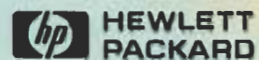


**The dawn of engineering excellence
starts with a 32-bit mainframe
at every desk.**



HP 9000 Computers



HP Computer Museum
www.hpmuseum.net

For research and education purposes only.

The new HP 9000 puts 32-bit computing power right where you want it.



Think of it!

A 32-bit mainframe computer that can execute one million instructions per second reshaped into such a small, flexible and economical package that you could realistically dedicate a separate one to each major engineering or scientific task!

Just imagine what you could accomplish with task-dedicated, 32-bit mainframes strategically placed throughout your engineering or scientific work areas! And what if you could network a series of these individual computers so they could access common data or programs and share expensive peripherals?

This is the way most everyone would like to do technical computing — in an environment where computing power is distributed to the individual. But few computer manufacturers have pursued the technology to actually do it.

Until now.

Introducing the HP 9000, a new family of technical computers that offers engineers, scientists and their managers the computing solution they have wanted all along: an easily configurable, 32-bit "desktop mainframe" with all the power of a company-size computing resource — at a fraction of the price! The HP 9000 offers:

- three different packaging options,
- single- or multi-user capabilities,
- three levels of performance via plug-in CPUs,
- and a choice of two powerful operating systems — a fully supported UNIX*-based system (called HP-UX) or an event-driven, multi-program BASIC system — both enhanced for the engineer.

But the HP 9000 is a lot more than flexible hardware. It is the basis of a new idea in allocating computer power within the engineering or lab function.

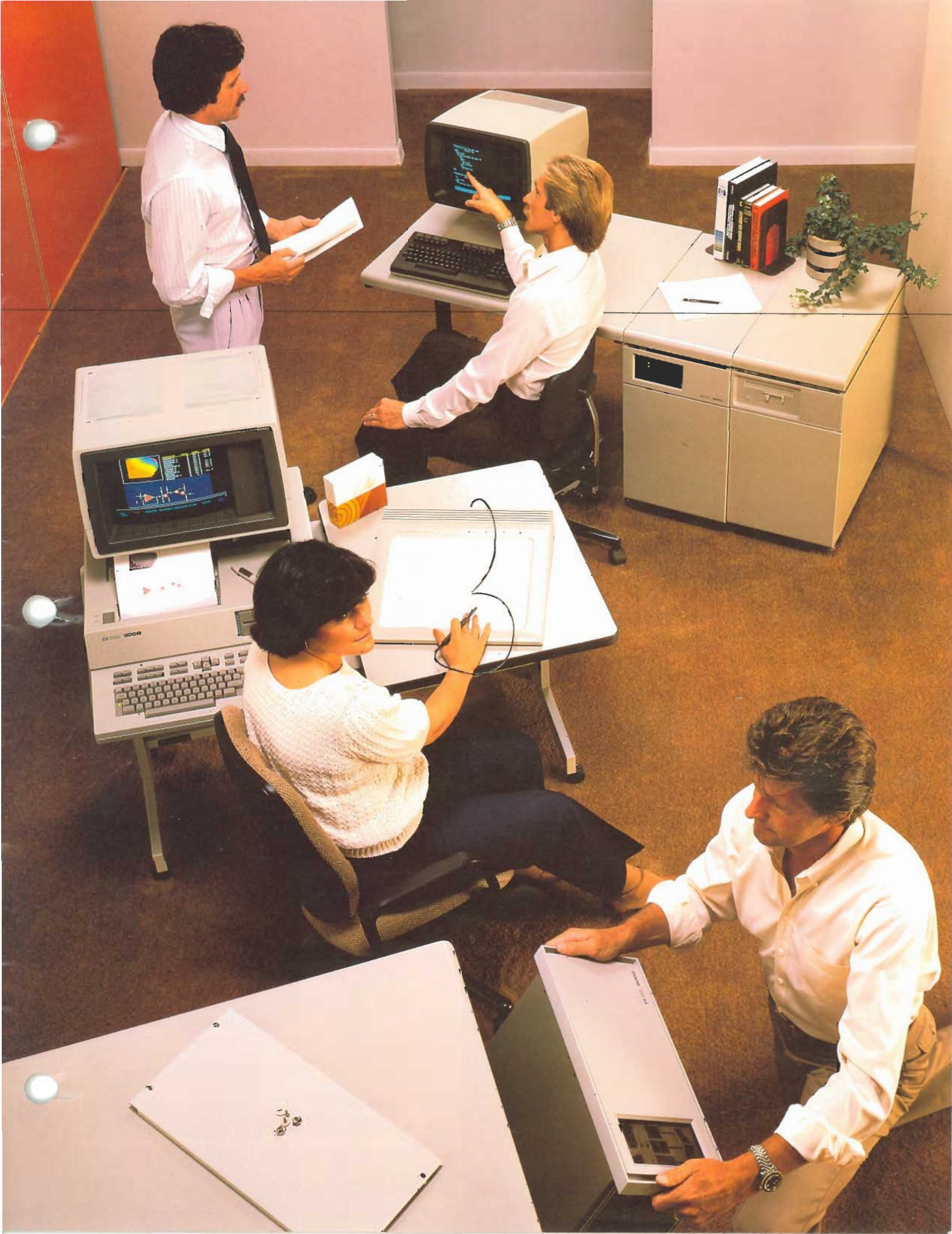
It lets you apply the 32-bit power you need — right where it's needed.

* UNIX is a trademark of Bell Laboratories, Inc.



The integrated package keeps mainframe performance while reducing size to workstation proportions.

Configure the HP 9000 the way you want it: in a compact desk-height cabinet (top); as an integrated workstation (middle) or in a rack-mount enclosure (bottom).



Dedicated workstations and shared systems from the same family of computers.

Let's face it.

Large, centralized engineering computers are expensive, complicated and absolutely necessary in today's technical environments.

But they don't have to be.

Their disadvantages become apparent when you try to maximize computer use to get the most from your investment. Piling on users and worrying about CPU usage may optimize your machine, but not your people.

Each additional user degrades system performance. That's not the best way to get more output from the people you have. And what if the central computer goes down? Your entire operation could grind to a halt. That's a limitation you can't afford. Yet until now, this has been the only way to get the really big jobs done.

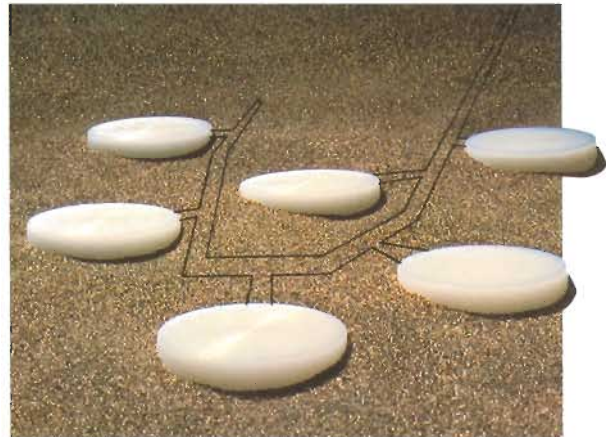
Now there is a new alternative: "decentralized" systems, each sharing data and resources, with mainframe power, but smaller in physical size. In other words, affordable 32-bit computer systems that can be assigned to specific tasks or workstations ...or even to individual users!

The HP 9000 offers this kind of power and flexibility.

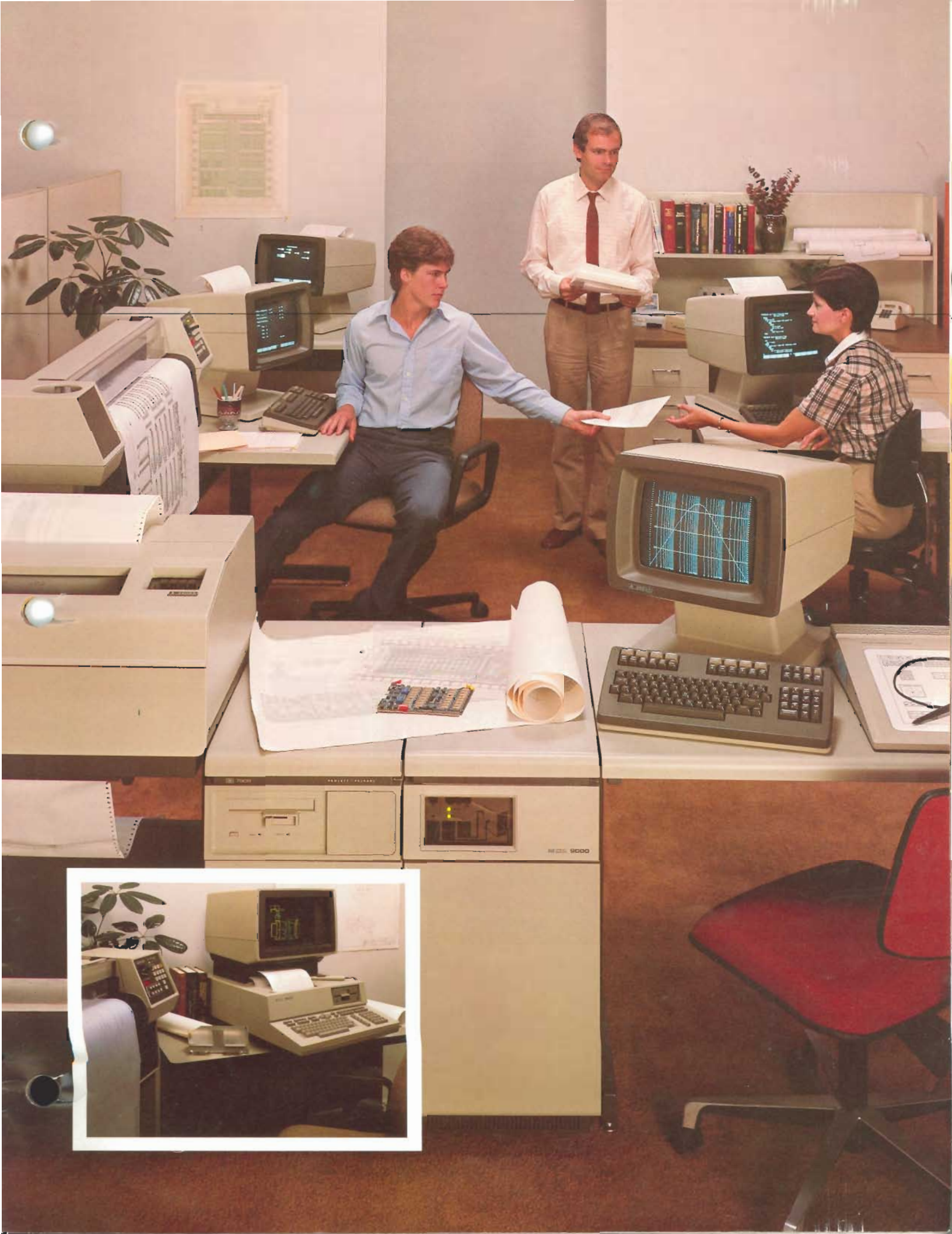
It lets you devote a full-function, 32-bit mainframe to single or multiple tasks to get the most performance per user. Of course, it can still provide multi-user configurations — at the lowest cost per user. And HP 9000 multi-user systems with multiple CPUs increase the CPU-per-user ratio for better performance. Best yet, HP 9000 workstations and multi-user systems linked in localized networks offer you "centralized" computer versatility without its drawbacks. It's your choice.

To provide this capability required condensing a 32-bit mainframe into a package small enough to fit on or next to a desk. That meant we had to move some pretty impressive electronic mountains.

Our first step was putting 450,000 transistors on a single integrated circuit chip.



Workstations and shared systems both have a place in HP's networking plans.



Reshaping 32-bit power: The astonishing HP 9000 technology.

The new IC technology developed for the HP 9000 paved the way for the world's first 32-bit, single-chip CPU. This chip features densities that are more than three times those of other chips on the market!

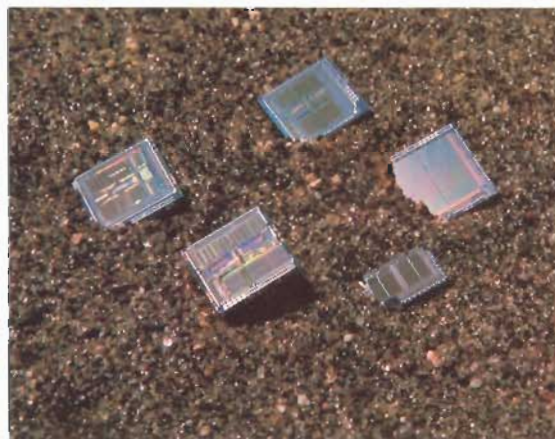
This revolutionary technology takes advantage of a simple physical rule: the shorter the distance electrical signals must travel, the higher the system speed and performance. By packing each transistor closer together (only 1/1000th of a millimeter separates them), you need fewer chips and less power. That means significantly greater reliability, lower system cost and a much smaller package.

But this new technology goes beyond merely shrinking IC devices. While other computers are designed by mixing and matching a combination of off-the-shelf and custom chips, HP 9000 chips are designed from the silicon up to provide maximum performance. In this way, each chip in the set complements and enhances the performance of the others.

Special temperature-controlled environments aren't necessary because the ICs are bonded directly to a unique combination of cooling fin and substrate we call a "finstrate". The chips transfer their heat directly into this PC board's copper core where it's drawn off by a small, quiet fan. Because of this packaging, the HP 9000 can work where the engineer or scientist works — in the office, in the lab or on the factory floor.

Several finstrates make up the complete VLSI system which is housed in a single card-cage assembly (Memory/Processor Module). There is room in this assembly for multiple CPU and I/O Processor finstrates plus incremental memory boards.

The HP 9000 provides real 32-bit architecture — 32-bit internal and external data paths, 32- and 64-bit math (IEEE floating point format), 32-bit memory addressing and a direct address range of 500 Mbytes. The sleight-of-hand other computers use to give you extended memory addressing isn't necessary with the HP 9000.

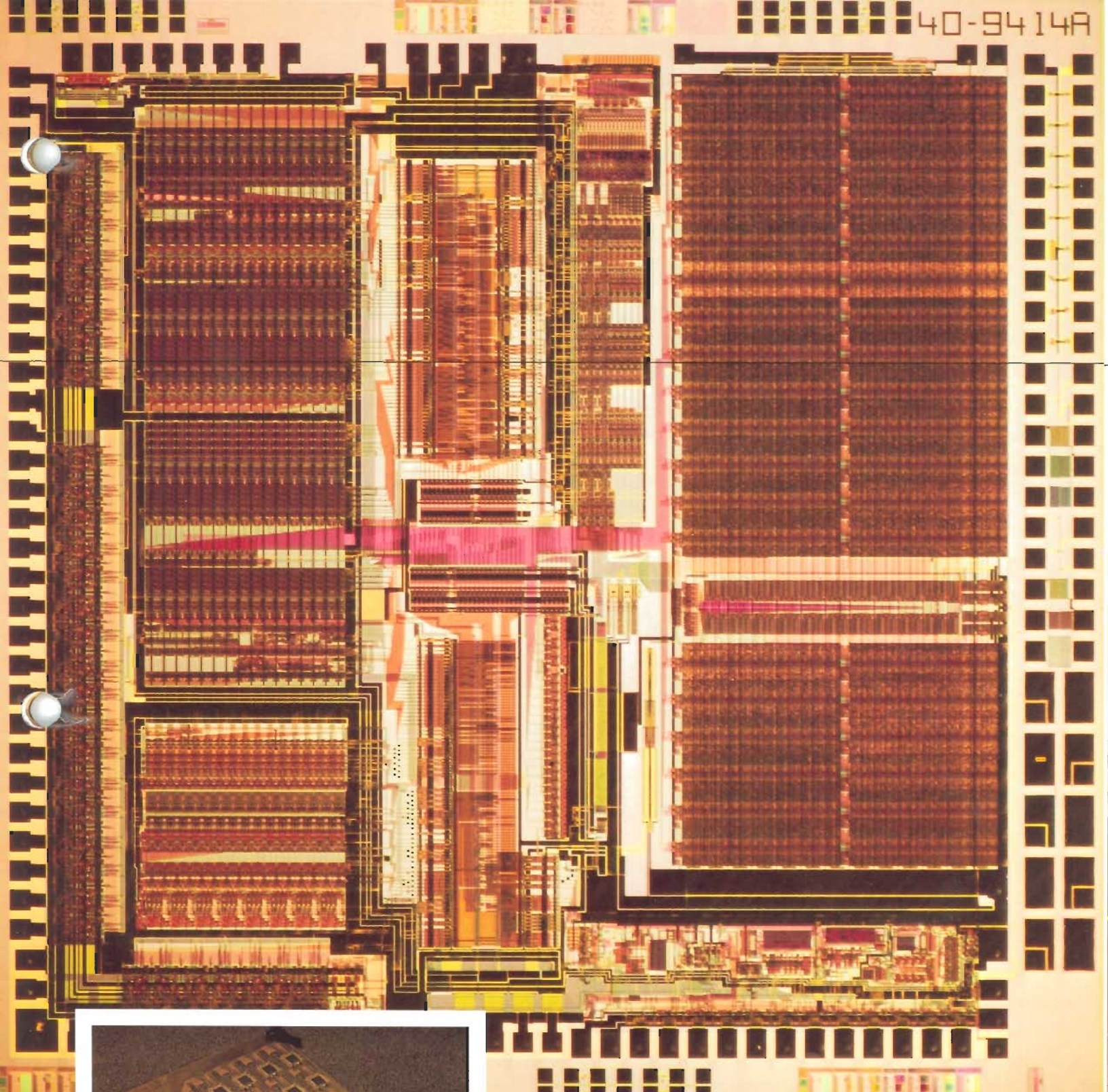


All five custom chips in the processing system are based on HP's new NMOS III technology, with the CPU boasting half-a-million devices.



The world's first 32-bit, single-chip CPU and its unique "finstrate" packaging are the heart of the HP 9000.

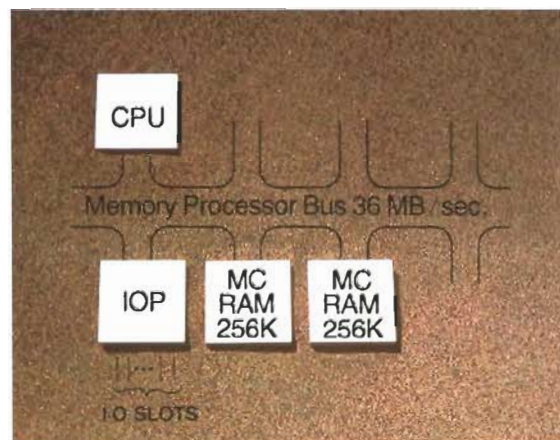
40-9414A



Throughput won't be hobbled by this system!

The HP 9000's CPU features on-board ROM control store and "pipelining" (one micro-instruction is being readied at the same time one is being executed). It supports both segmented and paged virtual memory. A clock rate of 18 MHz and a 55 nsec. micro-instruction time make it a real race horse!

Adding another one or two CPUs to the HP 9000 CAN mean a 2 or 3X performance increase at very low incremental cost. It's as simple as plugging in more finstrates. And, in a multi-tasking or multi-user environment, you won't have to rewrite your software to take advantage of the additional CPUs.



The memory-bus design complements the multiple CPU and IOP architecture.

A memory that catches errors and heals them.

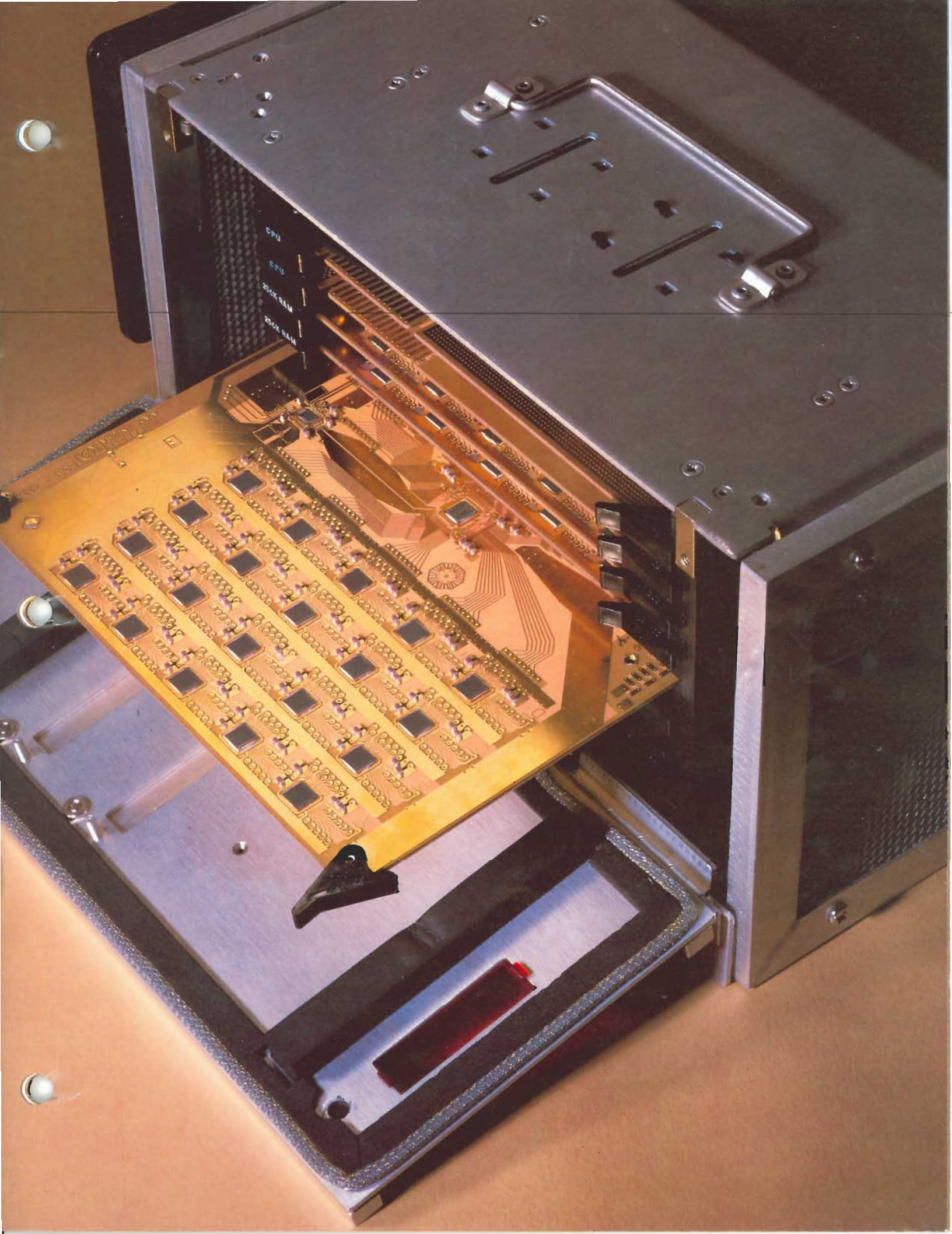
The HP 9000's internal memory can provide up to 2.5 Mbytes of Random Access Memory in increments of 256 Kbytes. Memory Controller chips provide memory mapping, error detection/correction and memory "healing." During run time, if a single-bit error is detected, the controller chip corrects the bit and copies the word in a special "healer" location. Subsequent accesses go directly to the healer location with no loss in performance.

Fully supported UNIX with Pascal, FORTRAN and "C", or easy-to-learn BASIC — take your pick.

To give you a broad choice of languages and software, the HP 9000 is available with HP-UX, a UNIX-based operating system, or a powerful version of HP's popular BASIC Language System. HP-UX is a productive programming environment for those who depend on computers to solve large, complex problems. It offers powerful graphics, IMAGE Data Base Management and other engineering extensions.

The BASIC Language System offers a run-time compiler that is state-of-the-art in software technology. It's friendly and fast. HP 9000 BASIC is for the engineer or scientist who needs the performance of a 32-bit technical computer but doesn't want to become a computer expert to get it. It also offers powerful 3D graphics, DBM, multi-tasking and extended I/O.

The business end of the HP 9000. This lunch box-size Memory Processor Module and its finstrates (CPUs, RAM and IOPs) make system expansion as simple as plugging-in another board.



Quality and productivity via linked, computer aided solutions.

From mental image to manufactured product, computers can dramatically improve information flow. Companies are using them in all areas to boost productivity and output.

Simply put, computers make work move faster without adding more people.

At HP we're striving to make those previously isolated computers even more productive by connecting them. We call it our Manufacturers Productivity Network (MPN).

The MPN is as much a corporate strategy for Hewlett-Packard as it is a selling point for our products. It draws on powerful HP technical computer and instrumentation products plus years of distributed data processing experience to give you the flexibility you need in applying computer solutions locally or in networks.

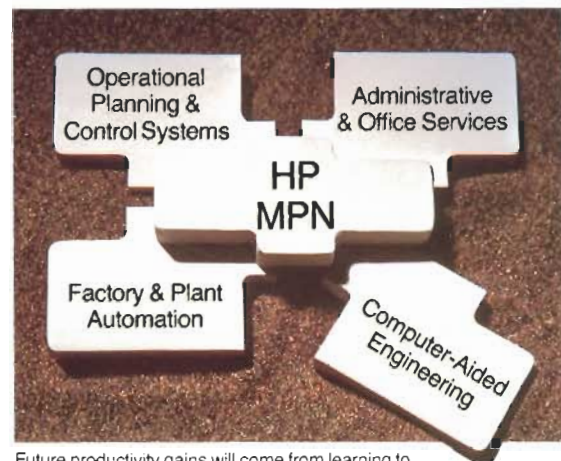
We're committed to making this concept work.

You can start building the engineering quadrant of your own MPN right now with a combination of HP 9000 computers and lower-cost, 16-bit HP 9800 Desktop Computers. As your needs expand, you can add more computers, new software solutions and data communications products from HP to link your systems into other networks and provide gateways to other systems.

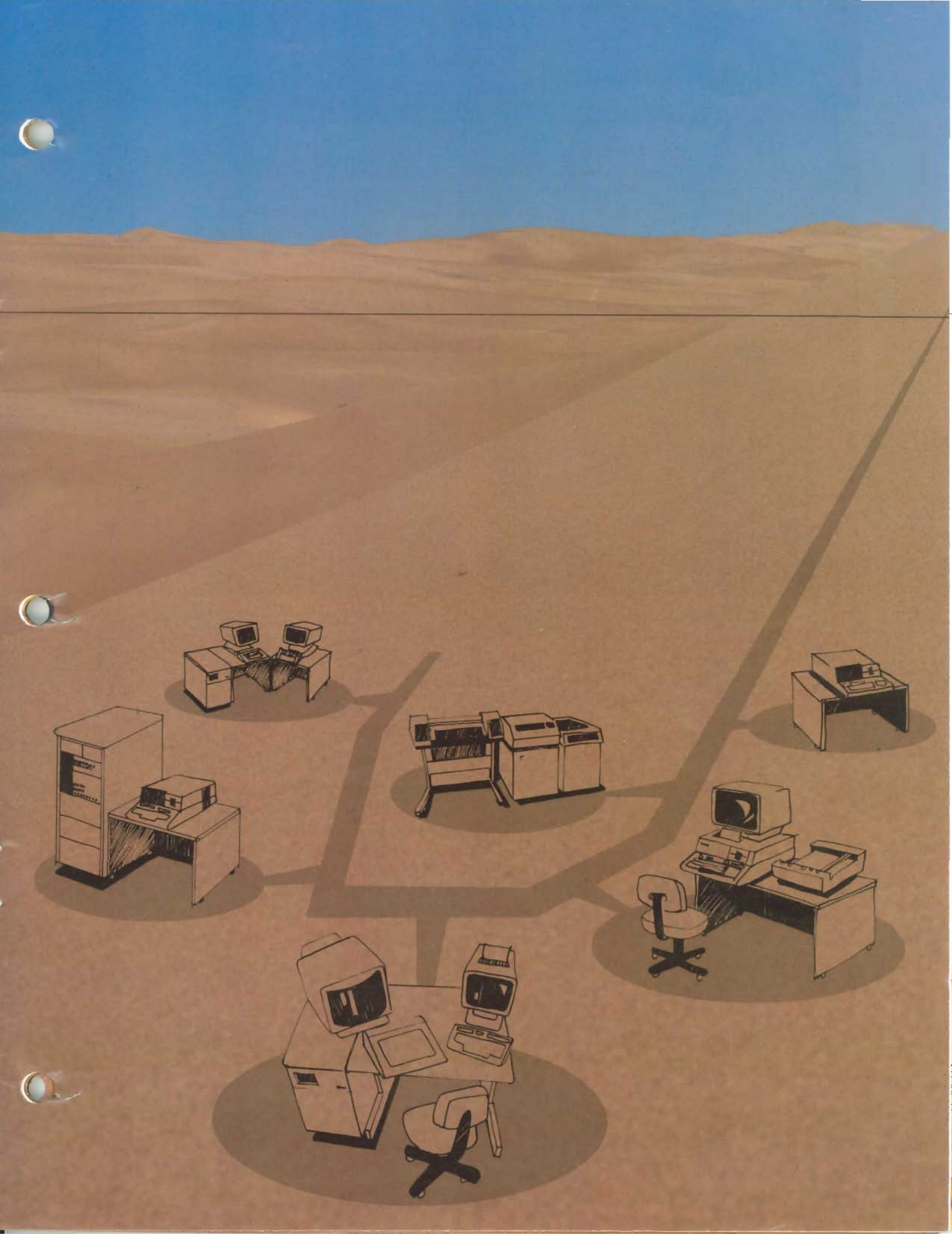
With HP, you can build your 32-bit solution with products from a single source.

The "finger pointing" that goes on when you need answers about a system in which there are several suppliers is not productive ...or necessary. When you build your system with the HP 9000, you can count on dealing with one source — from instrumentation to interfaces, from mainframes to monitors.

With HP-IB, our implementation of the IEEE-488 (1978) standard, you can count on plug-compatible connections and worry-free interfacing. After all, you shouldn't have to hire an army of wiring wizards just to get your system up and running.



Future productivity gains will come from learning to make departmental computers "play" together.



HP 9000 configurations:

Choosing a solution to fit the problem.

The HP 9000 family offers you superior flexibility in shaping 32-bit computing power to fit your application. The HP 9000 is available in a rack-mount enclosure, a desk-height cabinet or an integrated desktop package. It provides both single- and multi-user configurations in entry level machines as well as extended-function systems. Here are just a few examples of how you might tailor your system:

Interactive Engineering Workstation



HP 9000 Model 20

- BASIC Language System
- High-performance Color Display
- Light Pen Option
- Optional Winchester Disc Drive (built-in, 10 Mbyte)
- HP 9111A Data Tablet
- HP 7470 Plotter

This system could be highly effective in applications where the engineer must react to changes, add documentation or re-work his design. The engineer is most productive if changes can be made as the problems are discovered — in an interactive fashion.

Design Workstation

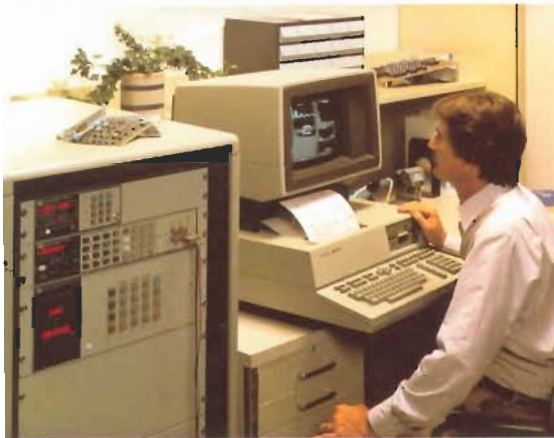


HP 9000 Model 40

- HP-UX Operating System
- 19" Color Monitor
- HP 9111A Data Tablet
- HP 7912A Disc Drive (65.6 Mbyte)
- HP 7585 Plotter (E-size)
- HP 262X Terminals
- HP 2608 Printer

Here is an HP 9000 configured for a Computer Aided Design application. The Model 40 with the HP-UX Operating System allows FORTRAN, Pascal or "C" languages plus virtual memory for the large programs and data usually required by CAD systems.

Instrumentation/Analysis Workstation



HP 9000 Model 20

- BASIC Language System
- HP-IB Interfacing

The HP 9000 is especially well-suited to large instrumentation systems. It has the bandwidth necessary to handle multiple, high-speed devices concurrently. The BASIC language is straight forward and flexible for I/O applications. The multiple-partition and windowing features of the CRT allow easy separation and viewing of all I/O tasks.

General Purpose Engineering System



HP 9000 Model 40

- HP-UX Operating System
- HP 7933 Disc Drive (404 Mbyte)
- HP 2631 Printer
- HP 7580 Plotter (D-size)
- HP 2623 Terminals
- HP 7470 Plotter

This HP 9000 system is configured specifically for planning, text and documentation preparation, programming and data entry. Its high quality graphics output and high capacity mass storage make it an excellent choice for Computer Aided Work, Software Engineering or management applications.

Confidence, reliability and support: The most important products we sell.

When you buy from Hewlett-Packard you are getting 40 years of high technology electronics experience and the product backing that goes with it. Our technical computers are built with the same fundamental objective that has made us the world leader in instrumentation: to provide products of lasting value that help technical people get the job done.

We don't think you should have to be in the troubleshooting business.

The HP 9000 is designed to be the most reliable computer we've ever built. We designed reliability into every assembly, sub-assembly, chip and switch. Every major system has extensive self-test and self-diagnostic capabilities. The HP 9000 tests its memory at power-on for any errors and maps out the affected portion. Each replaceable module in the system also tests itself and lets you know that the entire system is operating properly BEFORE you start running your program.

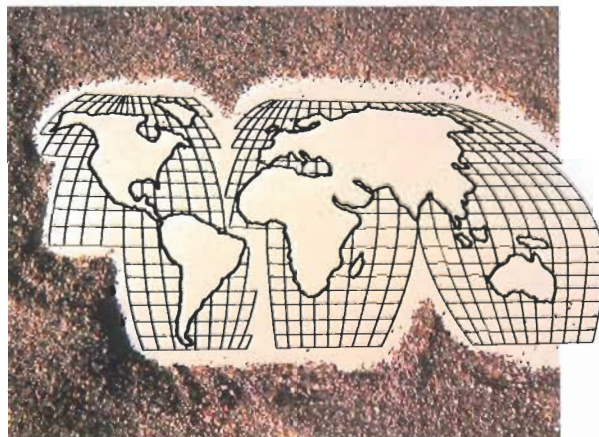
And if something should go wrong, HP 9000 self-diagnostics quickly point out the problem so service people can quickly get you back on-line.

We won't walk away after the sale is made.

Choosing HP also means you're buying from a company with a responsive service organization, a huge network of support facilities throughout the world and a complete program of training. We pride ourselves on providing prompt and reliable service. We can deploy a well-trained army of experts to assist you in overcoming any problems, technical or procedural, hardware or software.

Just ask any of our customers.

To find out how individual 32-bit computing power can dramatically improve your productivity, call your local HP Sales Representative today. We'll be happy to give you a closer look at the HP 9000 — the 32-bit mainframe that concentrates its power where the problems are.





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