Computer update, ~~Oct~~ Nov. 1988. ORG

ATTACK OF THE "/2"

Simson L. Garfinkel

PS/2.
Micro Channel.
OS/2.

Things are changing in the PC world. Or are they?

Just when you settle down with a PC clone, hard disk, and a set of applications programs you really like, two of the industry's giants come in and say, "Buy new hardware, buy a new operating system, buy new applications."

Allegedly, the new hardware—IBM's PS/2—and the new software—Microsoft's OS/2—will give computer users the power to do things faster and to do several things at the same time. Another stop on the road to the desktop Cray.

Is it really necessary? Many users seem content with the PCs and happy-go-lucky clones they've been living with for years. Most of these "conventional" computers are equipped with an Intel 8088 microprocessor and up to 640K of memory, although some have 80286 microprocessors and a megabyte or more. They run the MS-DOS operating system, as they have since day one, and programs work, at least for the most part.

Micro Channel. In April 1987, IBM brought out its line of PS/2 computers. Many users shouted "foul" when they first saw the machines: Like the Apple Macintosh, IBM had decided to go with a 3.5-inch microfloppy, turning its back on the 5.25-inch minidisk that the company had standardized six years earlier.

But disks are disks: Users can now purchase 3.5-inch or 5.25-inch disk drives for old and new machines. The real difference between the PS/2 and the old PCs lies on the inside. The PS/2 has a new expansion bus called Micro Channel. The expansion bus is the slots that add-on boards are plugged into.

Micro Channel is a 32-bit bus, designed to transfer four times as much data in an instant as the original PC bus. But the real advantage of Micro Channel is its bus-mastering capability, which lets other devices, such as disk and network interfaces, take command of the bus and transfer data directly to each other or into the computer's memory without the intervention of the central processor. All of this combines to make Micro Channel much faster than the bus it replaces.

If this discussion sounds familiar, it should. When the PC/AT came out, with its 16-bit processor, IBM designed an auxiliary bus to allow high-speed, 16-bit transfer between peripherals, memory, and the CPU. The nice thing about the PC/AT bus was that the additional eight bits were embodied in a separate connector: Cards that used only the original eight bits plugged into one connector, while cards that were designed to use the 16 bits plugged into both. All of the old eight-bit cards worked on the new 16-bit bus. That's called "backwards compatibility."

The main problem with Micro Channel is that it's not backwards compatible. Cards designed for the old eight- and 16-bit standards won't even fit into a Micro Channel slot. For manufacturers, it means that add-on boards have to be completely redesigned, which is one of the reasons that Micro Channel expansion boards have been so slow in coming to market.

Micro Channel hasn't been selling well. IBM says that only half of the PS/2s it has shipped—1 million in total—are Micro Channel machines. For comparison, in 1987 alone, 8.7 million IBM PCs and compatibles were sold which used the old bus standard. Micro Channel may be making a dent in the market, but not a very large one. Indeed, in September 1988, IBM introduced the PS/2 Model 30-286, its first computer in more than a year to use the old PC bus. But many observers think that it's too late for Big Blue.

The same day as IBM's announcement, a consortium of nine other computer vendors introduced the "Extended Industry Standard Architecture." EISA is another 32-bit bus, like Micro Channel, but, unlike IBM's bus, EISA is backwards compatible.

"That's the whole crux of this matter," says Liz Sidnam-Wright, a spokesperson for AST Research, one of the nine computer companies that helped develop EISA. With Micro Channel, "companies would have to give up their entire investment" in peripherals and add-on boards, she says. EISA, on the other hand, "gives you power and capabilities similar to Micro Channel and still has the backwards compatibility."

EISA works by providing the user with a *third* connector. In an EISA computer, a user's old eight-bit boards will plug into the first connector, 16-bit boards will plug into the first two, and 32-bit boards will plug into all three.

Of course, all discussions of EISA have to be set in the future tense, because EISA won't be here for another year. Until then, these companies say, just go ahead buying your eight- and 16-bit adaptor cards and forget about Micro Channel: You don't need it.

OS/2. OS/2 is doing for software what Micro Channel is doing for hardware.

The big advantage of OS/2 over MS-DOS is the ability to run more than one application at a time. This is called "multi-tasking," and it's something that other operating systems, such as Unix, have been doing since the early 1970s. Indeed, some third-party programs on the market even let users multi-task under MS-DOS.

OS/2 will give its users a graphical interface, similar to *Microsoft Windows* and the Apple Macintosh, but only for programs specifically designed to run with OS/2's *Presentation Manager*. And on 80286 computers, such as the PC/AT, only these specially-written OS/2 programs will allow multi-tasking. Although OS/2 will run MS-DOS programs also, it will be able to run only one at a time. To run multiple MS-DOS programs at one time, users will have to use an 80386 computer and a special version of OS/2 written for that machine.

Microsoft is giving OS/2 the hard sell, and with reason. Microsoft tells developers that anyone who doesn't bring out OS/2 applications is going to be left out in the cold. The real truth of the matter is that if developers don't write OS/2 applications, it's Microsoft that's going to be left out in the cold, because there will be no advantage to using its new operating system.

What to do? No matter what happens, software developers are always going to make sure that 8088 IBM PC/XT users with 640K of memory will be able to run their programs. Perhaps the programs won't run as fast as on a machine with one or two megabytes of memory, but the programs will run. No software developer in his or her right mind is going to cut out that sector of the market.

And then, there's LIM—the Lotus, Intel, Microsoft expanded memory standard—which lets 8088 computers break the one-megabyte barrier. Before LIM, accessing more than 640K of RAM was strictly a benefit of running a "protected mode" 80286 or 80386 operating system, such as Xenix or OS/2. But LIM makes the old PCs, albeit with new memory boards, able to use virtually as much memory as you can plug into them.

Micro Channel does have a market, but that market is limited to high performance applications that require a lot of input/output operations: multi-user computers, file servers, laboratory monitoring, and control systems. These are the users who will be purchasing IBM PS/2 Model 70s and 80s. These are not the users who want to run a simple word processor, spreadsheet, or database program.

Worse for IBM, Micro Channel's market is a subset of the Extended Industry Standard Architecture's market. The rest of EISA's market includes anybody who has existing eight- and 16-bit hardware and wants to get a new computer without buying new interfaces too. While Micro Channel is likely to do well in large corporations ("nobody ever got fired for buying IBM," a sales manager told me once), it's likely to have an uphill battle with users who care more about price than about Big Blue's name.

As for OS/2, users who demand multi-tasking would do well to look at Xenix, the Unix operating system available for the PC/AT. Besides being multi-tasking, Xenix is multi-user, which means that several people can use the same computer simultaneously.

The disadvantage of Xenix is price: Xenix for an 80286 costs $595, compared to $325 for OS/2. The 80386 version of Xenix that allows multiple MS-DOS programs to be run simultaneously costs $1,690. But for the user who's willing to pay for it, multi-user, multi-tasking operating systems are available today, notwithstanding the price.

For the rest of us, what we have will do nicely, thank you very much. Unless there's money burning a hole in your pocket, the best system is likely to be the one that you're using and happy with. ◻

Simson L. Garfinkel is a freelance journalist and computer consultant living in Somerville, Mass.

WELCOMI

Park S. Ge

Welcome
This columr
about the la
wrote them,
and which h
readers. Yo
on the auth
even how to
BCS membe
become auth
interest.)

Publishers
computer b
listing. We'l
far as space
significance
singled out
reviews will
occasionally
the importa
such treatm

This is not
Books of ge
their place, a
on operating
languages.

Readers' c
(although it
acknowledg
Write to this
office) about
or don't like
your compli
publishers. H
this column-
readers.

Since this
there's no lis
issue. Instead
of a book and
released in la
Mathematica:
Mathematics l
Stephen Wol
the Addison-
Company. It'
the computer
The simultan
computer pr
a press confe
Jobs participa
covered by m
including *Th*
so much atte
Stephen Wol

In the opin
Stephen Wol
mother taugh
University, a
ist. He attend
College; acco
he received a
During this p
ing scientific
which appea
when he was
Cal Tech and
degree there
the following
youngest per
of recipients
Foundation a