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ADVANCED TECHNOLOGY BUILT INTO

NEW IBM PERSONAL SYSTEM/2

RYE BROOK, N.Y., April 2 . . . Advanced technology in
the IBM Personal System/2^{TM} helps bring balanced system
performance and higher levels of built-in function to a broad
range of users.

Announced today, the family of products covers a balanced
range of performance, including the exceptionally powerful
Model 80, which combines IBM's fastest one-megabit memory
technology with an advanced 32-bit processor and 32-bit
architecture.

IBM-developed technology helps make the Personal System/2 as
much as five times more reliable than the original IBM Personal
Computer, and two to three times more reliable than today's most
popular models. Technical advances combined in the Personal
System/2 include new memory packaging and data storage media,
system boards with integrated functions, IBM-developed
high-function support chips and new monochrome and color analog
displays.

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New Architecture

Earlier personal computing equipment worked with an 8- or 16-bit bus path for data transfer. IBM's new Micro Channel[TM] with 32- and 16-bit data paths offers a major improvement in efficient high-volume data transfer. It allows the system to handle more data and to synchronize the entry and exit of the data in the same way a four-lane highway handles traffic more efficiently than a two-lane road.

The Micro Channel can support up to 15 Direct Memory Access devices, more than double the number available on the PC bus. With more Direct Memory Access devices, some operating concurrently, and the faster data rates of the new Micro Channel, customers will gain greater application throughput.

The Micro Channel forms a base for future technology enhancements. For example, anticipating the availability of future processors running faster than 20 MHz (megahertz or million cycles per second), the Micro Channel was designed to meet stringent FCC regulations for electronic devices.

Advanced Processors

From the Model 30 to the top-of-the-line Model 80, the Personal System/2 family members offer customers a range of processor speed faster than comparable members of the previous generation of IBM Personal Computers.

The balanced system design in the Personal System/2 uses the higher speed of the new processors to give users improved throughput across the family. For example, the potential system throughput of the Model 30 is up to 2.5 times faster than the IBM Personal Computer XT^{TM}. The Model 80 offers potential system throughput up to 3.5 times faster than the Personal Computer AT^{R}.

The Model 30 has an Intel 8086 16-bit processor with a clock speed of 8 MHz. Models 50 and 60 use an Intel 80286 processor with a clock speed of 10 MHz. And in the Model 80, two versions operate the 80386 at 16 MHz, while the third runs at 20 MHz.

Increased Memory

A new 3.5-inch diskette offers customers higher reliability in a rugged package with increased storage. The diskettes have a capacity of 720 kilobytes or up to 1.44 megabytes of storage, equivalent to 720 typewritten double-spaced pages.

Two different memory packaging technologies are employed in the systems.

In Models 30, 50 and 60, 256 kilobyte and 512 kilobyte Single Inline Packages that hold up to nine dynamic random access memory chips are integrated onto the system board. The packages snap into custom-designed connectors on the board for improved serviceability.

This packaging technology requires less space and has a higher density, reducing power requirements.

The Model 80 uses the one-megabit memory technology also used in IBM's RT^{TM} Personal Computer, midrange System/38 and mainframe 3090. The Model 80 random access memory operates at a very high speed, so that a word of data from its memory can be accessed in only 80 nanoseconds (billionths of a second). This faster memory -- almost twice as fast as the IBM Personal Computer AT -- will increase processor efficiency.

On the Model 80, up to four megabytes of random access memory can be installed on the system board. And the memory can be expanded to 16 megabytes with option cards.

For customers, the higher densities and reduced number of components in the single inline packaging and one-megabit technology mean increased memory and greater overall system reliability.

Storage Improvements

Fixed disk storage capacity in the Personal System/2 ranges from 20 megabytes in the Model 30 up to an optional 230 megabytes on the Model 80. The fixed disks are available with 20-, 44-, 70- and 115-megabyte capacities.

A new Enhanced Small Device Interface controller takes advantage of the higher data throughput of the Micro Channel. It increases the performance of the fixed disk, providing a higher data transfer rate, up to 10 megabits per second.

On Models 50, 60 and 80 customers can use up to 256 kilobytes of memory to provide a function analogous to that provided by the cache controller in a mainframe system. For example, when the system reads record "A" off the disk, it might also bring in records "B" and "C" and store them in the cache. Later, when record "C" is called for, the system will recognize that "C" is already in the cache and won't access the disk. This saves time because it is not necessary to go to the disk for that record.

Optical Storage

For the first time, IBM is offering an optical file that can store up to 200 megabytes of information. Customers can use the write-once, read-many-times optical disk to store and retrieve large amounts of information or as a backup storage device for fixed disks.

Integrated System Board

In Personal System/2, a sophisticated graphics support chip is built onto the system board as are the serial, parallel, pointing device (mouse) ports, keyboard functions, graphics display and diskette controller. This increased use of surface-mount technology and Very Large Scale Integration (VLSI) chips provides increased function in a smaller area, reducing system dimensions while increasing speed and reliability.

In Models 30 and 50, this also results in a reduced "footprint" on users' desktops. The Model 30 processor unit, for example, is about 25 percent smaller than the IBM Personal Computer XT.

VLSI Support Chips

Very Large Scale Integration has enabled the information industry to place more and more circuits in smaller areas, thereby improving the performance of data processing equipment.

VLSI technology in the Personal System/2 includes IBM custom gate arrays on the system boards of every model. These chips replace a number of lower-level technology components reducing power requirements, increasing system reliability, and providing a cooler running system.

The new custom gate arrays are made from high-performance and cool-running CMOS (Complimentary Metal-Oxide Semiconductor) technology, with circuits as small as 1.5 microns -- approximately 6/10,000ths of an inch. They include graphics, memory and processor support chips.

For example, on Models 50, 60 and 80 the Video Graphics Array has 12,750 gates. Together with the on-board 256 kilobytes of random access memory and a palette of more than 256,000 colors, it replaces both the first generation Color Graphics Adapter and Enhanced Graphics Adapter cards. The Video Graphics Array allows the choice of 16 colors in the 640 by 480 resolution, and 256 colors out of a possible 256,000 in the 320 by 200 resolution.

A new Processor Support Chip is a bipolar design with 3,100 circuits. It replaces five chips in the previous generation of Personal Computers to produce the same functions as the clock generator, bus controller and video clock.

New Displays

Each of the four new analog displays available on the Personal System/2 features higher levels of character and image clarity and quality. All the displays feature a non-glare screen and have an integrated or optional tilt and swivel base to enable the user to more easily adjust the screen. An increased scan rate serves to reduce screen flicker. The monochrome display has a white phosphor screen that allows black-on-white or white-on-black text and supports up to 64 shades of gray.

The integrated graphics capability, when combined with the analog displays, gives users almost unlimited colors, tints and shades on the color displays, depending on the system driving them.

In graphics mode, up to 640 by 480 individual dots can be addressed on the new 12-inch and 14-inch displays, and up to 1,024 by 768 dots are addressable on the top-of-the-line 16-inch color display.

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