Computer Advances

September/October 1984

HEWLETT PACKARD

Inside

HP Computer Museum
www.hpmuseum.net

For research and education purposes only.

Affordable automation for your office

With all the power of the top-of-the-line model of four years ago, and approximately half the cost of the most recent entry-level HP 3000, the HP 3000 Series 37 Office Computer brings a cost-effective solution to your office productivity needs.

The Series 37, the new, low-cost member of the HP 3000 computer family runs the same software as the largest HP 3000 yet it fits under a table and is quieter than a typewriter. Furthermore, you can install the HP Series 37 yourself in entry-level configurations. It operates in carpeted rooms over a wide temperature range without special air conditioning, and it plugs into an ordinary wall socket.

The compact HP 3000 Series 37 Office Computer works with other HP 3000 computers to bring office automation and distributed data processing together.

Versatility and power

The entry-level Series 37 has 512Kb of main memory, a 55Mb disc and cartridge tape backup all in a compact office cabinet. The system can be expanded to the larger Series 37XE supporting as many as 28 terminals, 2Mb of main memory and 2,100Mb of disc storage. With standard upgrades, you can easily grow into HP 3000 models, the largest of which can support as many as 400 terminals. And with HP's efficient data communications, the Series 37 can connect to other HP 3000s and IBM mainframes.

Protected software investment

The Series 37 protects your software investment. As part of the package, you receive all of the HP 3000 systems software, including MPE, IMAGE data base software, QUERY/3000, VPLUS/3000 and other HP utilities.

The Series 37 and other HP 3000s offer one of the widest ranges of price/performance choices available in the industry. The Series 37 product line compatibility lets you upgrade your system without costly software conversions, regardless of the range of upgrade. Many competitor's system upgrades require conversion, yet still can't match the HP 3000's superior on-line, interactive abilities, software productivity tools, networking and multi-vendor data communications facilities.

Ease of use

A key feature of the HP 3000 Series 37 is its ease of use. Costly, time-consuming backup with floppy discs has been eliminated on the Series 37, using a 67Mb cartridge tape.

The system backup can be performed easily. The Series 37 MPE operating system takes automatic control of the system backup and checks for data integrity. Therefore, backup requires no supervision by a systems operator and can be performed after hours with confidence.

Another ease of use feature can automatically deliver the appropriate application screen to each user at the start of the day so users can concentrate on their work right away.

Low cost of ownership

Reducing need for an in-house system operator, the Series 37 also has a reduced need for maintenance. With remote support capability, HP engineers can diagnose your system over the telephone in minutes, providing fast response to improve your system uptime, and reducing the number of more expensive on-site visits.

The VLSI technology used in the Series 37 has reduced the number of parts, power consumption and size. This accounts for twofold improvements in reliability and results in lower support costs.

Included with the Series 37 is a battery backup capability that maintains system memory during a power failure. When the power returns your application automatically resumes where it left off.

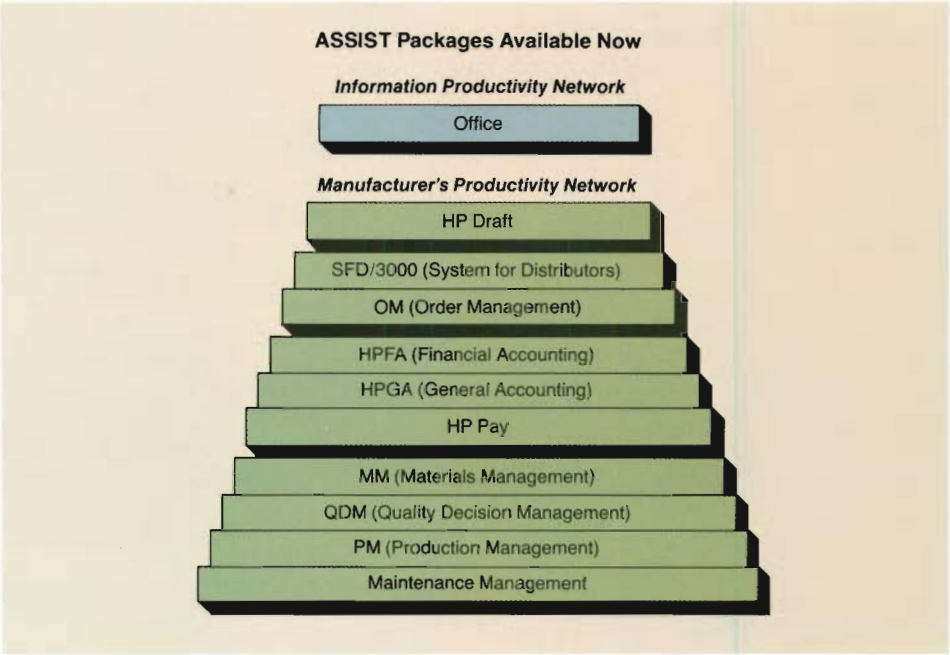
To find out more call your HP Sales Rep.

HP-ASSIST: Take the guesswork out of implementation

Would it help your business to get your new HP software application up and running as fast as possible? Or once it's up, to use it more effectively?

If so, you may benefit from new HP services called HP-ASSIST that help you solve the training and project management problems that sometimes occur in implementing a new system. There is an HP-ASSIST service designed to fit your specific needs, whether you are automating your office, accounting department, warehouse, engineering group or manufacturing floor.

HP-ASSIST can help you understand, avoid or overcome the problems of establishing, teaching and managing new procedures.



A proven process

It is a documented implementation service that provides you with business analysis, product training and project assistance to fully integrate HP applications into your business. HP-ASSIST is not time-and-materials consulting; it is a step-by-step process that takes the guesswork out of your implementation.

There are three phases to HP-ASSIST:

1) Customer Application Analysis provides a clearly defined and documented analysis of your business requirements and how our applications meet your needs.
2) Implementation Team Training teaches your project team to effectively manage the integration of the system into their business. This is achieved through project management training and developing goals and milestones for the entire implementation project.
3) Project Implementation Assistance is the final phase where you receive guidance in managing a project that will be completed on time and within budget. This includes product training and keeping your implementation on track with continuous progress reviews.

These three services assure a solution that meets your business needs. By reducing your start-up time, HP-ASSIST helps you achieve a return on your investment in a computer system sooner. Qualified HP professionals are located worldwide to provide the service you need.

For further information, please call your HP Sales Rep.

Two new HP 9000 Series 200 workstations

Two new engineering workstations feature the most-asked-for enhancements to the HP 9000 technical computer family. Now the Series 200 Models 217 and 237 workstations give you increased performance, larger displays, better graphics capabilities and modularity, at lower prices.

Powerful Model 217

Ideal for engineering and software tasks, the Model 217 is a high-powered 16/32 bit workstation that gives you a choice of high-performance HP BASIC or sophisticated HP Pascal. It's modular, so it can be tailored to your application.

You can perform routine tasks such as word processing, with 512Kb of memory, or handle data-intensive, complex tasks with up to 4Mb of memory. For even higher speeds, use the optional floating point math processor.

Information is displayed on the 14-inch monochrome monitor with 512 x 390 resolution. Memory, I/O and performance enhancements can be added in four available card slots.

Model 237 for graphics

A powerful stand-alone workstation, the new Model 237 offers high-resolution, low-cost graphics right at your desk. The quality of the 1024 x 768, 17-inch bit-mapped monochrome display results in sharp, clear images so you can see more detail. The 60 Hz refresh rate helps eliminate flicker.

New HP 9000 Model 237 workstation meets your demands.

The system's 16/32 bit processor lets you speed through design analysis and computations, or quickly generate and manipulate graphics displays. The optional floating point math hardware provides up to three times the standard computational speed for floating point calculations, and 16 slots provide extensive memory and I/O capabilities.

Model 237 operates in HP BASIC, which offers over 60 graphics commands for simplified creation of powerful design programs, or in HP Pascal, which includes graphics support for its modular program development environment.

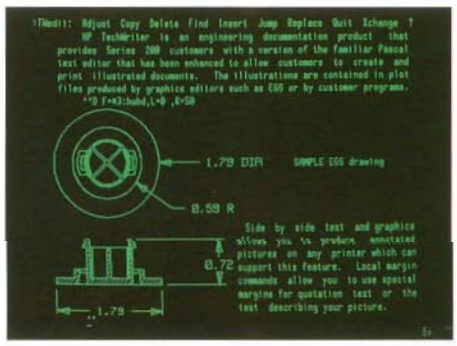
HP TechWriter brings pictures and words together on Series 200 computers

Now you can improve your document editing productivity with HP TechWriter, a new software package for the HP 9000 Series 200 computers. HP TechWriter, the only document editor for the Series 200, lets you include illustrations within the text.

HP TechWriter eliminates the need for 'cut and paste'—it shows text and graphics together on the screen as they will appear in the document. You can use it for documenting software or engineering tasks and for illustrating reports and memos.

The HP TechWriter software package includes a document editor, picture processor, lister and Pascal environment for stand-alone operations. Key features of the document editor include:

- Integrated graphics with text
- Insert/delete/find/replace text
- Word wrap
- Justified left and right margins
- Select areas not to be printed
- Table of contents
- Paging control.



HP TechWriter screen output using HP EGS/200 as the graphics input.

The picture processor will accept pictures from any graphics or user program that can produce plot files from Pascal 2.1/3.0 or BASIC 3.0. The picture processor takes the picture that has been plotted and creates a binary file that can be referenced in the document.

HP TechWriter will support plot files from popular software packages, including HP Graphics Presentation/200, HP EGS/200, HP Statistics Library/200 and HP Project Management/200.

HP TechWriter uses a security scheme that locks the software to a specific computer. Because of this, the software will run only on Series 200 systems with an ID PROM. Upgrades are available.

AUSTRALIAN AREA NEWS

HP Mini Controls Schedules For Ansett Fleet

Daily flight schedule graphs for Ansett Airlines of Australia, which used to take at least four hours to prepare manually, are now produced in eight minutes following the installation of a computer system with graphics capabilities.

The $600 million aircraft fleet is controlled by a Hewlett-Packard 1000 minicomputer system and a graphic plotter valued at about $140,000.

The computer system is also used for diary maintenance, traffic analysis and cost/revenue analysis of schedules.

A most important factor in deciding to convert the manual system on to a computer was the speed and flexibility it would offer, together with the ability to evaluate varying scenarios.

The computer system produces the flight schedule graphs in eight minutes by translating information stored on system to an eight-color pen graphics plotter. If there is a change in the schedule, a new flight schedule graph can be prepared in minutes.

Ansett's fleet of 27 jets service 200 flights a day throughout Australia, so it is necessary that schedulers have all the information needed at their fingertips for them to make important decisions at a glance.

When deciding on a schedule, some of the factors which must be considered are the peaks and troughs of passenger traffic which affect the size of aircraft to be used, connecting flights, curfews, maintenance scheduling and flying times.

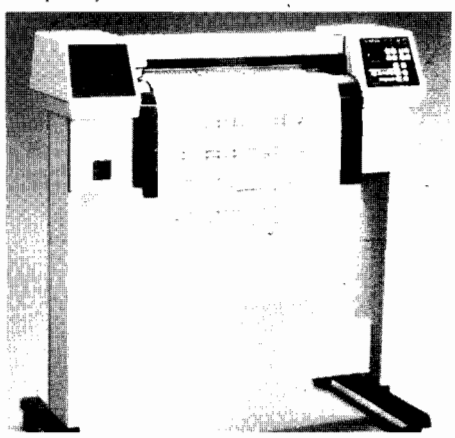
When a new schedule has been agreed upon by the Schedules Planning Department of Ansett, it is fed through to the Central Reservations Control (CRC) which updates the reservations computer. This in turn will advise travel companies and airlines all over the world.

Schedule change data is fed through to CRC as and when schedules changes are made.

The computer system has been in operation for 18 months and holds information on every flight schedule produced since then, as well as details of forthcoming schedules.

Ansett said that before deciding to build their own system, a team travelled around the world to evaluate the systems used by other airlines.

There were several airlines which had coped with some of their requirements, but no airline had a system that they thought would be completely suitable for Ansett.



The HP 7580 graphics plotter can produce complete flight schedule graphs in eight minutes.

N.Z. Building Society to use Australian Banking Software

A leading New Zealand building society, Countrywide Building Society, has signed a major contract with Financial Network Services Pty. Ltd., of Sydney for the supply of software which has been specially developed for building societies.

Countrywide will be the first building society outside Australia to utilise the unique banking software package "FINET", and the ATM, Pos and EFTS software package "TELEPAC".

This software is currently successfully being used by a number of banks and building societies in Australia.

The "FINET" software will be installed on a central dual NCR V8575 11 system. Key to the performance of the Countrywide Building Society network is the use of Hewlett-Packard computers which act as "front end" processors for the entire branch network and automatic teller machines.

Financial Network Services chose Hewlett-Packard's HP 1000 computer for this purpose because of their fast transaction processing performance, cost effectiveness and reliability.

About 250 existing terminals in the society's 52 branches throughout New Zealand will be connected to the new system.

Countrywide expects to have their network fully operational by next April.

Discussing the signing of the contract are (l - r) Mr. Bob Cattell, N.Z. Computer Group Manager for Hewlett-Packard; Mr. Mac Knowles, Chairman of Financial Network Services; Mr. Peter Martin, Chief Executive, and Mr. Peter Clapshaw, Vice-Chairman, both of Countrywide Building Society.

D.D.I.A.E. Student Graduates with HP Award

Hewlett-Packard Australia were pleased to again present an award at the Business Studies Prizegiving Ceremony held by Darling Downs Institute of Advanced Education, Toowoomba.

HP Brisbane Office Computer Sales Representative, Mr. Dave Robinson, presented an HP41CV calculator to Miss Karen O'Brian, for the Best Graduate in Computing.

Miss O'Brian also received a poster of the Columbia space shuttle, a fitting accompaniment to the HP41CV as this was used on board the space shuttle by the astronauts.

Mr. Dave Robinson, Computer Sales Representative with HP's Brisbane Office, presents Miss Karen O'Brian with the 41CV Calculator.

GMH Orders HP1000 Package

General Motors-Holden's Limited has placed an order with Hewlett-Packard Australia for the supply and installation of a computer system to monitor total plant operations in its foundry at Fishermens Bend.

Due to be installed in July, the Hewlett-Packard equipment will eventually control particular operations in the foundry.

The order, worth approximately $\$1\frac{1}{2}$ million, includes an HP1000 computer with 26 terminals running PMC/1000 software (Process Monitoring and Control). This is the first purchase in Australia of the PMC/1000 package which was originally written at Mt. Isa Mines and is now being sold world-wide by Hewlett-Packard.

Mr. Mike Rule, Manager Factory Automation Group of GMH, said they decided to purchase the Hewlett-Packard package because the hardware and software met the functional specifications, was of a very high quality and used the latest technology.

"HP's commitment to make our system work, by providing support during and after implementation, and offering extensive training was also a prime consideration."

HP150 drives Volvo Car to World & Australian Records

Hewlett-Packard Australia can claim to have been the driving force behind a spate of world and national records established by a Volvo 360GLT during a 24 hour endurance test run at the Surfers Paradise Raceway, Queensland.

During the record run Volvo established 14 international and 25 national records for speed and endurance.

And, behind it all was the magical, touchscreen HP150 personal computer. The HP150 recorded lap times, noted the driver and the amount of times the driver had driven (a team of 4 drivers was used during the run), the kilometres per hour achieved and the number of kilometres each driver had driven. A number of those dreaded police amphometres were strategically placed across the track to feed information to the microcomputer.

When the information was fed into the computer, organisers were able to determine when a record was about to be broken.

A special software program was written for the HP150 by Tony Cookes of BBJ Computer Services.

The Volvo car covered about 2500 kilometres in the 24 hours over 825 laps of the 3.2 kilometre track - a distance equivalent to that from Melbourne to Rockhampton. The average speed during the 24 hour run was 110 kilometres per hour.

Hewlett-Packard was a major sponsor of the record run.

The car itself is now going on show at Volvo dealers throughout Victoria and New South Wales and will also take pride of place - along with the HP150 - on Volvo's stand at the Sydney Motor Show in October.

The Volvo 360 GLT in action - taking a corner during the 24 hour speed and endurance run.

UWA Research Group Developing World's Most Accurate Clock

The Gravitational Radiation Research Group at the University of Western Australia has developed a new type of resonator which promises to lead to the world's most accurate clock, with an accuracy of about one second in the age of the Universe.

The clock depends on a new technology, developed in the Department of Physics at UWA, called the sapphire loaded superconducting cavity. The heart of the clock is a single crystal of artificial sapphire, about 50mm long and 30mm in diameter. Microwave signals resonate inside the sapphire crystal, and because sapphire is extremely hard and pure, the oscillation is extremely precise.

To develop this new technology Hewlett-Packard, who currently market the world's most accurate atomic clocks, has given the University of WA some essential test equipment to aid the development. Mr. Bruce Graham, General Manager of Hewlett-Packard Australia presented the equipment at the University earlier this year.

Dr. David Blair, a member of the GRRG, says that it is expected to be one hundred thousand times more accurate than atomic clocks, which themselves are already accurate to about a millionth of a second in a year. Such accuracy is far more than is needed for everyday use, but greater accuracy is needed by radio astronomers to improve their radio images of distant galaxies. The project is being carried out in conjunction with radio astronomers building the huge Australia Telescope project for Australia's Bicentenary.

The clock also has potential applications in spacecraft navigation, and can enable the position of a spacecraft near the edge of the solar system to be measured to less than 1mm accuracy.

LAWYERS USE PCS TO AVOID CASE CONFLICTS

US lawyers are now using personal computers in a unique way – to determine a possible conflict of interest between a new client and one they may have represented before.

Fifteen individual member firms of Connecticut Attorneys Title Insurance Company are using the HP 150 touchscreen and the Personal Card File database software package for this purpose.

Since Personal Card File operates like an electronic card file, they can list any kind of information they want e.g. name and address of a client, the type of case handled and its outcome.

To check for a potential conflict of interest, a lawyer can ask the computer to review all the firm's files to see if either party in a potential case has been represented before.

For instance, if the firm previously represented an oil company in some contract negotiations, it would represent a conflict of interest if a potential client came in wanting to sue that particular oil company.

The law firms are also using the HP 150 to help simplify the drafting and editing of legal documents as well as monitor billing – which allows the lawyers more time for legal services.

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Title: _____

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Protocol analyzers identify datacom problems and improve network efficiency

HP's protocol analyzers offer you affordable, high-performance test capability to minimize loss of time and revenue due to computer downtime. Whether you're bringing new datacom products and services on-line or monitoring performance, HP provides you with the tools to increase network availability and productivity on all types of computers and terminals.

The HP 4955A and HP 4951A protocol analyzers support the major protocols including X.25, BSC, HDLC, SDLC and custom character-oriented protocols. Application software is available for SNA, CCITT #7, X.21 and others.

The higher-level HP 4955A protocol analyzer operates from 50 bps to 72 kbps and features datacom-enhanced BASIC programming for sophisticated testing and network planning. The compact HP 4951A operates up to 19.2 kbps and will also capture data (bit-oriented protocols) up to 64 kbps.

The HP 4951A protocol analyzer, at left on the HP 3000 computer, offers high-performance test capability.

Fast problem resolution

Softkeys guide a data technician through test routines. To reduce setup errors once a selection is made, only appropriate choices are offered. With the HP 4951A, a push of the softkey "autoconfigure" determines protocol, line speed, data code, error-checking schemes and parity. Nonvolatile memory remembers test setups, simulate and monitor programs, as well as captured data. Complete bit error rate testing (BERT) is also featured on the HP 4951A so you can isolate problems down to the network component level.

Enhanced network management

For nonintrusive monitoring, HP's protocol analyzers examine data to determine network characteristics or overall network performance. The large buffer memory can capture data for analyzing hard-to-find, intermittent errors.

The datacom-enhanced BASIC programming option on the HP 4955A lets you develop network statistics to improve your efficiency for network planning and expansion. You can create statistical displays (tables, graphs, histograms) and perform detailed message manipulation for your own network needs.

Contact an HP Instruments Sales Rep for more information.

HP 1000 trade-up program

HP is now offering a special HP 1000 trade-up program that offers excellent financial incentives until October 31, 1984. If you have HP 1000 E/F-Series processors and have been considering upgrading to the A-Series A900 systems, this offer may be for you.

And to make it even more attractive you will receive either The Portable (U.S. and Canada) or the HP Touchscreen Personal Computer (other countries), absolutely free with your upgrade.

If you currently use a large F-Series system, you could be eligible for more than $30,000 in credits toward the purchase of a new A900 Model 29 system, peripherals and system engineering. You'll gain the performance benefits of the A900 computer and may be able to reduce your monthly maintenance costs by as much as one-half compared to your current system.

Contact your Sales Rep today for more information on the HP 1000 trade-up program.

Advanced technology keeps computer chips clean

The days of the computer-chip "clean room" may be numbered.

Hewlett-Packard has announced technology that one day may allow chips to be produced in a normal room environment by workers wearing regular clothing. Currently, chips are made in so-called "clean rooms," where workers must wear gowns, masks and gloves to keep the level of dust low.

Keeping dust away from integrated-circuit (IC) chips is vital because the circuitry etched on them is far finer than a human hair—a single dust particle can ruin an entire chip.

Referred to as a standard mechanical interface (SMIF), the HP technique employs small, dust-proof boxes to transport the wafers on which chips are made. A specially designed trap-door is used to transfer the wafers to and from chip-making machines without contamination.

Initial tests by HP indicate that the cleanliness of chip-making could be improved 100-fold with the new technology.

HP will encourage makers of IC-processing equipment to incorporate the new interface as a standard feature on current and future machines. At the same time, equipment already installed in clean rooms can be outfitted with the interface at low cost. At present, no such standard mechanical interface exists.

A traditional clean room requires workers to keep dust levels low by wearing gowns, masks and gloves.

Traditional environment

The typical commercial clean room operates with an average of 100 particles in each cubic foot of air. Early tests of the new HP technique indicate that the inside of the transport boxes can be kept at a level equivalent to one particle per cubic foot of air.

HP has begun installing the interface at its chip-making facility in Corvallis, Oregon, which produces ICs for HP calculators and portable computers.

"We believe integrated circuits can be made in an environment that is more comfortable for people," said John J. Vietor, R&D equipment engineer for HP's IC activities in Corvallis. "Today's clean rooms are designed with primary concern for the manufacturing environment. Since people always will be the biggest source of particles, we needed to develop a way to isolate the chip-makers from the chip-making."

"Existing techniques for improving clean-room dust levels call for continued use of protective garb and costly air-filtration equipment," said Mihir Parikh, manager of the department at Hewlett-Packard Laboratories in Palo Alto, where the SMIF project was conceived. "These particle-control measures are required due to the lack of a standard link-up among IC-processing machines.

"We think our proposed standard provides that needed link," Parikh said. "We believe the SMIF concept will lead to a new era of increased quality and productivity in integrated-circuit manufacturing." This means more reliable HP computers.

New disc drives in small packages

The HP 7941A disc drive (24Mb) and the HP 7945A disc drive (55Mb) expand HP's family of Command Set 80 Winchester disc drives while offering some new benefits to meet your mass storage needs:

- Reduced size—both drives are in the same small stand-alone desktop cabinet, one-tenth the size of other Command Set 80 disc drives.
- Quiet operation—these drives can barely be hears in a normal office environment.
- Customer installable.
- Designed and priced for entry-level multi-user systems.
- Good performance—with an average seek time of 30 ms.

These products are small enough to sit on your desk and quiet enough to use in your office.

Computerized forms generation speeds reporting and saves money

Bringing a drug to market is a complicated process. A pharmaceutical firm must collect, analyze and present volumes of documentation to the FDA—data requiring intense interaction between researchers, writers and administrators.

The Medical Research Department at Hoechst-Roussel Pharmaceuticals, Inc., (HRPI), has successfully integrated this process. "We replaced an inefficient manual system with a computerized one, and saved 70 percent of outside printing costs in the process," Dr. K. Arora, Group Director of Research Systems, stated.

The firm has networked word processing, forms design, graphics, printing and data base functions using Hewlett-Packard equipment: an HP 3000 business computer, an HP 2680 laser printer and 39 word processor/data processing terminals.

It works this way. At the start of a clinical trial, a graphic artist designs a case form on the computer to track information on each patient. The laser printer draws a form which is copied in-house. Previously, to get the same quality, the firm had to have the forms printed outside. The computer stores the form for future use or modification.

The graphic artists also use the laser printer to design and store charts, graphs and outlines of chemical compounds. Writers may insert these illustrations electronically into their reports.

Finally, the laser printer prints the finished drug application, including copy and illustrations. This integration replaces the traditional cut-and-paste method.

The corporation's Frankfurt, Germany, headquarters has installed a similar system, allowing the two offices, oceans apart, to communicate electronically.

Limited-time offers on HP 9000 16- and 32-bit computers

You can save money on HP 9000 engineering workstations with three bundled systems at reduced prices until October 31, 1984. Two special offers include HP 9000 Series 200 computers and one offer includes a Series 500 computer.

A special, single-user bundled configuration consists of a Series 200 Model 220 modular computer with HP-UX (HP-UX is Hewlett-Packard's enhanced version of the industry-standard UNIX* operating system), 1Mb RAM, 15Mb Winchester with a 3½-inch double-sided microfloppy disc drive and a 14-inch graphics display. It costs $12,999; this is 43.5% below the normal list price of $23,000.

A second Series 200 four-station HP-UX configuration, which uses a 132Mb disc, is discounted 11.3% below the normal list price of $44,555 and sells for $39,500.

A third special offer features a multiuser Series 500 HP-UX configuration consisting of twin CPUs, 4Mb RAM and 404Mb removable disc drive. This bundled system costs $99,995, which is 15.4% below the normal list price of $118,137.

UNIX is a trademark of AT&T Bell Laboratories

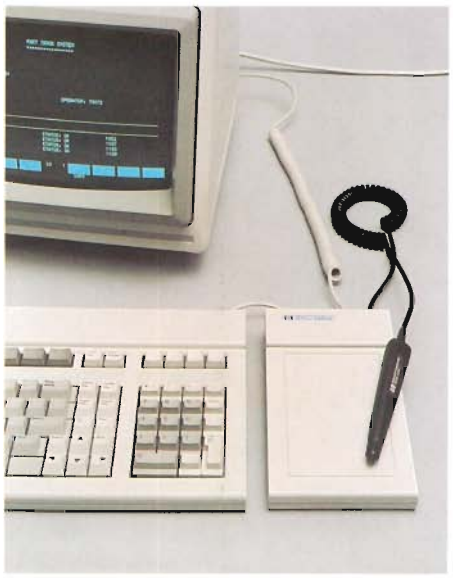
In Brief

- On September 1, 1984, Hewlett-Packard Co. and Samsung Semiconductor & Telecommunications Co. (SST) jointly celebrated the installation of the 15,000th HP 3000 computer system. It was only in October 1982 that HP sold its 10,000th HP 3000 system. The delivery of the 15,000th computer to SST in July represents a 50% growth in the installed base in just 20 months. The HP 3000 Series 68, running Semiconductor Productivity Network software, will be used in SST's IC manufacturing operation in Korea.
- Planning a trip to New York City? Hewlett-Packard will be exhibiting The Portable, the Touchscreen Personal Computer and office automation products at the INFO '84 trade show. It will be held in the New York Coliseum from October 1 to 4. The free show opens at 11 a.m. and closes at 5 p.m., except on the final day when it closes at 4 p.m. Look for HP in booth #2320 on the second floor.
- Now you can learn how to set up and control HP-IB instruments with your HP 1000 E/F-Series computer. The four-day course covers topics such as HP-IB fundamentals, RTE-6V/M operating system basics, and HP-IB control techniques using FORTRAN 77. The course (HP 50016E) is taught in HP's Atlanta training center. Call Dorothy Jegen for more information at (404) 955-1500, ext. 7196.

High-performance bar code reader for the HP Touchscreen Personal Computer and the HP 2392A terminal

The new HP 92915A bar code reader offers terminal and personal computer users a fast, accurate and reliable data entry method. A good read gets a hearty beep. This reliable reader is applicable in libraries, blood banks, hospitals and manufacturing plants.

Designed to work with the HP Touchscreen Personal Computer and the recently introduced HP 2392A Display Terminal, the HP 92915A features a sealed wand with a sapphire tip capable of scanning a variety of code densities.



Supported bar codes, switch selectable, are the popular Code 3 of 9 specified by the Department of Defense, the Automobile Industry Action Group and the Health Industry Bar Code Council; Interleaved 2 of 5, a highly dense numeric code selected by the Distribution Symbology Study Group for marking outer cases; CODABAR, historically the choice of blood banks and libraries, and the UPC/EAN/JAN codes of the retail industry.

All prices quoted herein are $US list and are subject to change without notice.

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Vol. 4, No. 6

Computer Advances *is published every two months for Hewlett-Packard computer customers to keep you informed of new HP products and services and to help you get more out of your investment in HP equipment.*

For more information on any of the products and services discussed herein, please contact your local HP Sales Office.

Note: *Not all HP computer products are sold and supported in countries other than the US. Please check with your local HP Sales Office.*

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