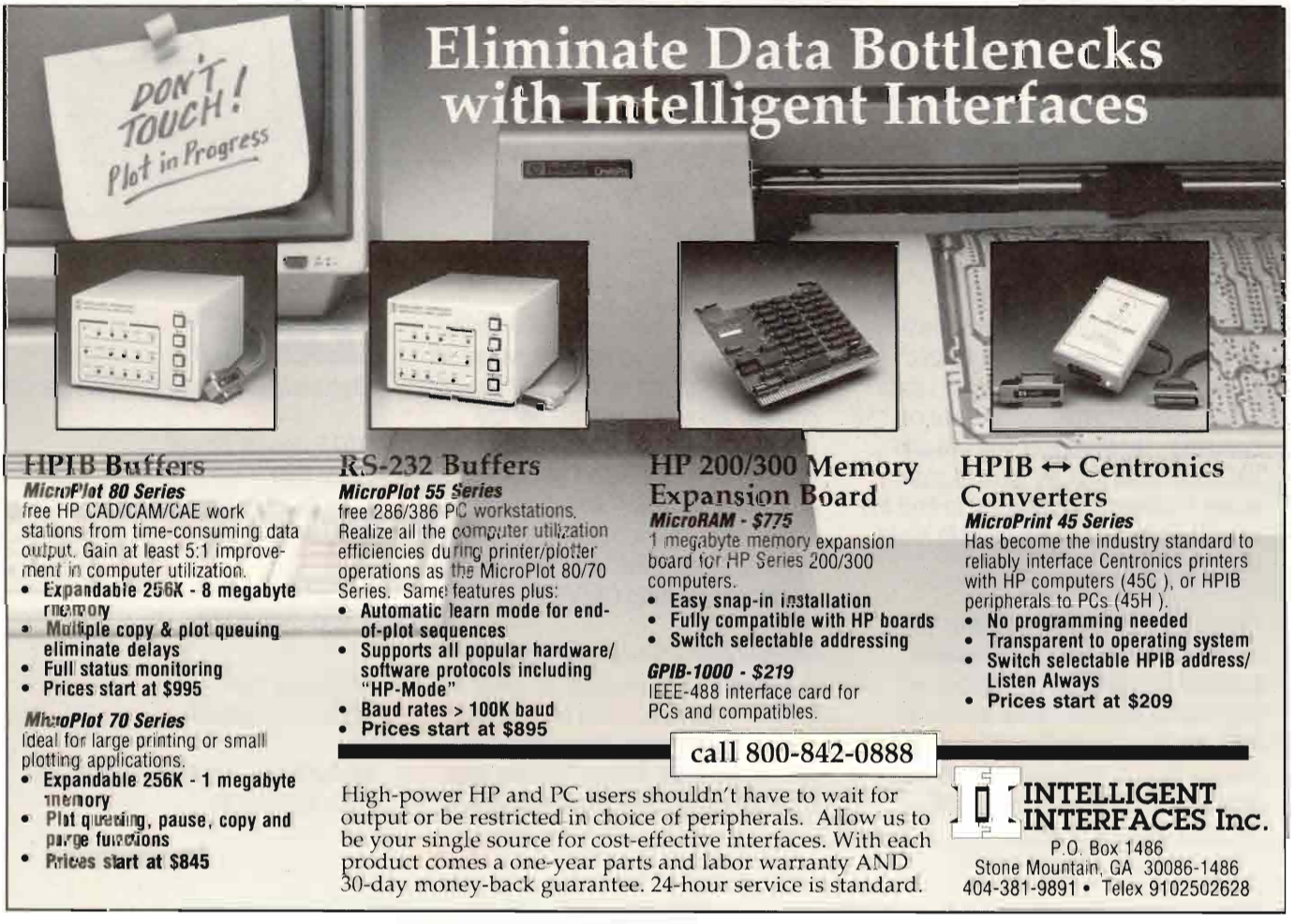
For that reason, applications that are written for the System V.3 operating system should be a very straightforward port to HP-UX.

HP also has added features that are intended to fulfill the Department of Defense's (DoD) C2 Trusted System Requirements. The features, which make the system more secure, have not been evaluated yet by the DoD, and such evaluation takes some time. However, HP is considering doing a joint evaluation when it moves to the next level of security," according to Stevens. "It's likely to be a year before it's evaluated," he added

More HP-UX Features

VERSION 7.0 OFFERS A number of other new HP-UX features, including support for Sun Microsystems Inc.'s Network File System (NFS) 3.2. This new version of NFS offers the capability of remote locking with greater granularity on file systems that aren't local. This means users can lock smaller portions of a file. Depending on the system users choose, NFS may be bundled or may be a separate purchasable product. A future version of HP-UX will support the Government Open Systems Interconnection Profile (GOSIP) of communications protocols, according to Stevens.

For Series 800 machines, Version 7.0 offers support for disc mirroring with HP Fiber Link (FL) disc drives. Disc mirroring means that the system has two hard discs and data is written to both in case one disc fails. DataPair/800 gives users



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two-way disc mirroring with the ability to do online backups using one of the disc banks for backing up the system while it's in operation. This separately purchasable feature is transparent, so no changes need to be made to applications to take advantage of it.

Version 7.0 includes several ease-of-use features. For example, a network update capability allows system administrators to update their systems to HP-UX 7.0 remotely. In addition, the ELM screen-oriented mail system will now be provided as a standard feature.

Features that have been supported in earlier versions of HP-UX continue to be supported, such as native language support (including support for National Language Input/Output (NLIO) which allows HP-UX to support Asian languages), DOS emulation through a product called SoftPC, and automatic restart battery backup capabilities.

Various communications products continue to be available as separate products, such as support for Transmission Control Protocol/Internet Protocol (TCP/IP), Berkeley Advanced Research Project Agency (ARPA) services, and HP Networking Services (NS), which allows HP-UX systems to communicate with HP 3000 minicomputers.

The minimum memory and disc requirements for Series 800 machines are 8 to 12 MB of memory and 150 MB to 18 GB of disc. For Series 300, the requirements are 4 to 48 MB of memory and 80 MB to 4 GB of disc.

Existing HP-UX users who are on HP's support service will receive HP-UX 7.0 free as part of their support update. If the users don't have support but want to update their systems, the upgrade can be purchased from HP for a price slightly higher than the price of an annual support contract.

The cost and number of users supported depends on the system. "When you buy a Series 800 family system, you get a 16-user license," Stevens explained. "On the Series 300, you get a 2-user license on workstations, and can upgrade." In addition, on the Series 300, HP-UX is available as an 'execute' only" license that does not include the full programming environment.

And, there's more to come in the next few months. HP plans to integrate HP-UX with the Domain operating system of its Apollo workstations, as well as with Open Systems Foundation (OSF) UNIX.

—Sharon Fisher is a San Francisco-based freelance writer specializing in computer communications.

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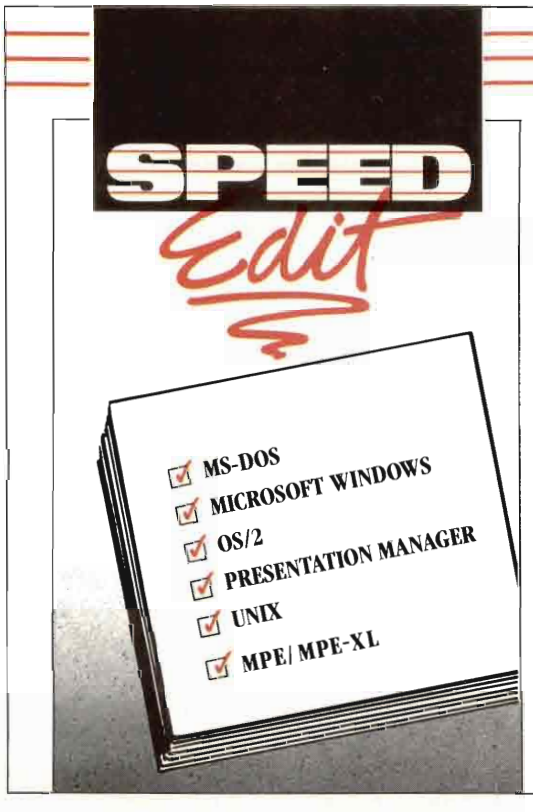

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SOFTWARE DEVELOPMENT

Lisa Burns

A few years ago, I wrote a data entry program for Stanford University using Lotus 1-2-3 and the HP PortablePlus laptop computer. It was a great learning experience for both parties. I learned Lotus and macros, while the Stanford fundraising office learned to use PCs for pledge tracking.

However, a very interesting thing happened to me while pilot testing the program: I had to use it! What a shock it was to realize that my masterpiece was a tremendous pain to use.

The program was easy to write and change, but awkward and clumsy for data entry. A lot of tabbing was required, mistakes were easy to make, and data entry took a long time. Training the Stanford staff was more difficult than I had expected and many of them were reluctant to use the package until it was improved.

I had made the mistake of writing the data entry package from a *programmer's* perspective, not from a *user's* perspective.

As a programming/system analysis manager for Hewlett-Packard, our project teams take a different approach than I took with Stanford. We work closely with users and with user representatives throughout our development process to ensure that the user interface on our business applications fits efficiently into the data entry process. Also, we make sure that user needs for efficiency, keystroke reduction and productivity are met.

In order to help you work better with users in your own shop, I'll describe the process we use to maintain a user perspective throughout the entire software development lifecycle. Also, I'll discuss the results we have had with user involvement in HP's sales systems area.

Who Are Your Users?

The first thing we consider when setting up a project in our shop is, "Who are our users?" This may seem like a simple question, but sometimes the answer is far from clear. For your own shop, you first need to consider your primary users. These are the people who use your system directly, work with your data entry screens, your reports, your online inquiry and other system functions. Next, you need to look at those departments and people who use your data, who need summary information, or who read your database directly. These people must also be involved in your design activities.

For example, a work order processing system may have work order data entry people and maintenance staff as primary users. These people enter and retrieve data directly from screens and reports. However, accounting workers who book maintenance billings against the general ledger are indirect users of work order data and should be represented in a system design.

Once you have identified your user base, you need to plan the involvement of representatives of that base in your development process. If you sit next to your users, as many MIS folks are lucky enough to do, you may simply need to plan weekly meetings with them to clarify needs and review specifications. If your users are scattered across several cities or countries, as ours are, this may not be practical. Instead of weekly meetings, you may need to set up telephone conferences, video conferences or perhaps monthly meetings to discuss system plans. Be sure that your plan includes a cross

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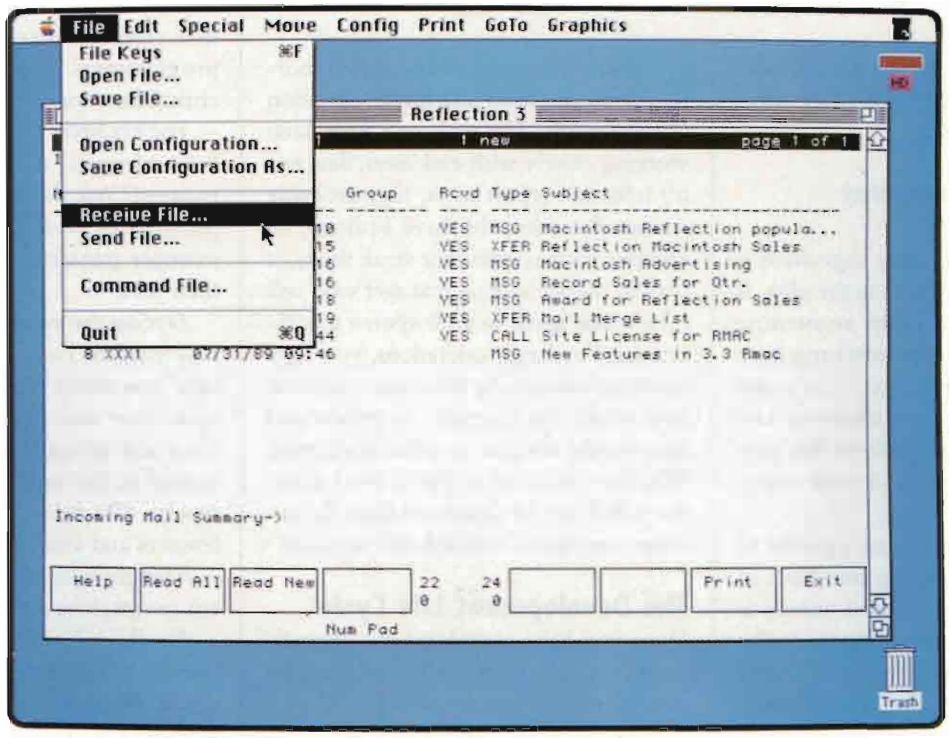

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section of your user base.

For example, this may mean getting both data entry people and management report users involved in your meetings, or involving one sales representative from each district. For a multinational situation, you may need to involve users from several countries.

A key ingredient is management commitment to the plan. If you need two hours of an accounting clerk's time once a week, you must have support from their manager.

Encourage Management Commitment

Whatever your plan, a key ingredient is management commitment to the plan. If you need two hours of an accounting clerk's time once a week, you must have support from their manager. The manager must agree to have someone else answer the phone and perform that person's tasks while they're in your meeting.

Similarly, if you're asking a person to attend a monthly meeting hundreds of miles away, you'll need travel money as well as management commitment to the time away from the user's job. Even a phone conference requires support. Establish the time and financial commitment with user management before you go any further with your project.

Another option to consider when setting up user involvement is to avoid the necessity of borrowing time from a user by hiring them instead. By including former users on the project team itself, you have dedicated resources at your disposal. You need not wait for a meeting or conference to clarify a point or check a specification. Also, these user advocates likely will have many contacts from their old job. They can then research problems and clarify questions quickly. Most important, because they have lived the life of a system user, they will have a completely different perspective than that of your programmers. This perspective is critical to your success.

Finally, you need to establish authority for specification and implementation phase signoffs. Although you have been working closely with end users, data entry folks and report users, they probably are not the ones who have authority to approve your system. For small shops, it may be the accounting manager who will review and agree to your system specifications. For larger operations, you may need representatives from each store in your chain, for example, to review and approve the test plan or other document. Whether you need to talk to Fred down the hall or get 15 signatures from the review committee, establish this up front.

The Development Life Cycle

Once you have completed the groundwork, it's time to start investigating and designing.

Our life cycle, which is probably similar to your own, goes from investigation to external specifications, to internal specifications, followed by coding and testing, and finally user alpha site testing. During your investigation, you want to fully understand and document existing information flows and system designs. In addition, you want to ask about functions missing from current systems and procedures. This will probably mean that programmers need to watch users performing their jobs even if you have users on the project team itself. Additionally, you may interview the users you have hired or arranged time with and have them explain their business process to you.

Once you have completed the investigation and generated whichever documents or flowcharts are needed, design work begins. This is where user involvement is, by far, the most critical. As you prepare draft screen and report layouts and as you begin describing the functionality of your system, work closely with the users you identified earlier. Ask them to check the placement of fields on screens and make sure that you do not require the user to tab all over the place to get to a frequently used field. Be sure that reports are organized intuitively and are easy to understand. Above all, ask the user representatives to make sure that programmers have not overlooked a critical function or field.

For example, are add and delete functions adequate, or is a modify function required? Ask the users to test the completeness of your designs by looking at example transactions or inquiries from their jobs.

During the system design phase, you may want to consider different tools to help you check the proposed software with your users. Hands-on demonstrations and prototypes may be especially helpful in this area, as may mockups of reports. We have also used phone conferences and video conferences to check our designs with users from many different geographies and functions.

Finally, by involving user representatives in software inspections (also called structured walk-throughs or peer review meetings), you can uncover and prevent system design defects and ensure that all designs are adequately reviewed.

At the end of this design phase, you will probably produce an external specifications document, or at the very least, a set of screens, edits and reports. When this is published to your users, you undoubtedly will be asked to change it — in fact, if you are not asked to change it, the users may not have read it!

Because of the upfront work you have done reviewing and prototyping your system with various user representatives, hopefully you'll have a proposed system very close to user needs, and the changes

requested will be minor and easy to incorporate. Assuming this is the case, you must now make the appropriate changes and announce that additional changes will become more expensive as time goes on.

The phrase, "speak now or forever hold your peace" is appropriate here. While completely frozen specifications are impossible, you should aim for something pretty "slushy" before you get user signoff on the external specification (ES).

Getting Down To Business

Now it's time to write the internal specifications for your system. This is mainly a technical activity, so user involvement will be less at this stage. You may be able to give your users a break, or if you have hired user representatives, you can start them writing the documentation for the system. Programmers may still occasionally need to contact them for clarification on edits or system functionality, however.

Once you have completed pseudocode, modules narratives or hierarchy charts for your system, and you begin coding and testing, user involvement will increase again. You'll need to include users in test plan writing and execution. This is another critical task. If you're like me, you're not very good at thinking up realistic test cases. For example, the only HP product number I know off the top of my head is the 2225A, the Thinkjet. Sales orders with 20 line items, all 2225As, don't make very representative test cases.

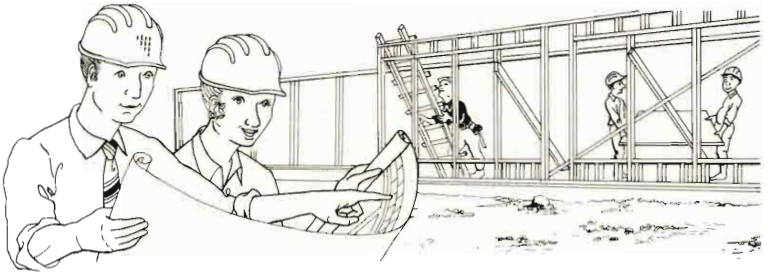
For this reason, taking sample transactions from your users' production workload is a great idea. User representatives can help you test error conditions, boundary conditions, as well as realistic production transactions. You will probably want to include them in software inspections of your test plans, and you may want to have them actually execute the unit tests themselves.

One caution here: Don't leave your programmers completely out of the unit test execution. Having to actually use your own software can have a very sobering effect. By testing your own code, you can begin to see why having to tab over 15 fields to get to the one you need is an annoyance. Programmers working with users is probably the best combination for testing.

As you approach the end of the construction phase and are executing the final unit test plans and fixing minor defects, you want to involve the users in writing your system test plan. Again, they will help ensure that you are covering all production cases as well as error conditions. In addition, they will help you make sure that your test environment matches a true user environment.

For example, they can help you in storing copies of user data files, databases, account structure and user lists, and restoring them onto your test machine or into your test account. This will make sure that your test environment is as close

What is Systems Integration?



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as possible to the one you will encounter in production. Also, users can help you exercise the system's complete functionality — all kinds of transactions, data flows and interfaces. You certainly want to have them review your system test plan document, and you may have them run the test itself.

One important thing to keep in mind during the system test is that you may need to involve programmers and users from other functional areas during the test. For example, if you are testing a new invoicing system that updates the accounts receivable files, you may need to involve users from the accounts receivable (AR) department as well as the invoicing area. Be sure to plan with the AR department well in advance to arrange for these people to help you. State clearly the time and task requirements so that there are no surprises later.

As the system test winds down, you should be meeting with the users who actually will run the production test of the new software. Testing a new system requires time away from their jobs and will mean extra effort for both the users and the development team. Be sure that you cover how each feature will be tested, whether parallel procedures are involved for an initial time, and how to move from parallel to production. Also, remember that they need not only to test the software itself, but also the training and documentation for the system. They also will test your software installation as well as the installation procedures. The end users probably have better ideas than you do about how to test the system's functionality — let them decide what will work best.

Next, decide how changes will be made to the new software during the production test. You may need to establish criteria for critical needs vs. enhancements. You also will need to decide how and when to install any changes to the software. For example, will the development team simply move the new code onto the production machine or account? Will tapes be given to the system manager? Will PC users be given new floppies? How will versions be tracked? These things sound simple, but if they aren't planned, many bad feelings may result.

Programmers unfortunately think like programmers; you see your software through the eyes of someone who works with your data entry screens 40 hours a week.

Finally, decide how to get signoff on the new system. Will you need to bring in all 15 user council members for a review meeting, or will buying Fred a beer be enough? How will any open issues be resolved? By establishing these procedures before the start of the production test, you will avoid many misunderstandings.

In our shop, we have found that the steps listed above work very well. There seems to be a very direct correlation between user involvement and the subsequent success of the project.

Several of our project teams have received commitments from user management to have users spend time reviewing documents or helping the development team by answering questions.

One of these project teams has taken the approach of setting up a user council. Representatives from each of the several user sites meet once a month or so throughout the life of the project to review documents from the development team. At these meetings, they also may view prototypes, suggest test cases, etc. This approach has worked well for the team. Their project is currently in production test at a user site in the Midwest, and only a few defects have been found, all minor. The users are happy with the functionality and with the "look and feel" of the new system.

My own project team has been lucky enough to hire some former users onto our staff. These people, our support team, provide a tremendous resource to the programmers. They have helped us analyze data entry transactions to determine how many VPLUS screens are needed for a given transaction, which fields are needed and how long the fields should be, where the fields should be placed, and how the softkeys should work. They have analyzed report layouts for field length, field placement and overall legibility. They have reviewed prototypes with current users in our various sites, and worked with the programmers to make changes to our software. Working with our user council, they have researched issues and department procedures which affect us. They have inspected our ES, and have assisted with specifying edits and data flows for our IS. Now that we are writing unit test plans, they are inspecting them and helping us come up with test data. They will do the same for our system test.

Because they are so involved, they have been able to write accurate and well-designed training and documentation materials for the new system. Our users are very happy with the team, largely because of the efforts of the support team. We expect the software to be very well received, as other projects we developed this way have been.

I hope that you can increase user involvement in your own software development process. Although we have found that programmers, unfortunately, think like programmers, users can help you see your software through the eyes of someone who works with your data entry screens 40 hours a week. The difference in customer satisfaction is dramatic. —*Lisa Burns is a OMS System Manager for Hewlett-Packard, Palo Alto, CA.*

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FAX FREEDOM

FAXLink/3000 Offers Fax Control At Your Fingertips

Few modern offices today are without fax machines. These little marvels of office automation seamlessly integrate a telephone, scanner, dot-matrix printer and modem.

Although the fax machine fits a very real office need, the standalone fax has two notable limitations. First, fax machines are paper-intensive devices. Even if the source input was originally electronic (a memo or document resident on a computer) you need to feed the fax at least two pieces of paper—your document and a cover page. Secondly, fax machines are single-user devices like the telephone. They do not provide the conveniences we have come to expect in our batch programs, for example, unattended operation at off-hours or the queuing of faxes to different recipients. The most common approach to queuing faxes in our office is staff members standing in line.

Both of these limitations now are

Joel Martin

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addressed in a combination of software for your HP 3000 and software and hardware for an MS-DOS personal computer. The software has been developed by Kaakontieto of Finland and supports a number of features that extend your ability to manage fax sending well beyond what's possible with a standalone fax machine. The hardware was developed by GammaLink (Palo Alto, CA). Both the software and hardware are available in Europe through Kaakontieto and in North America through Hillary Software (Spring Lake, NJ).

Through The Gateway

Hillary Software's FAXLink/3000 is software for both the HP 3000 (MPE V or MPE XL) and an MS-DOS compatible personal computer that supports the GammaFax fax gateway board. A fax gateway is a PC or other device that allows the sharing of a single fax line by linking a multiuser computer or local area network to the fax line.

FAXLink eliminates the intermediate paper step in sending a fax by directly connecting the HP 3000 to the fax gateway. Transmission of the faxes from the HP 3000 is managed by two background jobstreams and a session on the HP 3000 and a foreground program running on the personal computer serving as the gateway.

Faxes also can be scheduled for transmission at a future date or time, increasing the sender and receiver's convenience and reducing telephone charges. If the receiving fax machine is busy or if the fax transmission fails for any reason, then FAXLink/3000 attempts to retransmit your fax three times with a 10 minute delay between attempts. (Both the delay time and the number of attempts are configurable.) Faxes can be sent from PCs connected to the HP 3000 by first uploading the fax message to the 3000. (Certain restrictions in the formatting of the file may apply.)

A header or cover page for each fax sent is created automatically by FAXLink at the time of transmission. The cover page can be customized to display your company logo or another graphic. The cover page also notes the originating office and office phone number, the return fax number and the number of pages included in the fax.

FAXLink allows you to create a fax directory (distribution list) of the names and fax numbers of frequent fax recipients. A fax recipient doesn't need to be added to your fax directory in order to receive a fax. In addition to the recipient's name and fax number, the directory also can contain up to six lines of comments about each recipient. A single fax message can be sent to several recipients by selecting them from your directory, or by specifying the same message file after typing the name of each recipient.

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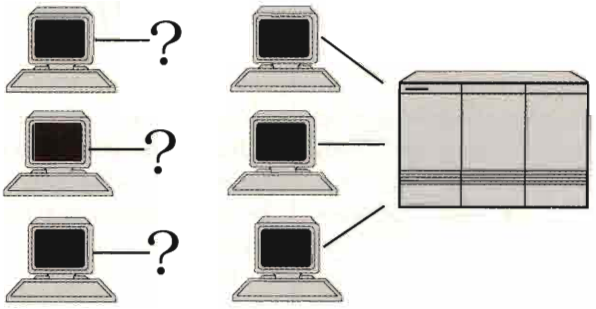

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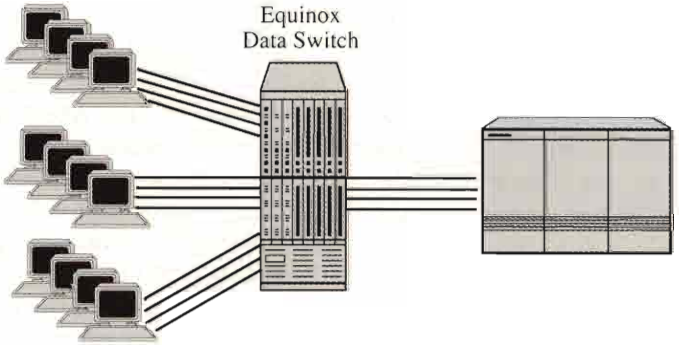

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Faxes can be sent through FAXLink in three ways: through an interface program developed by Kaakontieto, through HP DeskManager and programmatically through software you develop. (Faxes sent through HP Desk take advantage of your HP Desk directory.) Fax messages can be created with a standard text editor by using the minieditor supplied with the FAXLink interface program, or directly through HP Desk. FAXLink messages must be ASCII files of 80 bytes or less in length.

A tracking subsystem within FAXLink provides a history of faxes sent and scheduled. Tracking information is held for 31 days. This retention period is configurable if your fax traffic is particularly heavy or your audit requirements are particularly stringent.

The FAXLink software will support up to four outgoing fax phone lines from one PC. Support for a second phone line requires both a "bridge" board and a second GammaFax board. The third and fourth fax lines won't require another "bridge" board but each will require a GammaFax board.

With all the benefits I noted, you know that there must be a slight catch or two — and there is ... so don't throw away your existing fax machine(s) just yet. The two constraints you must accept are that FAXLink does not support receipt of incoming faxes, and outgoing FAXLink messages must be stored as ASCII text. (The cover page graphic is stored on the personal computer.) Faxes that include graphics or signed documents will need to be sent from your standalone fax machine in the standard fashion.

Installation & Set-up

The FAXLink/3000 product includes a GammaFax board and diskette for your HP Vectra or other PC compatible, two magnetic tapes or cartridges for your HP 3000 and five thin manuals. A version of the GammaFax board is also available for the IBM PS/2 or compatibles with the MicroChannel Architecture. One magnetic tape is for FAXLink and one is for KUDA/3000. KUDA/3000 is Kaakontieto's Universal Desk Adapter — a linking system for all Kaakontieto products link to HP Deskmanager. Your PC will need a 20 MB hard disk, 640KB of main memory, DOS version 3.20 or later, a 1.2 MB floppy disk drive, 1 serial and 1 parallel port and AdvanceLink version B.01.00 or later. If you don't yet have AdvanceLink you'll need to purchase it from Hewlett-Packard. The PC should be connected to a 9600 baud port on your HP 3000.

Installation of all of FAXLink's components is very straightforward, though the nature of the product requires a multistep install. Installation of the KUDA/3000 software and FAXLink/3000 software was easy. A slight amount of additional work is necessary to configure FAXLink to work with HP DeskManager. (We do not have Desk running.)

Installation of the FAXLink software on the PC is even more straightforward than on the HP 3000. After booting the PC with the supplied installation disk, a program will start that installs all necessary files on your hard disk. The only other steps to be performed are to edit the new AUTOEXEC.BAT file so that it contains the company name, phone numbers and other information specific to your site and to connect the GammaFax board to an appropriate phone line. (If you purchase FAXLink through Hillary Software the AUTOEXEC file will be customized for you based on information provided over the phone at the time of order. Hillary Software also can assist you with setting up a scanned image to be included on each fax cover page.) Before starting the installation, keep in mind that the PC used as the fax gateway will be unavailable for any other usage.

Except for an untimely hard disk failure on the PC, I was able to install FAXLink on the two hosts without a hitch. The time you need to install all the HP 3000 and PC components should not be more than one half hour.

Regarding the set-up, the file CATALOG.PUB.FAX contains warning and error messages for FAXLink. It can be localized to meet your particular language, phrasing or security requirements. A stream job is included among the other files to "compile" the CATALOG.PUB.FAX file.

Fax messages can be created with a standard text editor by using the minieditor supplied with the FAXLink interface program, or directly through HP Desk. FAXLink messages must be ASCII files of 80 bytes or less in length.

Test Results

After installing and setting up FAXLink, I logged on in a development account on our Micro 3000 XE and ran the FAXLink configurator program. I identified myself as the fax "super user" and added a new user ID. (The FAXLink super user is responsible for maintaining the table of valid FAXLink users.) The configurator program and the fax program used to send faxes operate in a similar manner. You're prompted to enter one of the valid commands assigned to the labelled function keys. Pressing the appropriate function key executes the command and brings you to the next level or prompt. Establishing a directory of users that includes user names (called "Sender IDs") and their passwords is very easy and very quick. The user name must be unique, but you are allowed up to 16 characters.

The 36 character sender ID need not be unique and can be the user's full name, title or any other entity.

After establishing a user ID for myself, I rebooted the PC (which then logged on to the HP 3000) and I started the two background jobstreams (MONITOR and FAXTRUCK) on the HP 3000. The background jobstreams ran without problems, though I would much prefer only a single job rather than the two. Rather than issuing two STREAM commands to start the jobs and two RUN commands to stop them, you'll probably establish a UDC command to start both jobs and another UDC command to stop both. (Neither job seemed affected by the timing of a start or stop command relative to the other job.)

Attempting to submit either of the background jobs while the first execution of the job was still running caused the second attempt to correctly fail with an appropriate error message.

I logged off and logged on again and following the instructions in the User's Guide I ran the fax program, created a small directory of fax recipients and tried sending faxes. I found the process to be simple, fast and much less time consuming than waiting in line or addressing an envelope. I created fax messages with the supplied editor as well as with HP's EDIT/3000 and sent them without trouble. Setting up a fax to be sent at a specific time of day also worked without a hitch.

One item that may pleasantly surprise your fax recipient is that the faxes you send from FAXLink will print on the recipient's fax machine at a much higher resolution than would be the case if a paper document was faxed in the standard fashion. The reason for this is that

FAXLink/3000

SYSTEM REQUIREMENTS: HP 3000 running MPE V or MPE XL; MS-DOS compatible personal computer.

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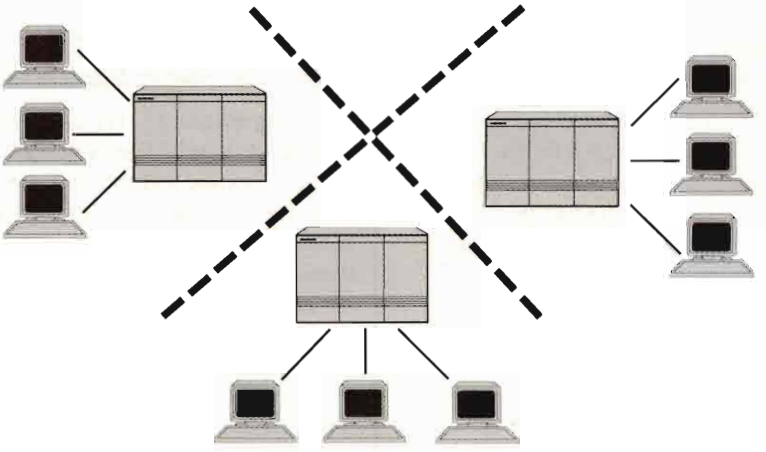

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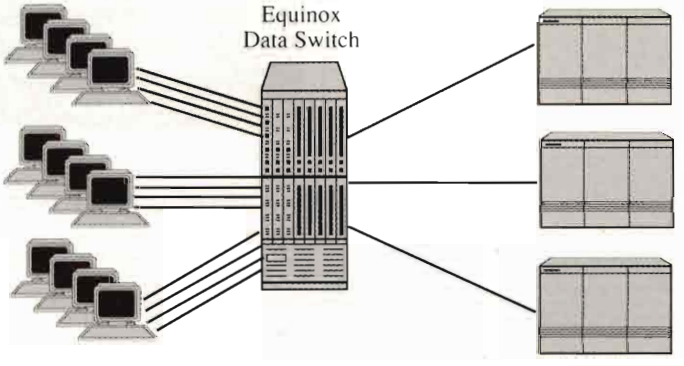

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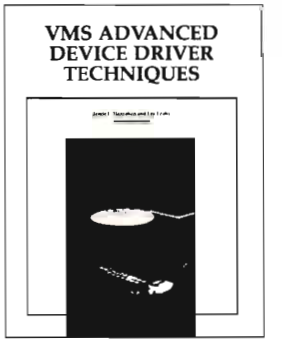

VMS Advanced Device Driver Techniques

By Experts Lee Leahy of Digital Equipment Corporation and Jamie Hanrahan of Simpact Associates

VMS Advanced Device Driver Techniques describes how to design, implement and debug device drivers for the VMS Version 5 operating system. Learn more about simple VMS device drivers, full duplex and state machine-based drivers, VAX BI Drivers, advanced strategies and techniques you can use for debugging VMS device drivers and much more. From the low-level "building blocks" to high-level design issues, it's everything you need to become a proficient user of VMS device drivers. (347 pgs.)

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I was not able to test the FAXLink to HP Deskmanager interface but I was able to contact two users of FAXLink with HP Desk. Both characterized the FAXLink to Desk interface to be so easy to use as to be nearly invisible to HP Desk users.

The sample program to send faxes from within an application also worked without problems, as did programmatic receipt of a fax acknowledgement. The sample COBOL source code for programmatic access that is included in the FAXLink/3000 package is brief, easy to follow and easy to imitate.

Incorporating FAXLink in an application program should be an easy task for any skilled HP 3000 programmer. Programmatic access to FAXLink is being incorporated into an application at one of the sites I contacted about the HP Desk interface. That customer will be using FAXLink to broadcast sales information from their home office to 20 remote offices automatically. (The sales information could take the form of memos or reports from an IMAGE database.)

Documentation

The FAXLink documentation is thin but sufficient. There are five manuals — an Installation manual, an Administrator's Guide, a User's Guide, a Guide for the HPDesk User and a Programmatic Linking Demo. The Administrator's Guide could be improved with additional information on the FAXLink databases (e.g., what parameters should be used to determine dataset capacities?) and the Programmatic Linking Demo would benefit from a customer case history or two. FAXLink is so easy to use that you probably won't need a user's manual after sending your first few faxes.

If your business sends a large number of fax memos, letters, reports or other text documents, you may find that FAXLink can save you a substantial amount on telephone costs and will also reduce the time it takes to send fax messages. It will not entirely replace your standalone fax machine, but it will become a significant addition to your office automation tools.

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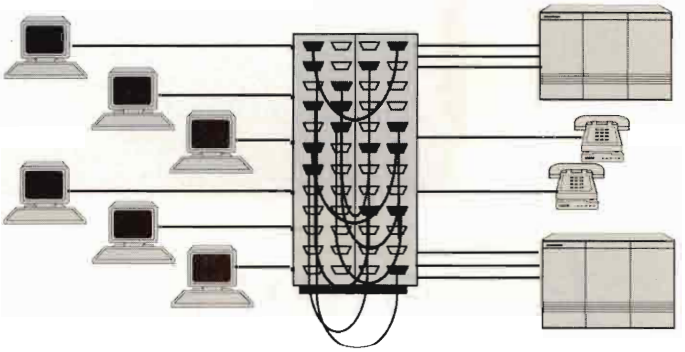

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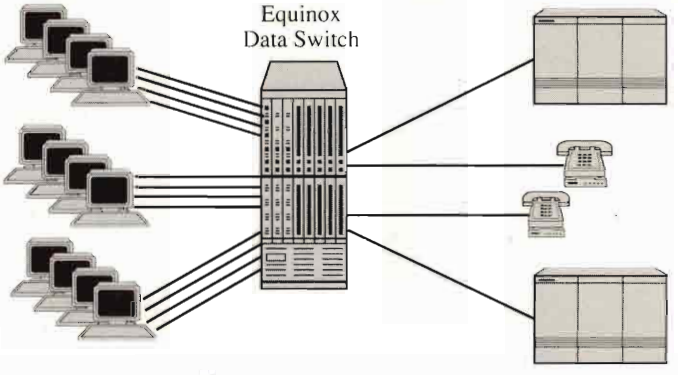

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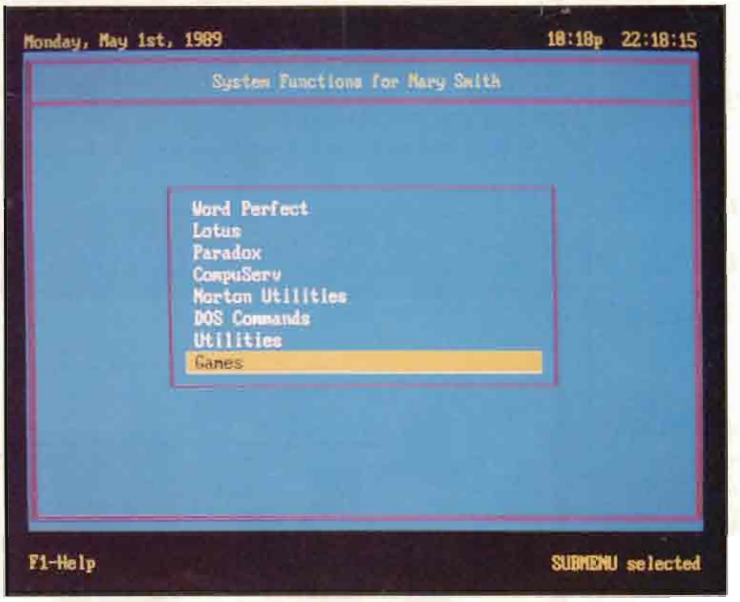

Program Manager Plus

It's not often that I have come across a program that solves a need for a large number of end users and also is inexpensive plus easy to learn. However, Program Manager Plus from Lassen Software (Paradise, CA) is such a product.

While I've always acknowledged the convenience that program menus provide, I've also felt that the memory usage and set-up difficulties often offset any benefit they offer. Program Manager Plus however, uses only 14K bytes of memory while it's dormant, and installation and setup is simple.

Configuration

I tested Program Manager Plus on a Vectra LS/12 with 640K bytes of conventional memory and a 40-MB hard disc. The program only requires 64K bytes of conventional memory, an 80- column monitor and display adaptor, a hard disc and a single flexible disc so it should run on almost any system.

The program as tested, Program Manager Plus Version 1.0, retails for $79.95 and is not copy protected.

Installation

The process of installing Program Manager Plus is as easy as copying the files from the 5 1/4-inch floppy to a directory on your hard disc. Once the files are copied, you simply run a configuration utility and include the Program Manager directory in your path, and you're ready to go.

Depending on the number of menus you want to build and the features you

Miles B. Kehoe

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may want to customize, you can be using Program Manager Plus in minutes.

Features

Program Manager Plus is a menu-based program manager not unlike HP's PAM program. However, it goes far beyond the limitations of PAM as a menu utility, and offers a number of additional features as well.

Lassen Software assumes that there will be a System Administrator to do the setup and to customize the program for novice users. The number of features that can be customized by the administrator ranks Program Manager Plus among the most flexible utilities I've ever seen. The menus, screen colors, access to certain advanced features and even the help screen text can be modified to provide maximum power and flexibility for the user.

This kind of flexibility makes Program Manager Plus useful in large companies where less experienced users want to access programs and data but don't know, and don't want to know, much about MS-DOS. However, the flexibility also makes Program Manager Plus ideal for system integrators and software houses who want to provide their user customers with menu-driven complete systems.

Program Manager Plus allows up to 32,000 unique pages of 16-item menus. Unlike PAM, each menu item can represent a program, a batch file, an MS-DOS command, or a link to another menu. I can't imagine anyone needing this kind of capacity, but I suppose it's good insurance that you won't outgrow the program's capacity.

The process of adding a program to a menu is interactive and very intuitive. Program Manager Plus leads you through the required information for each type of menu entry, and has a feature to let you test an entry before you save it. For those who have trouble remembering if a particular program is a COM or an EXE file, Program Manager Plus features a "search" capability that lets you search for a program or file while adding the menu entry: No more install programs or file manager programs are required.

Because Program Manager Plus is designed to help rather than hinder, you can access programs on the local disc or over a network without being concerned about where the program resides. In essence, any program or batch file you can access from MS-DOS you can access from Program Manager Plus. And because it's an application and not a TSR program, you won't have any problems related to using this utility with any of your other programs or TSRs.

Menu entries aren't limited to executable files, either. The ability to link an entry on one menu to another menu is a feature beyond the capability of PAM. In

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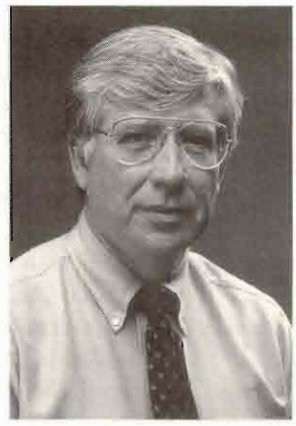

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addition, you can assign one or more passwords to any menu item and control access to any menu screen or program: If the user doesn't know the password, he can't access the menu or program.

Program Manager Plus allows the administrator to limit access to MS-DOS. In addition, the program can be installed so a user doesn't have the ability to exit the program, insuring the Program Manager Plus will be the interface the user always sees.

The setup menu, where the administrator does most of his work, also can be protected by a password, helping insure that a user can't make unauthorized changes to the system.

Finally, these security features make Program Manager Plus ideal in environments where more than one user must share a PC. Therefore, an accounting user authorized to enter data and review financial records can share the computer with someone who shouldn't have access to that data.

The utility also has a logging feature that lets the administrator review actions taken by any user. This includes a record of which programs were used and what actions were taken at the system running Program Manager Plus. This is great for verifying system security, as well as for backchecking when an error occurs to see exactly those programs used before a problem occurred.

Program Manager Plus features a concise user interface that shows the first menu screen and the time and date. It also can be displayed in U.S. or European formats, a nice feature when system integrators want an international product.

Finally, there is a screen saver utility that can be configured to erase the screen after a period of inactivity to prevent burn-in common to systems that run a single menu system all the time.

Improvements

Even though program Manager Plus serves several useful needs, there are some features I'd like to see in future versions.

For example, a useful utility that could be used by the administrator to print a map of the menus available to any user. This allows a sanity check of the entire menu tree to verify that all active menu entries do, in fact, lead to a valid menu or program. When there are a small number of menus involved, it's an easy task, but a large menu tree could easily become awkward and unwieldy.

I'd also like to see a way for access to MS-DOS to be controlled by password. Program Manager Plus does allow the administrator to block access to MS-DOS, but this blocking also controls the ability to exit the program completely. If I could launch COMMAND.COM without having to specify a command or batch file to run, I could do this using existing features. I just couldn't get the setup portion of the utility to accept a blank command line.

Finally, I'd like to see Program Manager Plus written such that, like PAM, it could be installed as the primary DOS shell. Many of the features help provide security and tracking of all steps taken by a user, but a user can either accidentally or intentionally break the AUTOEXEC.BAT file before MS-DOS loads Program Manager Plus and bypass all the security that could be available.

I think Program Manager Plus deserves a look by anyone charged with helping other users be productive with a PC. When you consider that, until now, I had never used a menu-based access manager that I really liked, you can tell how much I am impressed with Program Manager Plus. The features and the price are right.

Program Manager Plus

SYSTEM REQUIREMENTS: 64K bytes of conventional memory, 80 column monitor and display adapter, a hard disc drive and a single flexible disc. IBM PC/AT or compatible PC. MS-DOS Version 2.1 or greater. Optional mouse.

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HP-UX

Andy Feibus

Porting Inquiries

Porting is the process of converting a computer software product from one language/computer/operating system to another.

Ports are initiated for a number of reasons, all related to one business imperative: customer demand. Because UNIX is relatively new to the business marketplace, many companies are contemplating porting their product from an "older" operating system/computer to a UNIX system computer.

Deciding to port is a big step. Most businesses, unfortunately, have no idea how big. Let's answer a few questions that must be asked before porting the software product.

Will the ported version entirely emulate the initial version?

The answer is a long-term strategy decision. To "split" the two versions implies an increase in support costs: two sets of documents must be maintained, two sets of features must be supported, customers will want an upgrade path for their older systems, which becomes more difficult to provide as the two products grow apart.

As part of this decision, you may consider the possibility of abandoning the old platform in favor of the new. Usually, this is not a good idea: The collective blood pressure of your customer base may increase if the product they just purchased is suddenly made obsolete.

Do you maintain backward compatibility?

Backward compatibility implies that only a single version of your product's source code is maintained and modified. This version of code can compile and execute without modification on either the original system or the (porting) target system.

Backward compatibility decreases future development costs: A new feature only has to be written once and only one set of documentation is required for the new feature. Once the initial port is completed, the entire porting process can be automated so that future ports of new features require only two or three hours. Additionally, support and training costs are also smaller.

Deciding to port is a big step. Most businesses, unfortunately, have no idea how big.

However, testing becomes more time-consuming because any change to the source code requires testing on both systems.

If you plan to add the same features to the product on both the original and the target systems, you should maintain backward compatibility during the initial port.

How much does a port cost?

Obviously, the answer to this question depends on the size of the product and the cost of your employees. Programmers familiar with both the current product and the target system should be able to convert between 10,000 and 20,000 lines of code per man-month during the initial phase of the port. Once the initial port is completed, new features can be ported at the rate of 5,000 lines per man-day.

In addition, consider the time and money required for the following port-related expenses: documentation for the new product (to differentiate the new manuals from the old or to remove the system-specific information from the original documentation), training costs for your employees, system costs, additional customer support costs, marketing and advertising costs (your advertisements, brochures, etc. must be updated to mention UNIX), training costs for your customers (a new training course must be created or your old training materials must be updated). This list is not complete. Other costs may occur for your particular product that may not occur for porting a different product. Plan carefully.

Do you stay with the same language?

Sometimes this decision is based not only on the current porting requirements, but also future porting desires. If the product is written in HP 1000 FORTRAN, porting to the HP 9000 Series 800 is straightforward and tools are provided by HP to assist in the port. However, porting from HP 1000 FORTRAN to VAX/VMS FORTRAN can be a nightmare.

Carefully analyze the current code against the target language to determine whether changing your source code language is your best choice. If so, tools may be available to convert code from one language to another (for example, FORTRAN to C). Investigate these tools if staying within the language will require more porting time (both now and in the future) than you want to spend.

The bottom line: The cheapest and easiest port will be the one in which you add or change the least code.

Do you have enough time to perform the port?

Or, more accurately, do you have enough time to perform the port correctly for the long-term requirements of your business?

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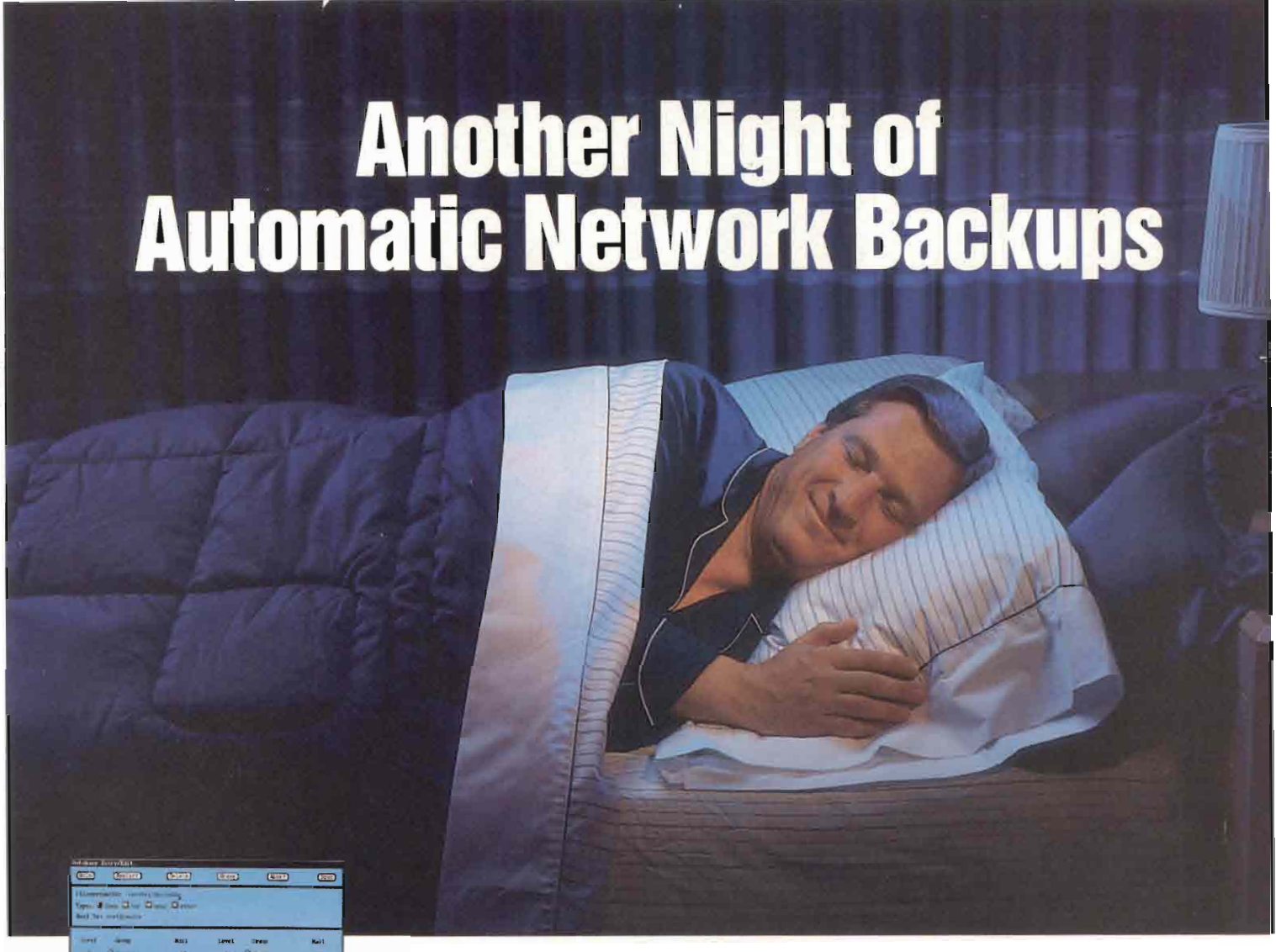

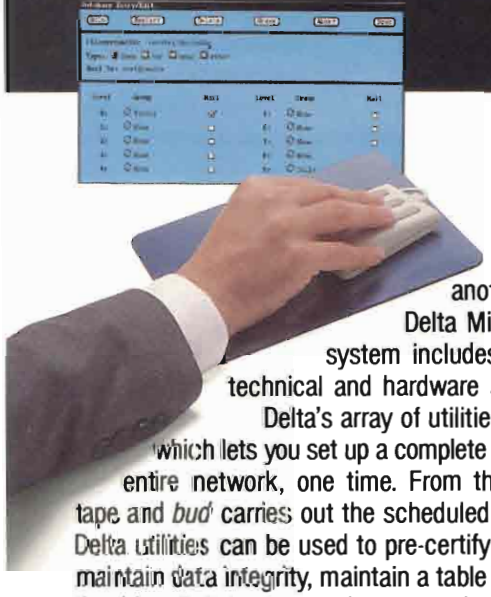

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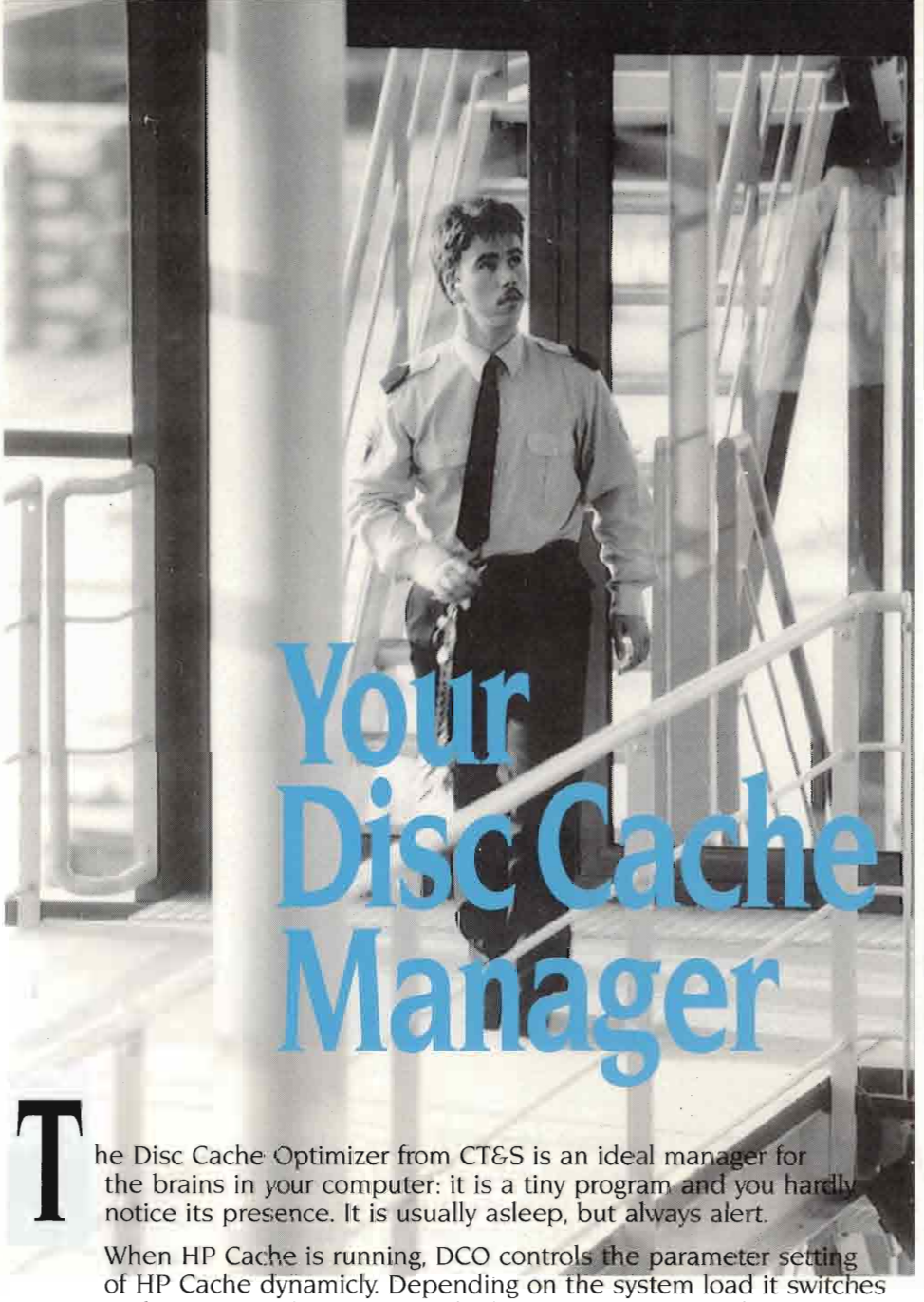

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If no one in your company has enough experience with the target operating environment and you are under time constraints, send your employees to training classes and hire *good* consultants to perform the port. Because a port is usually a one-time expense, hiring experienced consultants for this task is a good use of money.

If you have the time, allow at least four months for your employees to learn the new system and to map out the porting strategy *before* beginning the port.

Too many ports fail because of inadequate understanding of the target system's features and the ways in which users work with the target system. HP-UX users do work very differently from VMS users. Understanding these differences will decrease your future support and training costs.

A badly executed port will become a continuous money drain on your company. Good preparation can prevent this.

When will your new equipment appear?
As many HP customers know, obtaining a new system can require months unless the customer is influential enough to increase the speed of the ordering process. Plan early. If you don't have the time to plan early, check out the dealers of used or rental equipment that advertise in your local area or in this magazine.

Any time you obtain equipment from vendors other than HP, you are not dealing with HP support or service. Be aware of the vendor's service and return policy before signing anything.

The most important point is that good planning is the foundation for a good port. Once you've laid this foundation, the next step is to determine the techniques for porting the code from one system to another.

Next month, I'll discuss possible technologies for porting code from one system to another. —*Andy Feibus is president of Processware Inc., Atlanta, GA.*

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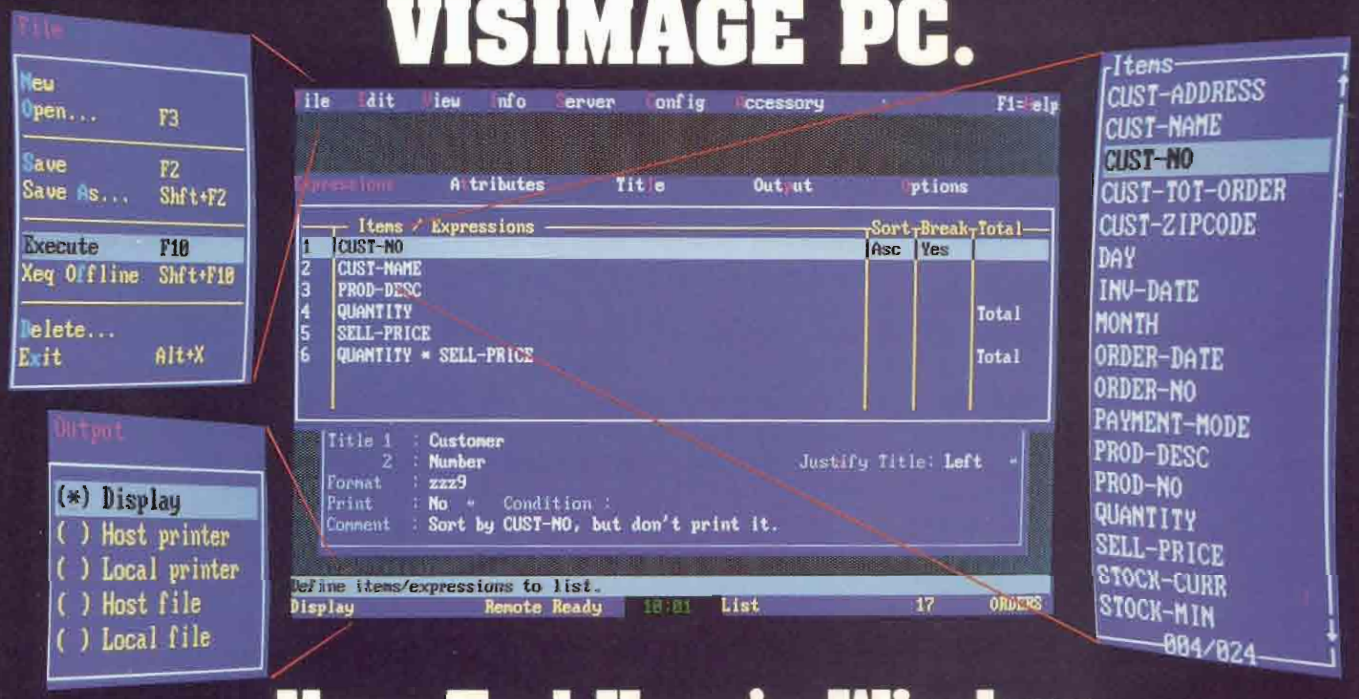

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RDBMS

Fabian Pascal

The Benefits Of The Relational Approach Are Often Misunderstood

Relational Fidelity

Despite the clarity and simplicity introduced by the relational approach, its properties and practical benefits are misunderstood and distorted in the market. So much, in fact, that the use of the term "relational" has become totally meaningless.

Some of this is caused by the existence of traditional products, techniques, skills and inertia. Given the fundamental differences between the relational and procedural approaches to database management, new DBMS engines would have to be designed to provide the practical benefits inherent in the model. This is expensive for vendors, and would invalidate many existing user applications and skills. Neither established vendors, or practitioners vested in traditional database environments are comfortable with this (relational benefits notwithstanding).

Moreover, a major purpose of the relational approach is to shift the burden of *managing* databases from users to the DBMS. The model delineates the *database* functions that should be handled centrally by the system, leaving much less work to the user. This means that much of the users intelligence must be transferred to DBMS products.

Developing a relational DBMS is, therefore, a nontrivial task and much more demanding. Experience and intuition no longer are sufficient, as DBMS designers must know and understand the underlying mathematics and logic. This is usually discounted by some vendors, primarily for expedience. They usually resort to simplistic solutions such as making their existing products "appear" relational, extend them with limited and frequently poor implemented relational functionality, or distort the term relational to suit what they already are selling.

Even some vendors of more recent, relationally oriented products do not always understand the model, and stop short of complying with its requirements. Very important features are eschewed or poorly supported, and simplistic extensions are developed without any regard for the relational principles or generality.

To try and resolve incompatibilities between traditional, proprietary database environments, the industry is heavily engaged in standardization efforts. ANSI, ISO, X/OPEN, OSF, the Federal procurement bodies, and IBM through its Systems Application Architecture (SAA), have set up groups and committees to define database standards, primarily around Structured Query Language (SQL), a relationally oriented language developed by IBM.

The relational model is a natural candidate for database standardization. But, unlike the relational model, these vendor-based standards are geared primarily to protect existing products, not users. The outcome is the lowest level of political consensus between the various participating vendors, each of which already has traditional or different SQL implementations in the market. Indeed, the sheer proliferation of different standard bodies (yet two new specifications for open access SQL have just been defined) is a contradiction in terms that reveals the fundamental flaw of the approach.

The SQL specifications generated by these bodies frequently ignore relational principles, aren't very coherent and have functional weaknesses. Moreover, they are very lax, allowing vendors to develop diverging products without losing their claim to standard compatibility. They also trail (rather than lead) the market, forcing vendors to extend products, in their own way, thus making consensus even more difficult in the future.

Under these circumstances, making database decisions becomes extremely confusing and difficult. And this is the precise problem that the relational approach was devised to eliminate. Users face a proliferation of DBMS products, all of which claim to be relational and compatible with all of these (different) standards.

Knowing and understanding the relational features already described is a crucial prerequisite for seeing through the misinformation. But remember, the features only define *basic* DBMS functionality. Many other functions are required in practice, and the model can (and was intended to) be extended for usability. For example, recursive operations would

TABLE I

1. Information Rule	7. Set Level Updates Rule
2. Guaranteed Access Rule	8. Physical Data Independence Rule
3. Missing Information Rule	9. Logical Data Independence Rule
4. System Catalog Rule	10. Integrity Independence Rule
5. Data Language Rule	11. Distribution Independence Rule
6. View Updatability Rule	12. Nonsubversion Rule

be useful for bill of material "explosions," and support of complex data types such as text or graphics needs to be defined in the same rigorous way. And, as we shall see, the issue of missing data also

The relational model is a natural candidate for database standardization. But, unlike the relational model, these vendor-based standards are geared primarily to protect existing products, not users.

needs to be resolved by research. Any such extensions *must not* (1) be ad-hoc and arbitrary, or (2) defeat or violate the basic features or basic principles.

Because of all this, some additional clarifications were necessary to guide in any genuine attempts to extend the model and make it more useful, as well as to implement it. Moreover, there are some other aspects that are *implicit* in the features, and necessary even if not directly covered by them. Yet others are not purely relational, but must be supported by the DBMS for completeness.

For all these reasons, Codd has supplemented the features with a basic set of rules (see *Table 1*) that a DBMS must obey if it's to provide the practical benefits inherent in the relational model.

They were intended to supplement the relational features in guiding standard setting bodies, vendors and users in specifying standards for, implementing and evaluating relational DBMS.

All 12 rules originate in, and are subsumed under one, most fundamental rule. Rule 0, the Foundation Rule, defines the overall thrust of the relational approach. The 12 rules then describe in more detail how the fundamental objective is to be achieved.

What hasn't been made clear is that the features and rules are not all at the same level. They form a sort of functional hierarchy, where features and rules lower in it are necessary for compliance with higher level ones (i.e., the latter are dependent on the former.) Because the features and rules are highly interdependent, it isn't possible to develop DBMSs which comply with only some, without affecting the support of the others.

The somewhat abstract formulation of the rules makes it difficult to see their practical implications. However, the implications are crucial for usability. But because the rules also are intended to defeat unjustified DBMS claims of relational fidelity, they have become controversial, with many discounting them as "irrelevant" for practical purposes.

So, starting next month, instead of just regurgitating the rules in their numeric order (as they are usually approached), I will place them in an overall functional context, and demonstrate how they help protect user investment in a DBMS.

Because it's difficult to explain individual rules in isolation of one another, I will divide the rules into some logical groups based on some basic functional aspect. I will explain the meaning of each rule and the consequences of the rules not being complied with by the DBMS. Also, I will discuss the practical implications for the users. — *Fabian Pascal is president of micro-paSQaL, an independent Washington DC consulting firm specializing in relational database management and SQL on the PC.*

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PC TIPS

Miles B. Kehoe

Past, Present And Future

The beginning of a new decade tends to bring with it the reluctance to look back and the temptation to look ahead. For HP, the past and the present can only lead to a strong future.

The Past

In 1980, HP sold the HP 3000 with MPE and IMAGE. For enough money, you could get as much as a million bytes of memory! Of course, terminals ran at 2400 baud, but IMAGE and FORMS were really unique and it looked like HP could do no wrong.

In the terminal market, HP's hottest products were the Z-80 based 2645 and 2647. For a premium price, $5,000 to $7,000, you could get a great terminal with eight pages of display memory. The 2647 had high resolution monochrome graphics and an optional floppy disc drive.

Printing technology was just starting to enter the laser age, and the HP 2680 was one of the leaders if you had $100,000 to put down. Despite the cost, it was the start of a revolution.

In the PC world, you could buy a small computer with 16K expandable to 64K for under $2,000. HP was on the verge of introducing the HP 85, billed as an instrument controller, but seen by many as HP's first entry in the PC market. It was to be the first in a long series of attempts to make a successful personal computer. A show special at the West Coast Computer Faire was 16K RAM for your Apple II for $95.

The UNIX operating system wasn't very well known and was used only inside of AT&T and some progressive colleges and universities.

The Present

Today, you can buy a PC for under $2,500 and it has more memory than the HP 3000 could support in 1980; has better graphics resolution in color than the best graphics terminals had in black and white; and can run programs that were undreamed of in 1980 (Lotus 1-2-3, Graphics Gallery and NewWave).

Workstations, virtually unheard of in 1980, offer powerful desktop solutions to problems that required a mainframe system. HP has spent millions to develop HP-PA, an architecture that the company says will last through the end of the century.

The HP 3000 and MPE have successfully migrated to the HP-PA architecture and offer a growth path to HP's large installed base. MPE is a mature operating system and continues to be the environment of choice for customers with database and transaction processing requirements.

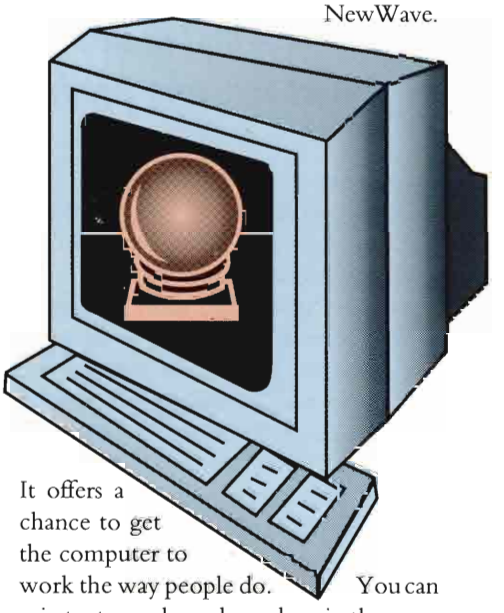
As more major customers begin to look for industry standards, the HP-PA family of systems should evolve into a full line of compatible products.

Because of its early association with Cannon on the HP 2680 Laser Printer years ago, HP enjoys the enviable position as the industry leader in PC peripherals. HP continues to expand in this market with personal laser printers and inkjet technology printers for Vectras and now for Apple's MacIntosh. Consider that HP probably generates more income from its laser printers than from any other product line in the company — this from a product that retails for under $2,500.

After years of slow, steady progress, HP is also a leader in the personal computer market. The Vectra is a competent family of systems and enjoys success not only in HP's direct sales but also through full-service dealers. The success of the LaserJet and the decision to make a fully compatible PC are finally paying off.

HP has introduced a number of software products for the Vectra and for any IBM AT compatible system: Drawing Gallery, Executive Memomaker and AdvanceLink are my favorite.

HP is also on the verge of making a big splash in software with the introduction of NewWave.



It offers a chance to get the computer to work the way people do. You can mix text, graphs and numbers in the same document without switching between applications.

Perhaps the biggest single change in HP in the last decade has been the shift from proprietary products to industry standards. HP has been a prime mover in the Open Software Foundation; in the EISA group to create a standard interface in the PC world; and generally has positioned itself as the company committed to standards.

The Future

There are all sorts of technologies that hold promise for the future, but predicting which will succeed is purely a guessing game.

Alternate methods for entering data may become more practical but I think the keyboard and mouse will remain the primary methods of computer interaction. After all, while voice input and

output may be handy at home, it could cause considerably more noise and confusion in a work environment.

The advances in optical discs and video technology seem to point to a much closer integration of computers and video. Video mail, animation, and even interactive video-conferencing may also gain popularity.

New communications technology will mean the end of the modem as we know it. The telephone company will provide high-speed interfaces for serial communications with basic telephone service, and may even provide a connection for a community-wide network. Information you need to dialup to get now will be available online thanks to digital communications technology.

Combining the advances in communications and in video technology may finally make telecomuting a reality. If you can do your work, meet with co-workers, and attend a meeting without leaving your home, you may be able to be more productive at home than at work after fighting rush hour traffic.

"What if..." simulations will become even more powerful. Giant textual databases and new retrieval technologies will make multigigabyte databases a snap to browse.

The Risks

As the new decade begins, HP enters a critical phase in its history. There are challenges in several areas, not the least of which is to extend the commitment to industry standards throughout all product lines. The HP 3000 will assume a smaller role in the future, and only time will tell whether the push for commercial customers for HP-UX can make up the difference.

In addition, there are major new competitors in several of the most profitable markets such as desktop laser printers. HP can't afford to rest on its successes of the 1980s.

NewWave marks a new opportunity for HP to improve on the future of computing for all of us. Without a major effort to recruit software vendors and to make NewWave truly multiplatform, HP may discover that its effort has been in vain. Right now there is a dedicated group working to accomplish these goals: I hope they get the management support to succeed.

Before closing, let's speculate about what my PC will be in 10 years. It's based on the 60 MHz Intel i2000 RISC processor, has 25 MB of main memory, and runs OS/4. The internal disc drive is one of the new 25 GB optical drives, and I have the Community Net connector that lets me tie into virtually any information I could want. The monitor is only 2048 x 2048 pixels with 24-bit color, but it's all I really need. I'm going to buy the video interface that includes the camera scanner as soon as I can find one for under $500. —*Miles B. Kehoe is an online support manager for Verity, Inc., Mountain View, CA.*

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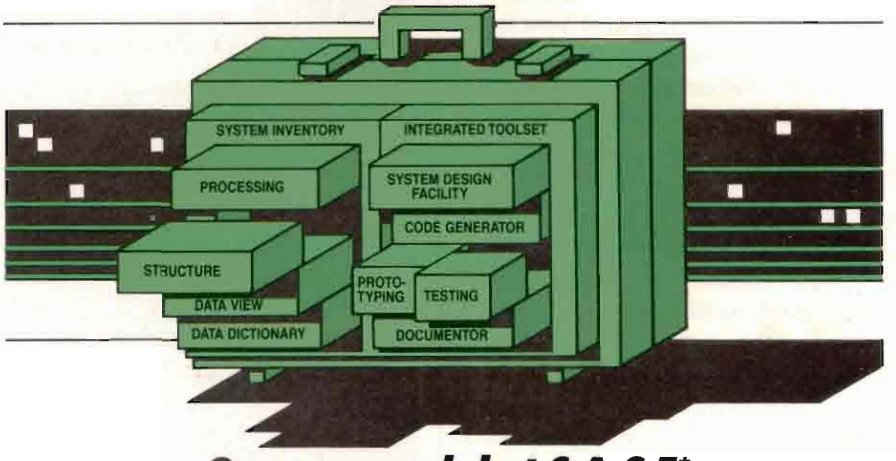

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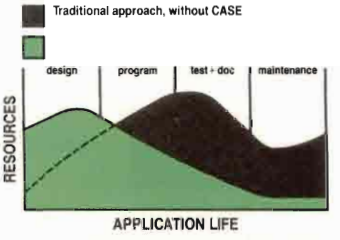

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FIELD SERVICE

Ron Levine

A Problem Solving Guide For Defining And Isolating Desktop Computer Problems

Desktop Computer Troubleshooting

The majority of desktop computer system problems don't require professional technical help to return the computer to operational status. A nontechnical user can isolate many malfunctions to the unit level (e.g., computer, disk drive, printer, monitor), and then decide if it is a do-it-yourself project or one for a professional repair service.

When a problem exists at your individual station, using the information provided here will aid you in defining and isloating that problem, then returning the system to operational status as quickly as possible. The procedures described are suggestions only. They should not be considered as the only methodology. The techniques outlined should be considered a basic guide to start with, build on and improve upon.

Most desktop computer system users simply want to replace the failing unit to return the system to operation, rather than call their service company to complete the repairs or take the problem unit to a qualified repair facility.

Only those users possessing a basic knowledge of electronics and computer systems should continue troubleshooting the problem past the defective unit point to the subassembly or printed circuit board (PCB) within the unit. This level of troubleshooting is better left to a trained technician.

Desktop Computer Troubleshooting

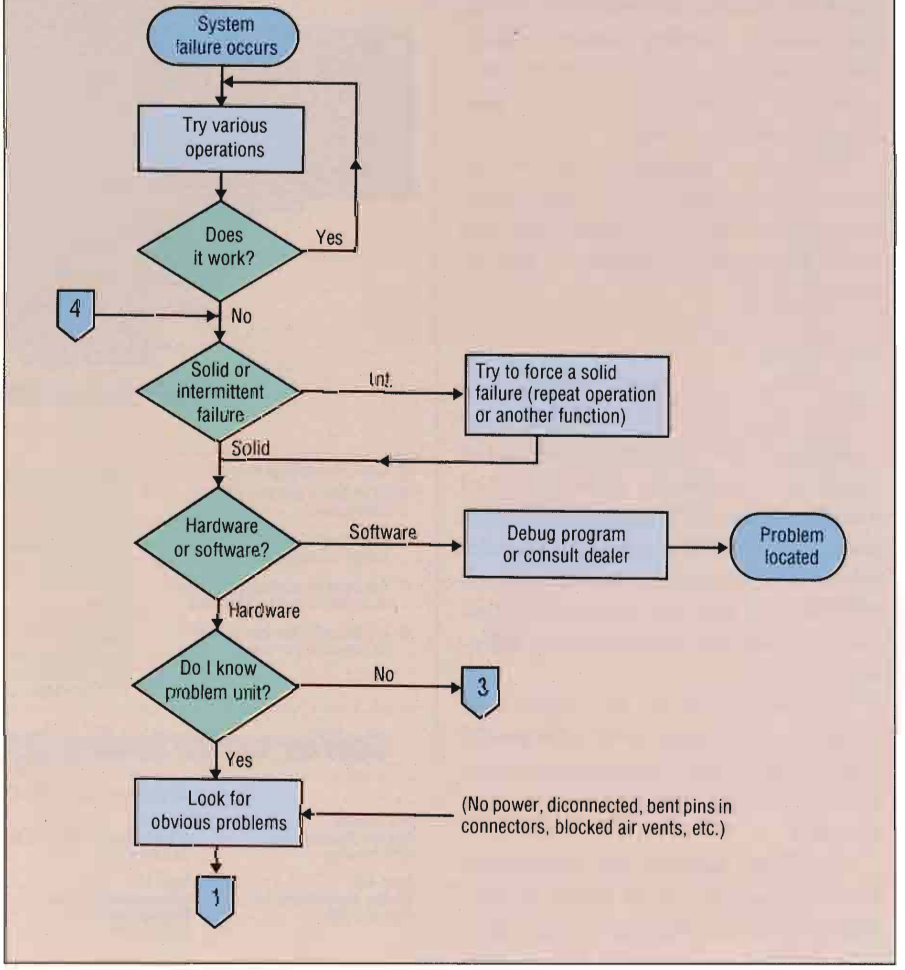
Troubleshooting a personal computer or workstation is simple when you adhere to a logical, definitive plan. Troubleshooting consists of two levels: problem determination and fault isolation.

LEVEL I. Problem Determination
First, investigate the circumstances causing the problem to occur. For example, does the problem occur only when a particular operation is attempted, such as a disk save to drive A or an output to the printer?

Once you figure out what is and isn't working, try to classify the problem as a solid failure (one that happens every time the same operation is attempted) or an intermittent failure (one that occasionally happens when the operation is attempted).

The problem may occur only when certain software (programs) are run. For

FIGURE 1.



The following flowchart summarizes the troubleshooting procedures to take.

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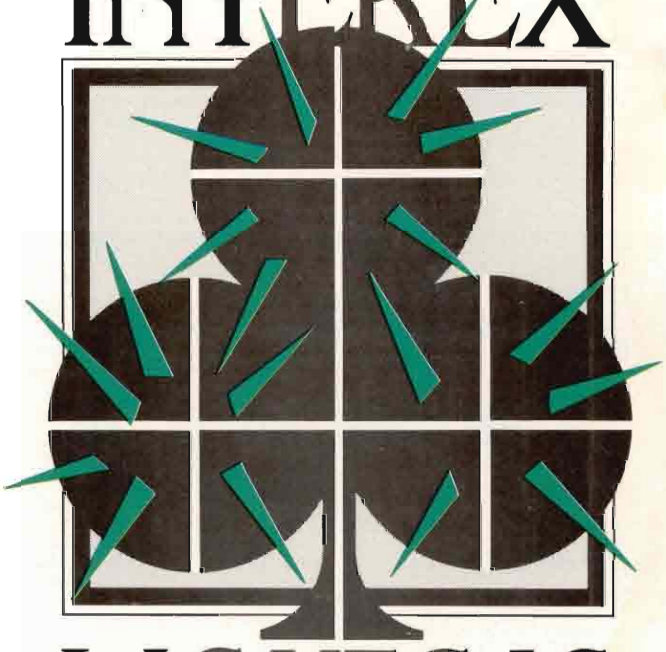

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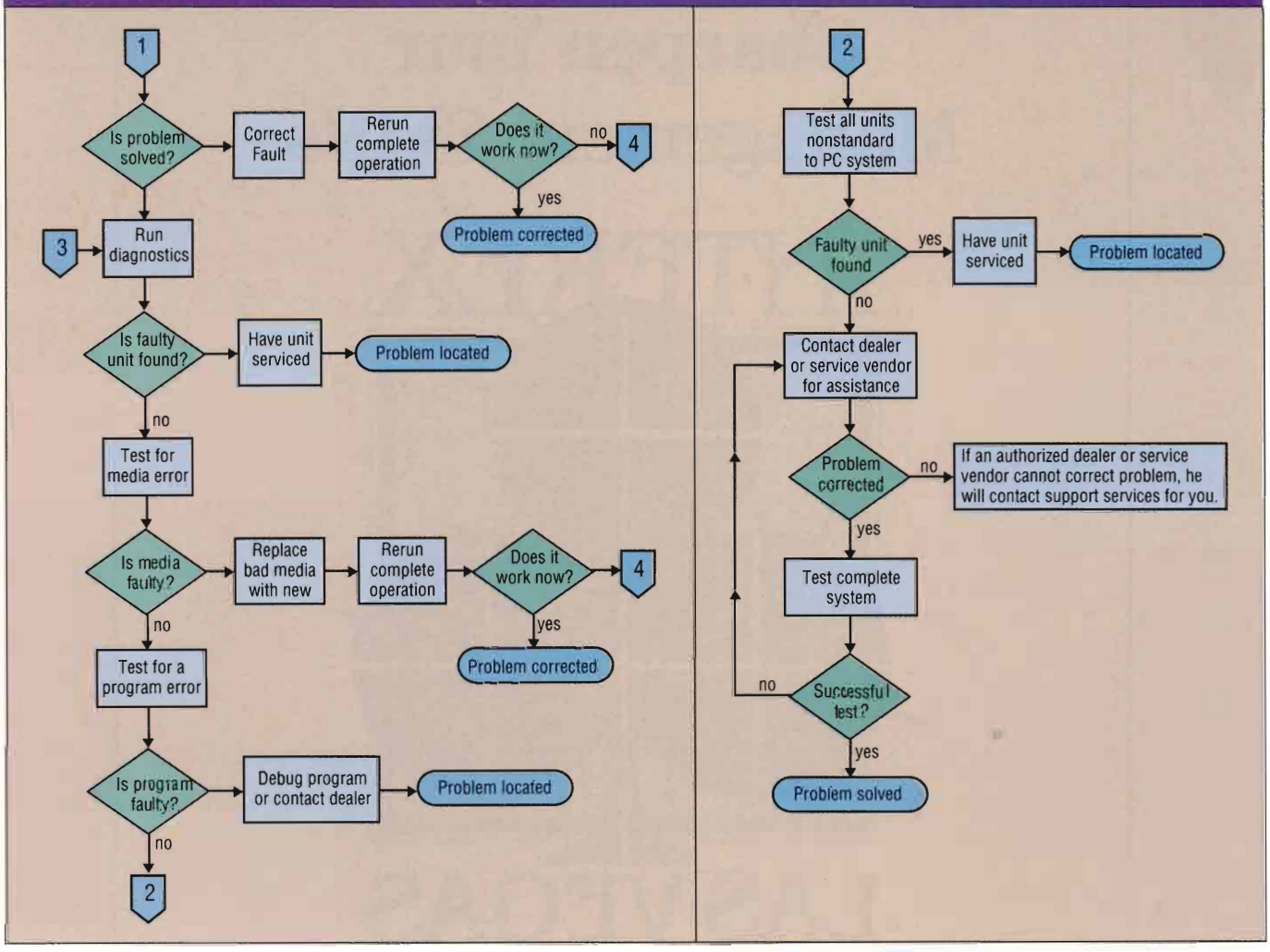
FIGURE 1 . . . continued



instance, an error occurs every time you try to execute a SAVE command in WordPerfect, but a SAVE operation under LOTUS 1-2-3 executes to completion. In this case, a program or media (diskette, disk, tape) failure may be the problem.

Investigate the functions that do and do not work by trying out as many operations as possible and noting the result. This is the most important step in troubleshooting because you must determine exactly what is wrong before you can isolate the cause and correct it.

Once you think you have accurately defined the problem, try to logically decide which unit is most likely to be at fault. For example, if a disk load from drive A fails, but a disk load from drive B works, chances are pretty good that drive A is at fault and not the computer. Likewise, if both drive A and B load operations fail, the computer or disk controller could be at fault.

Here are some Level I procedures to use in defining a possible problem. When a failure occurs, do each step below until the failure is remedied or all possibilities in Level I have been exhausted. After any step that you take an "action" (such as resetting a switch) retry the operation that previously failed to see if the "action" resolved the problem. This is the best way to finally pinpoint the problem-causing condition.

- Redo your failed operation again (retrace your procedure); it may have been an operator error.
- Check that all switches and settings are properly set.
- Power the system down and back up again (this often solves simple PC problems).
- Try using the back-up copy instead of the diskette you were using when the problem occurred (if it works with the back-up copy, it's likely that the problem is in your media — if so, make a back-up of the back-up copy and throw the old original away).
- Check all plugs and connections to

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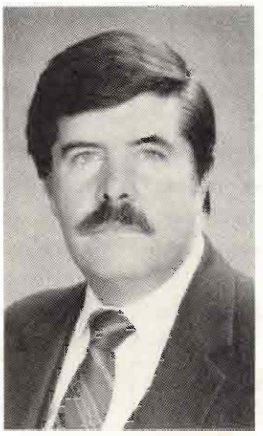

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make sure they are in tight (the system should be powered down when you do this). Check each for corrosion, bent pins (are they touching each other?) and broken or missing pins (did the pin fall where it could cause damage?).

- While the system is still powered down, check the fuses for that room. Plug a lamp, calculator, typewriter, etc. into the outlet you use for the system — does the outlet work?
- Check each component of the system to see if it's abnormally hot. You may need to adjust room temperature, close the drapes if the sun is shining directly on some equipment, or power down the system and wait an hour before trying again.
- Check the vents for blockage and dirt.
- If you don't have an antistatic mat, use some antistatic spray in the room.
- Of course, if you have extras of any equipment (or two disk drives), attempt the procedure again, using the other identical piece of equipment. This is an excellent way to test whether it is the equipment or the media.

The decision as to which of the foregoing you want to try first is up to you and will vary with the situation. Above all, when troubleshooting, *be logical*! For example, if your disk drive won't save something that has taken you an hour to enter, the last thing you want to try is powering down the system.

At this point, you may have a good guess as to the problem unit. If you cannot reasonably decide which unit is failing, proceed to Level II.

Level II. Fault Isolation

Problem isolation may require the running of a diagnostic. For example, if you are using an HP-Vectra, a diagnostic diskette is supplied with your machine. Similar test routines are supplied and/or available for other types of PCs and workstations. Most diagnostics check the operational status of the computer, disk drive(s), keyboard, monitor and standard printers.

Refer to the operations manual that came with your desktop for instructions on loading and executing the diagnostics.

Running the complete diagnostics will normally isolate the fault to the unit level. If the diagnostic gives no indication of a unit problem, the most likely reasons are:

1. Problem is caused by a software error.

To check this out, run a back-up copy of the program that failed. If it works, the media (diskette, disk, tape) originally used is damaged. Make another copy of the back-up and destroy the faulty copy.

If the back-up copy also fails in the exact same manner, the program probably needs debugging (editing and correcting). (If the program has accessed a nonstandard unit, the unit must be tested to confirm a program error.) If it's a store-bought program, refer the problem to the dealer where you purchased it.

2. Problem is caused by a nonstandard unit.

The unit that is faulty isn't tested by the supplied diagnostic program. Refer to the manufacturer's manual, the dealer from whom you purchased it, or consult your service vendor for advice.

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TABLE 1.

Symptom	Probable Cause	Action To Take
No display	1) No AC power. 2) Cable not connected. 3) Brightness control is fully counterclockwise. 4) Contrast control is fully counterclockwise.	1) Check switch, fuse, power connection, wall outlet working. 2) Connect and secure cable. 3) Turn control clockwise to desired setting. 4) Turn control clockwise to desired setting.
Display on, but it cannot communicate with PC	1) Cable loose. 2) Keyboard key stuck in pressed (down) position.	1) Secure cable. 2) Release key; check for foreign material between keys.
Display characters are distorted.	Contrast control is fully clockwise.	Turn control to desired level.
Random or unidentified characters are displayed	1) Baud rate switch set to wrong rate. 2) Parity switch set to wrong position.	1) Set switch to proper position. 2) Set switch to No Parity.
Random characters appear while operating with a modem.	Noise on phone line.	Try another phone line or reestablish phone connection (redial).
Paper continually comes out of paper tractors on printer, or paper feeds improperly	1) Paper not aligned properly. 2) Paper tension too loose. 3) Improper paper feeding path.	1) Align paper so it is straight. 2) Adjust tension so paper is tight (refer to printer's manual). 3) Feed path should be free of obstruction, straight with no pull on paper.
Miscellaneous characters (garbage) prints out	1) Incorrect settings in printer or computer. 2) Poor printer cable connection or bad cable. 3) Printer not adjusted correctly.	1) Check settings. 2) Check that both ends of the printer cable are securely connected and tight; if needed, replace cable. 3) Call repair service.
Characters print partially or not at all.	1) Ribbon is bad or used up. 2) Ribbon is improperly installed. 3) Cable between printer and system unit is not connected securely.	1) Replace ribbon. 2) Check for proper installation (ribbon path is correct with no obstructions). 3) Power system unit and printer OFF, reconnect cable and tighten securely.
Characters print lightly, sometimes printer fails, sometimes characters are missed.	Printing head too far from paper.	Readjust print head.
Uneven spacing between lines of printing.	Paper advance mechanism needs adjustment.	Call repair service.

Desktop Operator Troubleshooting Chart

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NDN Norm De Nardi Enterprises, 289 S. San Antonio Road, #204, Los Altos, CA 94022. (415) 941-8440. FAX (415) 941-2066. **Outside California: 1 (800) 2DB-EXPO.**

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CIRCLE 132 ON READER CARD

Continued from page 26.

industrial/commercial bit mapped graphics.

The MAGNUM LP15 printer is available in several interface configurations that allows it to be used in a wide range of host environments. The printer can be ordered with either RS-232 serial, Centronics parallel, IBM System 3X, IBM AS/400 or IBM 3270A interfacing.

Contact QMS, Inc., One Magnum Pass, Mobile, AL 36618; (205) 633-4300.

Circle 389 on reader card

4GL Development Tools Offer Productivity Gains

Unify Corp. introduced ACCELL/SQL for ORACLE, a high-performance, 4GL application development system designed to improve the programmer productivity of Oracle DBMS users.

ACCELL/SQL for ORACLE provides Oracle users with both a full featured 4GL and a powerful applications generator that can cut programming time and code by up to 80 percent. The development tools form a completely integrated application interface to an existing Oracle DBMS, while also allowing users the flexibility to use the Oracle SQL*Forms generator. In addition, ACCELL/SQL for ORACLE has a Cooperative Processing option that offloads user input-output processing from a UNIX host to DOS-based PCs.

Prices range from $1,500 to $140,000 depending on system size and configuration.

Contact Unify Corp., 3870 Rosin Court, Sacramento, CA 95834; (800) 24-UNIFY

Circle 388 on reader card

TGS Introduces Phigs Command Interpreter

Template Graphics Software Inc. (TGS), developer of FIGARO+ graphics software, has introduced its PHIGS Command Interpreter (PCI), a front-end option to FIGARO+ that lets you enter and execute FIGARO+ commands interactively without programming.

PCI can be used in prototyping, debugging, as a learning tool for 3-D application programmers, and to create complete application programs.

PCI accepts free-form input, prompts the user for missing information, and can read script files of PCI commands that correspond directly to FIGARO+ commands. PCI can be called as a subroutine by a FIGARO+ application program or it can be used as a standalone program. Like FIGARO+, PCI interfaces to both the FORTRAN and C language bindings included in the standard FIGARO+ product.

PCI is priced from $750 per copy on workstations and from $2,000 per copy on minicomputers, or as a part of the Application Developers Kit.

Contact TGS, 3510 Dunhill St., San Diego, CA 92121; (619) 457-5359.

Circle 387 on reader card

Genoa Adds Four Printer Emulation Compatibility Tests

Genoa Technology has announced that compatibility tests for the HP PaintJet, Epson FX850, IBM Proprinter III and DEC LA 210 printer emulations have been added to its product line.

Genoa's command-level compatibility tests, known as CET's (Comprehensive Emulation Test), are used by printer companies to assure that their printers are compatible with industry standard printer languages such as HP's PCL-4 (HP LaserJet) or Adobe's PostScript PDL.

Contact Genoa Technology, 2245 First Street, Suite 212, Simi Valley, CA 93065; (805) 583-2677

Circle 386 on reader card

SPEEDTEST/3000 Supports Native, Compatibility Modes

Intelware Systems Ltd. announced the MPE XL implementation of its SPEEDTEST/3000 productivity tool. This version supports both native mode and compatibility mode programs on the Spectrum.

SPEEDTEST/3000 version 2.0 provides a productive method for testing programs that use TurboImage databases. First, it eliminates the need to create and maintain test databases. It allows you to test with any database as the source of data without changing or corrupting it. This means that you now can test with production databases.

Second, SPEEDTEST/3000 provides new access modes to databases and a full trace facility that increases productivity and the reliability of programs.

SPEEDTEST/3000 version 2.0 supports all compilers and 4GL on the Spectrum.

Contact Intelware Systems Ltd., 216 Cote, Repentigny, Quebec J6A 1E8; (514) 654-7907.

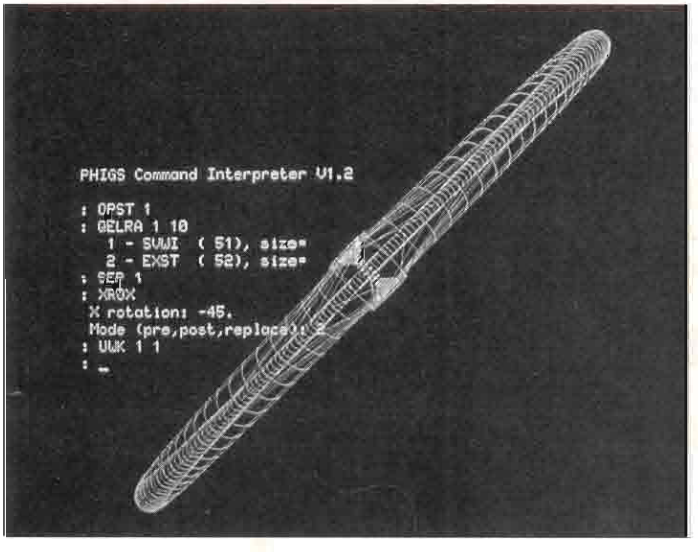
Circle 385 on reader card

BLAST II For UNIX, Xenix Now Shipping

Communications Research Group, developer of BLAST communications software products, announced the shipping of new BLAST II software for UNIX and SCO Xenix systems.

The new BLAST II software, version 8.4 for UNIX and SCI Xenix, includes all of BLAST's standard file transfer, terminal emulation and file management features for connecting UNIX and Xenix systems to other computers, with no extra boards or other hardware required.

New features include Adaptive Data Compression to speed transfers; PC-style sliding-bar menus for ease of use; script language for automating communications sessions and creating custom routines, or for



TGS introduced its PHIGS Command Interpreter (PCI) that can be used as a learning tool for 3-D application programmers.

linking BLAST communications to the user's programs. "Auto-Search" locates available communications ports from a user-specified list, fully automated dialing, logon and other functions; and identical menus and interface for UNIX and Xenix systems matching BLAST for PC, Mac VAX and others, to create one unified environment for all systems.

UNIX and Xenix BLAST are priced at $395-plus/copy. BLAST for PCs, Macs, minis and mainframes ranges from $195/copy (Macs) to $250/copy (PCs) to $695 (minis) and $5,500 (mainframes). Corporate licenses and Private Network licenses start at $10,000. Contact BLAST/Communications Research Group, 5615 Corporate Blvd., Baton Rouge LA 70808; (504) 923-0888.

Circle 380 on reader card

Word Processor Uses 3000 As Database Server

TEXTPLUS WINDOWS word processing features user-interface based on Microsoft Windows, program-to-program communication with the HP 3000, integration of text with the data stored in Image databases and functions for use with both the HP 3000 and the PC.

TEXTPLUS WINDOWS uses the PC as a workstation and the HP 3000 as a database server. You can write a text on a PC under Microsoft Windows, transfer it to the text database on the HP 3000 just by giving it a text name and pressing OKAY. The text can be put together with an address stored in an Image database by entering an address number and the name of a letterhead.

Contact Bay Bridge Software Inc., P.O. Box 28147, Oakland, CA 94604; (415) 839-1743.

Circle 384 on reader card

Adagen CASE Tool Ported To HP, Apollo

Adagen, Mark V Systems' graphical software design tool is now available on the HP 9000 and Apollo workstations. It's the first major CASE tool to span the range of HP and Apollo platforms running X Windows and Microsoft Windows.

Adagen supports the development team throughout the entire software lifecycle, from analysis and top-level design through detailed design and code. Adagen allows code maintenance and re-engineering and also features a reverse engineering tool that generates diagrams from code, producing as-built documentation for Ada.

Contact Mark V, 16400 Ventura Blvd., Encino, CA 91436; (818) 995-7671.

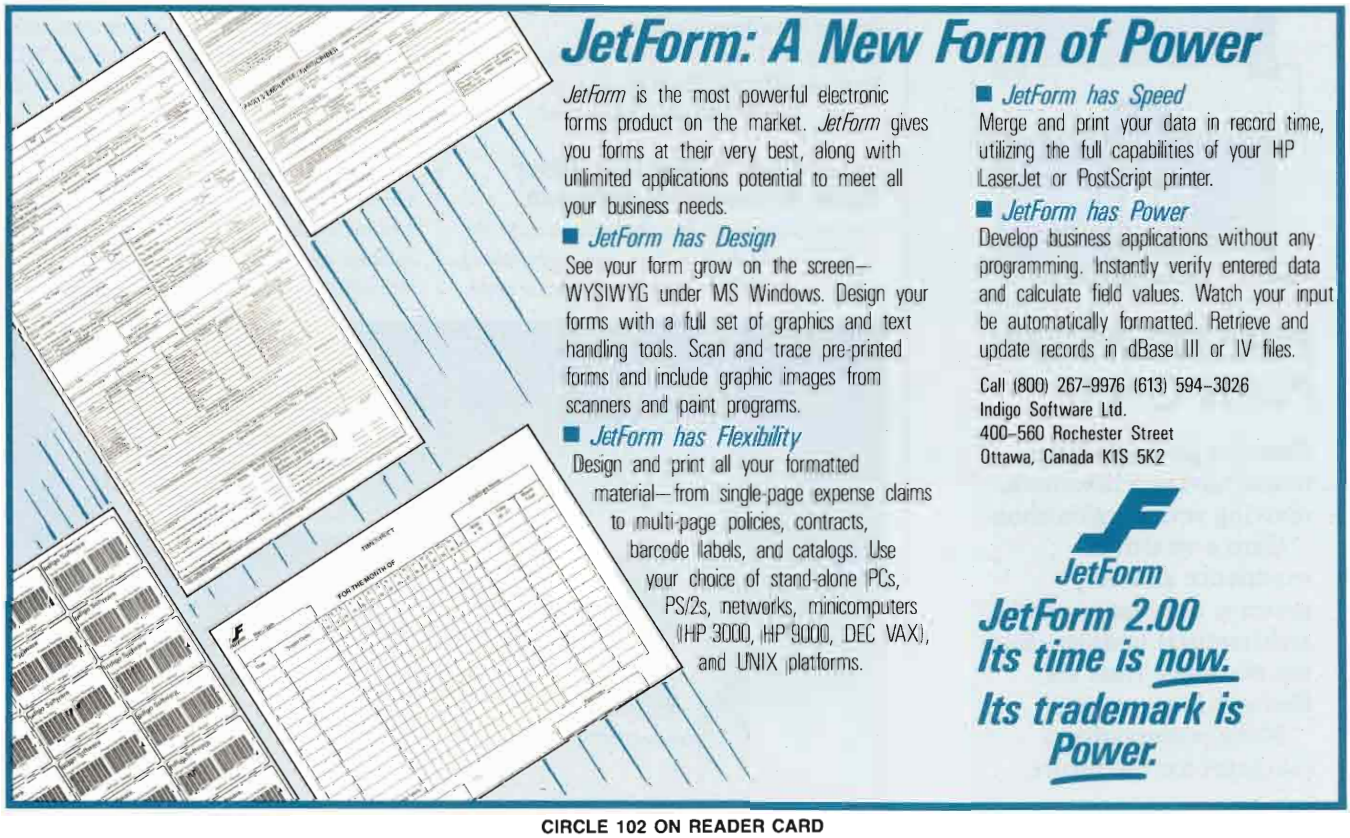
Circle 383 on reader card

Transarc Schedules Product Availability

Transarc Corp. announced Transarc AFS, a distributed file system for networks of computers, will be available March 1, 1990.

AFS 3.0 supports users running many varieties of the UNIX operating system. Transarc will market AFS to both commercial and university customers.

Transarc AFS enhances collaboration across local or wide area networks. Access to files takes place in the same way that users already use UNIX files, regardless of the



CIRCLE 102 ON READER CARD

physical location of the file or the type of hardware used. Individual users access the file systems from their own "client" machines. "Server" machines provide file services to a group of clients. Users see a single, large file system, and thus need not be concerned with the physical location of files.

Contact Transarc Corp., The Gulf Tower, 707 Grant St., Pittsburgh, PA 15129; (412) 338-4400.

Circle 382 on reader card

TEI Changes Project Management Package

TEI announced changes in its project management package, Perspective. The HP 9000 version (HP-UX Series 300 and 800) is now available with a windows style interface and will be known as VUE.

In addition to the new interface, VUE has added the ability to use multiple calendars within a project and to resource level according to schedule or resource constraints. It also has a new memo text editor and numerous other enhancements.

The HP 3000 version will continue as Perspective and has been rewritten using PowerHouse from Cognos.

Contact TEI Inc., W. 1527 Shannon Ave., Spokane, WA 99205; (509) 327- 2575.

Circle 381 on reader card

Lazer Link II Provides Fiber Optic Networking Solution

Applied Concepts Inc. has announced the SCSI Lazer Link II, a fiber optic networking solution for host-to-host to peripheral applications. The Lazer Link II provides an alternative to FDDI applications.

The Lazer Link II Fiber Optic Modem connects directly to standard SCSI interface adapters, providing a fully defined communications protocol for two to eight nodes. The Lazer Link II will support data rates to 5 MB per second over a link distance of 2,000 feet.

Applications for the Lazer Link II Modem include intercommunications networking between file servers, host processors, high-speed memory systems, and high-thruput peripherals such as post script laser printers and data acquisition systems.

Contact Applied Concepts, 10975 Torreyana Rd., Suite 201, San Diego, CA 92121; (619) 453-0090.

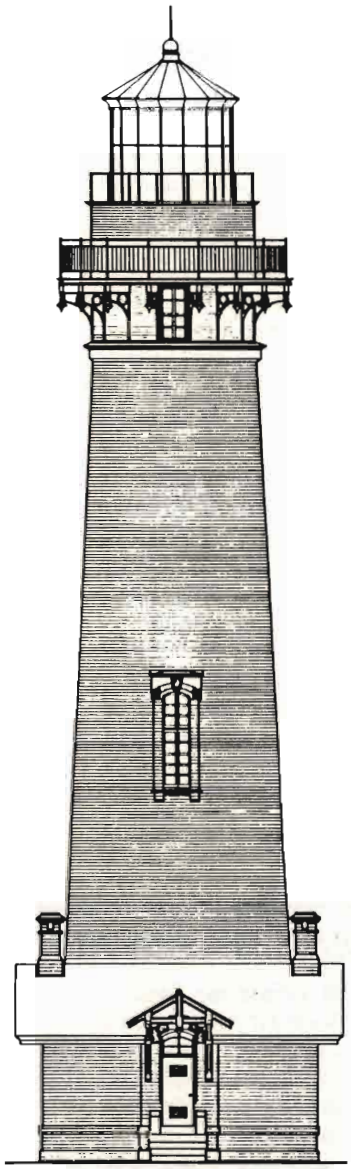
Circle 390 on reader card

CMI Announces MLINK Polling Manager

Corporate Microsystems Inc. (CMI) announced the release of its MLINK Polling Manager software system which provides unattended polling of computers at remote locations. It can be used to automate data communication between computers using different operating systems, including UNIX, Xenix, DOS, OS/2, Macintosh, THEOS and others.

The Polling Manager is designed to handle data collection and distribution requirements for companies with up to several thousand remote locations. It includes a menu-driven database administration system for establishing individual polling parameters and schedules

SCSI Lazer Link II Modem is an alternative to FDDI local area networks.



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for each remote site. By operating multiple communications ports simultaneously, the Polling Manager reduces the overall time required to complete daily polling.

Contact Corporate Microsystems Inc., P.O. Box 277, Etna, NH 03750; (603) 448-5193.

Circle 376 on reader card

DynaComm Supports HP's NewWave Environment

Future Soft Engineering Inc. has begun shipment of version 2.1 of DynaComm Asynchronous Edition, the communications software for the Microsoft Windows environment. This version includes several enhancements for Windows and support for Hewlett-Packard's object-oriented NewWave environment.

DynaComm, Version 2.1, includes many other enhancements including an easy-to-use "point-and-click" communications manager called Director. Director integrates all the functions of a phone dialer, and allows users to execute scripts created with DynaComm's script language.

Price is $295.

Contact Future Soft Engineering, Inc., 1001 South Dairy Ashford, Suite 203, Houston, TX 77077; (713) 496-9400

Circle 377 on reader card

Time Management Tools Available On HP-PA

Crosswind Technologies (Felton, CA) has ported its Synchronize workgroup time management tool to HP-UX multiuser host systems. The X system includes a graphical user interface and a mechanism for distributed processing across a network.

Synchronize allows a user with a display station (a client machine with a mouse) to schedule meetings, distribute agendas, write personal to-do lists and send out reminders. A Day-at-a-Time View shows the day's events, reminders and to-do items. Because each user's appointment calendar is kept in a common database, any workgroup member can use the Events Editor to review other members' available time in order to schedule meetings. The Events Editor also allows group members to respond "yes" or "no" to indicate whether or not they will attend a meeting.

In order to use Synchronize, a workgroup must have at least one server, a UNIX machine capable of running X programs

PC-EDIT/1000

EDIT/1000 on Your PC

Now the best editor on the HP/1000 is available on your PC. PC-EDIT/1000 is an implementation of Hewlett-Packard's Edit/1000 for MS-DOS users.

PC-EDIT/1000 is designed for the computer user who works on both personal computers and Hewlett-Packard's HP1000 Computer System.

PC-EDIT/1000 takes advantage of the capabilities of the personal computer providing features currently not available on HP's EDIT/1000.

PC-EDIT/1000 provides the features that HP EDIT/1000 users have come to expect: Screen and line modes, interactive and batch, powerful character string search and replacement commands are all available. The command stack window gives the user access to the last 20 commands and the UNDO command reverses the last line mode command executed.

PC-EDIT/1000 also provides the user with new features: Left and right scrolling in screen mode, automatic screen and line mode tab compensation, and screen mode brackets that can not be over-written.

PC-EDIT/1000 runs on PC-DOS or MS-DOS version 3.2 or greater. PC-EDIT/1000 requires 512K bytes of RAM and a hard disk or two floppies.

Single copy price of only $295. Available on both 3.5 inch and 5.25 inch media.

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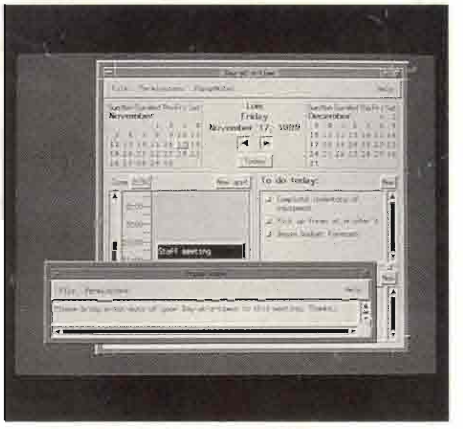

Crosswind Technologies has ported its Synchronize workgroup time management tools to HP-UX multiuser host systems.

(clients) from each user's X display station. Any multiuser minicomputers from the Series 800 or HP's new Series 9000 Model 635SV can run the X programs. The server must have at least 8 MB of (RAM).

The display stations (client machines) can be X terminals such as those in the new HP 700/x family of graphics terminals, any workstations that run HP-UX or another UNIX implementation, or personal computers.

Synchronize requires the latest release of HP-UX, Version 7.0, because this release is the first one that supports Version 11, Release 3 of the X Window System. A license for Synchronize costs $100 per user with a minimum of five users.
Contact 6630 Highway 9, Suite 201, Felton, CA 95018; (408) 335-4988.

Circle 364 on reader card

New SLAM/TESS Features Build Distribution

Pritsker Corp. announced the release of SLAM/TESS Version 4.0 that provides a fully integrated simulation environment supporting all phases of a simulation project.

Version 4.0 features distribution analysis capabilities, faster data collection and response time, context sensitive help and an interface to double precision simulation models, and runs on Apollo/Aegis.

Through its "build distribution" feature, Version 5.0 provides data distribution analysis capabilities. You now can characterize a raw data set or a histogram and fit one of 12 different distribution functions to the data. You can perform visual as well as statistical goodness-of-fit tests for the selected distribution through a menu-driven interface.
Contact Pritsker Corp., Suite 500, 8910 Purdue Rd., Indianapolis, IN 46268; (317) 879-1011.

Circle 375 on reader card

Sybase Debuts First Open RDBMS

Sybase Inc. announced the first open relational database management system. The new release of the SYBASE SQL Server, Release 4.0, combined with Sybase's new connectivity product, SYBASE Open Server, offers capabilities to develop online applications that span multiple servers, integrate data and functionality from non-SYBASE sources, and provide a generic communication mechanism between clients and servers.

To support its open strategy, Sybase also announced new partners that endorse the SYBASE connectivity products, including the Open Server, as a standard for database client/server communication. The company also announced commercial availability of SYBASE Open Client on the Macintosh and the SYBASE system on several UNIX computers, including HP 9000 Series 300 and 800.
Contact Sybase Inc., 6475 Christie Ave., Emeryville, CA 94608; (415) 496-3500.

Circle 374 on reader card

Taurus Software Offers Database Archive Tool

Taurus Software announced WAREHOUSE, a database archive tool. WAREHOUSE uses a scripting language to allow you to define the groups of information from one or more datasets to be archived either to disc, tape or another database.

The information to be archived can be from one or more datasets either physically or logically related. During the archival you can update or delete records and/or print reports.

WAREHOUSE can be used for periodic cleanup of "stale" data from your database, creation of test databases, and simple data restructuring. Benefits include reduced disc space utilization, faster processing times because of fewer records to process and high-quality test databases.

The price ranges from $3,000 to $9,000 for the first copy depending on system size.
Contact Taurus Software, 770 Welch Rd.,

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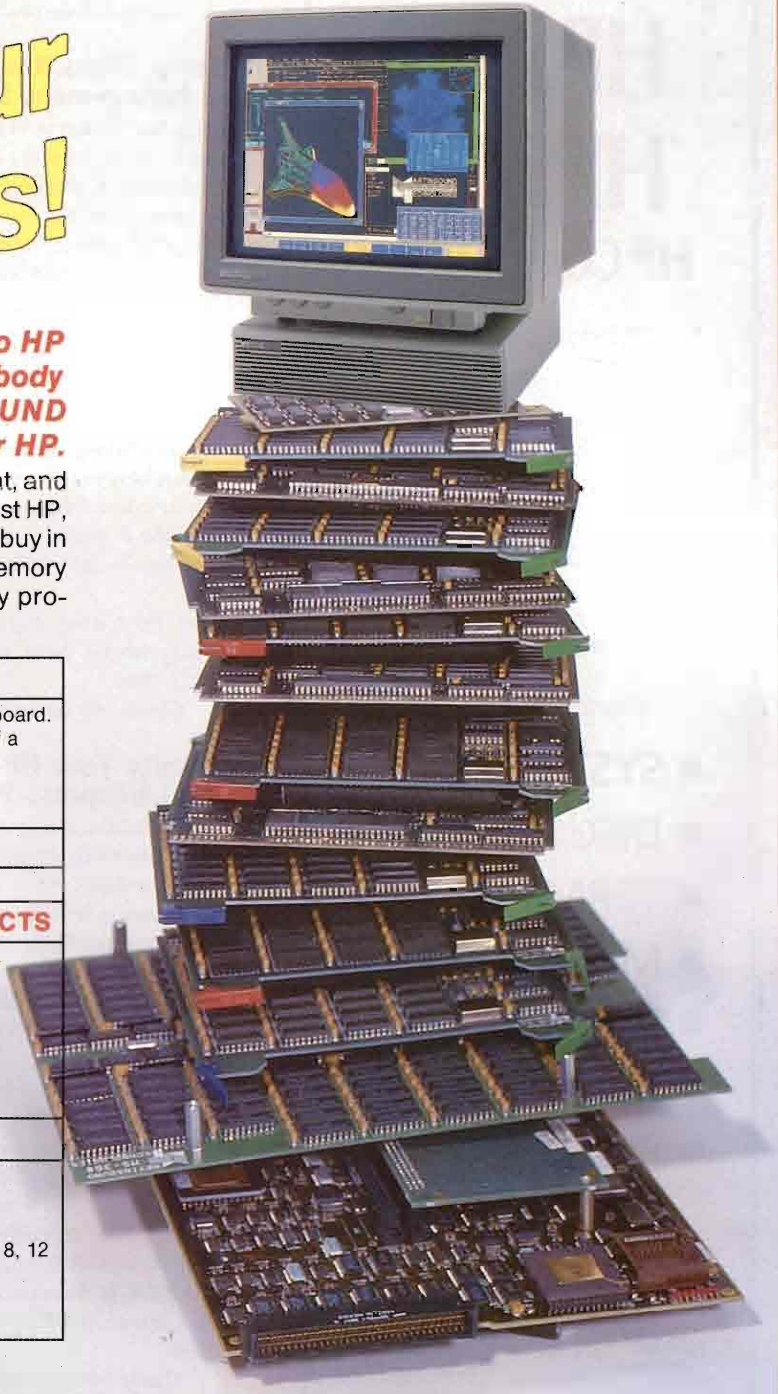

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Circle 355 on reader card

Hi Comp Offers New Data Management Strategy

Hi Comp has worked with Hewlett-Packard Company to include the new rewritable optical disk drive subsystem, and other HP optical products as they become available, in our BACKUP software strategy to provide a single-vendor solution for NETWORK BACKUP.

The solution includes using the large online storage capacity for unattended operation on any HP 3000 or 9000 system with a user interface for MPE V, XL and HP-UX systems, and having the ability to store and restore data between all systems.

This new technology also introduces the option of the dedicated backup engine to cut costs and time by fully automating the backup process.

Contact Hi Comp America Inc., 305 Broadway, 4th Fl., New York, NY 10007; (212) 732-1946.

Circle 363 on reader card

Customize Your HP-UX System With KLA/Express-9000

KLA & Associates announced the release of KLA/Express-9000, the HP-UX version of KLA/Express-3000.

KLA/Express-9000 is intelligence for the HP-UX scheduler/dispatcher allowing the user to customize the system based on his environment. KLA/Express-9000 allows the user to build his logic and thinking into the operating system.

The product allows the user to partition the executing queue and assign real-time and timesharing priority ranges for processes based on logon, terminal id and/or process name.

KLA/Express-9000 is menu-driven with over 4,000 lines of interactive help. It's priced from $2,100 to $3,700.

Contact KLA & Associates Inc., P.O. Box 14854, Clearwater, FL 34629-4854; (813) 784-5976.

Circle 360 on reader card

PC-EDIT/1000 Designed For HP MS-DOS Users

Paul W. Miller Inc. announced PC-EDIT/1000, an implementation of HP's Edit/1000 for MS-DOS users.

PC-EDIT/1000 is designed for those who work on both personal computers and HP 1000s. It takes advantage of the capabilities of the PC providing features currently not available on HP's EDIT/1000. These include left and right scrolling in screen mode, automatical screen and line mode tab compensation, automatic backup of the original file and screen mode brackets that can't be overwritten. The initialization file is executed every time PC-EDIT/1000 is run.

Single copy price is $295.

Contact Paul W. Miller Inc., 27 Rambling Brook Dr., Holmdel, NJ 07733; (201) 946-0440.

Circle 356 on reader card

Ferret Technology Announces The Capacity Advisor

Ferret Technology announced The Capacity Advisor, a program that helps users select TurboImage master data set capacities.

Intended for use before a dataset unload/reload is done, The Capacity Advisor helps assure that master data sets are rebuilt with a reasonably minimal number of secondaries (synonyms) and clustering.

The Capacity Advisor executes as a nonprivileged program and opens databases in rad-only mode. It runs on all MPE and MPE XL systems. A PC version for use on flat files also is available for 286/386-based systems (with or without math coprocessors). Program licenses are available for $295 per CPU, with site and multiple CPU options available. Contact Ferret Technology, P.O. Box 440, Corte Madera, CA 94925-0440; (415) 924-0584.

Circle 354 on reader card

MCBA Offers Financial Applications

MCBA Inc. has introduced its new 4th-generation language (4GL) based financial applications called the Resolution Financial System. The 4GL is targeted at cross-industry companies with general accounting needs and revenues in excess of $50 million.

At the core of the Resolution System is the Resolution Environment and Shared Application Layer (REAL Software), which offers use of Oracle's SQL*Forms and SQL*ReportWrite by providing seamless integration between the two so that the user doesn't have to exit from one package to use the other.

Resolution applications will be priced from $8,000 each, plus the cost of any Oracle tools required.
Contact MCBA, 425 West Broadway, Glendale, CA 91204-1269; (818) 242-9600.

Circle 373 on reader card

FOR YOUR INFORMATION

■ Bonafide Education (Boston, MA) announced the availability of a self-paced videotape training system for PowerHouse software products. Training kits available are QuizTrain, QTPTrain, QuickTrain, QschemaTrain, Q*ALLTrain and Q*QMI-Train. (617) 556-8488.

■ A new report called "High Resolution Graphics Cards for the IBM PC Family and Compatibles" (A#13-367) available from The S. Klein Library on Computer Graphics (Sudbury, MA). The report analyzes the market for high-resolution graphics cards for the PC and provides data to help guide the buying decision. (508) 443-4671.

■ A larger, more comprehensive version of *Your Guide to POSIX*, an executive-level overview of the emerging POSIX standards, the major issues of POSIX and the groups involved in the standard, has been released by UniForum (formerly /usr/group; Santa Clara, CA). (415) 329-8880

■ General Power Corp. (Anaheim, CA) announced the immediate availability of its eight-page brochure on the new Unistar Single Phase Uninterruptible power supply. (714) 956-9321

■ ORBiT (London and California) signed an agreement with ACI Automation Center International AG in which ACI will distribute ORBiT's proprietary ONLINE BACKUP/3000 software through its 11 subsidiaries and five European countries.

■ IMACS Systems Corp. (Seattle, WA) and M.B. Foster Associates Ltd. (Canada) announced that they have reached an agreement in principle for the purchase of IMACS domestic operations and product by M.B. Foster Associates. David Dummer, IMACS founder and president, will retain the leading role in product development. Birket Foster, president of M.B. Foster Associates, will be overseeing the company's marketing and sales efforts and working with Dummer and his staff to chart the company's direction.

■ Infocentre Corp. (Toronto, Ontario) announced the opening of a new sales office in Cleveland, Ohio, The office will be managed by Robert York, who is responsible for the sales and support of Infocentre's Speedware 4GL products in the Ohio region.

■ Jobscope Corp. has announced that its West Coast Training Center is being moved from Costa Mesa, CA to San Mateo, CA. The new address will be Jobscope Corp., 3 Waters Park Drive, Suite 217, San Mateo, CA 94403; (415) 358-9012. ■

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[CALENDAR]

[FEBRUARY]

5-8: The 13th Annual Communication Networks Conference and Exposition will be held at the Washington Convention Center in Washington, DC. For more information contact Dorothy Ferriter (800) 225-4698 or Robin Poulin (800) 343-6474.

8-9: Southeastern Regional Users Group (SERUG) is sponsoring a two-day meeting and vendor show at the Northwest Atlanta Hilton in Atlanta, GA. Call Tom Brightwell (404) 729-1903.

13-15: The National Conference on Software Development will be held at Techworld Plaza, Washington, DC. Call (301) 445-4400.

[MARCH]

12-14: The INTEREX Computing Management Symposium will take place at Ceasars Palace in Las Vegas, NV. Call (408) 738-4848 for more information.

19-22: The National Computer Graphics Association (NCGA) will hold a conference and exposition at the Anaheim Convention Center, Anaheim CA. Call Michael Weiner (703) 698-9600.

27-29: DB/Expo '90, The National Exposition and Conference will take place at the Moscone Convention Center, San Francisco, CA. Contact Dana De Nardi (415) 941-8440.

[APRIL]

8-10: BWRUG is holding its Fourth Atlantic Conference at Rosslyn Westpark Hotel, Arlington, VA. Registration fee $175. Call (301) 242-6777.

[MAY]

2-4: Southern California Regional Users Group (SCRUG) will hold its 13th annual technical conference and trade show for HP 3000 computer users at the Pasadena Conference Center, Pasadena, CA. For more information contact Betty Vaughan, (213) 450-3383.

28-6/1: The 11th Annual Eastern American Hewlett-Packard Users Conference will take place at Bally's Plaza Hotel and Casino, Atlantic City, NJ. Call (215) 875-5324.

[AUGUST]

20-23: 1990 INTEREX HP Users Conference will be held at the John B. Hynes Veterans Memorial Convention Center, Boston, MA. For more information call (408) 738-4848.

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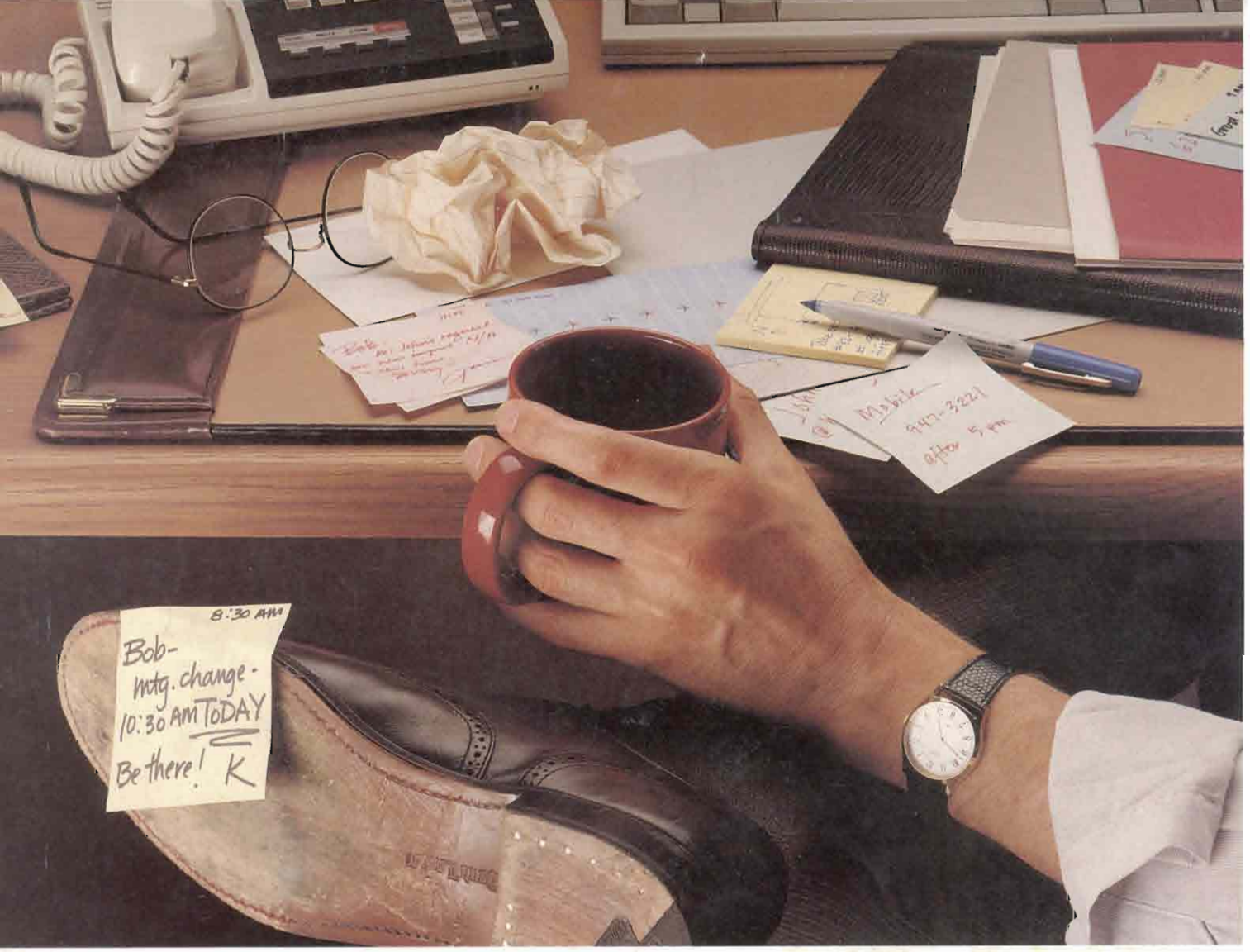

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