

# HP Professional

AN INDEPENDENT PUBLICATION FOR USERS OF HP COMPUTERS ■ VOL. 3 ■ NO. 4 ■ \$4.00

APRIL 1989

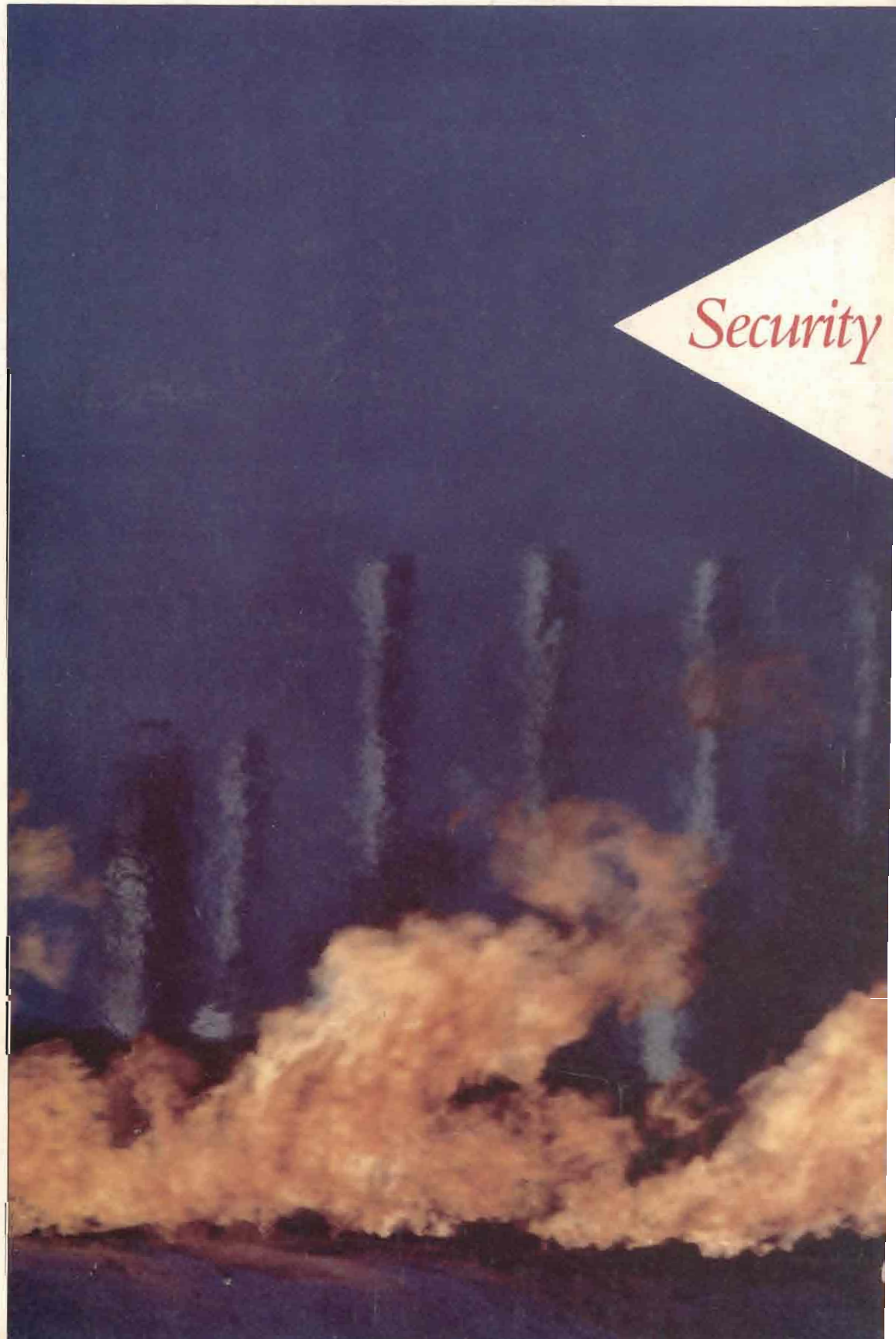
- MPE Security—  
Is It Adequate?
- Salvaging Erased  
HP Files
- Lab Review:  
Printer Gems



## FIELD SERVICE

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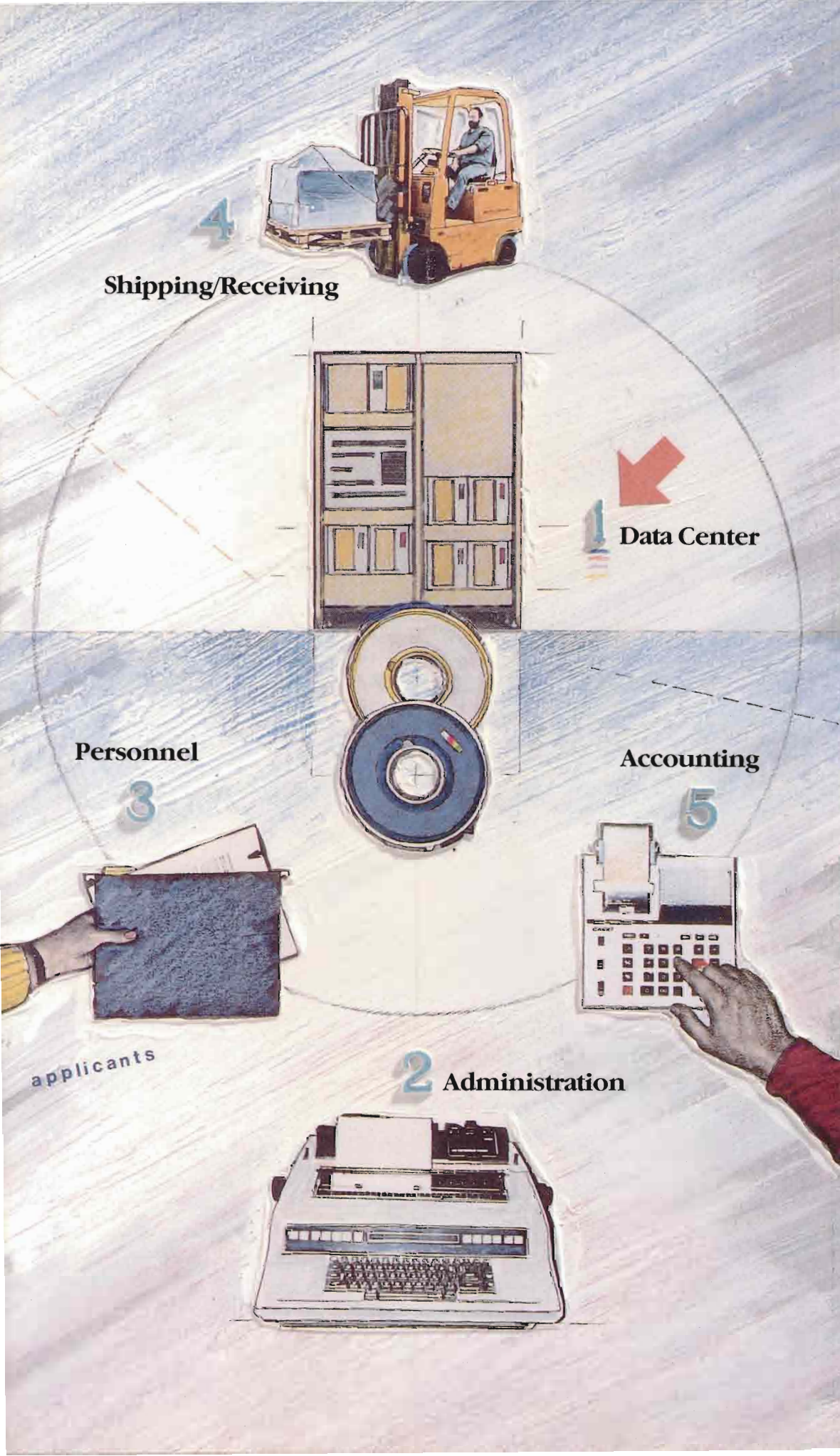
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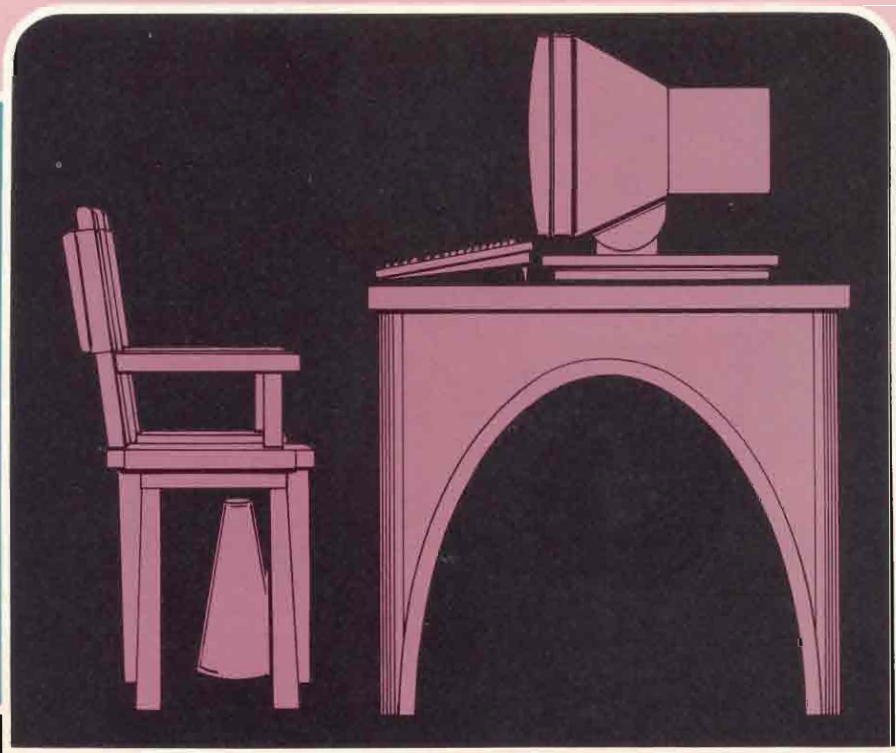
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## SCREEN CREDITS

**Compatibility** 700/92 ♦ 700/94 ♦ 2392 ♦ 2394  
VT-52 ♦ VT-100 ♦ ANSI X3.64

**Physical** Tilt/Swivel base ♦ 2392 keyboard layout

**Display** CRT: 15-in. flat profile ♦ 91 sq. in. of viewable display area ♦ P167 page white, standard ♦ Non-glare surface ♦ Dynamic focus for edge-to-edge readability ♦ Screen format: 80 or 132 columns ♦ 13 x 16 character cell (80-column mode) ♦ 75 Hz refresh rate ♦ 47.66 MHz horizontal pixel rate ♦ Proprietary SLEEP mode

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**Memory** 8 pages of display memory ♦ 16K of non-volatile memory ♦ 2394/A-compatible forms cache

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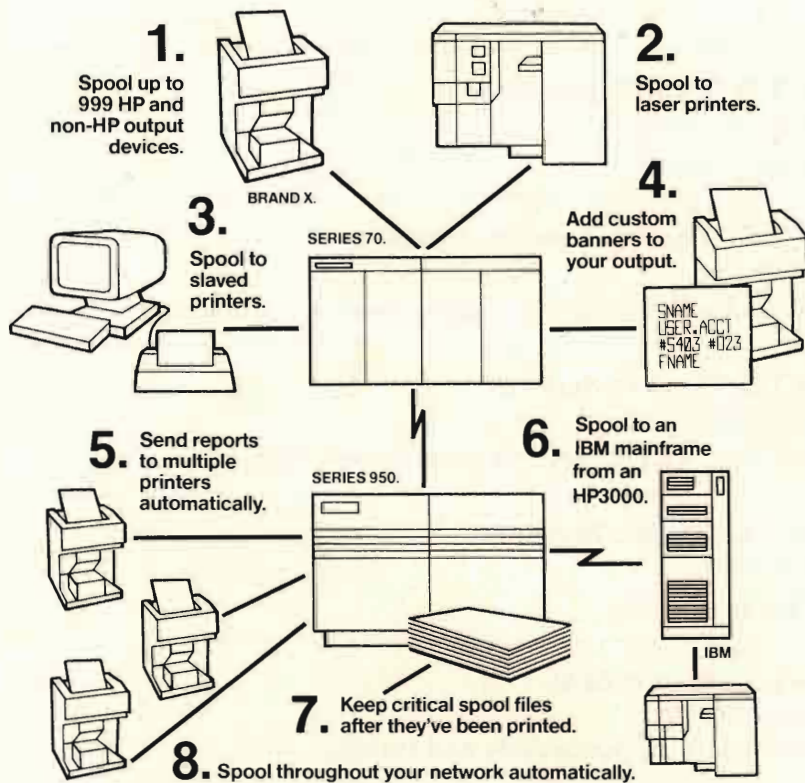
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#### On The Cover:

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*"With the new system from Hewlett-Packard, we're able to develop new products faster. And that's an important part of our marketing requirement. To come out with new products sooner than your competition gives you the leading edge."*

—Don Senecal, Corporate Controller, Spalding Sports Worldwide

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Sporting goods manufacturer Spalding had been using both a Series 70 system and a Series 58 system from HP. But as the company

experienced double-digit annual growth, large-scale data processing began to take longer and longer. The result? A bottleneck that kept end-users from accessing the system.

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*—Richard Villari, Vice President, Community Blue*

Community Blue, the HMO for Blue Cross of western New York state, has enlarged its membership base dramatically since 1985. But an HP 3000 Series 950 Precision Architecture computer has helped ease its growing

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# An Eye-Opener

---

Uniforum in San Francisco's Moscone Center was an eye-opener. In short, 15,000 attendees (refreshing) were treated to the spectacle of all the major computer makers locked in a bare-knuckle fist fight. They were fighting about who could field the fastest new workstation or server. The products that were introduced so exceed the performance of the traditional products from all the players that I was convinced that I had done a 'Rip Van Winkle' and had missed about 10 years of product development.

But the truth is that the RISC revolution is now over and products are on the shelf. These new machines surpass the performance of any of the traditional architectures: There is no comparison. Depending on the model, a VAX or HP-PA mip sells for between \$3,000 and \$30,000. A RISC mip in a workstation or small server now is priced between \$500 and \$850.

What's most exciting is that the field is almost wide open. Data General went from an also-ran to a major contender overnight by introducing a new line based on the Motorola 88000 series. DEC was the leader in redefining the cost of a multiuser server mip with its new DECsystem 3100 (4-64 user, 14mip, 300mb-1.5gb servers, \$20,000-\$75,000). And we only are seeing the tip of an iceberg.

Our industry is undergoing a revolution unparalleled in its history. In the space of a few months, machines with 30 times the price/performance have appeared as full-fledged products from the leading vendors, all of whom have been forced to discard their existing product lines by this amazing new architecture.

If you are wondering about the next wave of products, look at the Intel i860. This little marvel loafs along at 33 mips in its integer unit while its floating coprocessor pours out 80 megaflops . . . simultaneously. Not bad for \$750, quantity 1,000! This little gem isn't vaporware. You can buy evaluation quantities right now. The MIPS R3000 promises 25-30 mips and is shipping.

I am not sure where all of this is going to end, but the direction sure is clear.



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## LETTERS

### ANOTHER LOOK AT HP'S FUTURE

Reading Don Person's column on the future of HP in *HP Professional's* January '89 issue has left me upset over several points. I'm afraid that HP might listen to him. I've been using HP computers and peripherals for the past 11 years to do oceanographic research, and often in some very nasty conditions for electronic equipment. HP has, and still does, build serious instrument controlling computers that you can throw in a box, ship anywhere in the world, and be able to use when you arrive.

When HP introduced the Series 200 computers, I followed, and in addition to HPL was given the choice of three additional operating systems on the same hardware: RMB, HP Pascal and UNIX. RMB offered nothing that HPL didn't provide except the headache of having to rewrite programs.

However, Pascal offered an advanced compiled modular language that kept pace with the increasingly complex analysis I was trying. Incidentally, HPL is still alive and well in the hands of Structured Software Systems.

Mr. Person's article challenges HP to offer a "new" operating system, better than MS-DOS, single tasking and "wickedly efficient for one user." Mr. Person, wake up and look at HP Pascal, well disciplined, readable Pascal, with just the critical mix of extensions to

Address letters to the editor to the *HP PROFESSIONAL* magazine, P.O. Box 445, Spring House, PA 19477-0445. Letters should include the writer's full name, address and daytime telephone number. Letters may be edited for purposes of clarity or space.

make it more powerful than C! Look at some disassembly of the compiled code to see its efficiency. Try the simple efficiency of the Pascal Editor. Look at the Pascal Procedure Library to see the efficiency of its I/O and absolute real-time control. Then consider running this on a 25 MHz, 68030-based HP 360 computer. Whether Mr. Person or the world know it or not, this operating system has existed for five years and deserves careful consideration.

Like other HP technical users, I bemoan the lack of a technical word processor or spreadsheet. HP chooses to limit itself to providing excellent, albeit expensive, hardware and operating systems. Market share dictates that third parties can make more money writing yet another spreadsheet program for MS-DOS than an original decent one for HP Pascal. In fact, VisiCalc initially was available on the 200s but died for lack of interest. This is where I see HP's ven-

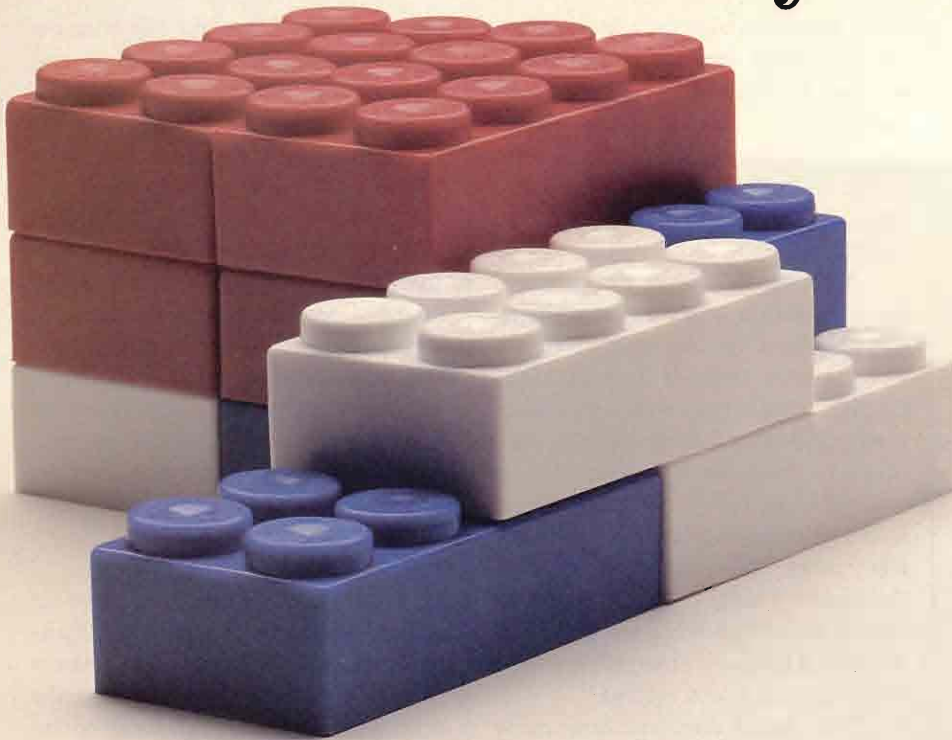
ture into UNIX as positive. With UNIX there is a world of professional third-party software available — provided I can pay the fare.

Mr. Person's maligning of UNIX notwithstanding, UNIX is a well tested, widely used, open, mainframe operating system now available to my desktop computer. The combination of faster processors and real-time interrupts eventually will solve the real-time problems. HP Pascal and RMB are both available as programming languages. I see UNIX evolving into the common hardware independent environment. Efforts by the Open Software Foundation to select a standard user interface similar to HP/Microsoft's Common X Interface or NeXT's Workspace Manager should isolate application users from the terser aspects of UNIX.

What HP chooses to do at the expensive, experimental RISC end or at the cheaper, toy MS-DOS end of its product line is for HP to decide. I can only hope that in the middle, they continue to provide serious professional workhorses. It's a fantasy for Mr. Person to think that HP can or will provide the processing power of a CRAY, the user interface of a Speak-and-Spell and the indestructibility of a 9825 all at the price of a clone.

**Jeffrey W. Nolten**  
Programmer Analyst III  
University of California, San Diego

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# DEC And HP Court Each Other's Customers



## INDUSTRY WATCH

Peggy King

1986 Interex Conference in Detroit where the company rented a suite at the Pontchartrain Hotel. There, HP 3000 users heard presentations about the benefits of switching to VAX/VMS.

In the fall of 1986, many HP 3000 users had outgrown their MPE systems and were getting impatient waiting for the Precision Architecture systems. DEC sensed a market opportunity, a chance to capitalize on customers' fears about RISC-based architecture and the difficulties they'd encounter in migrating to a 32-bit machine.

DEC's VAXattract program was designed to encourage HP 3000 users to switch to VAX/VMS instead of migrating to Spectrum. MIS departments were faced with migrating applications whether or not they left HP. This made the option of switching to DEC's scalable VAX systems attractive. To sweeten the deal, DEC offered tools for migrating both commercial and technical applications from MPE to VMS.

### Migrating Tools

DEC's series of tools for migrating from MPE to VAX/VMS is called VAXattract/H3K. There are language converters for FORTRAN, COBOL and BASIC and a screen management converter and emulator for converting source files containing VPLUS/3000 screen formats. The operating system's commands converter interactively translates MPE commands to their DCL equivalents, automates the conversion of UDC files and translates MPE Job Stream files to DCL files.

The toolkit for migration also pro-

vides migration aids for moving from an Image/3000 database to a database that can be used on VAX/VMS. These tools include a data-conversion library and two migrators, one that goes from Image to DEC's Rdb/VMS and another that goes to Cincom Systems' Ultra DBMS.

With the VAXattract program and the cooperation of some Complimentary Solutions Vendors (DEC's term for VABs), DEC has taken advantage of the fact that some key software applications used on HP 3000s also run on VAXs. DEC offers assistance to HP customers who want to change platforms but continue to use the same applications software. DEC offers migration aids for ASK Computer Systems' MANMAN products and a guide to converting an application written in Cognos' PowerHouse from an HP 3000 to a VAX system.

DEC hasn't disclosed how many customers have come to them from the VAXattract program, but program manager John McDonnell provided names of customers in various industries who had migrated.

One was an aerospace research center that replaced an HP 3000 Series III with a VAX 8250. It also purchased a MicroVAX and two VAXstations and networked them.

DEC wrote the VAXattract/H3K converter for HP BASIC in response to this customer's needs to convert BASIC programs. A scientist who used the BASIC converter said that the migration process still required a great number of manual changes.

Before DEC's filter program could be used, all HP BASIC files had to be converted to ASCII for them to be comprehensible to the VAX. It also took some manual effort to rewrite the statements that the converter flagged. A DEC

consultant who helped the center use the HP BASIC converter saved time and frustration in getting the job done.

The FORTRAN conversion was more straightforward because HP's FORTRAN is written in ASCII format. In the COBOL environment, DEC offers XCOST, an AI tool that helps customers analyze which applications should be migrated, recommends migration paths and estimates the amount of work involved in migrating applications. When XCOST shows that there are applications needing major revisions, DEC recommends its CASE for Information Systems (CASE/IS).

### Fighting Back

HP launched its own offensive in response. In early January 1989, HP announced a set of programs that systems engineers had been field testing since the previous fall. The targeted customers are owners of aging standalone 11/750s and 11/780s that may have begun to require extensive maintenance and whose price/performance ratios compare very unfavorably with newer, RISC-based multiuser computers.

HP's migration program is more comprehensive than DEC's because it helps with the financial and training aspects of migration and offers software tools. The program consists of three related DEC Migration programs: the RISC Free program (VABs, especially database vendors, participate too), the VAX Buyback program and PORT/VX migration tools bundled with consulting services. In contrast with the VAXattract program, which induces customers to change from one proprietary operating system to another, the goal of the DEC Migration programs is to get customers

## The leading HP terminal emulator for the Mac is now the only Windows-based emulator for the PC.



Session for Windows: The next generation in HP terminal emulation is here.

**F**our years ago, Tylabs pioneered the development of Session™ for Macintosh, an HP terminal emulator for the see-and-point desktop environment. Packing a sophisticated feature set into an intuitive, enjoyable and productive user interface, our Mac products have won acclaim from users and critics alike.

Building on the foundation of Microsoft® Windows for the PC, Vectra, and compatibles, we have been able to bring the power and ingenuity of our Mac-based emulators to Windows users as well. On both Mac and PC platforms, Session makes terminal emulation a full partner with today's desktop applications. For example, you can extract data from a database on your HP host and display it on your "terminal screen" (your Session window). Using the mouse or keyboard commands, you can copy the information into your PC or Mac-based spreadsheet, perform a few calculations, then paste

the results into a memo which you send out via HPDESK. You can even run multiple concurrent sessions on the host, leaving HPDESK or a lengthy compile running in one window, while you go on to other HP-based activities in another.

If this sounds like the solution you've been waiting for, don't wait any longer. Whether your organization has PCs, Macs, or both, you can standardize on Session for all your emulation needs. And because Windows is the stepping stone to HP NewWave and OS/2 Presentation Manager, Session protects your investment in software and training as you move to these powerful new environments.

### CIRCLE 165 ON READER CARD

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to switch from the proprietary VAX/VMS systems to any one of four HP 9000 Series 800 multiuser models that run on the standards-based HP-UX operating system.

### Trial Period

The RISC Free program gives owners of older VAXs the opportunity to test HP-PA hardware at their own sites for up to three months. If the high-end Model 850S is being considered, the trial period may be extended for an additional three months. The free trial includes use of magnetic and cartridge tape drives, disk drives, HP-IB and MUX hardware, printers, a systems console and terminals. The software includes HP-UX, Network File Services (NFS), LAN management software and ARPA services.

The list of VABs participating in RISC Free continues to grow. Prospective customers have their pick of at least a half dozen relational databases to try. Further, customers can test a sample application on more than one product during the trial period. Database vendors Oracle, Informix, Relational Technology, Progress and Unify all offer a one-month free trial of their software on the system, and HP will let the prospective customer use HP Allbase for the entire trial period.

HP has also put together an attractive financing package. Sonny Ng, sales promotional manager for the VAX Buyback program, claims that the customer's out-of-pocket expense for buying an HP system during the first year is less than the cost of maintaining an aging VAX. As part of the VAX Buyback program, HP has made arrangements with a VAX reseller so that VAX owners can receive a check for the fair market value of their existing DEC system if they wish to sell it. However, the value of the 11/7xx series has declined since DEC's recent announcement that it no longer will manufacture this series.

If the customer decides on a Series 9000 Model 800 system, HP stands ready with financing, whether the customer

ASK Computer Systems  
2440 El Camino Real W.  
Mountain View, CA 94039  
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Boston Business Computing Ltd.  
360 Merrimack St.  
Lawrence, MA 01843  
CIRCLE 279 ON READER CARD

Cincom Systems Inc.  
2300 Montana Ave.  
Cincinnati, OH 45211  
CIRCLE 278 ON READER CARD

Cognos  
2 Corporate Place, I-95  
Peabody, MA 01960  
CIRCLE 277 ON READER CARD

Digital Equipment Corp.  
146 Main St.  
Maynard, MA 01754  
CIRCLE 276 ON READER CARD

Hewlett-Packard  
3000 Hanover St.  
Palo Alto, CA 94304  
CIRCLE 275 ON READER CARD

Informix Software Inc.  
4100 Bohannon Dr.  
Menlo Park, CA 94025  
CIRCLE 274 ON READER CARD

Oracle Corp.  
20 Davis Dr.  
Belmont, CA 94002  
CIRCLE 273 ON READER CARD

Progress Software Corp.  
5 Oak Park  
Bedford, MA 01730  
CIRCLE 272 ON READER CARD

Relational Technology Inc.  
1080 Marina Village Pkwy.  
Alameda, CA 94501  
CIRCLE 271 ON READER CARD

Unify Corp.  
3870 Rosin Ct.  
Sacramento, CA 95834  
CIRCLE 270 ON READER CARD

prefers to buy, rent or lease. The Finance and Remarketing Division (FRD), the same division that refurbishes and resells used systems, handles financing. The plan with the lowest monthly payment is HP Lease With Option to Purchase (LWOP).

The third facet of the plan is designed to assist customers with porting FORTRAN applications from the VAX to a Series 800 system. The PORT/VX product consists of software tools and five days of on-site consulting services to help customers use these tools. An HP Systems Engineer (SE) works at the customer site for five days to evaluate each prospect's migration needs.

The SE moves application files from VMS to HP-UX, shows the customer how to use the FORTRAN Code Analyzer (FCA) to predict the ease or difficulty of migration, and introduces the PORT/VX tools. The PORT/VX tools include a FORTRAN Code Translator (FCT), a Data File Translator (DFT), a transport utility (Vbackup) and migration libraries to use in compatibility mode until applications can be ported to native mode.

The week of consulting also includes the migration of a selected application. The SE works with the MIS department to develop a migration plan and a performance plan to verify that the migration is complete.

Customers also can use one of HP's field-migration centers or the Technol-

ogy Access Center (Cupertino, CA) for further migration assistance. Additional consulting services are available on a time-and-materials basis.

HP's migration plan is so comprehensive that even users' concerns are considered. No one likes to change text editors or to learn a new command language. Boston Business Computing, an independent software vendor, has an editor called EDT Plus that runs on the HP 9000 Series 800 but has the look and feel of EDT, a popular VMS editor. Another product from that company is VCL, a shell over the operating system that accepts DCL commands but executes HP-UX commands. It comes with an on-line tutorial that shows DCL users the equivalent HP-UX commands. The users can pretend that nothing has changed while the MIS department tackles the migration and calls their SE back for help.

MIGRATION IS NEVER easy, but HP may have succeeded in making it inviting. Because the RISC Free program is independent of the VAX Buyback and the PORT/VX offering, I expect that many customers who want to try the HP-UX systems will be current HP 3000 owners. HP's bait to VAX owners may be as attractive to HP 3000 owners as the VAX-attract program from DEC.

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## SOTAS Incorporated Expands To SOTAS Int'l.

*Reflects Growing Overseas Business*

**S**OTAS Inc. has changed its name to SOTAS International Inc., reflecting the company's presence in the international accounting marketplace. International sales represent 35 percent of SOTAS sales. The company is represented in Canada, Europe, the Pacific Rim and Africa.

SOTAS "Accountable

Solutions" product line provides financial accounting software to users of HP 3000 and Wang VS systems. Its users have over 1,300 SOTAS applications installed worldwide.

Contact SOTAS, 192 Merrimack St., Haverhill, MA 01830; (508) 521-1300.

**Circle 379 on reader card**

## MCBA Chosen By 3M For Multisite Application

*HP 3000-Based Systems Implemented At Several Offices And Facilities*

**3**M signed an agreement with MCBA Referenced Reseller Quality Consultants Inc. to install MCBA CLASSIC Software for HP 3000 computers at various plants, sales offices and distribution facilities.

Under the agreement, 3M will use MCBA CLASSIC Accounts Payable as a draft-generated system, permitting each site to administer its "working fund account,"

generate payments and transfer financial data to the corporate mainframe.

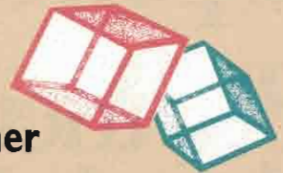
The MCBA CLASSIC Software will be installed and modified by Quality Consultants Inc. (QCI). The system will be tested at three pilot sites initially, then installed at sites that are using HP 3000 computers.

Contact MCBA, 425 West Broadway, Glendale, CA 91204-1269; (818) 242-9600.

**Circle 373 on reader card**

## Computer Graphics Vendors Join Together

*Set Performance Measurement Benchmarks*



**S**even companies have committed funds to develop software that will provide a standard method of measuring graphics performance for displays and workstations.

Companies supporting the Graphics Performance Characterization (GPC) project are Alliant, Apollo, Hewlett-Packard, IBM, Intergraph, Silicon Graphics and Tektronix.

The National Computer Graphics Association

(NCGA) is the GPC administrator that monitors project progress and provides information to the public. A beta implementation of the GPC software will be demonstrated at NCGA '89, the association's annual conference and exposition, April 17-20 in Philadelphia, PA.

Contact NCGA, 2722 Merrilee Dr., Suite 200, Fairfax, VA 22031; (703) 698-9600.

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## Hewlett-Packard Chooses Perwill's EDI/3000 Solution

*Will Provide Full EDI-GATEWAY Functionality*

**H**ewlett-Packard has chosen Perwill Inc.'s EDIFORM/3000 and EDIPARSE/3000 solutions for its corporate EDI-Gateway in Palo Alto, CA.

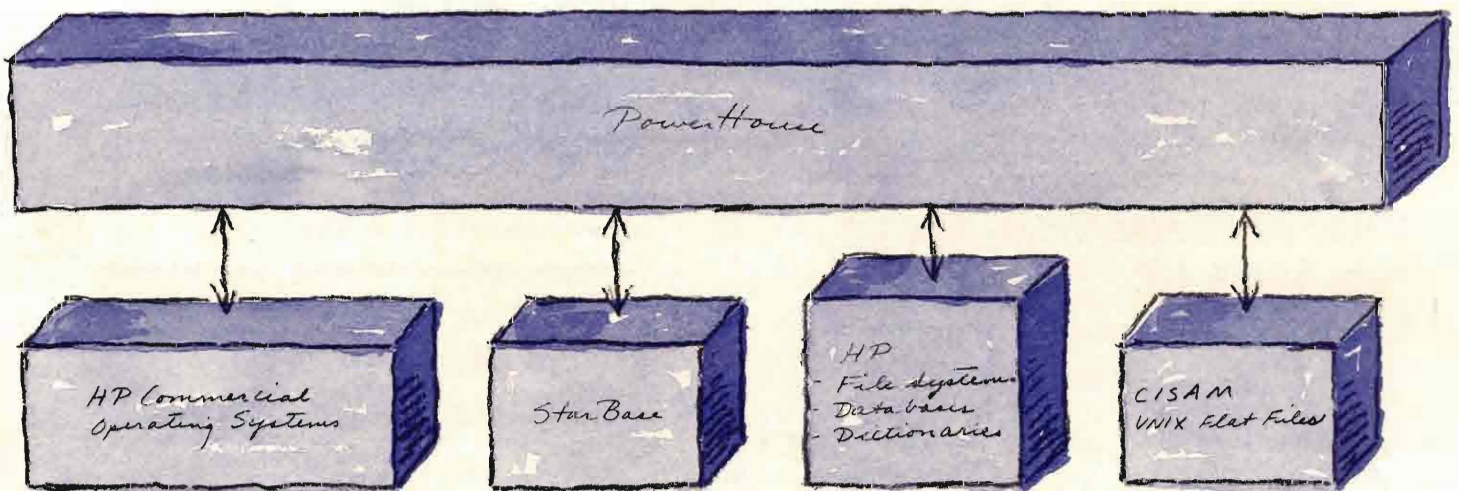
Perwill's EDI/3000 solution, which contains

EDIFORM/3000 and also EDIPARSE/3000 presents a single set of software that facilitates trading using ANSI X12 and EDIFACT standards.

Contact Ken Waters, Perwill Inc., 5053 La Mart Dr., Suite 101, Riverside, CA 92507; (714) 683-7920.

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# What you didn't know is that only PowerHouse integrates every HP commercial operating system, including HP-UX.<sup>®</sup>



When you implement the PowerHouse solution, you integrate your HP environment.

That, in a nutshell, is the strength of the PowerHouse solution.

Unlike common database approaches, which chain you to a captive environment, the PowerHouse solution acknowledges a simple, salient *business* fact: you've spent time and money getting to where you are today. Far from expecting you to abandon your current applications, as common 3rd party databases do, our solution preserves and enhances the investment you've already made in HP hardware and software.

The PowerHouse solution also acknowledges a simple, salient *computing* fact: environments today are as likely as not to be a mixture of different hardware platforms, oper-

ating systems, databases, even data sites. The beauty of PowerHouse is that it works with and, even more importantly, *helps you integrate* the disparate elements that make up your computing world.

With the PowerHouse solution, you get powerful 4GL development tools with links to CASE products, spreadsheet programs and PC LANs.

You get flexible database options—options that bring cohesiveness and enhanced performance to the most popular HP databases and all HP dictionaries. You get full support for all of HP's commercial platforms, including MPE V<sup>®</sup>—which other, so-called "complete" solutions ignore.

Perhaps most interesting of all, PowerHouse StarBase<sup>™</sup>, our new

RDBMS, will soon support HP's Precision Architecture Systems. Creating a distributed data management environment that offers you unparalleled performance, flexibility and freedom.

No wonder PowerHouse is the 4GL HP recommends most for internal MIS use.

Now that you know all this about PowerHouse, the only thing that remains for us to tell you is the number at which we can be reached. It's 1-800-426-4667. For seminar information, 1-800-548-6750.\*

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\*In Canada, call 1-800-267-2777. In Europe, call +44 344 486668.  
Cognos Corporation, 12 Corporate Place, 1-95, Peabody, MA 01960. Cognos Incorporated, 3775 Riverside Drive, P.O. Box 9707, Ottawa, Ont. Canada, K1G 5Z4.  
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CIRCLE 193 ON READER CARD

## Decision Data Signs \$20 Million OEM Agreement

*Part Of HP's Peripherals OEM Program*

**H**ewlett-Packard announced a \$20 million OEM agreement under which Decision Data Inc. (DDI) will purchase newly developed HP terminals compatible with IBM System 3X and AS/400 computers.

The new terminals will be resold by Decision Data Computer Corp. a subsidiary of DDI.

The OEM terminals were developed jointly by HP and DDI and are being manufactured at HP's

automated facility in Roseville, CA.

The terminals will be used in System/3X and AS/400 business applications, such as departmental computing, data processing for small businesses, payroll and inventory control.

The contract is part of HP's recently established Peripherals OEM Program, which provides products to high-volume manufacturers of computer systems.

## Naval Air Development Center Buys Seven HP Workstations

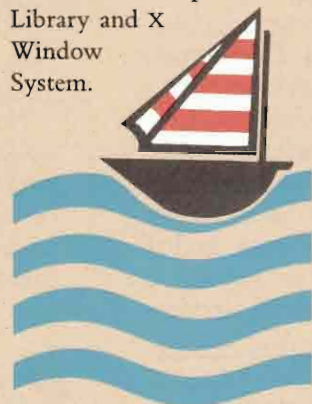
*Selects HP 9000 Series 835 Systems  
For Oceanographic Mapping System*

**H**ewlett-Packard announced the receipt of a \$1 million order from the Naval Air Development Center (Warminster, PA) for seven HP 9000 Model 835 graphics workstation to be used by NADC for the ISPADS (Integrated Survey Processing and Display System) contract. The system assists in sophisticated oceanographic mapping.

The HP 9000 computers process input data and execute elaborate modeling programs for real-time display of ocean-floor bathymetry. The data input will come from a variety of sonar and navigation systems connected to the computer

via a shipboard local area network.

The HP 9000 systems on order are based on HP's RISC architecture. They include seven HP 9000 Model 835 TurboSRX computers with floating-point coprocessor, 16 MB of RAM, a six-channel multiplexer, a 16-user license, the Starbase Graphics Library and X Window System.



## Arvey Paper & Office Products Invests \$5 Million For Automation

*Buys ADI And HP Software, Hardware*

**A**rvey Paper & Office Products, a division of International Paper, has purchased nearly \$5 million worth of American Data Industries (ADI) retail-management software and HP minicomputers and PCs to automate its superstore nationwide.

In addition, Arvey will receive more than \$1 million in customized software services and training specifically designed for the office product and printing supplies market. The software will operate on 24 HP 3000 minicomputer and 125 HP Vectra PCs.

ADI enhances the HP Vectra PCs by adding bar-code scanner, magnetic-strip readers, cash drawers and invoice printers.

The PCs will feed point-of-sale informational directly to 23 HP 3000 minicomputers located at Arvey's stores. Information for these remote systems will be exchanged with an HP 3000 Model 70 located at Arvey's corporate headquarters in Chicago.

## Five Major Hospital Centers Utilize Hospital Information Systems

*Systems Based On HP 9000 Series 300*

**H**ewlett-Packard and Infostat Inc. (Dallas, TX) signed contracts with five major hospital centers for integrated hospital information management systems valued at approximately \$4 million.

Included is a single order from Sacred Heart Corp. (Denver, CO) for \$1.4 million.

The other orders are from the Southern Oregon Medical Center (Grants Pass, OR), Grady Memorial Hospital (Chickasha, OK), Davies County Hospital (Washington, IN) and Madera Community Hospi-

tal (Madera, CA).

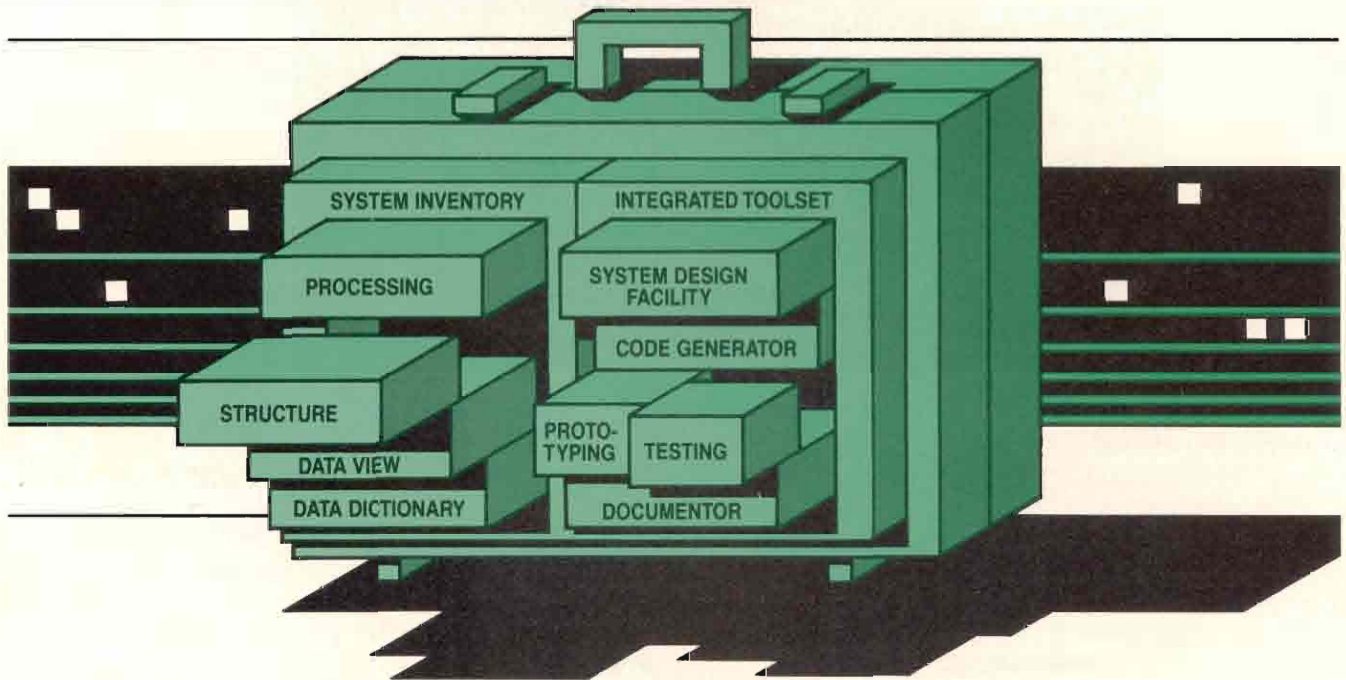
All systems are based on the HP 9000 Series 800 family of computers running the HP-UX operating system.

The Infostat Hospital Information and Control System (HICS), a fully integrated fourth-generation system, will be used for admission/discharge/transfer, patient accounting, medical records, utilization review, order entry/result reporting, pharmacy, accounts payable, payroll, human resources, general ledger, cost accounting and electronic claims. The system was installed on HP 9000 Models 850S and 825S computer systems.

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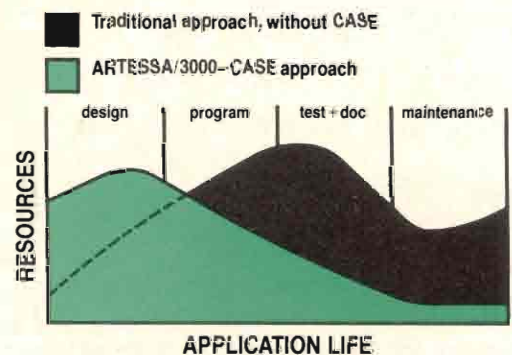
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Canada  
**COA Computer Systems, Inc.**  
(416) 333-0611

Belgium  
**NV RAET (Belgium) SA**  
(02) 720-9060

South East  
**Quality Consultants, Inc.**  
(404) 980-1988

South West  
**Information Systems Professionals, Inc.**  
(714) 778-1818

Australia  
**Field Technologies Pty. Ltd.**  
(03) 417-5661

UK  
**Assyst Computer Services Ltd.**  
(0525) 38 26 26

## HP 9000 Series 800 Systems Receive X/Open Certification

*HP First To Announce Compliance With The X/Open Standard*

**H**ewlett-Packard announced that all 11 HP 9000 Series 800 computer models have received the X/Open brand and certification.

HP is among the first computer manufacturers to announce compliance with the X/Open standard.

X/Open branding assures software-application portability for UNIX systems. X/Open is an internal consortium of 19 open-systems companies developing the Common Applications Environment.

X/Open created the verification and branding program to provide computer and application-

software vendors with a means of assuring users that products claiming X/Open compliance meet the specification outlined in the X/Open Portability Guide. Systems and software applications fully compliant and displaying X/Open brands require only basic recompilation of the applications to achieve portability.

HP 9000 Series 800 computers are based on HP Precision Architecture (HP-PA) and run on the HP-UX operating system. The family includes five high-performance single-user workstation models and six multiuser UNIX-system models.

## Mitek Products Now Called OpenConnect

*OpenConnect Server Model M2030-256 Increases Processor Performance*

**M**itek Systems Corp. announced that its products now are available under the new name OpenConnect. Mitek's latest introduction to the OpenConnect product line is the OpenConnect Server Model M2030-256.

The M2030-256 supports 256 sessions and features

increased processor performance.

OpenConnect products provide bi-directional communication between IBM hosts and systems like VAX, AT&T, HP, IBM PC's, Apollo, Sun, Tektronix workstations and others.

Contact Mitek Systems, 2033 Chenault Dr., Suite 100, Carrollton, TX 75006; (214) 490-4090.

**Circle 370 on reader card**

## IISI Contracted By Tupperware International

*Works Closely With Cardinal Data Corps*

**I**nnovative Information Systems Inc. (IISI) has been contracted by Tupperware International to customize and implement Cardinal Data Corps financial and distribution packages and add electronic data interchange capabilities between Cardinal modules and remote sites. IISI is a full-service systems consulting firm specializing in the HP 3000 systems including Spectrum and its associated third-party products.

Contact Innovative Information Systems Inc., 63 Nahatan St., Norwood, MA 02062 (617) 769-7511.

**Circle 372 on reader card**

## Access Technology Offers New Spreadsheet Software

*20/20 Available For HP 3000, 9000/800 Series Minicomputers*

**A**ccess Technology, Inc., developer of 20/20, an integrated spreadsheet software package for multiuser computers, announced that it has entered a new market with the availability of 20/20 for Hewlett-Packard's 3000 and 9000/800 Series of minicomputers.

20/20 offers advanced spreadsheet, graphics, data management and consolidation facilities. 20/20 has an easy-to-use English word command menu interface, on-line context sensitive help and tutorials, a conversion facility that allows 20/20 to import and export Lotus 1-2-3 files, and more than 60 functions for cable look up, regression analysis and statistical and string manipulation.

20/20 offers many

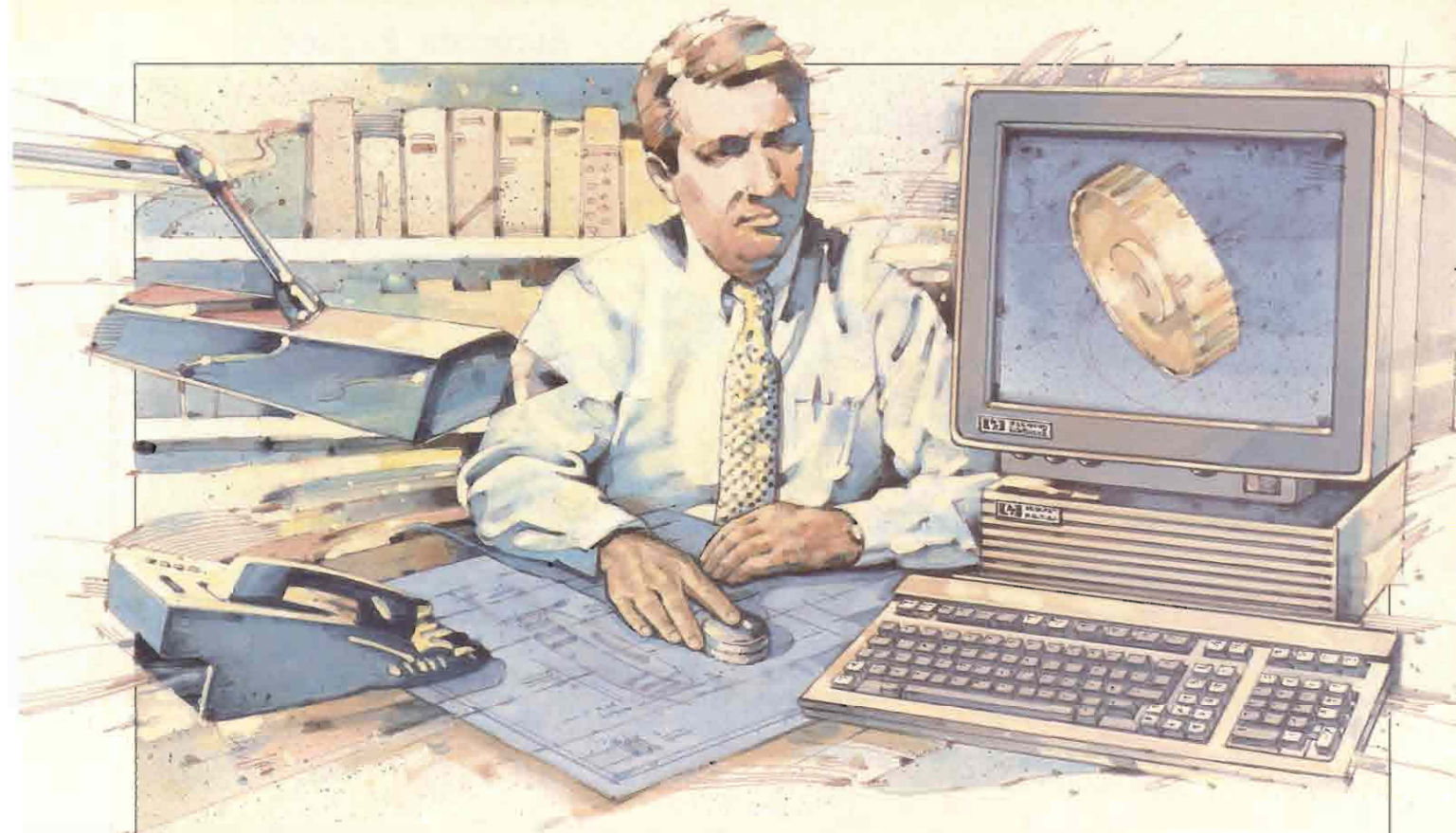
features including graphics support for HP graphics terminals, print report facilities and model password protection and more.

20/20 Release 2.2 is available immediately for HP 3000 users at prices ranging from \$2,800 for the Micro LX to \$12,800 for the 3000/950. For 9000/800 users, prices range from \$1,800 for the 9000/825 to \$6,800 for the 9000/850.

Contact Access Technology Inc., Two Natick Executive Park, Natick, MA 01760; (508) 655-9191.

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# HP 330/350/370 Users. Imagine Spending Less For More Memory!

If you have (or are considering buying) an HP Model 330, 350 or 370 computer, don't do another thing until you talk to Infotek! Chances are you're going to need more memory to run UNIX or memory-intensive applications like CAD and graphics. So, why spend more than you have to? And why get a short warranty when you can have a full two years?

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gives you an economical way to bring your computer to maximum memory capacity. Select:

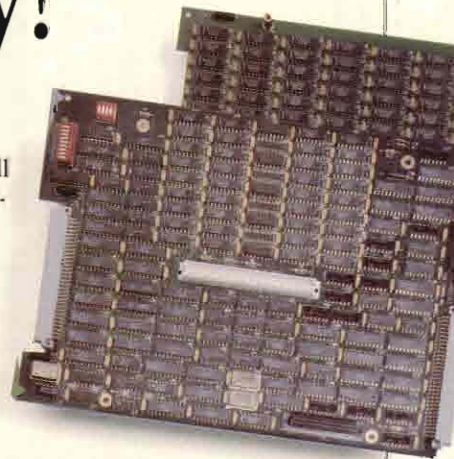
- EM 300: 4MB RAM controller board
  - EM 300 + 4: 4MB add-on board
  - EM 300 + 12: 12MB add-on board
- all at substantial savings.

Infotek is the world leader in enhancement products for HP workstations. We're known for the same kind of quality

you expect from your computer—so you can buy with confidence. Call today to order your additional memory—for less from Infotek.

(800) 227-0218. Or in California (800) 523-1682.

Infotek Systems, 1045 S. East Street, Anaheim, California 92815, (714) 956-9300, TELEX 678870, FAX: (714) 758-0289.



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SYSTEMS**

## Pantechnic Distributes COMPUMED

*Automated Medical Billing System Operates On HP 3000*

**P**antechnic Inc. announced its distribution of COMPUMED, an automated medical billing system for the HP 3000.

COMPUMED features both electronic claims transmission and electronic payment posting, eliminating paperwork on all assigned claims. The system enables doctors and administrators to obtain control over a clinic's funds by on-line capture of all charge and payment information. Detailed service analysis reports provide a means for increasing doctor efficiency. When COMPUMED is in-

tegrated with TEXTPRO, Pantechnic's word processing system, collection letters and service reminders are automatically generated, helping to increase clinic revenues.

COMPUMED also provides fully-integrated accounting systems for clinics. COMPUMED runs on all models of the HP 3000 and uses the HP700/92 as a workstation.

Contact Pantechnic Inc., 89 Mountain Valley Rd., Oakland, CA 94605; (415) 451-2381.

**Circle 371 on reader card**

## HP And DISC Sign Corporate License Agreement For OMNIDEX

*Gives All HP Sites Ability To Use OMNIDEX To Index Information*

**D**ynamic Information Systems Corp. and Hewlett-Packard have signed an agreement granting HP a corporate license for the internal use of DISC's OMNIDEX Information Management System software.

For the past several years, OMNIDEX has been the basis for HP's Response Center information system. This agreement gives all HP sites the ability to use OMNIDEX to index information for fast and flexible retrieval.

Included in the agreement is the entire OMNIDEX IMS product line consisting of OMNIDEX (multiple field, set and keyboard retrieval), IMSAM (sorted sequential access), OMNIQUIZ (direct interface between OMNIDEX and QUIZ from Cognos Corp.) and OMNIVIEW (Lotus 1-2-3- and add-in giving direct access to IMAGE databases from within the spreadsheet).

Contact Janet Eden-Harris, DISC, 910 Fifteenth St., Suite 610, Denver, CO 80202; (303) 893-0335.

**Circle 377 on reader card**

## Eurodata Expands Maintenance Services

*Offers 30-Percent Discount*

**E**urodata Inc. (Ottawa, Canada) recently announced the expansion of its hardware maintenance services to include Toronto and the surrounding area.

Eurodata Support Services offer maintenance on the complete line of Hewlett-Packard computer systems, peripherals, workstations and terminals, from offices in Ottawa, Montreal and now, Toronto.

Local parts and personnel allow Eurodata to provide contractual coverage including four-hour and next-day response, bench repair and time and materials services.

Contact Eurodata Inc., 2574 Sheffield Rd., Ottawa, Ontario Canada, K1B 3V7; (613) 745-0921.

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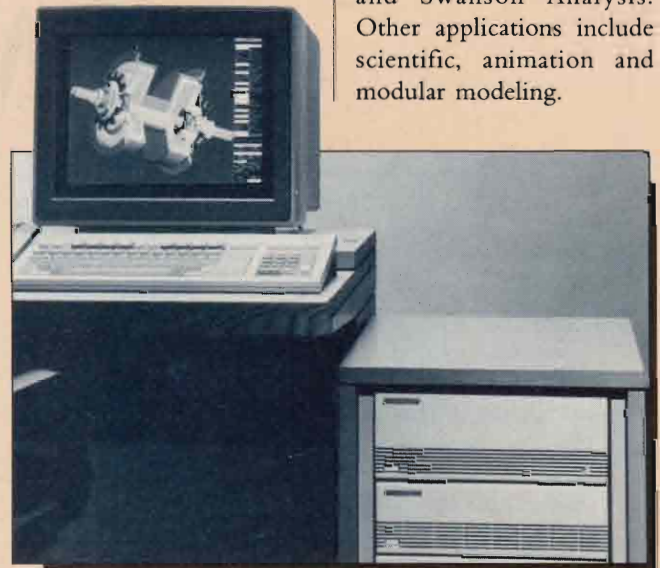
## HP Introduces New 3D Graphics Workstation

*Entry-Level Workstation Under \$15,000*

**H**ewlett-Packard has introduced an entry-level 3D-graphics workstation. At a U.S. list price of \$14,900, the Model 340SRX delivers all the benefits of HP's high-performance SRX graphics architecture. The new model 340SRX is source- and

object-code compatible with the existing HP 9000 Series 300 computers.

A broad range of 3D mechanical CAE and mechanical CAD applications is available from such vendors as SDRC, McDonnell Douglas, PDA Engineering and Swanson Analysis. Other applications include scientific, animation and modular modeling.



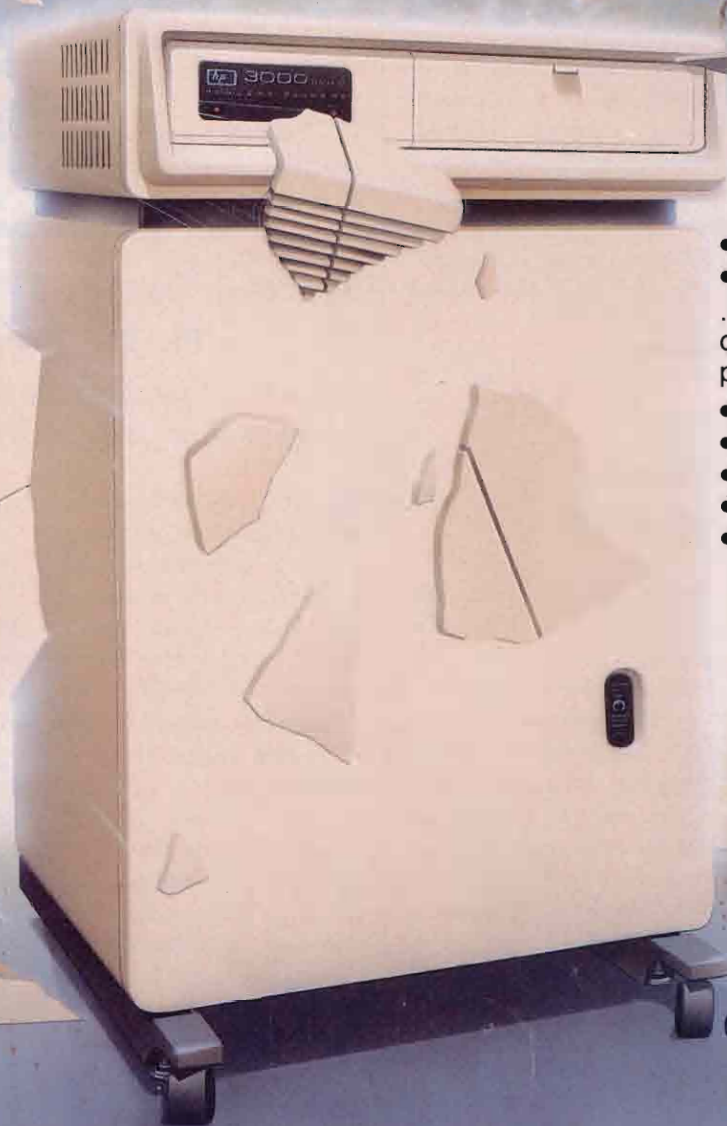
*The HP 9000 Model 340SRX from HP handles 3D mechanical CAE/CAD tasks.*



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## Bell-Northern Research Awards HP \$11.5 Million Contract

*Will Supply HP 9000  
Engineering Workstations*

**H**P (Canada) Ltd. was awarded a \$11.5 million contract to supply a minimum of 500 HP engineering workstations to Bell-Northern Research (BNR), Ottawa.

The contract includes HP 9000 Model 360MH engineering workstations, peripherals, software, file servers, network components, training and installation.

BNR is making the investment to accelerate soft-

ware development for product design of switching systems for Northern Telecom. The contract enables BNR to move its computer-aided software engineering (CASE) applications from mainframe computers to distribute HP workstations using standard telephone wiring for high-speed data communications.

Initial orders cover 360 systems for use in Canada, the U.S. and the United Kingdom.

## Relational Technology Forges Marketing Alliances

*Strengthens Relationship With HP*

**R**elational Technology Inc. strengthened its program of strategic alliances by forging a two-prong relationship with HP.

Relational's INGRES relational database management system (RDBMS) has been selected by HP as one of the third-party software packages being offered under the HP loaner program. At the same time, it was announced that Relational Technology was named an HP national account and INGRES would be supported by HP's sales and marketing staffs.

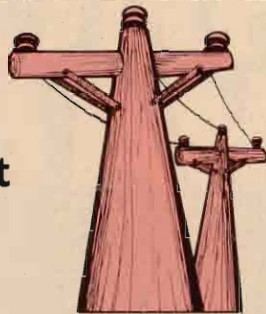
Under the program, prospective UNIX customers

receive HP 9000 Series 800 Precision Architecture midrange computer for evaluation for one year.

The agreement is part of HP's Solutions Marketing Program. Under the program, HP will dedicate fulltime sales and marketing staff to sell INGRES software and tools to HP customers with a requirement for a relational database solution. The full line of INGRES products is covered under the agreement.

Contact Relational Technology Inc., 1080 Marina Village Pkwy., Alameda, CA 94501; (800) 4-INGRES.

**Circle 374 on reader card**



## CCC Becomes New VAR Of HP PCs

*Combines FutureSource Technical  
Software With HP Vectra QS/16 PC*

**C**ommodities Communications Corp. (CCC), the developer of a technical-analysis trading tool, has been named a HP value-added reseller (VAR).

CCC will add its software, FutureSource Technical, to HP Vectra QS/16 PCs before offering the package to traders, brokers and market analysts.

The combined system of FutureSource Technical and HP Vectra PCs supplies

the power needed to run hundreds of studies dealing with futures contracts, foreign exchanges and options in real-time, plus the speed required to receive technical signals quickly and clearly.

FutureSource Technical requires a minimum PC configuration of an HP Vectra QS/16 PC with 2-MB of random-access memory, a 40-MB hard disc drive and a video graphics adapter.

## Sunrider Spends \$3 Million On Q-CIM, HP Products

*Purchases Process Manufacturing  
Software And HP-PA Minicomputers*

**S**unrider International, a manufacturer of food and herbal-care products, has purchased process manufacturing software from Q-CIM Development Laboratories and HP Precision Architecture (HP-PA) minicomputers valued at more than \$3 million.

The software, Q-CIM, which runs on HP 3000 minicomputers offers such features as quality-controlled shipments, total-lot traceability, shipments that help eliminate buy-backs, yield accountability in materials-requirement planning and formula-based bills of materials.

Q-CIM also incorporates financial applications from Collier-Jackson, in-

cluding modules for accounts receivable and general ledger.

This month an HP 3000 Model 950 will be installed in the Torrance, CA plant. Later this year, Sunrider distribution plants in the Far East including Bangkok, Taipei, Hong Kong and Kawasaki, Japan will receive HP 3000 Model 925 minicomputers.

**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.

# What's The Last Thing That Comes To Mind When We Say Spreadsheet?

Mention "spreadsheet" to a lot of people, and you can see the wheels turn a total of once. For them, spreadsheet equals PC.

Pity. For as many of you will soon discover, the HP™ 3000 running MPE is an *ideal* spreadsheet platform. Especially when the spreadsheet is 20/20™

Developed by the leading supplier of spreadsheets for multi-user computers, 20/20 is 1-2-3™-like in the way you use it. But it's more useful.

With 20/20, you and your people can create and share models of virtually unlimited size. 20/20 supports HP graphic devices, and integrates tightly with other applications. It also supports PC's as terminals and runs under MS-DOS and UNIX™

So you can create a budget on the 3000 and distribute it to department managers running PC's to do their projections. Then the whole thing can be consolidated into a corporate-wide forecast on the 3000.

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## SIGSTAT, New Graphics And Statistics Software

Significant Statistics has announced that its graphics and statistics software (SIGSTAT) for HP MS-DOS systems now runs on the HP 9000 Series 200, 300 and 800 systems under the HP-UX operating system.

SIGSTAT's easy-to-use graphics are based on the New S Package developed at AT&T Bell Labs. Simple to complex custom graphics are produced for a wide variety of graphic devices. Also, New S allows the addition of new functions and graphic device drivers through its high-level, expression-based language.

SIGSTAT'S statistics are an extension of the BMD package developed originally at UCLA. The 100 plus programs include univariate and multivariate analysis of variance and covariance; regression, cluster, discriminant and factor analysis; time series and more.

Significant Statistics also provides professional statistical consulting across a broad range of applications by members of the American Statistical Association. Individual projects as well as long-range planning are included.

SIGSTAT's graphics and statistics modules are available under HP-UX for a one-time purchase price of \$2,000 separately, or \$3,000 together. Source code for the statistics module is an additional \$1,000. Contact Significant Statistics, 3336 North Canyon Rd., Provo, UT 84604; (801) 377-4860.

Circle 399 on reader card

## Security Station Provides Micro Security

Data-MATE Inc. has introduced Security Station, designed to double as a space-saving workstation and physical security storage for microcomputers and printers.

Security Station is large enough to accommodate the largest personal computers

such as the Zenith 248, the Wang PC and virtually any other computer available. A doorlock system utilizing a hasp design accepts a GSA-approved three-position-combination padlock, meeting Department of Defense requirements for the physical security of secret data stored on non-removable hard discs.

Contact Bill Housh, Data-MATE Inc., P.O. Box 408, Nashua, NH 03061-0408; (603) 882-5142.

Circle 400 on reader card

## GPS CUSTOM Software Redefines 'User-Friendly'

GPS CUSTOM Software Co. has introduced a fifth generation custom program, which defines "user-friendly."

GPS has made available a software package that requires no programming code. The software package, GPS CUSTOM, allows you to develop application software from application level.

The system uses a windowing technique

and an easy-to-use visual interface. The need to write programming code has been eliminated. GPS CUSTOM provides the ability to build and maintain a complete system that includes a relational database, a full-function word processor, a comprehensive report generator, necessary printing management routines to generate documents and reports and an application creator.

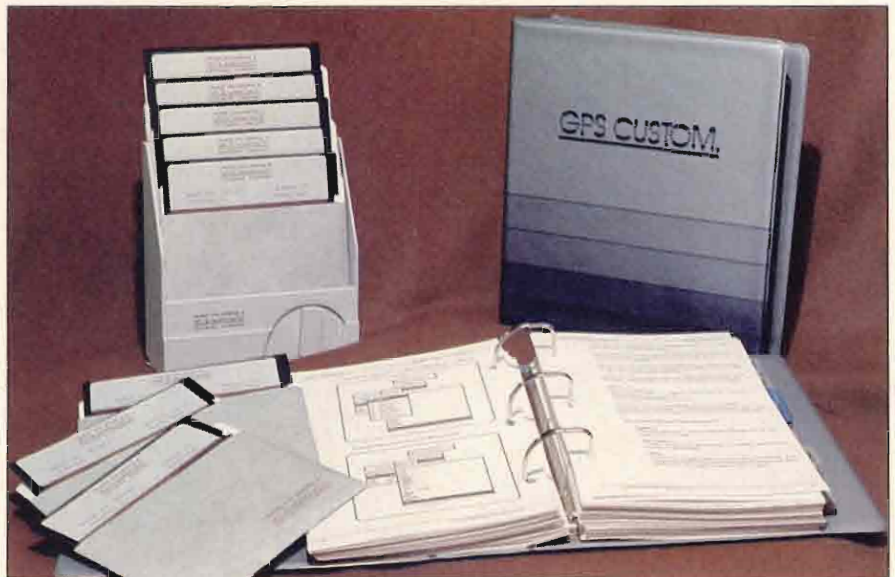
The system also includes SQL interfaces, a modular framework, a multilevel data security system and an auditing system.

For more information contact Dennis Lopez, GPS CUSTOM Software Co., 2700 N.E. Loop 410, Suite 440, San Antonio, TX 78217; (512) 590-0743.

Circle 398 on reader card

## HP Introduces New Interpreter Software

Hewlett-Packard has announced a new software package for the HP 4972A local-area-network (LAN) protocol analyzer. The software package decodes the U.S. Department



*GPS CUSTOM requires no programming code.*

of Defense's transmission-control protocol and internet protocol (TCP-IP).

The HP 18221A TCP/IP protocol interpreter will help network managers understand the operation of IEEE 802.3/Ethernet networks that have TCP/IP traffic.

LAN managers are able to analyze the network's protocol operation by capturing and displaying data in a decoded format for troubleshooting and network tuning. For inter-vendor LAN environments, this analyzer can decode the TCP/IP protocol information in a mnemonic display.

## ATI's LC-6026 Provides Increased Throughput

A 26-page-per-minute (ppm) laser printer that increases throughput of complex text and graphics by up to 350 percent over comparable printers, allowing them to run at the true rated speed, has been introduced by Advanced Technologies International.

The LC-6026 incorporates ATI's recently introduced LC-6000 controller. It can generate text at the 26 ppm ideal, and complex graphics can be generated.

The product is designed for high-volume users in such fields as law, insurance, finance, CAD/CAM or aerospace. Output is 300 x 300 dpi.

The product is available for \$24,900. Contact John Goetz, Advanced Technologies International Inc., 355 Sinclair-Frontage Rd., Milpitas, CA 95035; (408) 942-1780.

Circle 397 on reader card

## Transfer Spoolfiles With SPOOL 9000

Holland House has announced a new spooling product for the HP 9000 Series. SPOOL 9000 transfers spoolfiles between the HP 9000 and the HP 3000 machines. Spoolfile transfer is bi-directional so that spoolfiles can be sent to or received from the HP 3000. This product works in conjunction with Holland House's product UNISPOOL that runs on the HP 3000.

For more information contact Joe Copeland, Holland House, Box 1749, Beeville, TX 78102; (512) 287-3417.

Circle 394 on reader card

## DTS Announces New Font Manager

DTS announced the introduction of OUTLINE, a new German-designed font manager. Although it's primarily aimed at the



ATI has introduced the LC-6026, a high-speed laser printer.

many users of HP printers, it can be used with any other printer that has an HP emulation.

OUTLINE works with all major desktop publishing systems such as Word, PageMaker, WordPerfect and Ventura, and supports all softfonts currently available for the HP LaserJet. It also allows you to modify fonts in hundreds of different ways.

OUTLINE retails for \$495. The price includes the standard proportional fonts, Tmsrn and Helv, available from HP as well as a Symbol font. A manual is also included. Contact Digital Type Systems Ltd., 38 Profile Circle, Nashua, NH 03063; (603) 880-7541.

Circle 396 on reader card

## Terminal Emulation For X Windows

Optimization Inc. has announced its new line of terminal emulators for X Windows under HP-UX for the HP 300 Series workstations. These new emulators provide both text and graphics emulation for DEC, HP and Tektronix terminals while running in the new industry-standard X Windows.

These emulators meet the growing requirement of workstation users to be application-level compatible with a variety of remote hosts, such as VAX, HP 3000, IBM and others.

Optimization's emulators support LAN and RS-232 phone line communications. They also include file transfer between the workstation and the remote host, a built-in line analyzer and hardcopy output. All HP 300 models are supported, including the new Turbo SRX and the Model 340.

The terminals emulated for HP are the HP 2392 with block and format modes and the HP 2397 with HP's color graphics system; for DEC, the VT 220 with special fonts and downloadable function keys, and

the VT 241 with DEC's color ReGIS graphics; for Tektronix, the 4010 and 4014 with the capability of doing PLOT10 graphics. For further information contact Optimization Inc., 2510 Middlefield Rd., Redwood City, CA 94063; (415) 365-9880.

Circle 393 on reader card

## MicroPlot 55A Series Offers More Memory

Intelligent Interfaces has introduced MicroPlot 55A Series Buffers that will store data produced from any IBM PC, compatible or other RS-232 serial interface system and transfer it for processing by plotters, printers or any other output peripheral. The MicroPlot Series is capable of operating in the HP mode protocol, allowing Hewlett-Packard to be individually configured.

The new models available feature data transfer speeds greater than 100 KBps and expandable buffer memory to eight MBs.

Intelligent Interfaces offer a minimum one-year warranty and a 30-day money-back guarantee.

For more information contact Robert Jarvis, Intelligent Interfaces Inc., P.O. Box 1486, Stone Mountain, GA 30086-1486; (404) 381-9891 or (800) 842-0888.

Circle 387 on reader card

## HP Enhances MRP II Package

Hewlett-Packard has released a version of HP Manufacturing Management II (MM II) software for manufacturing-requirements planning (MRP II) applications.

The expanded functionality of the advanced version of HP Materials Management module addresses the needs of process and repetitive manufacturers who purchase HP MM II.

HP Materials Management, the founda-

tion module of the HP MM II, will be sold as HP Materials Management/Advanced Version, which is enhanced for process- and repetitive-manufacturing environments. It includes the following new functions: backflush for recording the consumption of raw materials and the manufacture of products; alternate parts to indicate the use of alternate recipes or components and to indicate when alternate products were produced; by-products for planning production and recording use; and selective MRP for anticipating the impact of changes to orders or requirements.

**QuickSpec Broadens Use Of PCs**

Meta Systems has announced QuickSpec, a PC/Windows CASE tool for accessing and controlling an object-oriented Repository.

QuickSpec allows systems analysts and designers user their PCs to enter, edit and review project information and specifications in an object-oriented CASE repository.

Information from all phases of the

systems development life cycle, from requirements through maintenance, can be represented in this one Repository. The Repository uses a representational model that is broader than that being proposed under IRDS.

QuickSpec's Repository can maintain information from different methodologies and diagram types. It's capable of integrating information from the most popular graphic-oriented tools.

Quick-Spec enforced an organization's own methodology by tailoring the objects in the Repository and by maintaining Repository integrity.

Meta systems offers compatible Repositories at all levels for the individual analyst, for the system component group and for the project as a whole. QuickSpec provides import/export links to Meta Systems host-based CASE tool PSL/PSA. Individuals or groups can work with their own portions of the project-wide PSL/PSA Repository. PSL/PSA runs on many host environments, including Digital VAX/VMS, IBM VM/CMS and IBM MVS/TSO.

QuickSpec is priced at \$3,500. Contact Meta Systems, 315 East Eisenhower Parkway, Suite 200, Ann Arbor, MI 48108; (313) 663-6027.

Circle 385 on reader card

**Instructional Video Tape From Personalized Software**

Personalized Software (Fairfield, IA) has announced a five-hour set of three VHS video tapes demonstrating all the fundamentals of using the Hewlett-Packard 110 Portable and Portable Plus computers.

The instruction goes through every procedure necessary to use the HP Portables including some tips that are not covered in the user manual.

The price for the three tapes is \$150. For more information contact Personalized Software, P.O. Box 869, Fairfield, IA 52556; (515) 472-6330.

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Continued on page 84

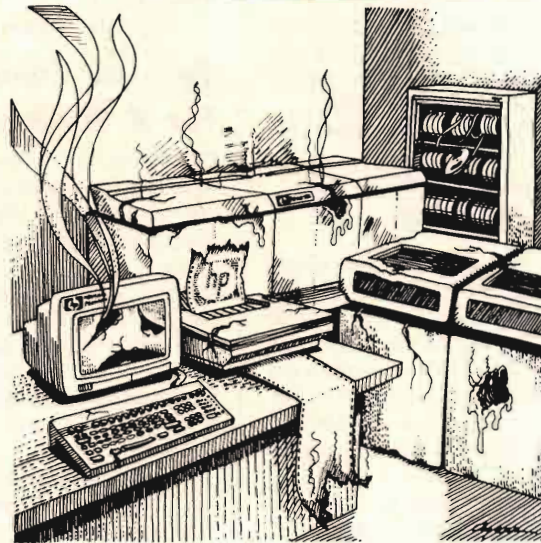
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Not bad! But what makes this feature like magic is the way Reflection continues to execute

commands, perform file transfers, and monitor the host session, even while it's in background. Improve your productivity by getting two things done at once.

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including Novell and even Digital's LAT.

Reflection has set the standard against which all others are measured. Over 250,000 users worldwide enjoy the advanced features and superior support they get when they choose Reflection.

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more reasons to trade-up to Reflection **today!** This trade-up offer is available from Walker Richer & Quinn and authorized dealers in Canada, Europe and Australia. For more information call Darcie Brintnall at (800) 872-2829 or (206) 324-0350.

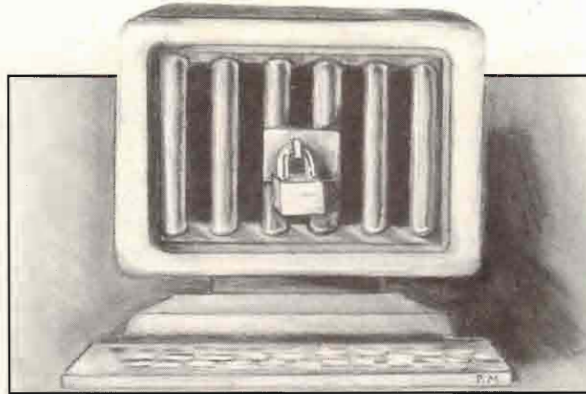
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**CIRCLE 142 ON READER CARD**

*Is MPE Security Adequate?*

# Protecting Your Data

[By David L. Stanton]

**R**ecently, MIS directors have increased efforts toward preventing computer security violations. In an age of network interfaces, CRTs and PCs have become an integral part of the daily operations of business and industry. The increased utilization of computers brings with it a need for improved access controls, protection of data and the prevention of system resource corruption.

Fortunately, most HP 3000 sites can establish security procedures utilizing existing MPE security features that provide some degree of protection. Surprisingly, many sites utilize the standard MPE features inappropriately, or in many cases, not at all.

Should you consider supplementary hardware/software security products? In order to make this determination, you should review your existing MPE security capabilities, coupled with an analysis of your specific site requirements to determine if additional security is warranted.

Where do most breaches of security occur? Studies indicate that most losses attributed to computer crime occur from within. A recent poll conducted by Ernst & Whinney (New York, NY) found that out of 390 companies interviewed, one-third reported some financial loss during the past two years. Out of those companies reporting losses, 22 percent said a breach of computer security had occurred. Further, 11 percent of those companies claimed losses of \$50,000 to \$1 million, and 18 percent reported losses less than \$50,000.

Computer-related audits have become policy within many corporations.

Establishing and maintaining defined security standards have become required functions of system managers. Clearly, site management can be held accountable for user violations resulting from inadequate or nonexistent security procedures.

However, overreaction to computer security problems

Passwords supplied with  
 third-party software  
 systems or those left  
 on the system by HP  
 personnel should be changed.

also can be costly. Recently, I visited a shop that implements and operates applications with a large number of users, but lacks a good and complete system security plan. A new project was planned to provide an application on a dial-in network that included the setup of a dedicated computer system, despite the fact that the existing system's capacity was fully capable of handling the increased processing load. The reason for the added computer was *solely* to prevent security violations. This plan was implemented because the shop lacked knowledge of MPE security and lacked confidence in the existing in-house security applications.

**E**VERY COMPANY'S SECURITY requirement is unique. Before defining a security plan, thoroughly review and analyze your company's specific security requirements. First, examine variables such as access methods, classes of data and the scope and nature of the user population. In addition, you should fully understand the MPE security features in order to utilize those features that provide appropriate protection.

If all security features are used indiscriminately without considering site needs, unnecessary barriers to convenient system use probably will result. For example, assigning passwords at the account, user and group level for every user probably is unnecessary. Also, ordering a second system to isolate one class of users from another is unnecessary.

Security requirements will vary depending on the applications, mixture of applications, configuration, physical environment and users. However, there is a common thread of discipline with respect to security that can be followed at all HP 3000 installations. These techniques can help establish a basic level of security that can be appropriate even as a system grows in size and number of applications. Over time, the following procedures may be supplemented but will continue

to be useful for as long as MPE is not significantly changed.

There are four fundamental security categories:

- Log-on protection from unauthorized users
- Restricted access to data and functions
- Special capabilities management
- Protection of the operating system and its resources

Log-on protection is the most important and most often required security element. Locked computer rooms are becoming less prevalent with the advent of high-capacity systems able to operate in an office environment.

If you consider your site too small to require log-on protection, consider this: Can the data in your system be safely contained in an open file cabinet? If not, the use of password protection is strongly urged. Larger sites with a mixture of user classes, with each class accessing different applications containing sensitive data, or sites with dial-in lines to systems containing sensitive data, certainly should utilize log-on protection.

Often, adequate protection can be obtained with a set of passwords at the user and account levels, which are chosen with some care and changed periodically. Account-level passwords are mandatory. User passwords also are recommended and can be maintained by a responsible account manager for each account.

Site management could assign the account passwords and the various departments could assign their own user passwords. In this manner, responsibility for security is at the department level. The user often avoids such responsibility, and in these instances, site management should try to reinforce the importance of this task.

Passwords must be reviewed on a regular basis and changed periodically. If each user's password is unique, then a single account password name or a limited number of names could be assigned. Accounts with System Manager (SM) capability, however, should always have a unique password. Account passwords maintained by site management should be changed en masse if system-wide security has been broken. If evidence indicates that someone with SM capability has obtained information, then you must assume that he knows every account and user password on the system. When this occurs, changing all account passwords should be done quickly, when no jobs or sessions are active.

Never leave commonly known passwords on the system. Passwords supplied with third-party software systems or those left on the system by HP personnel should be changed.

Several years ago, a security breach occurred at a timesharing service bureau utilizing an HP 3000 with approximately 36 ports. A knowledgeable HP 3000 user gained access to the system by using a commonly known HP CE password which had been left on the SUPPORT account.

The user logged on (dial-in port) under SUPPORT and installed in PUB.SYS a "Trojan Horse," a program with a name similar to an existing MPE system program file. When

executed, the program entered Privileged Mode (PM) and set a bit in a normally write-protected area of memory, yielding SM capability. In this way, he gained important SM capabilities and was able to obtain system passwords.

As soon as the break-in was recognized (console messages were conveniently sent by the user declaring security had been broken), the password for the SUPPORT account was changed. But the next day, the user again logged on under another account and repeated the same procedure and obtained passwords. For several successive days, he logged on using passwords he obtained the previous day. Of course, his continued success depended on the existence of an account/user combination that did not have passwords changed since his previous session. Therefore, if system security is broken, be sure to change at least all the account-level passwords.

Dial-in lines must have the device TYPE and SUB-TYPE correctly designated and the correct modem option setup so that when a user "hangs up," an auto disconnect occurs to trigger a log-off sequence. A serious breach of security can occur if a user dials in and is connected to an existing session. Utilizing software that logs off idle ports is not a satisfactory solution to this problem because a timely review of idle sessions does not occur. Generally, the solution can be found through the correct selection of port/modem configuration options.

## Restricted Access

ONE OF THE BEST WAYS to provide user restrictions is through the use of a menu type of program invoked by a User Defined Command (UDC) with auto connect and NOBREAK. The FOS doesn't include a MENU program. However, Hewlett-Packard and several third parties offer a selection of these programs.

Incorporating this type of security feature contributes toward a user-friendly environment in addition to providing good protection. Even within sites utilizing menu type of systems there are certain users who don't utilize menus (programmers, analysts, operators, etc.). In these instances, a good security foundation to underlie and supplement the protection of menus should be achieved by carefully protecting critical data files, programs etc., from access by unauthorized users.

With or without a menu system, the following procedures should be followed:

- Apply lockwords to all dangerous programs with PM access.
- Install passwords on all databases.
- Secure all "released" files.
- Limit the use of QUERY. A user with knowledge of the D/B password usually has only one system utility that will allow access to the D/B, and that is QUERY.
- Review each account and its intended use. Often system-

wide access is not required and the account access matrix can be adjusted to restrict access to only groups within the account.

If you do not utilize a menu system to enforce restrictions, there is a variety of MPE security features that can provide protection. For example, if sensitive data is maintained in an IMAGE D/B, and the existence of the D/B password is known only to selected technical support personnel, then the password can be supplied by the applications programs at runtime. This prevents users from accessing the data except via their programs. Such programs can be designed to include the use of the "WHO" intrinsic and only be executed by certain "USERS" matching an entry in an internal table of valid users.

## Special Capabilities

OF ALL THE SPECIAL capabilities, none is more important than SM capability. Only one account and one user should have SM capability. The group containing the job files that run with SM capability should be password-protected and have read access by creator only and execute access to allow users to stream jobs, but not examine them. For example, the group SYSJOBS in account SYS could be established with a group password, not assigned as a default group to any user and ACC=(R,W,L,A:CR;X:AC). Such an arrangement will allow users logged on under the SYS account to "stream" jobs residing in the SYSJOB group, but not examine and determine passwords.

The SM account/user should have unique passwords known only to the system manager and perhaps one other person. Passwords can be kept in a sealed envelope and placed in a location known only to a few key people. If an emergency arises, passwords can be obtained.

Operators typically don't need to have SM capability, because they generally don't require access to sensitive data. Remember, execute access allows STREAM access. Operator (OP) capability should be made available with discretion, because this feature allows the performance of STORE/RESTORE functions.

Only those users who perform STORE/RESTORE functions should be issued OP capability. Also, unattended system consoles should be logged off. Such capability should not be readily available in an open office environment or in a computer room frequented by persons without a need for this capability.

## Resource Protection

NUMEROUS IMPORTANT SECURITY features are present as a direct result of the inherent design of the HP 3000. Password access protection, object reuse control, access protection and PM are several important security elements addressed in the HP 3000 design. Unlike many

other computer systems, the HP 3000 retains user authorization information, (passwords, usernames, capabilities, etc.) on disc in an area isolated from the "public" file directory and not accessible to the general user. Other systems tend to maintain this information as a file in the systems account.

Object Reuse is a term that describes the availability to a user of information, sometimes sensitive, that has been left over from a previous user in a blocking buffer, allocated but not yet written (by current user) sectors on disc, and data segments obtained at run-time. For files, the HP 3000 user can't, with standard capabilities, access allocated space in files beyond the "EOF" pointer. Some other computer systems apparently can permit access beyond the EOF pointer — a condition that has prompted highly secure government requirements to dictate that released disc space and blocking buffers be cleared after use (much system overhead can be devoted to this activity).

Separation of users from data can be accomplished by exclusion or inclusion. Exclusion by means of account/group access; i.e., all users outside the account containing the data are restricted to "read only" access; inclusion by means of a list of users authorized to access a data structure. This feature is not yet available on the HP 3000, but it can, to some extent, be affected by including a list of users in a program that at

run-time validates a user for access and then applies a password for access to a file or D/B.

Default file access at the account or group level should be limited to groups within the account only, not system-wide. Generally, the only system-wide access situations should be system libraries, and often only EXECUTE access is needed. Sometimes requirements may dictate that a group containing MPE data files be accessible to users outside an account. In this situation, assign a lockword/password and modify the applications to programmatically use the lockword/password.

For many HP 3000 sites, if standard MPE security features are utilized and reviewed on a regular basis, MPE can provide adequate security protection against unauthorized break-ins, data access violations, corruption of the operating system and related system resources. A few third-party software packages provide specific reports on MPE security utilization. For those sites requiring supplemental security features there are several third-party menu type of systems and password enhancement systems. For the most secure environments, a combination of all three techniques will be required. —David L. Stanton is president of Chestnut Data Systems, Philadelphia, PA.

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Examining Emergency Procedures Can Increase  
Productivity In Everyday Operations

# DISASTER RECOVERY OPTIONS

[ BY PEGGY KING ]

**E**ditor's Note: At the NevCal conference in Reno last fall, James Depp, vice-president of UP TIME, (Sacramento, CA) gave a presentation detailing the pros and cons of eight options for disaster recovery. Depp defines a data processing disaster as an interruption of processing that causes extensive or total loss to operating facilities. This article is based upon his presentation.

Most businesses are already in the practice of storing backup tapes offsite in order to protect their programming effort and vital data from being wiped out by unforeseen events or a disaster. Protecting investments in software and data through remote storage of backup tapes is the first step in disaster recovery. However, a recovery plan is not complete unless there is a system available on which to load these tapes.

Some options to recover operations require no outside service to provide backup. These options include returning to manual operations, owning a "redundant" or backup system at another location, or having a reciprocal agreement with another organization. Companies that require disaster recovery services pay an outside source for this service. Outside source options include hiring a service bureau to handle data processing needs until the system can be replaced or restored, using the vendor's facilities, contracting with a service that provides either off site or relocatable recovery facilities, or having a service provide an empty shell.

**A**T FIRST GLANCE IT MAY seem that returning to manual operations is the simplest and least expensive way to process data and provide services when the computer system is shut down. But in reality it's difficult or impossible to revert to manual methods. In order to return to manual operations a business must be small and have low-

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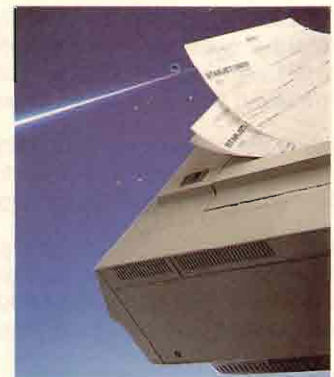
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volume transactions. In addition, there needs to be a core of employees who know how to replace computer operations with manual procedures. Most businesses that have had computerized operations for any length of time have procedures that are significantly different from a manual operation. Even if there are employees who understand how to implement up-to-date procedures manually, special provisions for hardcopy record keeping must be implemented. Although manual procedures can replace the data processing activities, there is no real substitute for the telecommunication capabilities provided by computers and networks.

Very few businesses can afford the loss of productivity they would suffer by operating without the data processing and telecommunications capabilities that a system offers.

Another low-cost alternative is for two businesses that have similar hardware configurations and who each have excess hardware capacity to enter into a legal agreement. This agreement would stipulate terms and conditions whereby both would share hardware in the event of a disaster.

This arrangement provides data processing capability at minimal expense, but reciprocal agreements become increasingly hard to maintain as the two businesses begin to grow

at different rates and acquire different hardware and software applications.

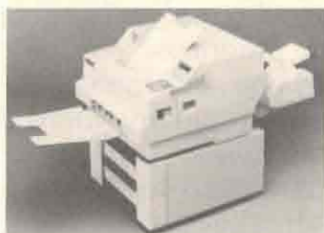
The parties involved in a reciprocal agreement must exchange information about what software applications they're using. If both businesses use any of the same software, members of the MIS department from each company need to decide upon unique file names to avoid conflicting directory entries and keep out of one another's files when the two companies are sharing a system. They also need to be sure they're using system resources in complementary ways.

Very few companies are able to continue a reciprocal agreement in the long run. In order to make these agreements work, the companies need to share their plans about acquiring new hardware and to renew which software operations are critical to their business. Many companies consider this confidential information.

Although it may seem most convenient to have a reciprocal agreement with a company in the same geographical area, such an arrangement increases the likelihood that both companies would be affected by the same disaster in a local area.

Another problem with sharing resources is that the two companies may need to process payroll or do other critical

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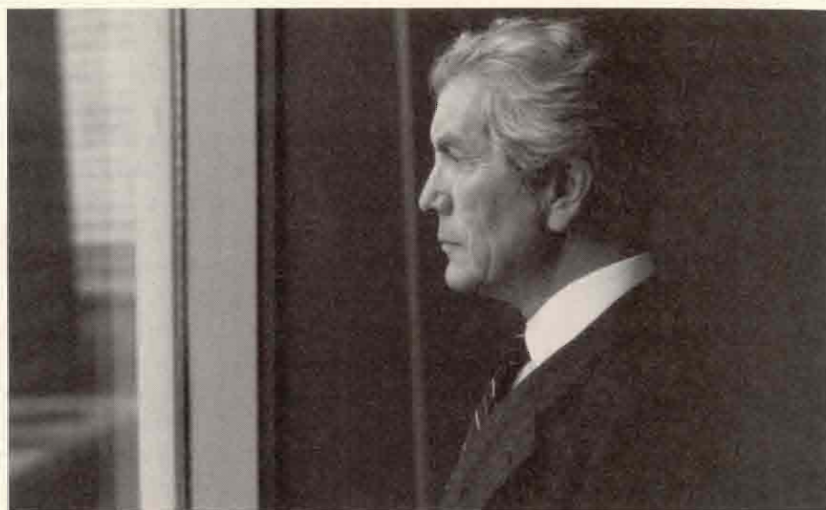
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Since the early '80s there have been businesses offering disaster recovery services for HP 3000 systems.

operations at the same time. Any agreement should work out detailed provisions about who controls the system and the priorities for running various applications during the period when the two companies are sharing resources. The effectiveness of reciprocal agreements is limited to smaller operations and short-term emergencies.

Having a redundant system is another solution that does not involve an outside service agency. Large companies that require immediate and complete restoration of data processing activities sometimes choose to purchase and maintain an identical system at a remote location. This method is the most costly approach to disaster recovery, but it is also the most full-service solution. A company with a completely equipped site at a separate location has a controllable, readily available and completely accessible system that is less likely to be affected by the same disaster. If no employees are affected by the disaster, it is possible to return to business even if the disaster destroyed the building and all computer equipment.

## Solutions Involving Outside Services

**H**AVING AN AGREEMENT WITH a local HP sales office in case of a disaster can be a low-cost way to attain backup service. Often a sales office will have an HP 3000 system used for display, customer benchmarking, demos and the sales office's own business needs. While it is possible that this machine can be placed in service when a customer has a disaster, that machine also may be in use or away at a trade show. This solution may be adequate for a small business with a single HP 3000 and few critical applications, but relying on help from the vendor leaves many factors to chance and works only as a stopgap measure.

Companies who work out an arrangement with the vendor must usually settle for whatever equipment happens to be available. They cannot specify a specific configuration, be assured that the equipment will be available or test the applications at the backup site. Such an arrangement makes it impossible to plan the logistics of preparing for disaster or

do a realistic rehearsal of procedures. A potential problem with vendor facilities for companies who have not migrated to Precision Architecture is that in the next few years, fewer and fewer sales offices will have the "classic" HP 3000s available for emergency customer backups.

Contracting with a service bureau that uses compatible hardware is a way to assure that critical processing needs like payroll are protected. A company can fulfill immediate processing needs for stand-alone applications through a service bureau. The solution is a limited one, however. A company using a service bureau can get a critical application run, but there may be no administrative support and little or no telecommunications to aid other aspects of recovery. If the disaster affects an entire local area or region, the service bureau may not be able to offer timely help to all the businesses wanting to use its services.

## Hot Sites

**T**HE TERM "Disaster Recovery Service" usually refers to businesses who provide hot sites for corporate customers who contract with them on a yearly basis. A hot site is a computer room that contains the systems, networking and peripherals necessary to offer a backup data processing department. Since the early '80s there have been businesses offering disaster recovery services for HP 3000 systems. Disaster recovery vendors offer either stationary or mobile hot sites. Both types of sites offer the customer the advantage of a trained staff experienced in dealing with disaster recovery. In the HP market, all service vendors offer some hands-on applications testing and rehearsal to help companies prepare for unexpected occurrences.

Stationary hot sites for Hewlett-Packard systems are available from four vendors (See article on page 42 for a survey of the hot site offerings.) The advantages of a stationary site include sufficient room for unique equipment to be installed at the customer's expense, and most stationary sites have a room with terminals that can be used for routine training. When there is a disaster, there is room for the customer's staff to work at the alternate site. Disadvantages include the slightly higher cost of the stationary unit and the additional expense and dislocation of having to have key employees travel to the recovery site just after a catastrophe.

The other approach that is offered by two disaster recovery vendors is to provide air-conditioned 30- to 40-foot "boxes" that are delivered by truck to customer sites. One advantage is that existing communication links can be utilized. Having the computer room brought to the site also eliminates the need to transport data and printouts back and forth between the remote site and company headquarters. The main disadvantage of mobile sites concerns their small size. It is difficult (and uncomfortable during the cooler months) for staff

members to work in the confined space of the portable unit. However, the size is less of a factor when the mobile unit can be wired into an alternative office location. An advantage of the small space is that these cramped quarters will encourage the company to restore and rebuild as quickly as possible.

### Empty Shell

**A**N EMPTY SHELL IS a minimal disaster recovery option for companies that can afford a time lag before processing can resume. The term refers to a fully constructed computer facility that has no hardware but does have the power, air conditioning and sometimes even the data communications to support hardware when it is delivered. In the event of a disaster, the customer negotiates with vendors for delivery of hardware, software and peripherals. This option may be less expensive than a hot site because the customer is paying for use of just a facility rather than an entire system. Customers can use such a site for long-term backup while their own facilities are rebuilt. The disadvantage of an empty shell is that applications cannot be tested on the hardware where they ultimately will be installed during the recovery period.

Regardless of what option you choose, the process of

planning and evaluating your company's recovery needs has payoffs of its own. A company that has formed a disaster recovery team to study the options is better able to respond to downtime caused by minor crises, accidents and errors. It doesn't take a five-alarm fire or flood to realize the benefits of careful planning and rehearsals. Companies that have examined their emergency procedures for hardware and software backup may find new ways to become more productive in everyday operations.

James Depp cites the example of a how a company in the process of planning a backup system studied the option of running on a processor with reduced disc capacity and fewer ports. During the disaster planning they found that they were able to save money and energy by reducing their regular data storage capacity.

A disaster recovery plan is more than an insurance policy, it's an evolving study of how a company uses its equipment, facility, applications and procedures. Although disaster preparedness cannot prevent most disasters, it can minimize the devastation of unavoidable ones.

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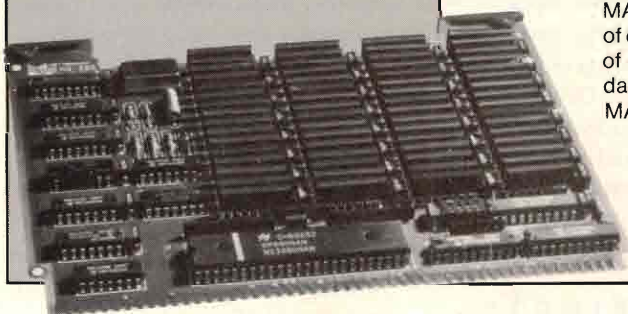
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# Hot Site Services

## Six Companies That Can Bail You Out When Disaster Strikes

**E**arthquakes in California, flooding in the Midwest, a fire in a skyscraper in Lower Manhattan, these are the kind of disasters that spur businesses to think hard about disaster recovery plans. However, it usually takes a visit from a financial or data processing auditor to move a company into devising a contingency plan for disasters.

According to Gerald Heath at Computer Solutions, when auditors typically make their fourth-quarter visit, that's the time when many customers actually sign contracts for hot site services. A hot site is a backup facility equipped with complete computer and communications systems, power and air conditioning. "The auditors are our best salespeople," says Heath. Taffy Rau at UP TIME agrees, "Five years ago the auditors would ask companies if they had a contingency plan for disasters. Now they ask if they have tested a contingency plan. Their questions have led some customers to contract for hot site recovery services."

*HP Professional* surveyed available hot site recovery services for HP 3000 systems. We've found six companies, including Hewlett-Packard, who provide disaster recovery services. Here is a list of the companies providing disaster recovery for HP systems, including the number of subscribers they serve as of February 1989:

**Computer Disaster Recovery (CDR)** of Birmingham, England began offering relocatable "boxes" equipped with HP systems in January 1982. Currently they have six mobile units and a location in Liege, Belgium to serve continental Europe. CDR began operation with HP equipment only, but now provides backup facilities for customers with Data General, Prime, ICL, Honeywell

Bull, DEC and IBM equipment as well. CDR has about 400 subscribers including about 200 who have HP systems.

**UP TIME** of Sacramento, CA began offering mobile HP 3000 hot sites in February 1984. Customers can have the mobile unit brought to them or use it at UP TIME's site. There is also an East Coast unit kept on a truck in Pennsylvania. Between the two coasts, UP TIME has 40 subscribers.

**Hewlett-Packard** entered the U.S. disaster recovery market in July 1988 when it announced HP Backup in a subcontracting agreement with Weyerhaeuser Information Services at their site near Tacoma, WA. The Weyerhaeuser site, originally constructed as a division of Weyerhaeuser Company, used to provide multivendor backup services for one division of the company. In 1984 when Weyerhaeuser split its operations into separate commercial companies, the newly created Weyerhaeuser Information Systems reconfigured the facility for use as a commercial backup site. Current customers wanting backup for HP machines contract with HP, but they can contract directly with Weyerhaeuser Information Systems for hot sites for their Honeywell, DEC (both VAX and PDP) and various types of IBM systems. Weyerhaeuser Information Systems has offered these contracts to outside customers including other Weyerhaeuser commercial companies since early 1985. Of the over 50 clients who use Weyerhaeuser Information Systems as a stationary hot site, 14 have a contract with Hewlett-Packard for HP Backup services.

**OFF-SITE** of Batavia, NY began operating a stationary hot site in June 1988. There are currently five subscribers.

**National DataGuard Technologies** of Cleveland, OH began offering its hot site in September 1988 and has four subscribers.

[BY PEGGY KING]

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**Computer Solutions** of Orange, NJ has offered backup capabilities to vertical market customers at school districts and pharmacies for the past 10 years. In November 1988 they began making contracts for their stationary hot site backup facilities available to the general public. There are 16 subscribers.

**Facilities Devoted To Disaster Recovery**

**CDR** — Six air-conditioned truck bodies of approximately 160 square feet.

**UP TIME** — Two 224-square-foot air-conditioned truck bodies and the 336-square-foot computer room at its office in Sacramento also is available.

**HP Backup** — HP subcontracts the HP-related portions of recovery services provided at Weyerhaeuser Information Systems' 12,000-square-foot facility for multivendor disaster recovery services. The HP systems are housed in a portion of a large computer room.

**OFF-SITE** — A 384-square-foot room for the computer and disc drives and a 480-square-foot room for the other peripherals.

**National DataGuard Technologies** — A 2,000-square-foot computer room.

**Computer Solutions** — A 1,200-square-foot computer room which also houses its corporate system.

**Types Of HP Computer Equipment Available (As Of February 1989)**

**CDR** — Series 950 (a second system is expected to be in service at the Liege site by mid-1989), three Series 70s, a Series 58 and a Series 52, four Series 42s and, three Series 48s, a Series 30 and a Series III.

**UP TIME** — Two 70s and two 48s, one for each coast's mobile unit and a Series 42 in the company's computer room. A Series 950 is on order and should be available by mid-1989.

**HP Backup** — A Series 70 and a Series 58 with plans to add a Series 950 by mid year.

**OFF-SITE** — A Series 68

**National DataGuard Systems** — A Series 950

**Computer Solutions** — Two Series 70s (one of these is crated and ready to ship for customers choosing the Freight Ready Option), a Series 58 and a Series 48. In addition, there are HP Micro 3000s that can be packed with 9144 cartridge tape drives and shipped to sites needing a smaller machine for backup.

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**CDR** — Up to 30 terminals can be sent out from England and 10 from the continent, but very few customers ask for terminals to be included. The new Liege office has up to 25,000 square feet of space that can be used as office accommodations.

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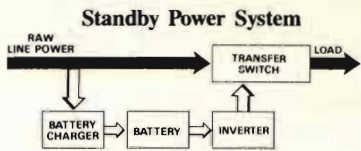
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Shown below are three traditional UPS configurations. Each has its advantages and disadvantages.

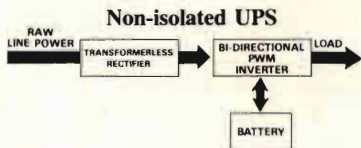


**Advantages:**

- Low cost
- Inverter normally off
- High efficiency

**Disadvantages:**

- No derived neutral
- Break in transfer
- Poor isolation
- Poor brownout protection
- Poor high line protection
- Poor lightning protection

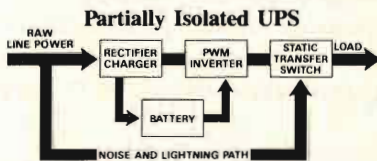


**Advantages:**

- Moderate cost
- Brownout protection
- High line protection
- No break system

**Disadvantages:**

- No derived neutral
- Poor isolation
- Inverter on continuously
- Poor lightning protection
- Non-linear load



**Advantages:**

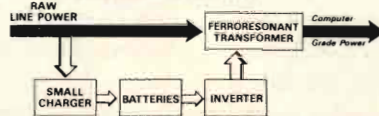
- Brownout protection
- High line protection
- Partial no-break system
- Separately derived neutral

**Disadvantages:**

- Break in transfer to line
- Poor isolation
- Poor lightning protection
- Non-linear load
- Poor efficiency
- Expensive

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- High isolation
- No-break transfer
- Brownout protection
- Lightning protection

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**UP TIME** — Up to 12 terminals can be included when the mobile truck bodies are sent out. There can also be up to three printers including a 35 page per minute HP 2680 laser or a high-speed HP line printer. Customers who set up their backup operations at UP TIME's office can use three vacant offices and a full selection of office equipment including fax and copier. When multiple clients are involved in a disaster, UP TIME is prepared to heat and furnish part of its 5,000-square-foot warehouse.

**HP Backup** — There are three separate work areas with a total of 900-square-foot of space, up to 20 terminals and two line printers.

Since HP's backup service is designed for Fortune 100 companies, the Weyerhaeuser Information Systems Facility also provides comprehensive business services. There is a print shop, bulk mail facility, corporate message center, word processing service, fax and telex machines and conference rooms.

Services provided by HP Backup staff members include procuring additional offsite space and arranging travel and lodging for the employees temporarily relocating to the Tacoma area. Weyerhaeuser Information Systems' corporate fitness center and cafeteria are also available to clients using the recovery facilities.

**OFF-SITE** — There is a 986-square-foot training facility that can seat up to 40 people, 22 HP 2622 terminals and a 385-square-foot meeting room with seating for 14 people and includes presentation aids. Fax and copying are available from another business in the same building. There is an HP 2680 laser printer and an HP 2608 printer available with the backup system.

**National DataGuard Technologies** — There is 1,500-square-foot of office space, 10 HP 700 terminals and a 600 lpm line printer. The site also provides a "Ready Center" office equipped with conference room, private offices and a lunchroom.

**Computer Solutions** — 300 square feet of office space, with all terminals and choice of high speed line printers. Fax and copier available.

### Communications Equipment

**CDR** — There is a one kilometer range of communications with optional laser links between the mobile unit and the customer's building. This unique system works with two laser cameras (one on either end) and can be used to support up to 50 users.

**UP TIME** — Communications configurations can use up to 12 dial-in lines, 1,000 feet of fiberoptics and an eight port multiplexer for local terminals.

**HP Backup** — A very extensive assortment of multivendor telecommunications equipment is housed in an area adjacent to the systems, and a variety of networks can be installed with over 100 circuits.

**OFF-SITE** — Series 68 system is configured with 12 modem ports and 24 ATP ports.

**National DataGuard Technologies** — There are modems and

multiplexers to support up to 72 ports. There is an X.25 PAD so that remote terminals can run on an X.25 network. Wide area networking with IBM machines also is available.

**Computer Solutions** — Multiplexers, dial-up modems, stationary modems and 20 dial-up lines available.

### Amount Of Rehearsal And Testing Time Included In The Contract

**CDR** — One full test a year (one or two days of testing). For an additional charge, CDR will test up to four times a year and provide testing at the customer's site.

**UP TIME** — Two days of testing at mobile sites and three days when the customer comes to their site. UP TIME recommends that the first test take place at their location.

**OFF SITE** — Eight hours at no additional charge.

**HP Backup** — 48 hours (six working days) per year plus an additional eight hours the first year.

**National DataGuard Technologies** — 32 hours at no additional charge.

**Computer Solutions** — One test per subscriber, per year.

**S**OME COMPANIES ENACT a disaster recovery plan that calls for a two step recovery process. Immediately after the disaster, they move their processing to a hot site. In addition, they contract with an empty shell (also known as a cold site) so that they'll have a place to set up their replacement equipment if it arrives before their facility is restored or rebuilt.

**Provident Recovery Systems** of Cary, NC has 11 mobile cold sites available. Customers can contract for one or more of these sites to be brought to their grounds after a disaster. About 30 of Provident's 100 clients have HP systems, some of whom also contract with a hot site service.

**UP TIME** — There is extra space in UP TIME's computer room for use as a cold site.

**HP Backup** — Hot site customers can contract to use the 500 square-foot cold site for up to six weeks as part of their contract with HP Disaster Recovery Services.

**OFF SITE** — There is a 450-square-foot cold site available to hot site customers only.

**National DataGuard Technologies** — Vault storage service are available.

### Planning Products Available

**CDR** sells a microcomputer software package called C Plan. It's a set of templates that can be used to formulate a contingency plan that is not specifically designed for HP equipment.

### Disaster Recovery Services

**HP** offers Disaster Recovery Planning tools and training that can be purchased without contracting for hot site coverage. Along with a two-day training classes, HP offers two software templates to provide the boilerplate for creating plan-



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Computer Solutions  
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ning documents. One is used with either an HP 3000 or PC-based word processor to write the recovery plans. The second template works with project management software to specify the tasks involved with writing a disaster recovery plan. It's specially designed for the HP 3000 environment. **OFF-SITE** offers an information processing audit for helping customers develop contingency plans. Planning analysts conduct interviews with key personnel at the customer's site. **National DataGuard Technologies** sells a PC-based planning methodology and has planning consultants on staff. **Computer Solutions** markets DP-AID, a software package that

allows companies to do an impact/risk analysis and then to prepare a comprehensive disaster recovery plan. Consulting services are also available.

This survey shows that there is no standard plan, facility or service for disaster recovery. Each service vendor has a unique offering; no two of the services are even equivalent, much less similar. Therefore, a comparison of contract prices would be meaningless. Hot site contracts are expensive, and many smaller companies neither need nor can afford this level of coverage.

For most smaller companies, a contingency plan (and a test of how well it works) is the most important protection against an extensive losses after a disaster. Less than a month before a fire destroyed seven stories of First Interstate Bank in Los Angeles, the bank conducted a practice drill of its disaster recovery plan. Quick thinking on the part of employees did more to save the business during the first few hours after the fire was detected than the backup efforts that began after that. Knowing how to respond helped the bank minimize losses from interrupted business. The main benefits of disaster recovery planning require more expenditure of time and effort than of cash.

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- What accounts, users, programs have been granted special capabilities?
- What accounts, groups and files have system wide WRITE, READ, APPEND or EXECUTE access?
- How old are MPE passwords?

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# Disaster Recovery

## Resurrecting Erased HP Files

**T**he simplest error always seems to beget the most complicated problem. One of the worst is erasing data and/or programs. Whether by accident or mistake, we're all probably doomed to dump the wrong file someday. Pointing at icons with a mouse is just as effective as doing a PURGE "MYFILES". Regardless of your route, it's about as humbling an experience as you can get for the money.

The depth of your folly turns out to be quite a variable thing. If you blow away a program and have a backup copy, you have a minor inconvenience on your hands. Erasing a day's work or more can bring on a real sweat. Little compares to wiping out a whole disc full of text, program code or research data. That's when the perspiration turns to ice. At various times in my career, I've rescued discs both soft and hard from a variety of misadventure, and had a lot of fun in the process. The bulk of the success stories have been with HP LIF proprietary formats, and while it has been profitable, I think it's time to show how it's done.

**I**F YOU HAPPEN to have an HP-UX-based operating system, erased files might as well have never lived. HP's cooperative minions have seen fit to conceal every shred of information that might shed light on the inner workings of its version of the UNIX operating system. Starting with the fact that HP-UX doesn't include the concept of centralized directories and extending through a bi-level linked allocation scheme, I'm amazed that it works even when it isn't corrupted. This approach is good for password security and terrific for maintaining HP's hold-over operating system disc extensions, but it renders recovery a lost cause.

MS-DOS systems are much closer

**[BY DON PERSON]**

to earth. While fragmentation of the allocation table is likely, if not downright inevitable on a heavily used disc, you do have a few things going for you. First, there's a unified directory, and the names of erased files are present except for the first letter of each name. In earlier releases of DOS, you even get the number of the first cluster that the dead file occupied. This can be of service on slightly fragmented discs.

If you build a list of starting clusters and assume sequential allocation, ending with the next file's base, a workable picture can emerge. While not trivial, salvation can be the reward of persistence. Reasonably automatic recovery isn't possible unless you happen to be running Peter Norton's directory saver utility as part of your system's daily startup.

I've kept the best for last. HP's proprietary disc organization, while showing its age, has some features that make "unerasing" surprisingly simple, once you know the trick. A discussion of LIF DOS organization reads a lot like the children's story, "Good News/Bad News."

The good news is that when you erase a file, all but a tiny amount of information is still there, exactly as it was when you were last in the file. This is an excellent basis for automatic resurrection. The bad news is that the missing part is the file's "type." The two most critical missing bytes tell the operating system what kind of information is in the file; that is, if the file contains DATA, BDAT a binary, a program or some application-dependent mess. PURGE throws that datum away. Because LIF discs are broken up into consecutive blocks, the size of erased files must be stored to prevent space from becoming "orphaned" or permanently unclaimed through repeated erasure and reuse.

You now know why "NULL" files don't shrink when you store a fresh,

though smaller, file in the "hole." That's part of the bad news. Creating and then erasing many small files on a disc makes it difficult to shrink out the space left behind.

The infamous PACK operation cleans up through the hazardous and time-consuming expedient of physically relocating files. Just hope the power doesn't dip while you're in the middle of packing reshuffle. The result? A dead disc.

More good news: Files are never fragmented. The bad news: Unless a file is the last one in the directory, you can't enlarge it dynamically, or return unused space for that matter. This forces people to err on the side of excess caution by creating entries big enough for a worst-case specification. This leads to terrible underutilization, especially when coupled with HP's traditional ultra-conservative track-sparing and low-bit density.

The good news that stands by itself is that for all the clumsiness and inefficiency that we bear in the legacy of LIF, almost any file that has been erased and not overwritten can be reclaimed 100 percent intact. Best of all, it can be done almost automatically. Try that with erased HFS or SDF files!

The last bit of good news is that all HP computers I know of have some mechanism for reading and writing LIF files, even if handled by a specific translation program. The bad news? If you try to step outside the HP line, nobody knows LIF from laugh.

Tying it together on your system requires only one specialized programming resource: a physical record disc utility. Fortunately, these are available for all major HP systems. (Yes, even the MS-DOS systems.) The PHYREC binary is reasonably well known to Series 200 and 300 owners. Last year, I rewrote and updated PHYREC 80 for the Series 80. Owing to the compliant nature of LIF, files from almost any other system can be recovered on any other, provided you know the "divisional offset" integer codes used to differentiate files originating on computers manufactured by HP's various divisions.

HP chose to pack quite a bit of information into the two file-type bytes. The second byte is the low integer part of the type. This is a bit-mapped quantity conveying the attributes describing the organization of the file (see Table 1).

The high order part of the definition is a negative number from which the low-order part of the type is subtracted. This results in a file-type signed integer between 0 and -32768. Zero, of course, is reserved for null (erased) files.

It has become pretty much a standard to place this value as a signed integer in the first two bytes of the root sector on each disc, so if in doubt, read it before recovering a disc. Don't count on it, of course, because it's only an HP standard. That means that each division does its best to change, ignore or supersede it the day after it's promulgated, most often as a way of reasserting autonomy. Dissect enough discs and you'll see what I mean.

The high-order part can be used to identify the

originating division as shown in Table 2.

HP's LIF documents claim that only the following characters can be used to make legal file and volume names:

- Letters A-Z both upper- and lowercase.
- Integers 0-9
- The underscore character

So much for good intentions. Expect to find any and all characters in the names of real discs. Don't be surprised to find one system's filename delimiter as a legal character elsewhere.

TABLE 1	
Here is the formula for decoding the low order part of the type:	
BIT#	Attribute
0	Hide Directory Name During CATalog Indicates LIF ASCII if all other bits are zero.
1	Soft Write Protect. Indicates LIF BINARY file if all other bits are zero.
2	Extended File Type. If true, the type is indicated by a combination of the remaining high-five bits of this byte.
3	Binary or Object Code. Indicates a program of this type in many systems.
4	DATA
5	Program File
6	Null or part of extended type
7	Next Free File Block " " " " "

TABLE 2		
RANGE	Act-ID	Division
+2	to +32767	Reserved by HP
-3	to -1024	Used for interchange
-1025	to -2048	GSD System 300
-2049	to -3072	CSY System 3000
-3073	to -4096	DSD System 1000
-4097	to -5120	GSD System 250
-5121	to -6144	DCD 98xx
-6145	to -7168	DTD
-7169	to -8192	CVD Series 80
-8193	to -9216	CSD
-9217	to -32767	Free as of 1981

The Series 80 volume delimiter, the period, is the extension delimiter in HP PASCAL, for instance. People at the divisions have stretched and changed the standard in a variety of ways, but most of the abuse has been limited to the name and byte count fields.

## Automatic Recovery

**N**OW THAT YOU HAVE an idea of how to recreate a trashed file's type field, all that's left is to grasp automatic recovery. When files are purged in a group, while the extent may be gone, the base sector is still in its proper place. Simply reading the directory entries and subtracting one base from the preceding value accurately reconstructs the file's original size. If you know the offset, all you need to prompt for is the low order information. Once installed, you physically rewrite the disc sector containing the entities in question.

There would have to be one special case, or it wouldn't be HP that we're talking about. The last erased file has no succeeding entry; hence, there's no base to index for the true length of the file. There is a solution: I wrote a quick fix for this in Series 80 assembly language called SHRINK. You can do the same thing at high level with RSECTOR. Here's what you need to do:

1. Read the last sector of the disc. If the content is uniform, remember the initialization pattern found here.

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Paul Mace Software  
400 Williamson Way  
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2. Starting with the base sector of the last file, conduct a binary search to find the highest sector not equal to the format-initialized sector read in step one.

3. Subtract the sector number found in step two from the base and install this value as the extent of the file.

Now even the last file is as good as new.

*Program 1* a short example written for the Series 80. The code has been written so that only minor modification needs to be done in order to run under any of the other HP BASICS you may have.

While I've painted a dim picture of HP-UX recovery, several commercial programs to clean up killed files after the fact exist for HP's MS-DOS computers. The best known are Norton and Paul Mace Utility packages. Each offers before and after file recovery and is available nationwide. —*Don Person is an independent consultant based in Albany, NY.*

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# A

UNPURGE.DOC

## Program .

```

1000 ! do a smart UNPURGE with feedback from OPERATOR dep
1100 !*****
1200 ! * BEGIN RECOVERY FROM A PURGE "xxx",0 TO a purge and pack of the end
1300 ! * this program searches out all files at end and restores their length
1400 ! * you must restore their type.
1500 !*****
1510 DEF FNINUM2(X$) = 256*NUM (X$)+NUM (X${2}) ! convert string -> integer
1520 DEF FNICH2$(X) = CHR$( X DIV 256)&CHR$( RMD (X,256)) ! int->string
1600 ON ERROR GOTO SKIP_ERROR ! insure that binary program is loaded
1700 LOADBIN "PHYREC80"
1800 SKIP_ERROR: OFF ERROR
1900 EOF$=RPTS (CHR$( 0),10)&CHR$( 255)&CHR$( 255) ! set reference data
2000 MK$=EOF$(11,12)
2100 DIM AS(256),BS(16384) ! WORKING BUFFER for up to,64 sec directory
2200 CLEAR
2300 FIX=0
2400 GET_ADDR: DISP "What disk drive has the disk to unpurge "
2500 INPUT MS$ 2600 DX=DISKSIZE (MS$) ! get highest sector number from PHYREC
2700 !*****
2800 ! * FIRST GO GET THE HEADER -EOF$ marks the real end *
2900 !*****
3000 RSECTOR AS$,0,MS$ ! get the base of volume
3100 DIR1=NUM (AS(12)) ! first sector that directory is in
3200 ! NOW READ THE DIRECTORY UP TO 64 SECTORS
3300 DS=MIN (NUM (AS(20))*256,16384) ! total directory size or $ max

3400 RSECTOR BS(1,DS),DIR1,MS$
3500 FOR J=1 TO DS STEP 32 ! now loop through till EOF$ is found
3600 DISP BS(J,J+9) ! SHOW THE NAME OF THE FILE
3700 IF BS(J,J+11)=EOF$ THEN WRITIT ! end of directory mark found
3800 IF BS(J+10,J+11)=EOF$(1,2) THEN GOSUB FIXIT ! null file found
3900 IF BS(J+10,J+11)=MK$ THEN GOSUB FIXIT ELSE FIX=0 ! false purge EOF
4000 NEXT J
4100 WRITIT: WSECTOR BS(1,DS),DIR1,MS$ ! re write the directory block
4200 DISP " ALL DONE WITH THE DISK"
4300 BEEP
4400 END
4500 ! this routine checks the entry to find the missing information
4600 FIXIT: MYBASE=FNINUM2(BS(J+14,J+15)) ! extract the base sector
4700 FIX=1 ! flag as changed
4800 NEXTBASE=MIN (DX, FNINUM2(BS(J+46,J+47))) ! index to next entry
4900 IF NEXTBASE=0 OR NEXTBASE=DX OR SGN (NEXTBASE)=-1 THEN NEXTBASE=DX
5000 BS(J+18,J+19)=FNICH2$(NEXTBASE-MYBASE) ! install new extent in dir
5100 DISP "File length is "&VAL$(NEXTBASE-MYBASE)
5200 DISP "File is 'B'inary 'G'raph 'D'ata 'A'ssm 'P'rog 'F'orm 'K'ey?"
5300 INPUT DS
5400 DS=TRIMS (UPCS (DS(1,1))) ! guard against error
5500 X$=CHR$( POS ("BGDA"KP"FFF",DS)*4) ! make the file type
5600 IF X$=CHR$( 0) THEN X$=X$&CHR$( 0) ELSE X$=CHR$( 224)&X$ ! CVDoffs
5700 BS(J+10,J+11)=X$ ! Set the file type integer string into the entry
5800 RETURN
    
```

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# T HE BENEFITS OF ADA

**It's Reliable,  
Efficient,  
Modifiable,  
Understandable  
And Portable**

Why would anyone in the MIS world want to read an article about Ada? Isn't Ada only used in the Department of Defense? How can it be of any use to the civilian sector? What are the benefits of using it anywhere?

Ada is a general-purpose programming environment developed by Honeywell-Bull in the mid-'70s for the U.S. Department of Defense. It's regarded by many as the first language to be designed according to modern principles of software engineering. Ada now is available in almost every major computing environment, but not in MPE. In addition, civilian software developers are beginning to take Ada seriously as a language for building commercial systems.

The principle benefits of the language are its emphasis on reliability, efficiency, modifiability, understandability and portability. The main disadvantage is the need for someone using it to think differently about the programming process. Ada is much more modular than traditional languages such as COBOL, FORTRAN or PASCAL. In addition, it is "extensible;" that is, we can extend the features of the language to represent real-world solutions.

Another benefit is its ability to create maintainable software. In fact, since many software industry analysts estimate that 80 percent of all software effort is devoted to maintenance, code written in Ada will return genuine economic benefits long after the original programmer has moved on to another assignment and the maintenance team has taken over.

There have been other computer languages of great promise in the past. In some cases, these languages have been too restricted in their scope of application. COBOL and

FORTRAN for example, each were designed for a particular class of problems. PL/1 was an excellent start toward a more generalized language, but it never received the level of support it deserved. PASCAL has become popular in some environments, but it's both elegant in its structures and inadequate in its application capabilities.

The current darling of the microcomputer community, C, is powerful, extensible and well-designed. It also is more suited to systems programming than applications development. It's not an easy language to learn. COBOL-85 is a good step in the right direction with its new emphasis on structured design.

But we have reached a point in the evolution of software development tools when we need to recognize the need for something akin to a "unified field theory." We need some set of principles (not methods) that will guide the process of creating new software and provide the foundation for consistent quality. Moreover, the principles should help us create tools to maintain that quality through all phases of the software lifecycle, from requirements definition through maintenance.

## **Discipline And Quality**

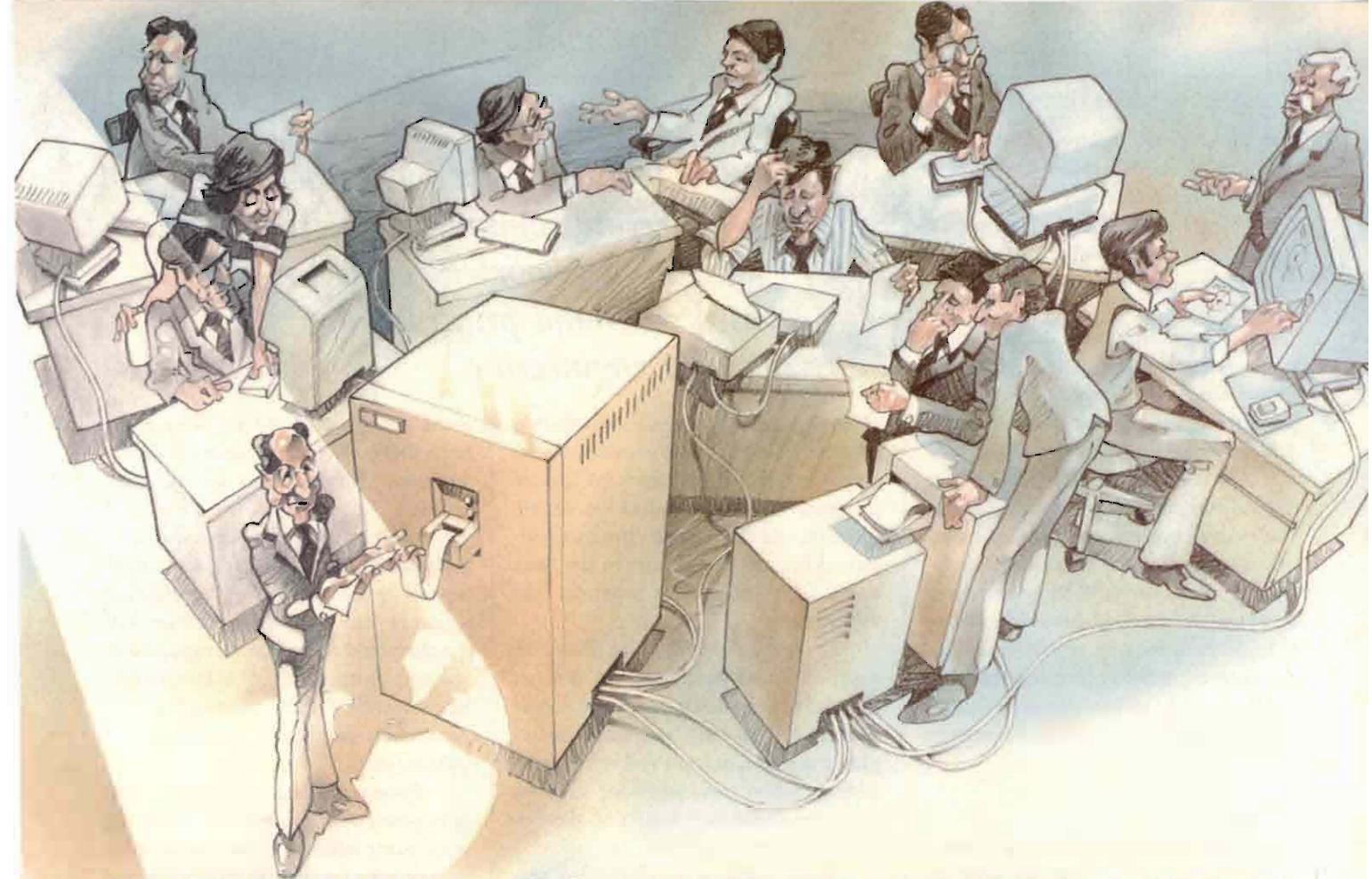
There is a new phrase in the computing community: *software engineering*. To many "old-timers" this is just another word for programming. To others, it represents an effort to bring some sense of discipline and quality to our profession.

To illustrate the idea of software engineering, we can use Thomas Edison as an example. Edison was a brilliant man who developed wonderful new inventions in the field of electricity. Was he an electrical engineer? Not by today's standards. His creativity transcended his training. And we need more people like



**LANGUAGES**

**Richard Riehle**



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Software has come to the same point as electrical engineering. We no longer can afford to rely on folklore and good luck to assure us that our systems will do what we want them to do.

Ada is an attempt by the software engineering community to create a software development environment based on sound principles of software engineering. A discussion of those principles is beyond the scope of this article. However, we can note that principles are not the same as methods. Because software engineering is an emerging discipline, new principles are certain to emerge with it.

### HP Ada

As of this writing, HP has not made a commitment to provide an MPE or MPE-XL version of Ada. However, there are MPE users within HP and customers of HP who want Ada. In fact, now that the Department of Defense has become more tight-fisted about granting waivers, it is probably appropriate for HP to elevate its commitment to an MPE version of Ada.

Hewlett-Packard has made a substantial commitment to Ada in its 9000/300 HP-UX. So far, there is no HP-supplied Ada compiler for any precision architecture operating system. However, an Ada-to-C cross-compiler is available for UNIX versions of the RISC machines from Irvine Compiler Corporation.

At present, the incentive is in HP-UX Ada systems (using Ada-300) because software contractors are winning substantial contracts using Ada on the HP 9000/300 Series. In fact, HP systems have been selected for several major development projects.

One of Ada's original charters was "embedded" systems; that is, executable

*Ada is an attempt by the software engineering community to create a software development environment based on sound principles of software engineering.*

programs that are compiled on one system and embedded into another. An example is missile telemetry. A source program can be compiled on an HP 9000/3xx, and the compiler produces object code that will execute in the "on-board" computer that controls the telemetry.

Embedded systems are found in many different environments, but are especially important to space and missile systems. HP has long been an important player in space, defense and avionics instrumentation and embedded systems. It's natural that this would be the domain of initial emphasis.

Why, if Ada is an embedded systems language, should we be interested in it for MPE environments?

MPE is the operating system of choice for MIS organizations using HP equipment. The ability to easily network multiple processors, the power of the IMAGE database management system, and the availability of development tools and packages for both manufacturing environments and accounting systems has been an important strength of the HP 3000 line of computers. In particular, MPE's ability to reliably manage on-line transaction processing (OLTP) systems has been an important selling point.

In addition to these advantages, HP's reputation for quality hardware at reasonable prices has been a real plus to many MIS managers.

The key word here is "reliable." Both Ada and HP stress reliability.

One of Ada's principle design goals was reliability. That goal has obvious virtue in our embedded systems, but it also might be considered appropriate to emphasize the same goal in our non-

embedded systems. As software engineers daily confront the issue of reliable software, Ada becomes an attractive option.

Another important design goal is maintainability. With estimates of 80 percent as the time spent maintaining software, most software management people would agree that a language that was easy to maintain would be valuable. Maintenance comes in several forms: preventive, predictive, corrective and enhancement.

These maintenance forms are regularly performed in any production software environment. Properly designed Ada systems greatly can reduce the cost of all forms of maintenance. In fact, many software professionals believe that Ada's real benefit will be in the cost savings associated with the maintenance process.

There are other important issues such as efficiency, documentation, quality assurance and ease of design and coding. All of these effectively are addressed in Ada. But the key issues in many MIS environments are:

■ *Does the software consistently do what it is supposed to do (reliability)?*

■ *Is it economical to maintain it?*

Under MPE, we have three basic options for software languages: SPL, PASCAL and COBOL (recently, COBOL-85)

Of course, there are other tools such as FORTRAN, RPG, PROTOS, COGNOS and a whole list of program generators. But we are discussing the procedural languages.

Under MPE-XL, we lose SPL when programming in Native Mode (NM). So we are left with PASCAL and COBOL.



Yes, the MPE-XL PASCAL is excellent. So is the COBOL-85 compiler. But neither of those languages takes us as far as Ada. In fact, Ada is derived from PASCAL and substantially improves upon it.

### At First Glance

When some programmers first see Ada, their eyes glaze over from the sense of seeing a software gothic. There are many aspects of the language that look familiar to experienced PASCAL or PL/1 programmers, but there are many things that seem peculiar. Ada requires that the programmer think about the programming process differently.

Imagine a time-traveling Euclid picking up a modern textbook on high-school algebra. He would be totally bewildered by it. The quadratic equation would look like meaningless scribbling. Poor Euclid didn't even have the number zero. He would have no context in which to deduce what the equations and expressions meant. Sometimes we have the same feeling when we are confronted with a new computer language. We need a context for it, and we need to alter our mode of thinking.

Ada requires this kind of intellectual adjustment.

The language is large, and anyone who tries to take it all in with one glance probably will suffer intellectual indigestion. The beauty of Ada is that you don't need to know all of it to use it productively.

It's much like your home computer. If there were no case surrounding the circuits, power supply, mother board and other components, you easily could be intimidated by the seeming complexity of the wiry beast. Instead, you turn it on, select the program you want to run, observe on the display screen that things are as you want them to be and press some keys to make other things happen. How it happens and the components that make it happen are hidden from you.

Hiding is an important characteristic of Ada. We call it "information hiding" and use the term information in a very broad sense. We also use the term

"levels of abstraction" to mean that we have no need to deal with implementation details; we only need to deal with the details necessary to do the work at hand.

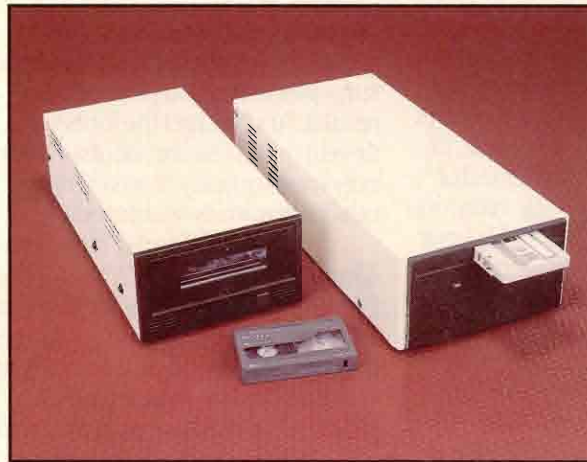
Ada extends the idea of information hiding and abstraction so they become features of the language. These features, in turn, evolve into other features such

as modularity, localization and the concept of generic software components. This last idea, components, is carried to a very high level of sophistication in Ada.

There are three fundamental components in Ada: package, subprograms and tasks.

These can be decomposed into

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


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other components that we shall look at as we proceed. In addition, some of the above components can be coded as a "generic."

The Ada package is a collection of subprograms, specifications and type declarations. It is somewhat analogous to the PASCAL "UNIT" Packages may be nested and may be included within subprograms.

The package consists of two parts: the specification and the body. The specification is that part of the package that will be seen by a user of the package. The body typically is hidden. Sometimes the specification is called a "window" into the package. The body contains the implementation algorithms.

### Create New Data Types

One of Ada's powerful features is the ability to create completely new data types. That is, a class of data for which we define the operations and values permitted for variables of that type. In this respect, Ada is far more powerful than

PASCAL and certainly more powerful than COBOL or FORTRAN.

As an example, suppose we require that a group of subprograms perform arithmetic on fractions. In most languages, we convert a fraction such as 14/77 or 7/15 to a decimal and then perform the arithmetic. In Ada we can create a new data type and set of arithmetic operations for data of type fraction. The programmer only needs to code statements such as:

```
A : FRACTION__TYPE := 9/17;
B : FRACTION__TYPE := 3/51;
X : FRACTION__TYPE;

X := A + B;
```

and Ada will enter the result 10/17 in X. In this case, the decimal fraction result (.5882352) is the same whether we do the fraction arithmetic or convert each fraction to a decimal number first and then perform addition. However, in situations where there are large numbers of fractions with many decimal places precision, it is more appropriate to retain the fractional form throughout all calculations before converting to a decimal fraction.

The mathematically trained reader will see at once the possibilities for statistics, numerical analysis and many forms of engineering mathematics. But this capability also has great value in business data processing where reliability is equally important.

In an accounting environment, we have always had to contend with the problem that programmers do not understand debits and credits. In Ada, we can create a completely new set of data types named "asset\_\_type" and "liability\_\_type" and define the permitted set of operations for those types. Let's name those operations debit and credit. Then we have:

```
CASH : asset__type;
SALE : liability__type;
LOAN : liability__type;
LOAN_PAYMENT : liability__type;
```

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and we could build a complete general ledger system around the idea of debits and credits so the programmer would never have to be confused about when to add or subtract any particular kind of account.

We could have code that reads:

```
debit(CASH, 500.20)
or
credit(LOAN, 30.57)
```

and have a program that is completely readable by someone with an accounting background. We could restrict the operations on `asset_type` and `liability_type` to only debit and credit. The programmer would not be able to explicitly add one `asset_type` to another or subtract some value from a variable of either type. This example could be carried to a high level of sophistication to include permitted operations to include such things as "balance," "sub\_total" or "total."

The items of each data type could be enclosed in a composite data type such as an array or a record. It's not the intention of this article to describe a complete general ledger system, but the illustration should indicate the possibilities. Moreover, the point is that you aren't restricted to a traditional programming view of the data. You can create new data types that more closely represent the view of the discipline you're attempting to model. This feature of Ada is valuable in disciplines as wide-ranging as the vocabulary and operations associated with organic chemistry to the abstract language of artificial intelligence. You can, in effect, build a language within a language.

Ada raises the level of language power one more notch with a concept it calls "generics." In every programming environment, there are certain procedures or groups of procedures we code over and over. Frequently, these procedures only vary in the type of data (range, size or permitted operations) they access. Ada permits us to create templates called "generics" to eliminate

HP PROFESSIONAL

the need to replicate code. An example of a long-standing generic from the existing programming environment is the SORT. Normally we invoke the generic SORT and, tell it the characteristics of the data to be sorted. It then generates a new version of the sort program with those new characteristics and does its thing. Ada has, as a language feature, the capability for creating generic program units.

One HP software developer, CRI (Santa Clara, CA) rewrote its main product, RELATE/DB in Ada for the DEC VAX environment and surprised itself. The use of Ada's generic capability greatly reduced the number of lines of source code required to port its HP product to the VAX. Unfortunately, they cannot use this work on the HP 3000 because of HP's delays in getting an Ada compiler ready for MPE. Too bad! Other developers have had the same experience where they were able to think carefully about their system. Also, not only do

generics reduce the lines of original source code in a program, the resulting program is much easier to maintain.

It is true that Ada has not yet caught on in a big way in the civilian sector. It has been adopted by the FAA for the new air traffic control system, and NASA is using it for new software development in embedded systems. Also, many universities now are offering Ada as a first course in structured computer programming. But MIS directors have been frightened off by its formidable appearance. For one thing, it doesn't look like the languages they are use to. For another, to use it, their programmers must change the way they think about programming. In fact, Ada is a language for "software engineering," not programming.

Software engineering implies that there is a new level of discipline and agreed upon principles for the creation of software systems. Admittedly, software engineering is still an emerging

discipline. The emergence is accelerating and bringing with it new technologies for building software systems. Ada is one of those technologies. And, as usual, the advent of a new technology leaves some people behind.

Over the next five years, as more university graduates enter the marketplace with Ada training and the economics of Ada software engineering become apparent to the civilian computer domain, we will see more and more important systems built in Ada. IBM, DEC, Tandem, UNISYS, PRIME and a wide range of other hardware vendors have one or more Ada compilers for their main line of hardware. HP's MPE should not continue to be an Ada orphan. Too much depends on it for the future. —Richard Riehle is an instructor of Ada at Foothill College, Los Altos Hills, CA and Merritt College, Oakland, CA.

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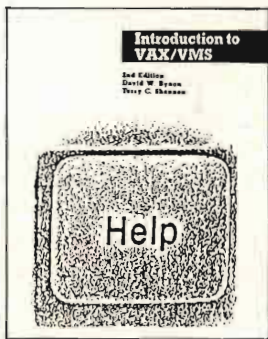
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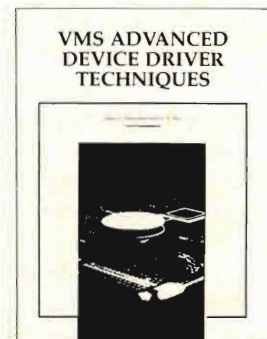


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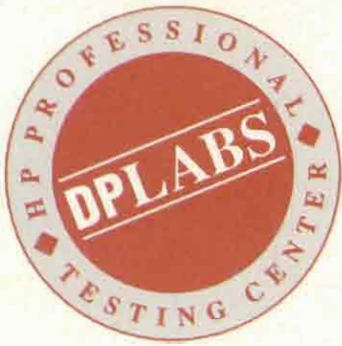
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By Del Lukens

It's surprising how much extra effort is needed to use HP's Edit/3000. After years of using this line editor, I forgot how difficult it was when I was just starting out. In the beginning, I had to develop a certain mind set to help overcome the shortcomings of a line editor. But, with a little brute force, I eventually became proficient in using it.

SPEEDEDIT from Bradford Business Systems, (Laguna Hills, CA) however, is a full-screen text editor loaded with additional features that can transform your program development and document processing environment. The installation tape includes stream jobs that build the necessary accounting structure and restores the software. Total installation time is about 10 minutes. The software is up and running immediately with no configuration or other overhead. SPEEDEDIT runs on any HP 3000 running the current release of MPE.

This editor is extremely easy to use. There is a brief, self-paced tutorial that guides the new user through the basic commands and uses of the function keys. While the commands are somewhat intuitive, some mental reprogramming may be required if you have used HP's Edit/3000 for a long time. The tutorial is an excellent, on-line tool for getting the most out of SPEEDEDIT quickly and painlessly.

A welcomed feature of this software package is its documentation. Two manuals come with the software: One is a command reference booklet that lists all the commands with a brief description and example.

The other manual is 350 pages. It's hard to imagine an editor with a 350-page manual, but it's clearly written and in a format that will lend itself to reference purposes after you become familiar with the package. Each page is consistent in format and layout. The top half of the page lists the command name, the intended purpose for using it, the syntax and the options or features available. The bottom half describes in detail what the command does, how and when to use it and usually includes an example or two. *Figure 1* shows an example of the page for the KEEP command.

One reason for such a large manual is the amount of features built into SPEEDEDIT. The following are of particular interest:

- Compile source files without leaving the editor. There is support for COBOL-I, COBOL-II, SPL, FORTRAN, PASCAL and RPG.
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The edit files generated with this editor are completely compatible with HP's Edit/3000. No conversion of your existing files is needed. It doesn't use Block Mode and runs well on just about any HP compatible terminal. There are many additional features included with the SPEEDEDIT package. A demo is available from Bradford Business Systems for \$100. If you decide to buy it, the \$100 is applied toward the purchase price.

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## FIGURE

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**KEEP**

Abbreviation:

**KP**

**PURPOSE:** Saves the current work (text) file either under its' current name or under another name if given.

**SYNTAX:** KEEP or KEEP ? or KEEP filename

**COMMAND KEY** ● **CONTROL-Y** ○  
**CONTROL-Y BREAKABLE** ○

**GENERAL USAGE** ○  
**INTERMEDIATE** ●  
**ADVANCED** ○

**WORD PROCESSING** ●  
**PROGRAMMING** ●  
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The KEEP command saves a copy of the current text under the name given. If no name is included as part of the KEEP command the name of the current file is used. The KEEP command will save all lines and is not affected by the currently defined window.

If the KEEP command is followed by a question mark (?), the file will only be kept if changes have been made since the file was last kept. If no changes have been made since the last keep, the KEEP ? command will be disregarded.

The KEEP ? command is most useful when included as a command in an XEQ file. When the XEQ file containing the KEEP ? command is executed, the file will only be kept if necessary. Bypassing an unnecessary KEEP may save substantial time. Please refer to the sections regarding the XEQ and SET AUTOXEQ commands for further information about execute functions.

If the KEEP command is followed by an exclamation point (!), the file will be kept immediately without any questions. You will not be asked if you wish to purge the old copy of the file.

For saves of only some of the lines in the current file see the description of the HOLD command.

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# Printer Gems

By David B. Miller

Do your users get most of their daily exercise adding paper to your LaserJet? Let's face it, the paper trays that come with most desktop laser printers are inadequate for busy office use. Not only is it annoying to keep refilling the tray, the constant pulling out and pushing in required to change the paper contributes to the wear and tear the printer receives.

BigBin, from Laser Connection Inc. (Mobile, AL) is a single-bin sheet feeder capable of holding up to 1,000 sheets of paper in weights of 16, 20 and 24 pounds. A legal-sized paper adapter is optional. The unit fits on laser printers equipped with the Canon SX, Ricoh 4080/81 or Ricoh 4150 engines.

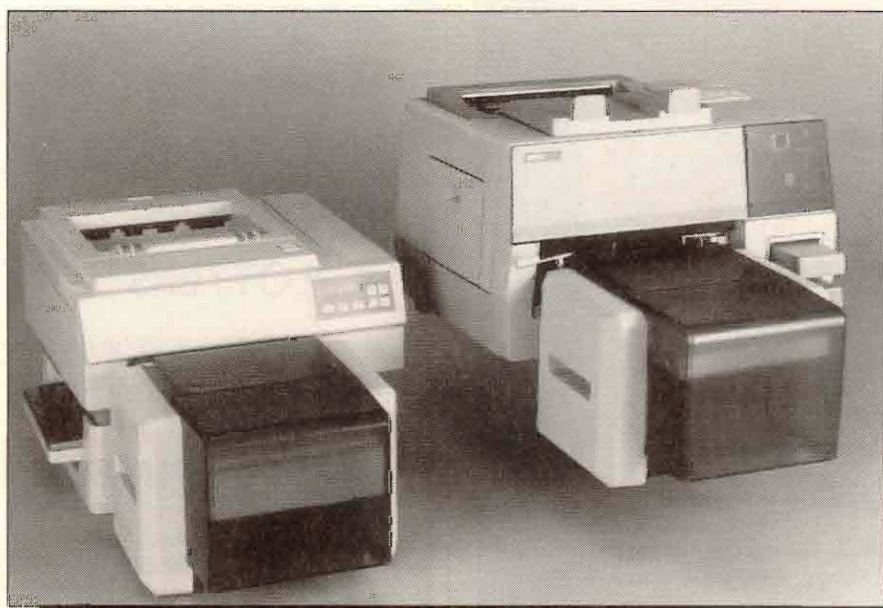
BigBin is easy to install. The documentation is very clear and leaves no questions unanswered.

For Canon SX-based printers, a pedestal used to raise the printer to the proper height comes with the paper-feeder unit. The pedestal has slots that hold a ream of paper and two additional font cartridges.

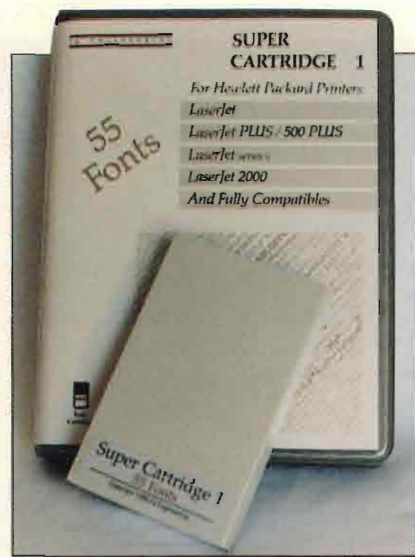
After removing the original paper tray, simply place the printer on the pedestal and slide BigBin into the vacant paper tray slot. A power cord supplied with BigBin connects the feeder unit to the printer's power socket. The power cord that came with your printer runs from the feeder to a wall outlet.

BigBin powers up as soon as it's plugged in. No power switch is on the unit. If you need to power everything down, make sure you unplug the power cord from the wall socket; switching the printer off won't turn off BigBin.

When the cover is opened, the paper elevator is lowered to allow paper to be loaded. Laser Connection doesn't recommend vellum, card stock, labels, embossed paper, multipart forms, paper with rough edges, paper heavier than 25 pounds or other special stock. If you use



Laser Connection's BigBin is available for the HP LaserJet and DEC LN03 printers, as well as a variety of Canon and Ricoh print-engine-based laser printers.



Super Cartridge 1 replaces standard LaserJet font cartridges.

special forms from time to time, you might have to stick with your original methods. After closing the door, the paper is lifted automatically to the correct height and a single sheet is fed partially into the printer.

We found few problems with BigBin. There was a minor problem when the bin was pulled out slightly and refused to function. Over time, loading paper into the bin probably unseated it enough to cause the problem. A clamp mechanism might help keep the bin closer to the printer and keep the paper tray firmly seated in the printer's paper path opening.

BigBin is noisier than the original paper tray, as more gears and motors are involved. We found the sound to be unobtrusive, but it should be a consideration in very quiet environments.

## Super Cartridge 1

If you're tired of working with downloadable fonts or of having to change font cartridges frequently on your LaserJet or 100 percent compatible printer, Super Cartridge 1 can help. Super Cartridge 1, from IQ Engineer-

ing, is distributed and supported by Do It Marketing Resources, both of Sunnyvale, CA.

Super Cartridge 1 provides 55 fonts and 10 typefaces in both portrait and landscape orientations. Point sizes can range from 4 to 16. While providing the additional capability, Super Cartridge 1 users should be able to plug the cartridge into their LaserJet and experience no compatibility problems with their original cartridges. Some sample fonts are shown in *Figure 1*.

Escape sequences used to select fonts and to perform other printer duties remain unchanged from those of the original cartridges. Because Super Cartridge 1 combines the fonts of many original cartridges, you won't have to change cartridges often, if at all. The user sees no difference. At the same time, Super Cartridge 1 shouldn't conflict with any downloadable fonts you currently use.

In addition to the standard character sets, several special-purpose fonts are included.

The Line Draw and PC Line fonts provide compatibility with previous

**BigBin**

**PLATFORMS:** Laser printers using the Canon SX or Ricoh 4080/81/4150 print engines

**PRICE:** \$795

**LASER CONNECTION INC.**

**HEADQUARTERS:**  
7852 Schillingers Park W.  
Mobile, AL 36608  
(205) 633-7223

**FOUNDED:** 1977

**PRODUCT LINE:** Laser printers and supplies

**OWNERSHIP:** Public. A wholly owned subsidiary of QMS Inc. (NYSE: AQM)

CIRCLE 269 ON READER CARD

cartridges and offer line drawing characters found in the IBM PC's and compatibles' line drawing character set.

The Pi-X, a 10-point font, is a collection of legal, foreign and national symbols, line drawing, mathematical and other special characters.

**Super Cartridge 1**

**PLATFORMS:** HP LaserJet and 100 percent compatible printers

**PRICE:** \$499

**DO IT MARKETING RESOURCES**

**HEADQUARTERS:**  
1689 Canary Dr.  
Sunnyvale, CA 94087  
(408) 736-3000

**FOUNDED:** 1987

**PRODUCT LINE:** Cartridge-based printer products

**OWNERSHIP:** Partnership

CIRCLE 268 ON READER CARD

The Math8A font includes a full Greek alphabet plus other special characters in 10 and 7 points. Mathematical characters, such as integration symbols and square roots, can be found in the Math8B font in 10 and 7 points.

We're using the Super Cartridge 1 in place of our Hewlett-Packard M-Z cartridge. Because we use Microsystems Engineering Corporation's Mass-11 for word processing, we simply set up Mass-11's system parameter file to map the desired font with a Mass-11 font number. We also increased Mass-11's vertical space units parameter by 25 percent to improve readability.

Super Cartridge 1 provides compatibility with the full range of HP A to Z font cartridges. Very few differences exist. In some special cases, fonts provided by an HP cartridge aren't available with the Super Cartridge 1. For example, the HP T cartridge TaxDraw typeface isn't available with the Super Cartridge 1.

In some cases, Super Cartridge 1

## FIGURE 1

Helvetica 8 point  
 Line Printer 8.5 point  
 Times Roman 10 point  
*Helvetica Italic 10 point*  
**Times Roman Bold 10 point**  
 Prestige Elite 10 point  
**Courier Bold 10 point**  
 Helvetica 12 point  
*Times Roman Italic 12 point*  
*Letter Gothic Italic 12 point*  
**Helvetica Bold 14 point**  
 Letter Gothic 14 point  
**Times Roman Bold 14 point**  
**PRESENTATION BOLD 16 POINT**

*A small sample of the 55 available Super Cartridge 1 fonts.*



will substitute fonts. For example, older, variable-pitch fonts have been superseded by fonts in HP's Z cartridge. Rather than provide both fonts, the Super Cartridge 1 opts for the newer, improved Z-type fonts.

Unless you're doing highly specialized printing, you'll encounter no problems with Super Cartridge 1's equivalents to HP A to Z fonts. In most cases, the Super Cartridge 1 equivalent is an improvement over the corresponding HP font.

Power users who need to change fonts and orientations often should be thrilled with Super Cartridge 1. Escape sequences follow an eight-tier hierarchy. From highest to lowest priority, the tiers are Orientation, Symbol Set, Proportional Font Spacing, Pitch, Point Size, Style, Boldness and Typeface. The hierarchy helps eliminate long escape se-

quences. You only need to supply the portion of the escape sequence needed to invoke the features you desire.

For example, changing pitch only requires that you supply the portion of the escape sequence that affects pitch, if you want everything else to remain the same. The manual provides a detailed

explanation of the escape sequence priority scheme and to what extent you can abbreviate sequences.

Super Cartridge 1's documentation provides an excellent complement to your laser printer's manuals. Many examples of font selection sequences are provided.

<p>Canon U.S.A. Inc. 5 Dedrick Pl. W. Caldwell, NJ 07006 CIRCLE 257 ON READER CARD</p>	<p>Hewlett-Packard 3000 Hanover St. Palo Alto, CA 94304 CIRCLE 265 ON READER CARD</p>	<p>QMS Inc. One Magnum Pass Mobile, AL 36618 CIRCLE 262 ON READER CARD</p>
<p>Digital Equipment Corp. 146 Main St. Maynard, MA 01754 CIRCLE 266 ON READER CARD</p>	<p>IQ Engineering P.O. Box 60955 Sunnyvale, CA 94086 CIRCLE 264 ON READER CARD</p>	<p>Ricoh Corp. One Cannon Plaza Lake Success, NY 11042 CIRCLE 261 ON READER CARD</p>
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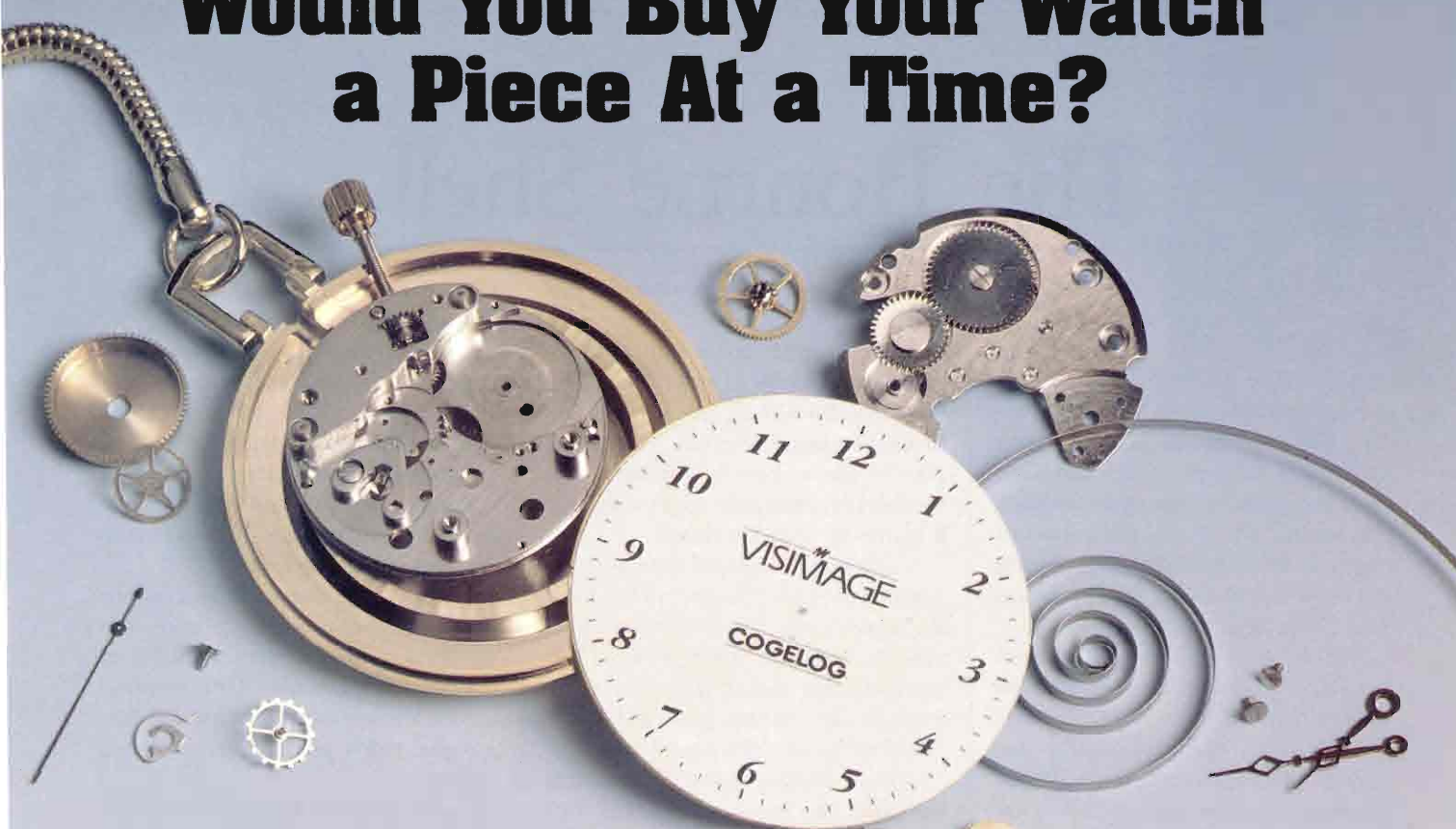
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CIRCLE 186 ON READER CARD

# The Bourne Shell



Andy Feibus

An HP-UX shell is the environment in which you execute commands to perform some action. Three shells are provided with HP-UX: Bourne shell, C shell and Korn shell. Each has its own characteristics. This month, I'll discuss the important aspects of the Bourne shell environment and show how to create shell programs to perform repetitious work.

All HP-UX shells are documented in *HP-UX Concepts and Tutorials: Shells and Miscellaneous Tools*.

All shells maintain certain environmental information in "shell variables." To view these variables, use the command **set**. A few important shell variables are:

**TERM** — *the type of terminal you're using*. Many HP-UX programs use this variable to determine how to control the screen. This variable must be set properly for certain programs (e.g., **vi**) to operate.

**HOME** — *the directory in which you begin operating when you log in*. Certain HP-UX commands expect configuration files to be stored in this directory. This variable is automatically set when you log in.

**PATH** — *the list of directories searched when you request a program (e.g., **rm**) to be executed*. If the program is located in a directory not specified in your **PATH** list, the program won't be found (unless the program's complete directory path is specified; e.g., **/bin/rm**).

The following example demonstrates how to set these variables:

```
$ TERM=hp2392.
$ PATH=$PATH:/usr/local/
  bin:/usr/lib:/etc
$ export TERM PATH
```

The first command sets the type of terminal to "hp2392" (if your terminal is an HP 700 series or an HP 293x series

terminal, this is the best value for this variable).

The second command sets the search path variable to include the directories **/usr/local/bin**, **/usr/lib** and **/etc** in any command searches. This example also shows how to reference shell variables in commands; i.e., by using the **\$** before the variable name.

The third command is required to permit subsequent commands to obtain the values you establish for these shell variables. In other words, without this command, any shell variables you set are local to the current shell and aren't inherited by any subsequent shells.

The following session demonstrates this point (the importance of this concept, however, will be shown later). The computer's responses are italicized:

```
$ TERM=hp2392
$ export TERM
$ /bin/sh
$ echo $TERM
hp2392
$ TERM=2622
$ echo $TERM
2622
$ /bin/sh
$ echo $TERM
hp2392
$ exit
$ exit
```

The result from the first **echo** command is the value for **TERM** inherited from the first shell (because of the **export** command). The result from the second **echo** is the value for **TERM** that has been set for that shell. The result from the third **echo** is the value inherited from the first shell (and not the second, because the second shell didn't **export** this value).

To view all inherited values, use the command **env**. To view all values local to the current shell (those not **exported**), use the **set** command.

The **exit** command terminates the last Bourne shell entered. Two **exit** commands were required because two additional shells were started. When **exit**

is used in the log-in shell, you are logged out.

When you log into your system account, the Bourne shell automatically attempts to execute the shell scripts **/etc/profile** and **\$HOME/.profile**. Shell scripts (or shell programs) are files that contain a series of shell commands to execute. These files can be created with any text editor; e.g., **vi**.

The script **/etc/profile** contains commands that your system administrator wants all Bourne shell users to execute at log-in time. This command file usually assigns the **TERM** variable, a useful **PATH** and any other system settings.

The script in **\$HOME/.profile** (in other words, the file **.profile** in your **HOME** directory) contains user-specific commands to execute each time a Bourne shell is created for you. These commands can be used to establish any user-specific **PATH** locations, automatically execute any applications or reconfigure your shell environment.

When you log in, the Bourne shell executes the commands in **/etc/profile** first. Once this script finishes (assuming the **logout** command isn't contained in the script), the shell executes the commands in **\$HOME/.profile**.

Some commands to place into your **.profile** file are: **stty** (set your terminal line characteristics) and **mail** (read any electronic mail). Both of these commands are documented in Section 1 of the *HP-UX Reference Manual*.

To complete the explanation of **export** (and to show how to create and execute a shell script), create a file (name it "prog1") containing the following line:

```
echo "$FILE"
```

Execute the following commands (the computer's responses are shown in

italics):

```
$/prog1
$ FILE='Hello'
$/prog1
$ export FILE
$/prog1
Hello
$
```

Why didn't the computer display the value of **FILE** until it was **exported**? When a Bourne shell script is executed, a Bourne shell automatically is started to execute the script (even if your current shell is a Bourne shell); the new shell only inherits values that previously were **exported**.

When you executed **prog1**, you may have received the message:

```
prog1: cannot execute
```

This message indicates that the shell program's file is restricted from being executed. To remove these restrictions, use the **chmod** command (which is documented in Section 1 of the *HP-UX Reference Manual*).

I'll close this month with an example of a shell script I often use. I work with a product containing 500,000 lines of FORTRAN code that are stored in over 2,000 files and about 40 directories. Sometimes I need to find all uses of a particular subroutine (for example, when changing the arguments for the subroutine "subname"). Without using a shell program, I could use the command:

```
$ grep -i subname find /
source -name '*.f' -print
```

However, **grep** can't handle that many input files. So, a shell script is needed to find all source files and pass them to **grep** in small groups. This script follows (create it and store in the file **prog2**):

```
DIRS=find /source -type d -print
for dir in $DIRS
do
  if [ -d $dir ]
  then
    cd $dir
    FILES=*.f
    if [ -n "$FILES" ]
```

```
then
  MFILE='grep -i subname $FILES'
  if [ -n "$MFILE" ]
  then
    echo $dir ...
    echo "$MFILE"
  fi
fi
done
```

For each directory in the **/source** directory, all FORTRAN files (those with a suffix of **.f**) are located. The list of these files is stored in the shell variable **FILES**. Then **grep** is used to determine if there are any references to "subname". All references are stored in the shell variable **MFILE**. If **MFILE** is blank (no references found), then nothing is output and the script proceeds to the next directory; otherwise, **MFILE** is displayed.

A better understanding of the script might be gained by placing the following command (which causes the script to display the result of each command executed) as the first line in the script:

```
set -x
```

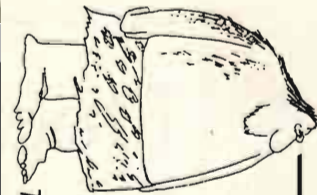
The square brackets ( **[]** ) indicate the test command (documented in Section 1 of the *HP-UX Reference Manual*). The **for** statement causes a loop to occur for each directory stored in the shell variable **DIRS**. All valid output from this script is written to **stdout** (if the output isn't redirected, this is your terminal).

To make this script more general-purpose, substitute "subname" with **\$1**. In shell scripts, **\$n** references the **n**'th argument on the command line when the script is executed. Once this substitution is made, execute the script as follows:

```
$ prog2 subname
```

Next time I'll cover how to configure and use the C shell to save you time. —*Andy Feibus is a software engineer for Bradley Ward Inc., Atlanta, GA.*

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# Does Your Security System Measure Up?



## SECURITY

Jeffrey Caldwell

As greater amounts of data continue to be processed

on more complex computer networks with increasingly sophisticated communication equipment, management needs to be concerned with the security environment more than ever.

Gone are the days of a small mini-computer with a handful of users simply processing checks or general ledger information. Today's computers must be able to handle just-in-time (JIT) inventory calculations, talk to other computers through electronic data interchange (EDI), or provide access to a local area network of personal computers.

These and other features make the security issue even more important to corporate executives and information system managers. The question of how to measure your current security environment is sometimes a difficult one to answer.

A SECURITY SYSTEM is made up of many different components and layers of controls. These layers of controls act much like a brick wall around the data. If a few bricks are missing or if there are small gaps, then there is some risk of a security breach. If the wall of security is small or has been neglected, the risk of someone manipulating or destroying data and programs becomes greater.

The first step in measuring your current level of security is to gain an overview of your security system.

Some of these controls can be called access controls, such as user passwords, account and group passwords, or file

lockwords. Capabilities assigned through the use of the MPE operating system also help to limit access once a user has signed onto the system. Physical security, such as locked computer rooms also can help limit unauthorized access to valuable data.

Policies and procedures over the implementation and maintenance of computer programs and production data are also part of a good security system. The ability to change programs should be limited and authorized through the use of change-request forms. These forms should contain places for a user to describe the request, blanks for approvals from the head of the user department and the data processing manager, sign-offs for testing and space for implementation information.

Also, operational controls should include job schedules, review of processing logs, security over utility and system software and limited access to source code by operators.

One other area of security is application software that provides functional security limiting users once they have signed onto the system. It provides safeguards over incompatible duties, such as letting an accounts-payable clerk retrieve accounts-receivable data.

All of these different checks, controls, policies, procedures and review points help to form a good wall of security.

THE NEXT STEP is to create a review plan. Once you understand the various levels of security, you should be able to make a list of all of the controls that are in place.

In addition, as you're reviewing controls, try to come up with a list of controls that are completely lacking. Many times you're so busy with day-

to-day tasks that obvious control procedures have never been thought of or implemented.

From your list of current controls you need to identify and perform some key tests for each control. The tests should be designed to show if the control is functioning as designed, and if it is providing the required level of comfort over the associated risk.

For maintenance controls, you could review some of the change-request forms from completed projects. Were the proper signatures present? Does it appear that the users signed off on the form in a timely manner? Is there a system established to track the progress of the changes?

Tests concerning password controls could include signing on to the system with SM capability and reviewing the user passwords. Other tests might include talking to various users to see how often they really change their passwords. You also should see if security software such as VeSoft's Security 3000 has been installed to supplement the MPE security system, or if security monitoring software such as InCase's Engarde product

### **Security 3000**

VeSoft  
1135 South Beverly Dr.  
Los Angeles, CA 90035  
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### **Engarde**

InCase  
2055 Woodside Rd.  
Suite 171  
Redwood City, CA 94061  
CIRCLE 283 ON READER CARD



is being used to help report on the level of security.

Application software security should be checked to see if unique passwords are assigned to each employee, or if multiple employees with the same duties share the same passwords. Password sharing leads to everyone in the department, or even the

company, having access to protected data. The use of common passwords also makes it more difficult to trace transactions back to specific users.

System utilities and software should be checked to see who has the ability to use or modify them. If there isn't limited access to utilities, they can be modified to grant users higher capabilities that can

lead to a deterioration in the security wall.

Tests in the operation area could include making sure operators don't have access to the source code or don't have the ability to change production data. Another test would be to review previous days' process logs or schedules to make sure all jobs were properly authorized and run in the proper order, and any problems that occurred were handled correctly.

Once you've gained an understanding of the security environment, identified current and lacking controls, and tested the current controls, the last step is to evaluate your findings.

Where controls were missing, a decision needs to be made concerning the cost and benefit associated with implementation. Where controls previously had been designed and put into place, but weren't being adhered to, the control should be reviewed for its suitability and either be changed or re-emphasized by management.

Now that you better understand some of the tasks that are involved in completely measuring your level of security, take the quick security test in the *Table*. It consists of yes/no security questions and might give you an idea of how soon you should begin your full security measurement project.

FINALLY, REVIEW YOUR INTERNAL resource personnel and, if they don't have the expertise or time to do the job, hire a professional to help. If you go that route, be sure to structure the tasks so that there is a transfer of knowledge from the professional to your staff in order to increase your company's security expertise. —*Jeffrey Caldwell is an information technology manager specializing in computer security and control for Coopers and Lybrand, Los Angeles, CA.*

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## TABLE.

QUICK TEST OF SECURITY		
INSTRUCTION: Place a check mark in either the yes or no column for each question. Count the number of yes answers and compare it to the rating at the bottom.		
QUESTION	YES	NO
<b>PROGRAM MAINTENANCE</b>		
1. DO YOU USE FORMAL PROGRAM REQUEST FORMS ?	___	___
2. DO YOU LIMIT ACCESS TO PRODUCTION PROGRAMS ?	___	___
3. ARE THERE CONTROLS OVER UNAUTHORIZED CODE BEING ENTERED AS PROGRAM CHANGES ARE MADE ?	___	___
4. ARE USERS INVOLVED IN THE TESTING PROCESS ?	___	___
5. ARE PROGRAMMERS RESTRICTED FROM PRODUCTION DATA ?	___	___
<b>ACCESS SECURITY</b>		
1. ARE PASSWORDS CHANGED PERIODICALLY ?	___	___
2. DO ALL USERS HAVE UNIQUE PASSWORDS ?	___	___
3. ARE PASSWORDS GREATER THAN SIX DIGITS ?	___	___
4. ARE PASSWORDS ALPHANUMERIC ?	___	___
5. IS THERE ONLY ONE USER WITH SYSTEM MANAGER (SM) CAPABILITIES ?	___	___
<b>OPERATION CONTROLS</b>		
1. ARE OPERATORS DENIED ACCESS TO PROGRAM SOURCE CODE ?	___	___
2. ARE OPERATORS PREVENTED FROM CHANGING PRODUCTION DATA ?	___	___
3. DOES OPERATIONS MANAGEMENT REVIEW PROCESSING LOGS ?	___	___
4. IS THE USE OF SYSTEM UTILITIES LIMITED AND REVIEWED ?	___	___
5. ARE ALL PROBLEMS WITH JOBS REPORTED TO THE PROPER LEVEL IN A TIMELY MANNER?	___	___
<b>MISCELLANEOUS</b>		
1. IS THE COMPUTER ROOM LOCKED AT ALL TIMES ?	___	___
2. ARE TERMINALS LOCATED IN SECURE PLACES ?	___	___
3. IS THERE PROTECTION OVER OUTSIDERS ACCESSING THE SYSTEM USING MODEMS ?	___	___
4. HAS A FORMAL SECURITY POLICY BE ISSUED AND SIGNED BY EACH EMPLOYEE ?	___	___
5. DOES MANAGEMENT PERIODICALLY REVIEW THE SECURITY PRACTICES ?	___	___
TOTAL CORRECT ___ SECURITY RATING: 16-20, GOOD; 10-15, KEEP TRYING; BELOW 10, WATCH OUT!		

# Writing Text On The HP Vectra Display



## PC TIPS

Miles B. Kehoe

When writing programs for use by others, one of your concerns is often the speed of execution your user sees on the screen. When your application is written for the Vectra, how your application writes to the screen can have a considerable effect on the perceived performance of your software.

There are several methods you can choose to output text on the screen, and the default is often the language output statement.

Consider the C statement:

```
printf("this prints on the screen");
```

If you include this line in your source code, the compiler will generate a call to the MS-DOS "standard output" function call. Through the magic of MS-DOS, this call will get the string printed on the standard output device, typically the Vectra screen. Along the way, any escape characters may be processed by the ANSLSYS device driver and may be redirected by the user to a file or other device.

By using the language-specific call, you ensure compatibility with non-MS-DOS operating environments, but you lose the performance you could have.

In the process of executing the output call, MS-DOS eventually may call the ROM BIOS to perform the actual screen output.

If you're willing to give up the I/O redirection feature of MS-DOS and assume the output will go only to the screen, you can bypass MS-DOS and pass the string to the ROM BIOS on your own, speeding your display accordingly.

One call available through the ROM

BIOS allows you to display a string of characters on the screen. However, this function is available only in AT-class machines, so I use a different function. Because it only outputs a single character at a time and doesn't advance the cursor position automatically, it requires a bit more overhead.

Nonetheless, my application is done on every PC so the extra overhead is worth the effort.

*Program 1* shows a prototype C procedure in Turbo C 2.0 to output directly through the Vectra ROM BIOS. The routine will position the cursor before each character, so I have to specify the

line number each time I call the procedure.

By using this ROM BIOS calling sequence, you make your screen display much more quickly and speed the execution of your program.

### Writing To Display Memory

While using ROM BIOS calls is much faster than using standard output, there is an even faster method of sending text to the screen. By treating the display as an array of memory mapped locations, you can write to the screen at memory speed and maximize your output.

To do so, you need to understand

## A

### Program 1. VECTRA.DOC

```

Display String using ROM BIOS Calls

#include <dos.h>
union REGS regs;

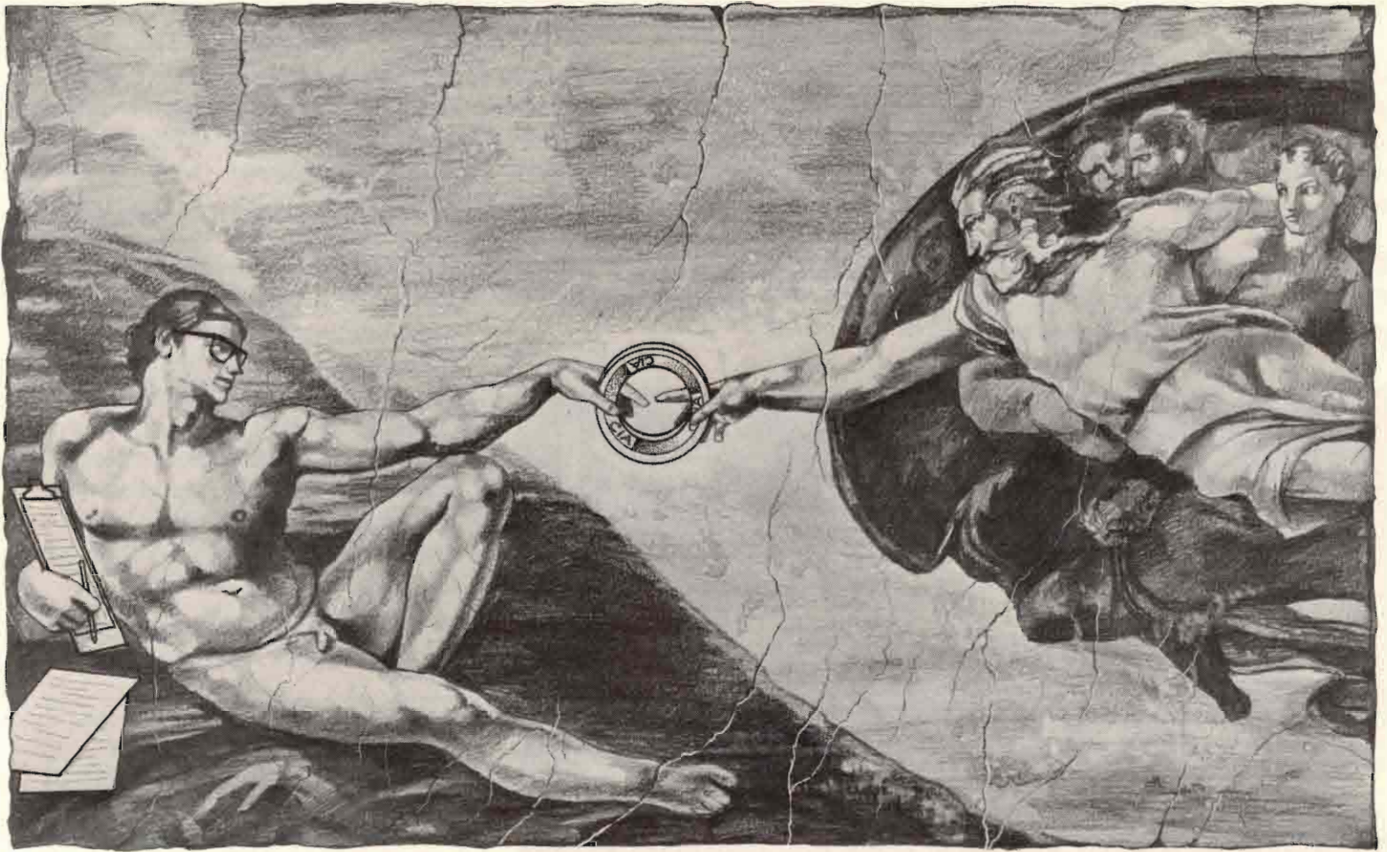
/* calling sequence: writebios(line,string); */
void writebios(line_no, buf)
int line_no;
char *buf;
{
    int col = 0;

    while(*buf != '\0') /* C strings terminate with null
byte */
    {
        regs.h.ah = 2; /* Position cursor
regs.h.bh = 0;
regs.h.dh = line_no;
regs.h.dl = col++;
int86(0x10, &regs, &regs);

regs.h.ah = 0x09; /* Write character w/
Attribute */
regs.h.al = *buf++; /* Character address */
regs.h.bh = 0; /* Video Page Number */
regs.h.bl = 15; /* Bright white attribute
*/
regs.x.cx = 1; /* Number of repeats */
int86(0x10, &regs, &regs);
    }
}

```

*Display screens using ROM BIOS calls*



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some of the basics of the Vectra (and IBM) video display. It isn't overly complex, and a little time spent understanding the basics can offer much faster overall performance.

### Video Modes

The Vectra has a number of different monitors and interface cards. Internally,

there are a number of different video "modes." By selecting from among the different modes, you select the screen resolution and number of colors you see.

Using `printf` or ROM BIOS output functions don't require you to set the video mode. However, direct writes to display RAM require you to set the mode manually.

Figure 1 shows some of the more common video modes, the amount of display memory they utilize and the starting memory address.

In text modes, the display is organized as 25 rows of 80 columns. However, in display memory, characters are located at even byte addresses and the enhancements for those characters are located at odd byte addresses. For example, the character displayed at the upper left corner of the screen, at coordinate (0,0), is actually stored at memory address B800:0000. The enhancement for that character is stored at address B800:0001. Figure 2 shows this in action for mode 2.

The attribute byte contains a value encoded as follows:

Common Memory Modes				
Mode	Type	Display Memory	Segment Address	Comments
4	TEXT	4K	B800	16 color 25 x 80 CGA/EGA/VGA
6	GRAPH	16K	B800	2 color 640x200 CGA Graphics
7	TEXT	4K	B000	2 color 25 x 80 Monochrome/EGA/VGA
16	GRAPH	32K	A000	64 color 640x350 EGA/VGA

Common memory modes

Text Display Memory Map	
B800:0000	Character at Row 0, Column 0
B800:0001	Attribute for character (0,0)
B800:0002	Character at Row 0, Column 1
B800:0003	Attribute for character (0,1)
...	
B800:0050	Character at Row 1, Column 0
B800:0051	Attribute for character (1,0)
B800:0052	Character at Row 1, Column 1
B800:0053	Attribute for character (1,1)
...	

Text display memory map

Comparison of Screen Methods		
Method Used	Characters per second	Seconds to fill screen
<code>printf</code>	996	2.01
ROM BIOS	1385	1.44
Memory Writes	52380	.04

Comparison of screen methods

Bit 7	Foreground	Character Blinking
Bit 6	Background	Red Component
Bit 5	Background	Blue Component
Bit 4	Background	Green Component
Bit 3	Foreground	Intensity
Bit 2	Foreground	Red Component
Bit 1	Foreground	Blue Component
Bit 0	Foreground	Green Component

To create a high-intensity white character on a black background, the attribute byte must have bits 0, 1, 2 and 3 "on," and all other bits "off."

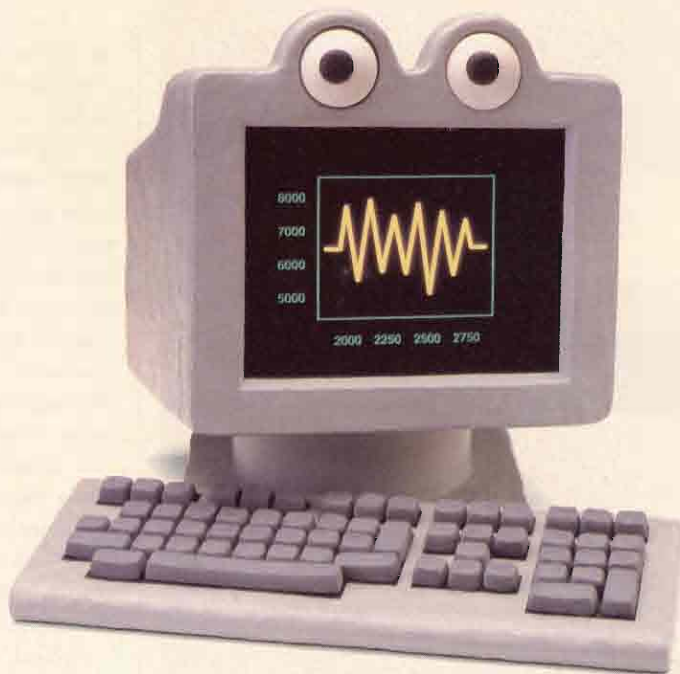
This means the attribute byte will have the value of hex or 15 decimal.

To produce a yellow character on a blue background, bits 0, 1 and 5 will be set to one or "on" yielding a value of 23 hex or 35 decimal. Not all combinations are available on all monitors (for example, true monochrome monitors underline instead of blink), so experiment with the monitors you expect to support for your application.

In summary, to write the letter "A" in high intensity white on black at screen location (0,0) (the upper left-hand corner of the display), you store the value 65 decimal at address B800:0000; and an attribute value of 15 decimal at address B800:0001.

To implement a procedure similar to "writebios" with direct memory

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## Program 2.

Display String using Direct Memory Write

```
#include <string.h>

/* calling sequence: writeram(line, attribute, string); */
void writeram(line_no, attr, buf)
unsigned int line_no;
unsigned char attr;
char *buf;
{
    char far *mem_loc;
    int i,
        len;

    len = strlen(buf);

    /* Calculate the address of start of line */
    mem_loc = 0xb8000000+(line_no * 160);

    for(i=0; i<len ; i++)
    {
        *mem_loc = buf[i];      /* move character to memory
*/
        *(mem_loc+1) = attr;    /* move attribute to next
loc */
        mem_loc += 2;          /* and increment mem pointer
*/
    }
}
```

*Display string using direct memory write*

access, we need to use some C pointers and a loop.

In *Program 2*, I've added a parameter to the calling sequence — the attribute to be used for all characters of the string.

When you write directly to display memory, there's more setup required as well. As I mentioned earlier, you will need to set the video mode you wish to use.

### Setting The Video Mode

The procedure I use to set screen mode also returns the current screen mode, so when I'm done, I can restore the original mode.

Note that a call to change screen modes will clear the screen even if the mode doesn't change: Some people use this as a way to erase display memory. (Actually, I've found that changing screen modes produces a "bounce" on a number of monitors, so I don't use this method of clearing the screen.) *Program 3* contains the listing.

I've provided some 'benchmark' results for each of these methods, and I've included a summary of my findings in *Table 1*.

As you can see, display writes are much faster than either of the other methods. Of course, there are advantages of each method and you should consider them all when you write an application. Portability to other operating systems favors **printf**, and speed favors memory writes. If you're using Microsoft and HP Windows, you'll have other considerations.

In addition, you may want to include "bounds checks" in your routines to insure a calling routine doesn't pass a bad line number or video mode. Your results still will be much better with direct memory access.

Next time, we'll look at several ways to handle the screen as a graphics device and add to your applications. —Miles B. Kehoe is a technical product manager for Hewlett-Packard, Cupertino, California.

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## Program 3.

Setting Screen Mode

```
int setmode(mode)
int mode;
{
    int save_mode;

    regs.h.ah = 0x0f;      /* read current screen mode
*/
    int86(0x10, &regs, &regs);
    save_mode = regs.h.al; /* and save it */

    regs.h.ah = 0x00;      /* Set new video mode */
    regs.h.al = mode;
    int86(0x10, &regs, &regs);

    return(save_mode);    /* and return previous mode
*/
}
```

*Setting screen mode*

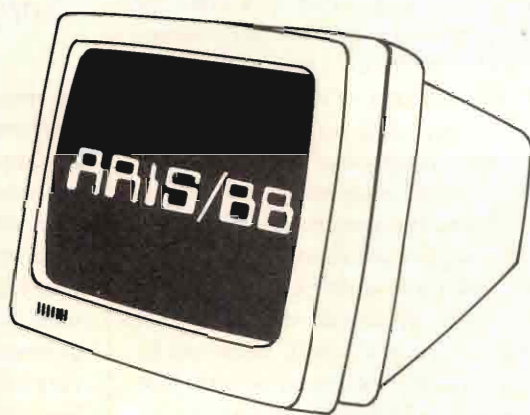
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# Testing The Network

Maintaining near 100 percent uptime on today's critical

data communications and local area networks (LANs) has become mandatory for many users. With business and industry becoming more dependent on computers and telecommunications, network downtime can no longer be tolerated. When computer links are down many companies grind to a halt and the resulting loss in productivity may never be recaptured.

**Proactive** maintenance is the ideal goal of all network managers (i.e., detecting potential problems before they occur, thus eliminating downtime). Of course, in the real world, there will be occasional downtime even with the best predictive maintenance procedures.

Your second option is to implement a well thought out **reactive** maintenance program. This should focus on troubleshooting procedures that hold downtime, along with user dissatisfaction, to a minimum.

Troubleshooting the network involves looking at the interfaces over which computers, terminals and remote peripherals talk to each other. The technician, or sometimes the operator must determine if a network problem is located at the source from which the information is carried, the channel over which the information is transmitted, the receiving hardware, or other system fault or operator error.

The network troubleshooting task is complicated by the common use of multivendor equipment. To identify the fault and resolve the problem often means that a variety of protocols must

**U**sing the right test tools are essential to maintain efficient data communications and local area networks.

be understood and tested across the physical, data link and network layers of a communications system. If system maintenance is handled by multiple outside service providers, the task can become additionally cumbersome since finger pointing between vendors also must be eliminated. In order to expedite getting the network back on-line, the user must deal with isolating the problem to a specific vendor's equipment.

Using the right test tools are essential to maintain efficient data communications and local area networks. These tools should provide network performance information by observing actual network traffic (monitoring) or by actively testing the communications system.

### Communications Test Tools

Field service troubleshooting of data communications and LANs is best handled by three types of portable test devices. These tools monitor the activity over the lines, provide specific test data for transmission, and/or analyze all network activity. The three most common devices used for these purposes are the breakout box, the data line monitor and the protocol analyzer.

A breakout box monitors the individual pins of a communications interface in order to detect the presence or absence of activity (it indicates whether a specific pin or line is being used). This

helps the user determine if the transmission on a specified pin has reached its destination. It's ideal for cable checking or during new installations. Before installing a system, the breakout box can simulate the finished wiring (you can "rewire" the cable by opening leads with the switches and jumpers on the box.) This can be done until the wiring format that allows the devices to communicate with each other is found.

There are many different types of breakout boxes. There are basic models that provide bare-bones monitoring and testing of data transmission over an interface, to sophisticated models with many built-in troubleshooting aids. However, all breakout boxes only detect for line activity. These monitoring tools don't test the active signal for errors, determine if the transmitted data is correctly received, or monitor for "garbage" on the line. The boxes can't perform such tasks as store, send, receive, check or interpret data. Breakout boxes don't test baud rates, perform line testing, check protocols, or measure voltages; they simply monitor the individual leads (pins) of a communications interface for activity.

Sometimes the limited monitoring ability of the breakout box is not enough. A Data Line Monitor is needed when the data itself must be checked for errors, the communications lines moni-



tored for throughput and noise, or it becomes necessary to actually capture bytes (to "read" the data) in its transmitted formats.

The monitor picks up where a breakout box leaves off. I define it as a sort of logic analyzer for data communications. You can use the monitor to observe the flow of transmitted and received data, hold data bytes and store them for future reference, display the data in various formats and perform bit error rate testing (BERT).

When more in-depth, total network performance analysis is required, such as determining the quality and congestion of a link or monitoring frame sizes and data packets, a Protocol Analyzer can be used.

Hewlett-Packard makes a number of these test devices for both monitoring and LAN/WAN testing.

HP's 4951C and 4952A are portable

WAN protocol analyzers suitable for field use. They have all of the capabilities of the breakout box and the data line monitor plus they can provide higher level flexible monitoring of all major protocols and data codes on all common network interfaces. The HP 4972A provides LAN protocol analysis at the field level.

### A Basic Network Troubleshooting Guide

From various HP documents, I've put together the following basic communications network troubleshooting guidelines. These tips will help you to rapidly isolate a network problem and return the system to full operational status.

Familiarity with your network's normal operating "fingerprint" is essential for quick resolution of future problems. By capturing data when your network is working properly, you are

aware of normal operating characteristics. These characteristics can be used for comparison purposes when problems arise, enabling you to spot a malfunction and to isolate the fault to a specific network component.

By collecting measurements at key points around your network under normal operating conditions and archiving the results, the data can be used later for future reference during troubleshooting. It's important to note that every network's performance level is different because of the different devices connected, node usage and user's work habits. By making a series of performance measurements (e.g., type of traffic carried, node use patterns, cyclic activity during heavy and light loads, bandwidth usage, line utilization, data transmission quality) and interpreting the results, you'll understand your network's characteristics. This often will

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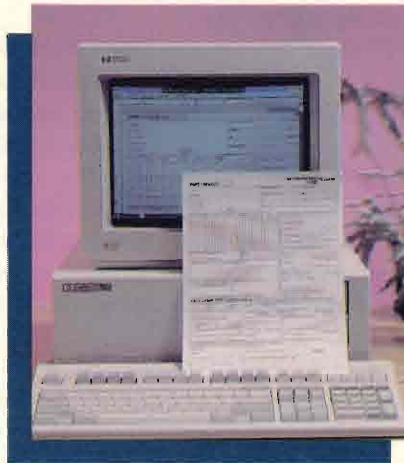
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enable you to spot changes that can point to network degradation and potential troublespots before they become causes of network or node downtime. When downtime does occur,

**A**lways rule out operator error before assuming that the network is down.

this network performance database will aid in rapid remedial action.

Always rule out operator error before assuming that the network is down. In other words, verify that a problem really exists. Human errors, like improper use of the network or lack of correct operating knowledge, is a major cause of reported "problems."

Once human error has been ruled out, here are some guidelines to assist you in pinpointing the cause of the trouble.

- A single user experiencing a problem most likely points to a communications line problem from his terminal to the host. Or, the fault may lie at the terminal itself, cable-to-cluster controller, controller connection or configuration, or system configuration at the host. If the problem is intermittent, it also may be caused by another user dominating the system.

- Multiple users experiencing problems, on a single cluster controller, point to the line from that cluster to the host as being the most likely culprit. The cluster controller, modems, multidrop line, or system configuration on the host may be at fault. Again, a user on that cluster may also be hogging the system at certain times.

- Many or all users experiencing data communications problems on a multidrop system point to the possibility of

overload of that multidrop system, modems, leased line or system configuration on the host.

- Decide whether to use passive or active testing. Passive (non-intrusive) troubleshooting doesn't interfere with data traffic on the network. Traffic monitoring is used in an attempt to locate reported or suspected problems without affecting other users on the system or causing downtime. A test port must be available to which test equipment can be connected. Active testing (intrusive) removes that part of the network being tested from service while troubleshooting is in progress. This type of testing, while sometimes causing a hardship, usually provides better results.

- Have the proper test tools available to isolate the fault in the quickest possible time.

## A Typical Troubleshooting Procedure

Network troubleshooting can be broken down into three layers of testing:

**Level 1** — the physical interface. This is the hardware that is used to physically connect and transmit the data.

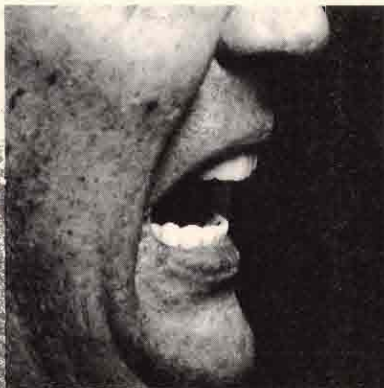
**Level 2** — the data link level. Here, we mainly are concerned with the software that is responsible for moving data reliably across the physical link. In a LAN this is usually an Ethernet, IEEE 802.2 or Starlan package.

**Level 3** — the network level. This level is responsible for switching and routing information and for maintaining connections between systems.

Always check the physical interfaces first as they are the most common source of network problems (after user errors have been eliminated). A break in the physical connection, such as a downed phone line or loose cabling is at the root of many communications faults. The easiest method for checking a physical connection is to monitor the pins (leads) at both sides of the connection (e.g., at the entry and exit points of a MODEM, or at the sending pins of a host computer and the receiving pins of

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a target terminal), using a breakout box, data line monitor or protocol analyzer.

This is where the database you collected on system performance becomes a valuable asset. Compare the activity on the leads under test against their status when the network was working properly. If the current results match the fingerprint data previously gathered, the physical connections are probably good.

Next, check for indications of poor line quality. Two tipoffs are excessive bit errors during transmission and excessive rejects. Problems can be determined by using a data line monitor or protocol analyzer. Again, compare the present results against the fingerprint data.

If the preceding checks don't indicate any fault conditions, next look for possible configuration errors or bad clocks. This is easily done by employing a protocol analyzer. The testing, monitoring and decoding to accomplish this will depend on the type of level 2 environment being utilized (refer to the application document listing at end of this article for additional information).

If no error conditions have been located, but a network problem exists, you are ready to start the next level of troubleshooting. Two types of problems are possible here: system software faults, (which are very rare) and user related faults, like improper addressing and network congestion, or a busy signal on a phone line. Again, the exact testing pro-

cedures will depend on the type of environment in which you operate.

Usually, if no faults are isolated by the time you reached this point, either the problem was missed during troubleshooting or the problem is not network based. If you are convinced there is a network problem, the line should be taken down for active testing. This includes bit error rate testing (BERT), simulation testing, or network and subscriber emulation testing. Protocol analyzers are best utilized for these higher-level procedures.

In today's complex data processing-communications environment, keeping your network on-line requires the ability to manage a variety of computer equipment, understand possibly dozens of protocols and to maintain a working knowledge of your network's unique operating characteristics. Good preventive and predictive maintenance programs can alleviate many potential

problems before they cause users to lose precious processing time.

When a network does go down, time is of the essence to return to operational status. A good corrective maintenance program is essential to minimizing downtime. It doesn't start when the system fails, it must begin when the system is operating normally. Learning the ins and outs of the network, being aware of how it performs under normal operating conditions and having the proper troubleshooting tools (including a performance database) handy and ready to be put to use in an emergency keeps you in control of the network. This control ensures that a fault can be rapidly identified, isolated and resolved, resulting in a more controlled situation.

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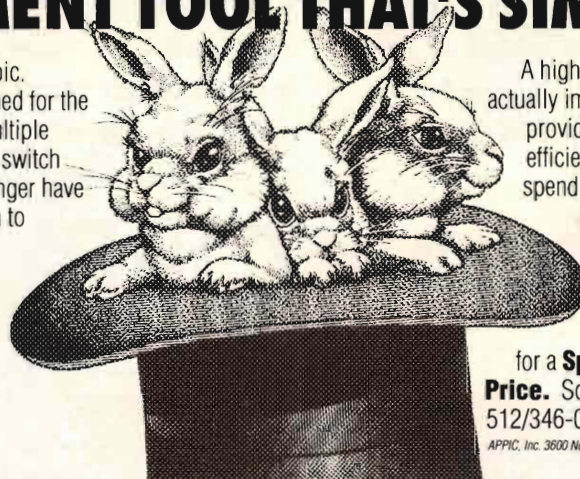
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3. LAN performance Analysis Product Note (5952-5103)
4. Application note 424 (SNA networks) (5952-5131)
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# HICOMP-SOFTWARE IS SAVEWARE

Lappin Werbeagentur • Hamburg



**Hewlett-Packard recently acquired the worldwide rights, with unrestricted usage for their own company, to two advanced tools, HIBACK and DBTUNE from HI-COMP.**

*This partnership provided sufficient reason for Klaus Stamer, General Manager of Hewlett-Packard in North Germany (photo right) to personally present Uwe Hinrichs of HI-COMP Hinrichs GmbH with a special certificate.*



Confirming the contract (February 1989)

*HIBACK and DBTUNE from HI-COMP. Developed to let you access and save all data files on an HP3000. The Hewlett-Packard people set the challenge and were delighted with the results.*

**The MPE/V and MPE/XL versions are completely compatible – saving time and money.**

#### **HIBACK/3000 and HIBACK/XL**

- Hi-density data compression
- Full compatible with all HP storage devices
- LAN/DS network support
- Unattended operation
- Hi-speed combined data base and file backup

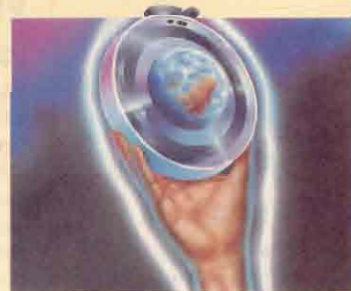
#### **DBTUNE/3000 and DBTUNE/XL**

- Capacity Management
- Preventive Maintenance
- Performance Tuning
- General Maintenance
- Rootfile Maintenance

*Functional and reliable tools. The hardware manufacturer and the software house shook hands on the deal upon completion of extensive tests. The customer is the lucky winner.*

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Telefax: +49 (40) 6316004

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New York, N. Y. 10007  
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INTERNATIONAL

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CIRCLE 116 ON READER CARD

Continued from page 28

## HP Announces MAP 3.0 Protocol Analyzer

Hewlett-Packard has introduced a MAP 3.0 protocol analyzer designed for network-development and maintenance testing on Open System Interconnect (OSI) networks.

The HP 4974S MAP protocol analyzer contributes to OSI network testing by decoding the seven-layer MAP protocol stack. It connects to IEEE 802.4 networks and offers testing for the MAP 3.0 protocol stack, including file transfer and management and the manufacturing messaging service.

In addition, the HP 4974S lets users view protocol events so they can debug MAP implementation and increase interoperability. The analyzer is part of HP's family of HP OpenView network-management products.

## AutoMate Initiates Jobs Without An Operator

Complementary Solutions Inc. has released AutoMate, a software product that initiates computer jobs without operator intervention. AutoMate allows PC users to program their computers to perform routine tasks on a predetermined schedule. Tasks such as creating back-up files, printing reports, scheduling batch jobs or any task that can be executed for the DOS prompt may be automatically initiated by AutoMate.

AutoMate also enables PCs with communication capabilities to initiate communications with remote micros, minis or mainframes in an operator unattended environment. The PCs can then go on to perform other tasks automatically.

AutoMate runs on any IBM compatible with a fixed disc and MS-DOS 2.0 or higher. AutoMate utilizes a background TSR program of only 3KB.

AutoMate sells for \$199 or \$249 with Keyboard Macro.

Contact Complementary Solutions Inc., Suite 202, 4470 Chamblee-Dunwoody Rd., Atlanta, GA 30338; (404) 454-8033.

**Circle 384 on reader card**

## MiniSoft 2392 Now Includes PC-To-Host Printing

MiniSoft has released MiniSoft 2392, version 4.0. MiniSoft 2392 features the ability to print PC-based applications such as word processing, spreadsheets and graphics off of printers connected to HP 3000, 9000 and 1000s and VAX computer systems.

MiniSoft 2392 is a terminal emulation and a data communications package designed

for the IBM PC family and compatibles. MiniSoft 2392 provides a complete emulation of the Hewlett-Packard 2392 CRT terminals.

Some features include: ASCII/Binary file copy for file transfers between the PC and HP 3000, DEC VAX, HP 9000 or HP 1000 computer systems, user definable function keys, the ability to break to DOS without logging off, multipage scrolling memory, complete HP printer function support, and support of baud rates from 300 to 19,200.

Price is \$95.

For more information contact MiniSoft Inc., 16315 NE 87th, Suite B101, Redmond, WA 98052; (206) 883-1353.

**Circle 395 on reader card**

## Infotek Systems Introduces Enhancement Boards

Infotek Systems has introduced two new enhancement boards for users of Hewlett-Packard 9000 Series 200/300 workstation computers. The additions to Infotek's comprehensive product line are the MC300 motion controller and the DSP316 digital signal processor (DSP).

The MC300 is a programmable motion controller based on the HP HCTL1000 motion control IC, which provides five control functions for a wide range of industry-standard stepper, DC and DC brushless motors.

The Infotek DSP316 is 16-bit fixed-point DSP that is suited for applications that require Fast Fourier Transforms, digital filtering and correlation. Operating up to 8 MIPS, the board can complete a 1024-point FFT in nine milliseconds.

For more information contact Infotek Systems 1045 S. East St., Anaheim, CA 92815-8508; (714) 956-9300.

**Circle 380 on reader card**

## VITEQ's Benchmark Family Expands

The benchmark family of products from VITEQ has been expanded to include interface capability with RS-232C interface. This new interfacing capability ensures that the Benchmark UPS family of products with "ideal" power protection may be used for all networking applications with a computer having an RS-232C port.

The computer operating system using the RS-232C communications port can transmit or receive information through the VITEQ full duplex interface. Information capable of being transmitted via the interface includes various utility power source and

UPS status indications. In addition, the UPS will accept a shutdown command from the computer system.

Once alerted by the Benchmark UPS that utility power has been interrupted, the operating system can be programmed to initiate automatic shutdown routines utilizing user-defined parameters.

Network users can be notified of the time remaining to log off the system. When the time has elapsed, the operating system writes all data in memory to disc storage and shuts itself down. The entire operation is coordinated to automatically finish within the reserve time of the Benchmark UPS battery.

Prices for the Benchmark UPS with interface capability range from \$1,945 to \$3,345 including interface cable.

Contact VITEQ Corp., 10000 Aerospace Rd., Lanham, MD 20706; (301) 731-0400.

**Circle 381 on reader card**

## Scientific Software Improves Technical Graphics Program

Scientific Software has released GraphStar 2.0, the latest version of its technical graphics program. GraphStar is a full-featured technical and data graphics system, designed to meet the graphics needs of scientists, engineers, mathematicians, analysts and other technical professionals.

GraphStar (\$99) provides features such as Log and Linear scales, automatic or manual scaling, interpolation for drawing smooth curves, text annotations and legends placed anywhere in the graph and a built-in data editor.

Menus are provided for entering the data files to be plotted, the graph set-up parameters and text or legends to be placed in the graph area. These menus give you total control over the plot, including scale divisions, tick marks, plotting symbols and axis labels. High resolution screen previews are provided to allow interactive graph creation and archive files are used to store graphs for later use.

GraphStar is designed to provide the high-quality hard copy graphics required for scientific publications. For most dot-matrix printers, both high and medium-quality outputs are provided. Typical high-resolution copy is 216 x 240 dots per inch. Pen Plotters also are supported. GraphStar runs under PC-DOS and is compatible with CGA, EGA Hercules and VGA graphics adapters.

For more information contact Scientific Software Solutions P.O. 956, Valley Forge, PA 19482; (215) 269-0198.

**Circle 391 on reader card**

## ACQPAK — Acquisition And Analysis Package

Intelligent Applications Corp. has announced ACQPAK data acquisition software, a general-purpose acquisition and analysis package that requires no user programming.

ACQPAK captures real-time data automatically from instrumented research and manufacturing processes. It's designed for use by engineers and technicians and provides an uncomplicated way to handle complex data.

Channels are defined in a flexible menu-driven, spreadsheet format. You can collect data, convert it to engineering units and display measurements real-time from up to 999 channels. Basic statistics, including mean, range and standard deviation can be calculated over any desired time interval. Data appears in tabular and graphical formats.

ACQPAK (\$1,500) runs on any computer using HP Pascal 3.2 including HP 9000 Series 200/300, HP Vectra PC-305 and PC-308 with Pascal option and IBM AT and compatibles with HP Language Processor.

ACQPAK is designed to work with a variety of front-end measurement equipment, including the HP 3852 and the HP 3497. Demonstration software is available. Complete ACQPAK systems, integrated with computers and data acquisition hardware also are available directly from the company. Contact Intelligent Applications Corp., P.O. Box 6233, Wilmington, DE 19804-0833; (215) 388-1000.

Circle 390 on reader card

## Provident Recovery Offers Relocatable Data Centers

Provident Recovery Systems offers an alternative to disaster recovery by offering relocatable data centers. With multiple locations, Provident's client base covers the continental U.S. and includes major manufacturers, retailers, governmental agencies, research firms and corporations.

A program based on flexibility, service and response to specialized requirements, Provident has been designed to bring all functions of the recovery procession to where

they can be most effectively handled — at the client site. The relocatable recovery center comes equipped with air conditioning, power panels, humidity control, raised-flooring security system generators, Halon fire protection and is available in configurations between 600 and 3,500 square feet for any type hardware.

Contact Provident Recovery Systems, 110 MacKenan Dr., Cary, NC 27511; (919) 469-3325.

Circle 383 on reader card

## OCS/PRIVATE 4.0 Simplifies Password Administration

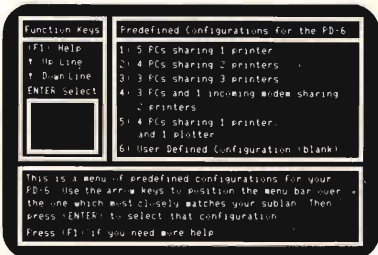
Operations Control Systems (OCS) announced OCS/PRIVATE 4.0, a comprehensive new release of its advanced security management software product for the HP 3000.

OCS/PRIVATE 4.0 provides an approach to password management access control, auditability, automatic log off, jobstream security and self maintenance. The new releases shifts the emphasis of security related

# 4 Ways To Share Laser Printers



**HP LaserJet Series II D™ resident selections are a keystroke away, no matter what applications you're using, and this capability is available for every major brand of printer.**



**Autoinstall provides automatic installation for your particular configuration.**

Digital Products is the leader in providing affordable printer sharing. With more than 300,000 ports installed in a wide range of Fortune 1000 businesses, Digital Products has the experience and leadership to solve your printer sharing problems. Pick the price and performance level that your application requires.

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Ports	8-32	6-16	6	4
Autoinstall	Y	Y		Y
Copies	Y (collated)	Y		Y
Popup operations, RAM resident and non-resident	BigPop	SmallPop		LaserPop
Job cancel	Y	Y		Y
Automatic form feed	Y	Y		Y
Forms overlay printing	Y			
Text enhancement	Y			
Font management	Y	Y		
Resource utilization reports	Y			

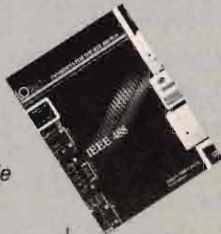
LaserJet Series II Printer is a trademark of Hewlett-Packard Co.

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# HP-IB Interfaces

- HP-IB instrument & plotter interfaces for Vectra, PC, AT, 386, PS/2 & Macintosh
- HP-IB data buffers
- HP-IB bus extenders
- HP-IB converters to RS-232, RS-422, modem, Parallel (Centronics), SCSI, analog I/O, digital I/O, GPIO & BCD
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## NEW PRODUCTS

information from the logo to the individual and thereby greatly simplifies the administration of passwords.

In addition OCS/PRIVATE 4.0 now allows for the suspension of users after a configurable period of inactivity. Any attempted use of an inactive log on is recorded in the OCS/PRIVATE 4.0 violation log file. When necessary a suspended log on can be easily reactivated by the System administrator.

User security has been enhanced through a notification feature that informs users of the date on which they last logged on. This helps alert users to security violations made through the use of their individualized log on procedures.

To prevent the ability to continue "guessing" at a password, OCS/PRIVATE 4.0 will now automatically shut down access to a particular log on after a configurable number of failed attempts.

OCS/PRIVATE 4.0 also utilizes a sophisticated parameter substitution facility that eliminates the need for operators to prepare jobstreams for production. Instead of hardcoding passwords, lockwords, constants and dates into jobstreams, the system allows users to specify variables such as "today's date" or "the last workday of the month." Then during production, OCS PRIVATE 4.0 automatically retrieves or calculates the correct value of the parameter and substitutes it into the jobstream. Contact Operations Control Systems, 560 San Antonio Rd., Palo Alto, CA 94306; (415) 493-4122.

**Circle 323 on reader card**

### HP Test Expert Incorporates AI

Hewlett-Packard has introduced HP Test Expert, an expert system for electronics manufacturing that reduces redundant testing, eliminates the need to write diagnostic software and can reduce the software costs.

A component of the HP ATS 2000, HP Test Expert is one of the first ATE tools to incorporate artificial intelligence capabilities.

HP Test Expert features include multiple-fault diagnosis, hierarchical diagnosis and case-adaptive test ordering.

### Network Research Corp. Ships Fusion TCP/IP

Network Research Corp. (NRC) announced shipment of its FUSION Network Software for Hewlett-Packard 9000 Series 200 and 300 Pascal workstations (PWS). The new NRC software provides users of HP 9000 workstations with TCP/IP (Transmission Control

Protocol/Internet Protocol) multi vendor networking compatibilities for the first time.

TCP/IP, adopted by the Department of Defense, is the most widely used de facto standard for multivendor communications in engineering, manufacturing and commercial networking environments.

Hewlett-Packard funded and provided equipment for the development of the FUSION for PWS product. While HP is providing marketing and technical assistance, NRC is directly selling and supporting the product. HP will recommend the product as an HP listed product.

FUSION for PWS features file transfer capabilities using the File Transfer Protocol (FTP) and virtual terminal (TELNET) applications which are executed from the Pascal operating system's menu-driven interface.

NRC is bundling network management utilities in FUSION for PWS plus a programmatic socket library interface which can be used to develop network applications and perform interprocess communications.

NRC is also in the process of developing FUSION Networking Software for HP 9000 BASIC workstations. This software is expected to be available during the third quarter of 1989.

The U.S. list price for FUSION for PWS is \$1,000.

For more information contact, Jean Sylwanowicz, Network Research Corp., 2380 N. Rose Ave., Oxnard, CA 93030; (805) 485-2700.

**Circle 324 on reader card**

### Digital Products Inc. Offers Forms Capabilities

Digital Products Inc., a developer of subLAN and peripheral sharing products, announced an enhanced version of its Popup printer control software that enables users to print company letterheads and forms on plain paper using a laser printer.

The forms overlay capability enables users to select and print an image, logo or letterhead at the same time as the document itself, eliminating the need to change paper trays. In addition, the command to print the image can be stored in memory in Digital Products' NetCommander subLAN or PrintDirector printer sharing device, so the overlay command automatically will be sent to the printer at the start of the user's next print job. This feature makes it possible for several users to print multiple forms without changing paper trays.

The forms overlay feature can be used with Hewlett-Packard Series II, IID, LaserJet Plus and any HP LaserJet Plus-compatible



# Bering's solution series.



Bering introduces three new members to its family of Hewlett-Packard subsystems. Each of these products is specifically tailored to meet today's demanding storage needs.

The new EconoPac 5050, delivers 500MB of storage capacity, an ideal solution for local area networking, or any other large capacity requirement.

The TwinPac II offers removable storage for security, expandability, exchangability, backup and archiving.

The all new 5¼ inch format means even more convenience and continued reliability.

And Bering's new 2000MB Tape backup subsystem can handle any backup need. State-of-the-art helical scan technology ensures efficient, error free backup.\*

Bering's products are 100% hardware and software compatible with HP computers using CS/80 and SS/80 command sets, including, HP9000 Series 200/300/500, HP1000, and HP3000 computers.

Also, each unit is protected by a one year warranty.

Bering remains committed to high quality and high performance at a savings.

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\*Product available for shipment 1/89

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laser printers. Up to 32 overlays can be sorted at a time.

Digital Products also offers a form preparation service. The company scans and convert images such as letterheads and company logos into HP format for overlay forms. These custom forms can be loaded from a personal computer into the printer memory. Text descriptions of the overlays appear as options in the Popup menu, enabling any user to select a desired letterhead or heading.

Featured in the printer control software is JetTalk, Digital Products' printer control language. JetTalk enables users to control LaserJet printers without having to learn HP PCL commands. JetTalk commands make it easy, for example, for users to change fonts, highlight text or print a border around a document.

JetTalk is useful for enhancing printouts generated from programs with little printer support, such as Lotus 1-2-3, Multiplan and DBase. With the forms feature, users do not have to reset the printer each time a new logo or form is needed.

The Popup software with forms capabilities comes with all Digital Products printer sharing devices. The forms preparation service is available at \$400 per page. For further information contact, Marilyn Peterson, Digital Products Inc., 108 Water St., Watertown, MA 02172; (617) 924-1680.

**Circle 367 on reader card**

## TQC Software Identifies Matching Component Sets

Test Quality Co. has released Component Matching Software, an engineering productivity tool that matches measured component characteristics by specified tolerances and produces component groupings by the maximum number of matched sets. Operating through a matching-algorithm, TQC's Component Matching Software eliminates the labor-intensive and tedious task of manual comparisons and calculations of units, which, in any event, would rarely result in the optimum number of matched sets.

TQC's Component Matching Software operates from a table of measured data that lists measurement points and matching tolerances by component identification number.

TQC 2120 Component Matching Software is designed for automated laboratory and production test environments. It operates on the HP 9000 Series 200/300 under BASIC 5.X. The software cost is \$2,800, with immediate delivery available.

For more information contact, Marketing

Dept., Test Quality Co., 2316 Walsh Ave., Santa Clara, CA 95051; (408) 986-8880.

**Circle 361 on reader card**

## Cognos Offers Financial Applications

Cognos Inc. announced the availability of its financial application software packages, MULTIVIEW 5.04 and PowerPlan 5.01F, for the HP 3000 Series 900 midrange computers.

MULTIVIEW Financial Software, which consists of the integrated product set of MULTIVIEW GL, AP and AR, is now available in native mode PowerHouse on the MPE-XL operating system. PowerPlan, the Financial Planning and Analysis tool, is offered in compatibility on MPE XL.

HP 3000 customers using 900 Series systems now can take full advantage of features like the MULTIVIEW Accounts Payable (AP) package, which provides maximum control and flexibility in cash disbursements management, as well as Accounts Receivable software featuring on-line credit information and customized statements. Financial managers also can gain from the features provided by MULTIVIEW General Ledger software, which accommodates multiple-companies, period structures and charts of account and organizational structures.

HP 3000 MPE XL users also will benefit from PowerPlan's consolidation capabilities. In addition, PowerPlan is a true decision support tool that can be used in a variety of applications ranging from Performance Reporting to Operational Analysis.

Contact, Wendy Rajala, Manager, Public Relations, Cognos Inc., 3755 Riverside Dr., Ottawa, Ontario K1G 3Z4; (613) 738-1440, ext. 4306.

**Circle 365 on reader card**

## DBPIX Offers Printing And Assembly Service

DBPIX now offers a printing and assembly service using its database diagramming utility software. Instead of purchasing the software, any user of IMAGE or Turbo-IMAGE on any HP 3000 can send a copy of a database schema to DBPIX and DBPIX will print the database diagram for a flat fee. For an additional fee based on the number of sets in the database, DBPIX also assembles the database diagram into a complete database poster. Various character sizes and styles are available including high-quality LaserJet fonts. These poster-size diagrams are ideal for system documentation, database training and educa-

tion, DBPIX provides the database documentation facility that IMAGE and Turbo-IMAGE always have lacked. U.S. list price for the printing service is \$50 plus shipping. For further information contact, DBPIX, Box 223, West Newton, MA 02165; (617) 527-7087.

**Circle 363 on reader card**

## Wollongong Ships HP 3000 Communications Software

The Wollongong Group has introduced an enhanced version of WIN/TCP for MPE/V that's designed to give customers access to block mode applications across their TCP/IP networks. WIN/TCP for MPE/V is a member of the Wollongong Integrated Networking Solutions (WINS) family.

One enhancement to the data communications package is the block mode TELNET, File Transfer Protocol (FTP) performance improvements, Simple Mail Transfer Protocol (SMTP) support for multiple address forms, and Domain Name Resolver support.

The TELNET enhancements in Release 1.1 enable a block mode terminal (or PC with a block mode terminal emulator—such as Walker Richer & Quinn's Reflection software) to TELNET into an HP 3000 system and run most block mode applications. The HP block mode terminal can be connected either to a terminal server or a host, with both running TCP/IP. Wollongong's capability is transparent to most block mode applications. TELNET enables users to interact with a remote system as if the terminal and the other system were directly connected.

FTP throughput has been improved in Release 1.1. File transfers are faster by 100 to 300 percent, depending on file and block size.

Also, users of the TCP/IP SMTP mail service can now use partial address specification of HPDesk distribution list recipients. This allows more natural support for HPDesk users on other machines.

Release 1.1 now supports use of the Domain Name Service for all host references.

The TCP/IP (Transmission Control Protocol/Internet Protocol) standards allow two or more cooperating processes on different computer systems to communicate. TCP/IP hosts may be any mixture of computers and operating systems that are interconnected by the TCP/IP networking software.

Available immediately, WIN/TCP for MPE/V licensing fees are based on processor size. Prices begin at \$5,000 for a Micro 3000 Series 3X, to \$12,500 for a Series 70. Educa-

tional discounts are available.

For further information contact, The Wollongong Group Inc., 1129 San Antonio Rd., Palo Alto, CA 94303; (415) 962-7100.

Circle 325 on reader card

## ONLINE-BACKUP/3000 V2.12 Eliminates Downtime

Version 2.12 of ONLINE-BACKUP/3000 from ORBiT Software completely eliminates the need for system downtime in the backup of Image databases.

The original ONLINE-BACKUP/3000 enabled the operator to back up data during normal system productivity. Ten minutes of downtime (for system synchronization) was required.

Version 2.12 also features true disc-to-disc backup, enabling the user to restore backed-up data from the disc file and to copy backup disc files to tape for multiple backup copies. It eliminates the need for multiple tape drives for companies which require more than one backup.

Other features of Version 2.12 enable the user to select various parameters of the backup, including compression factors and acceptable error rates.

For more information contact, ORBiT Software (USA) Inc., 319 Diablo Rd., Suite 218, Danville, CA 94526; (800) 6-ONLINE or (415) 837-4143.

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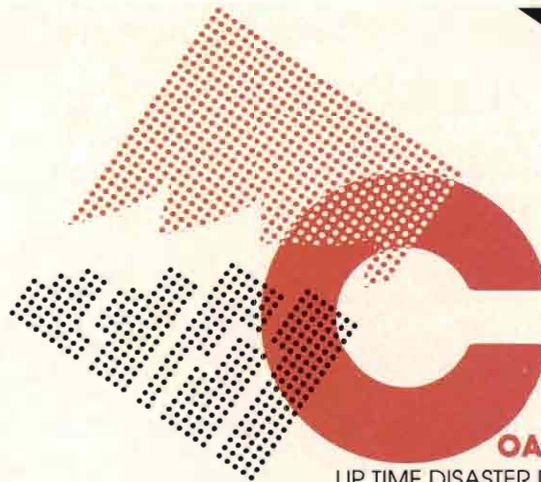
## New Warehouse Management System

Bakco Data Inc., an innovator of System Solutions for Warehousing, announced an enhanced version of its Warehouse Management system (WMS) functioning on the DEC VAX and Hewlett-Packard HP 3000 computers.

The Bakco WMS provides management with the ability to reduce warehouse labor, increase warehouse space utilization and improve service levels.

The Bakco WMS provides the Warehouse Manager with the ability to "preslot" each full and partial skid of merchandise in the most efficient manner. The Bakco WMS automatically can account for merchandise size and weight constraints, as well as frequency of use, to determine the best location within the warehouse to store inventory. For more information contact, Bakco Data Inc., 1417 Lake Cook Rd., Deerfield, IL 60015; (312) 940-8330.

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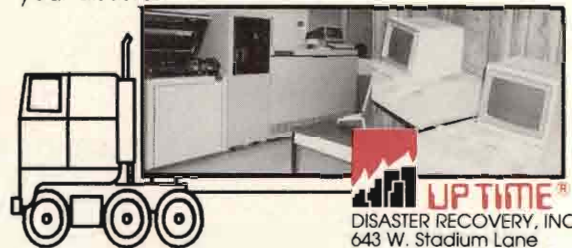


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## How Secure Is Your Data Centre?

- Are your users individually identified and authenticated?
- Are their actions authorized and monitored?
- Are they prevented from being in direct contact with MPE?
- Are your PC users prevented from issuing unauthorized sequences of MPE commands?
- Do your users require multiple log-ons and a myriad of associated passwords to access all their authorized application functions?

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## Eastern American HP Users Conference

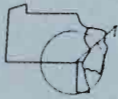
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Need more information? Call Jeri Fuller at 215-825-7760.

Please make your room reservations directly with Harrah's Marina at 800-242-7724. The special conference rate is \$79 a night in the Tower or \$89 for the Altrium Suites. Guarantee your room in the hotel by calling before May 3.

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Fee includes valet parking, 3 breakfasts,

2 luncheons, coffee breaks, 3 receptions and conference gifts.

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Some publications, we're sorry to say, keep their readers undercover. They steadfastly refuse to let BPA (Business Publications Audit of Circulation, Inc.) or any other independent, not-for-profit organization audit their circulation records.

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## Fourhills Technology Extends Life For DSG/3000

Fourhills Technology Group has announced new software that will extend the life of DSG/3000 chart drawing software.

CI/DSG allows DSG/3000 charts to be drawn on the new Spectrum class HP 3000 computers. Users upgrading to the new models can continue to run existing charts and can create new charts.

Users of 4GL languages now can create customized charts directly for those language. Users of standard languages can create production charts without using intrinsics. Simple ASCII files that contain all the information needed to draw a chart can be created by these languages.

Chart drawing can be deferred to off hours with the batch processing feature. Sites with spoolable plotters or printers can draw charts in off hours without operator intervention. Other sites can have the plotters/printers monitored by the computer operator. This saves CPU time during peak hours and better utilizes staff.

For more information contact Fourhills Technology Group, P.O. Box 243 Cupertino, CA 95015; (408) 446-2725.

Circle 382 on reader card

## Pacific Data Releases Plotter In A Cartridge

Pacific Data Products has announced Plotter in a Cartridge, a HP-GL emulation cartridge for laser printers. The cartridge is a complete emulation of Hewlett-Packard's 7475A plotter and implements HP-GL on a Hewlett-Packard LaserJet Series II printer.

Plotter in a Cartridge plugs into the font cartridge slot of the printer and is fully compatible with all major CAD, presentation graphics and spreadsheet graphics software programs. The cartridge produces high-quality graphics in a fraction of the time required for pen plotters or PC-based software emulations. Features include variable pen/line thickness, x and y axis scaling, arc and circle generation, plot rotation, multiple fill and shading patterns plus full paper sizing capabilities. Plots automatically are rescaled to the paper, configuration in use including regular, legal, A3, A4 paper transparent media and envelopes.

The list price for Plotter in a Cartridge is \$395.

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

Circle 388 on reader card

## Carolian Systems Offers Resource Planning Tool

Carolian Systems International Inc. has released version A.04.00 of SYSPLAN. This new version has been enhanced to provide greater power and flexibility for analyzing historical system resource utilization and for predicting future performance trends.

Highlights of the release include the ability to modify the value of any point or points on a line graph, allowing you to create a "what if" type of report based on expertise and knowledge of forthcoming events.

The new database feature in SYSPLAN allows you to report on one or several machines in your network and to display that information on a single graph. With this capability you also can group several machines together making it easy to do a "site-by-site" report. In all, the new database allows you to create five new types of network-wide reports.

For more information contact Carolian Systems International Inc., 3397 American

Drive, #5, Mississauga, Ontario, L4V 1T8; (800) 263-8787.

Circle 389 on reader card

## Lasersoft/3000 Now Includes Multiple Part Forms Module

Business Systems International has announced the release of the new version of Lasersoft/3000 a multiuser electronic forms design and data merge application for HP 3000s and the HP LaserJet Series of printers, including the new LaserJet Series IID.

Release 1.4 of Lasersoft/3000 includes the Multiple Part Forms Module that allows users to replace even the most complex pre-printed form sets with electronic forms. The new module supports printing multiple part forms without requiring modifications to the user's application. Up to 99 different parts may be printed from a single page of output data. The multiple part may have a unique routing designation printed on it and be routed to a different department printer.

Lasersoft/3000 includes a forms com-

position module that allows electronic form files to be created and maintained on the HP 3000. It also includes a printer management module which allows forms and soft fonts to be downloaded directly from the HP 3000 to the laser printer, either on-line or by batch job, which can be executed by itself or as part of an application job stream.

Lasersoft/3000 operates on any model of the HP 3000 computer and supports the Hewlett-Packard LaserJet/PLUS, LaserJet Series II, LaserJet ID, LaserJet 2000 and any true emulation of these printers.

For more information contact Business Systems International Inc., 20942 Osborne St., Canoga Park, CA 91304; (818) 998-7227.

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*Note: For more information about HP products, contact the Hewlett-Packard sales office listed in the white pages of your telephone directory.*



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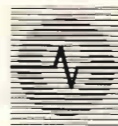
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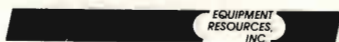
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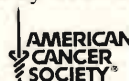
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## [ CALENDAR ]

### [ APRIL ]

**26-28:** The International Association of UNIX systems users and Patricia Seybold's Office Computing Group will jointly sponsor the Executive Uniform Symposium at the Santa Barbara Biltmore Resort Hotel, in Santa Barbara, CA. For further information, contact Judy Hurwitz at Patricia Seybold's Office Computing Group, 148 State Street, Suite 612, Boston, MA 02109; (617) 742-5200.

**16-18:** The Corporate Electronic Publishing Systems (CEPS) Show and Conference will be held at Chicago's McCormick Place. Topics range from desktop publishing to open architecture and system integration. Contact Kim Ray, Cahner's Exposition Group, 999 Summer St., P.O. Box 3833, Stamford, CT 06905; (203) 964-0000.

**18:** Unisys Education Marketing and Sales is sponsoring a Disaster Recovery Planning/Information Security Management training program. The programs will be held at Unisys Education Centers nationwide and are scheduled now through June 1989. Contact Unisys Corp., P.O. Box 2191, Princeton, NJ; (800) 222-0966 or in NJ (201) 329-3899.

### [ MAY ]

**3-5:** The Southern California Regional Users Group (SCRUG) will sponsor its 1989 Technical Conference and Vendor Show in Pasadena, CA. For more information contact Karen Zimmerman, SCRUG, P.O. Box 84219, Los Angeles, CA 90073; (213) 450-3383.

**4:** Arthur Young and Company is organizing a seminar on Financial Applications of Expert Systems, (Los Angeles, CA) For more information contact Barbara Day at Arthur Young and Company, 515 South Flower St., Los Angeles, CA 90071; (213) 977-3284.

**16:** NOWRUG is holding a meeting at 6:30 p.m. in the Greenwood Hotel in Bellevue, WA. The speaker is Craig Fransen of Fransen/King Ltd. The topic is HP 3000/PC Integration: Can You Get There From Here? Cost \$10. Contact Sharon Robbins, (206) 282-6888.

**30-6/2:** NECRUG will hold the 10th Annual Eastern American Hewlett-Packard Users Conference at Harrah's Marina Hotel and Casino in Atlantic City, NJ. Send \$279 check to NECRUG Inc, c/o Jeri Fuller, U.S. Mortgage Insurance Co., P.O. Box 190, Blue Bell, PA 19422; (215) 825-7760. (After 4/28 send \$319, also non-NECRUG members add \$21.) For more information contact Jeri Fuller, for vendor information contact Scott Baldwin, (215) 875-5324.

### [ JUNE ]

**7:** There will be a conference on Intelligent Mapping at the Anaheim Marriot. The theme is "Focus on Desktop Mapping." Contact the conference director, Intelligent Mapping '89, 11956 Bernardo Plaza Dr., Suite 425, San Diego, CA 92128; (800) 882-2058.

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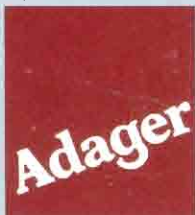
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