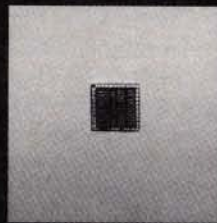


**In 1981,
Hewlett-Packard
announced the world's
densest computer
chip.**



Our 450,000-transistor, one-chip
32-bit CPU.

Today, it's the heart of a 32-bit computer that's so affordable your top engineers can have their own mainframes.

From time to time, miracles of technology come along to make previously impossible tasks not only possible, but easy. That little integrated circuit chip on the preceding page is one of those technological miracles.

Hewlett-Packard didn't develop it just to break the record for most transistors on a chip, but to put on an engineer's or scientist's desk a computer so powerful that it can do the work of mainframes costing four times as much.

32-bit computers for 32-bit applications.

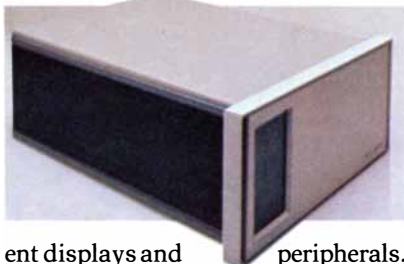
The new HP 9000 computer based on this and four other 'superchips' can handle formidable engineering and scientific problems. The scientist solving complex systems of equations, the mechanical engineer doing finite element analysis or three-dimensional modeling, the electrical engineer analyzing complex circuits or designing very large-scale integrated circuits—these are the kinds of technical people and problems the HP 9000 family is designed for.

It comes in three versions. The integrated workstation is complete with keyboard, color or monochromatic graphics display, fixed and flexible disc drives, and printer. For systems manufacturers, there's a rack-mountable box. And for a variety of single-user and multi-user applications, the minicabinet version works with many differ-



As a minicabinet, it can handle multiple users.

A rack-mountable version is available, too.



ent displays and peripherals. All are true 32-bit computers, with 32-bit CPUs, memories, and data paths. And the multi-CPU architecture lets you nearly double or triple your processing power at any time by adding one or two CPU boards. Without increasing the computer's size.

Two operating systems are better than one.

The integrated workstation is available with a choice of operating systems. One is HP's highly evolved, high-performance Enhanced BASIC, augmented with 3-D graphics and a software innovation called a run-time compiler. This substantially increases program execution speed, while retaining an interactive development environment.

The other operating system, called HP-UX, is a fully supported, extended version of the popular UNIX®. HP-UX, available on all HP 9000s, adds virtual memory, graphics, data base management, data communications, and enhanced file capability to the basic UNIX 'shell.' High-level programming languages available with HP-UX are FORTRAN 77, Pascal and C.

Software, and plenty of it.

Much of the vast range of existing software written in HP BASIC, FORTRAN 77, Pascal and

The 32-bit CPU chip is bonded to the finstrate which doubles as a signal carrier and heat sink.

Up to three CPU boards and three Input/Output Processors can fit into a single HP 9000.

C is transportable to the HP 9000. HP will also be offering proprietary software packages emphasizing computer-aided design and engineering. These will tie the HP 9000 into HP's Manufacturer's Productivity Network (MPN). Third-party software suppliers will be providing many of the most widely used CAE packages for 32-bit computer systems. And both HP 9000 operating



TCG-207

Computer for scientists

systems offer extensive program development tools.

You also get a choice of communication tools. The HP 9000 is currently compatible with Ethernet™, and with HP's Shared Resource Manager (SRM) which lets clusters of HP 9000 and 16-bit desktop computers share data and use common peripherals.

Links to central computers

are also available. And in late 1983, HP will offer local area networks based on the IEEE-802 standard.

New technology from the silicon up.

The five superchips that make the HP 9000 possible are the 32-bit CPU, which can execute a million instructions per second; an eight-channel Input/Output processor (IOP); a random-access memory chip capable of storing 128K bytes of data; a memory controller that 'heals' up to 32 bad memory locations; and an 18-megahertz clock.

Hewlett-Packard's advanced NMOS-III process makes it possible to put 450,000 transistors on a chip only 0.4 centimeters square. This tremendous density of electronic components could have required an expensive and elaborate cooling system.

Instead, HP engineers developed a new mounting structure called a finstrate, a copper-cored circuit board, which acts as both cooling fin and substrate. The finstrates containing the CPU, IOP, memory, and clock chips are housed in a lunchpail-sized module.

One user, one mainframe.

Clearly the trend in engineering and scientific computation is away from large machines shared by multiple users and towards networks of powerful personal workstations, sharing peripherals and data bases. The reason is compelling. An engineer or scientist in personal control of an HP 9000 can solve so many more problems more easily that the increased productivity alone makes the cost of individual computers easy to justify.

For complete information about this powerful breakthrough in 32-bit computing, contact the local HP sales office listed in your telephone directory. Ask a Technical Computer Specialist for a demonstration. Or write to Pete Hamilton, Dept. 56151, Hewlett-Packard, 3404 East Harmony Road, Fort Collins, CO 80525.



Full-color or monochromatic display. 3-D graphics are available.

Eight soft keys play an important role in the menu-driven operation.

Built-in thermal printer produces graphics and alphanumeric hard copy.

Flexible disc drive.

Optional 10-Mbyte Winchester disc.



**HEWLETT
PACKARD**

UNIX is a registered trademark of Bell Laboratories. Ethernet is a trademark of Xerox Corporation.