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PC MAGAZINE

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California Dreamin':
Apple Takes On IBM

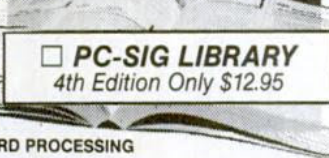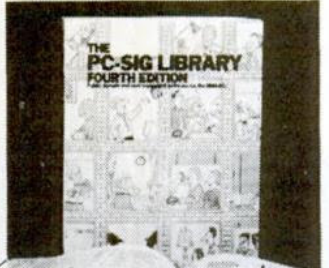MAC II

MAC WHO?

- **386 Operating Systems: Why Wait for OS/2?**

- **Sharper Images: 5 Full-Page, Black-on-White Monitors for CAD and Desktop Publishing**

- **Disk Caching: From and For Heavy Hitters**

WHAT'S INSIDE

We all know contrib-
uting editor Jim Sey-
mour as a longtime
PC user and arbiter of
taste in the DOS
world. In his column,
he doles out praise
and censure with
equal grace, unearth-
ing little-known hard-
ware and software
gems, warning read-
ers against lemons,
and exploring com-
puting issues.

But Seymour's
also an avid—and
longtime—Mac user.
"Like so many oth-
ers, I got one of those
early 128K, one-flop-
py-disk Macs," he says, "and almost im-
mediately fell into a love-hate relationship
with it: love, because the graphical inter-
face gave promise of big things to come;
hate, because those big things took forever
to appear."

"My 128K Mac grew into a two-flop-
py, then two-floppy-plus-hard-disk 512K
Enhanced machine, and when the 'good
stuff' hit about a year and a half ago, the
machine finally began to make the meta-
morphosis from Yuppie totem to business
computer."

"The Mac II fundamentally changes
the equation for both Apple and
IBM—and for business users of PCs,"
says Seymour. "The Mac II's speed and
power put it on a more or less equal footing
with the high-end IBM-compatible ma-
chines. And the graphical approach of
most Mac software makes the machine a
better choice for a lot of jobs."

With its fast processor, hi-res graphics,
and growing business software library, the
Mac II is a formidable sparring partner for
IBM's top-of-the-line PS/2 Model 80.
That's why we had Seymour put them

Columnist Jim Seymour with the dynamic duo that duke it out in
this issue's cover story. True Blue meets full zoot fruit, page 92.

head-to-head in our cover story, which be-
gins on page 92. Along with his in-depth
review and point-by-point comparison,
you'll find a historical overview by anoth-
er of our more-outspoken columnists, John
C. Dvorak. In his inimitable style, Dvorak
recaps 10 years of IBM/Apple seesawing
and gives some insight into two very dif-
ferent philosophies.

While both writers agree that the Mac is
now ready for the big leagues, Seymour
bemoans the innocence it lost on the way
to sophistication. "The Mac isn't all that
easy to buy and learn to use anymore," he
says. "A very small voice within me
yearns for the good old days when you
could have any color Mac you wanted, as
long as it was tan and came with Steve
Jobs's choice of monitor, drive, and key-
board. But that voice is silenced quickly by
the satisfaction I get from driving a Mac II,
a Lambo instead of the Yugo that was the
original Mac. But the price of that satisfac-
tion is a long list of tough questions. And a
deep dip into the savings account."

As the story says, "Toto, I've a feeling
we're not in Kansas anymore." **PC**

Photograph: Roberto Brosan

PC MAGAZINE

Take two: Apple and IBM are at it again with the Mac II and PS/2 Model 80, hot contenders for the power user's dollar.

KRISTIN

MAC II

MAC WHO?

Cover Photograph:
Roberto Brosan
Cover Screen Images:
Joseph Prieboy
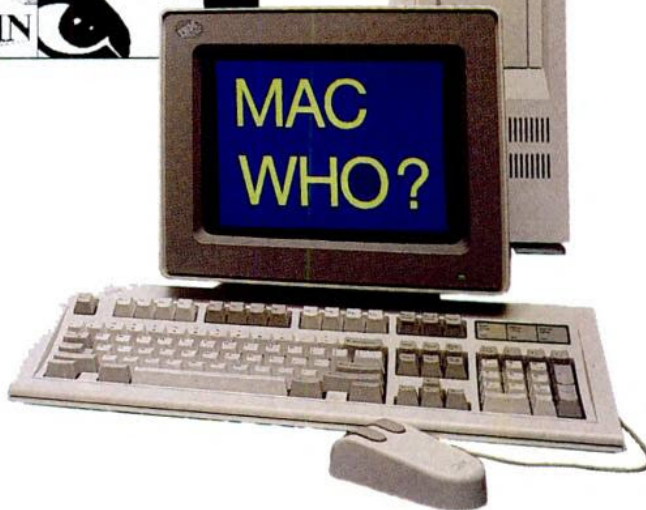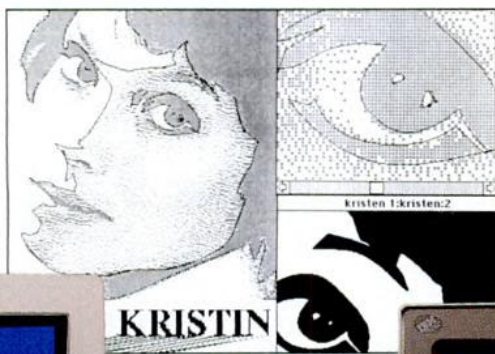
MAC THE KNIFE:

**Apple strikes to meet the
PS/2 Model 80 challenge and take a healthy slice
out of Big Blue's business.**

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COVER STORY

FOR THE SERIOUS PC USER in business, until recently the ongoing Macintosh-versus-PC debate was theoretical—if theory meant winning arguments and reality meant opening corporate pocketbooks. A couple of Macs might have found their way into the graphics department, but there was never much serious thought given to standardizing on a machine that had no hard disk, came with a monitor that you could hide behind a Stephen King paperback, and made a funny bing-bing noise when it booted up.

PC Magazine faced off the original Mac against the IBM PC-XT in the July 23, 1985 issue (Volume 4 Number 15). The cover photo showed them both together, with the Mac screen displaying the mes-

in power and much closer in purpose, despite their different operating systems. If the underlying theme 2½ years ago was ''know thine enemy,'' this one could be ''partners together.'' Both computers boast full 32-bit CPUs, big hard disks, dazzling 640- by 480-pixel color displays, and connectability for communications and file sharing among an increasing number of similar applications (*PageMaker*, *Microsoft Word*, *Excel*). And now Apple—made respectable by John Sculley, the LaserWriter Plus, and most recently the Mac II—is poised to move out of the desktop publishing niche and into general circulation.

Is Apple ready for the gray flannel mainstream? Does IBM finally understand the importance of graphics? *PC Magazine* as-

APPLE CUTS IN ON IBM

sage, ''Hello''; the PC screen, ''Get lost.'' A close comparison found them pretty much dissimilar equals, the Mac's 16/32-bit chip offsetting the 8/16-bit XT's color monitor and hard disk. Mac sales didn't soar, however.

The new generations introduced by Apple and IBM this year are light-years ahead

signed columnists and contributing editors John C. Dvorak and Jim Seymour, industry gurus with feet planted firmly in both camps, to poke, prod, and benchmark-test the Mac II and PS/2 Model 80 using the best software available for both machines.

Their reports follow.
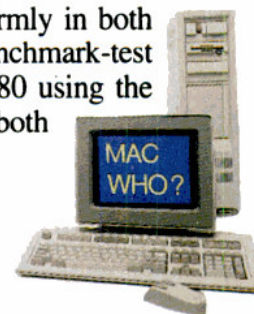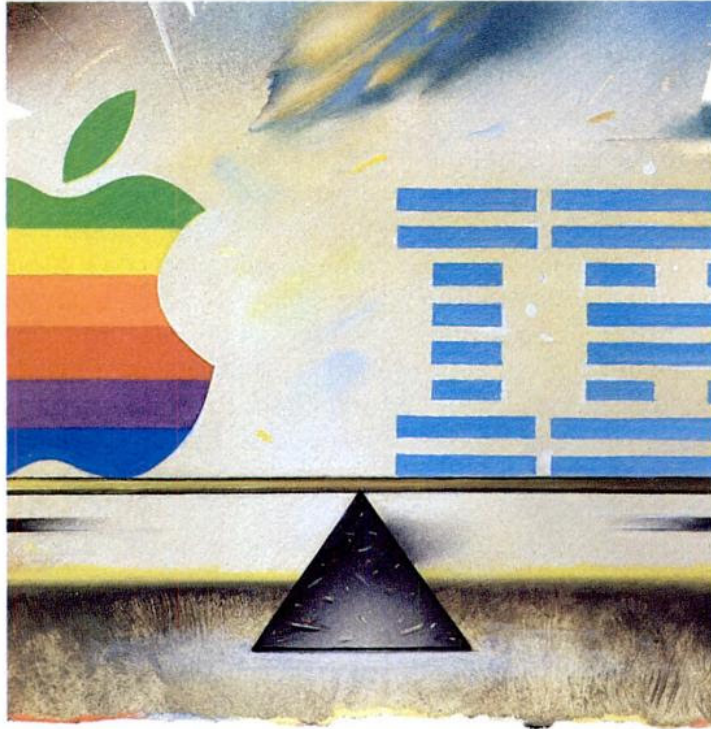
DOUBLE STANDARD

For years, IBM and Apple have competed for the hearts and minds of business users. The new Mac II makes the race closer than ever.

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COVER STORY JOHN C. DVORAK

Everyone was abuzz. A year before its announcement, rumors began about the new computer from Apple. The experts said that the new mouse-based marvel was what Apple finally needed to take on IBM in the business market. It was easier to use than an IBM PC, more powerful than any IBM (according to the Apple boosters), and pretty, too. The software, with its icons and windows, was much more innovative and advanced. The media went gaga when Apple first showed the machine. One writer for a trade weekly told *Business Week*, "It blew me away."

That was in 1982, and the machine was the Lisa, now extinct. The Lisa was the darling of the press for a few months, and you would have thought the world belonged to Apple. Too bad the boosters of the machine couldn't find enough dough in their pockets to buy one. Enthusiasm deteriorated when the incredible price tag of $10,000 threatened to show up on American Express tabs. The Lisa was just too expensive.

Also, the machine was an incredible dud. In its waning days the Lisa was renamed the Mac XL in hopes of dumping the last few that were buried in the warehouse. The last Lisa was shipped in April 1985.

Times have changed since then. The miracle of the Macintosh saved the day. The Macintosh, a machine not that different from the Lisa, was released by Apple on January 24, 1984, as Steven P. Jobs's last hurrah. With another forceful publicity boost, the company wowed the crowds and sold 100,000 machines in less than 90 days—this despite the fact that the machine did little more than run a crude word processor and a paint program. Still, it seemed different. It was somehow exciting. It had that magic you see in a product once in a blue moon.

Programmers and hackers fell in love with the machine because it had the easy-to-program 68000 chip and represented an antiestablishment ideal.

Years earlier, before IBM, things had been different. Apple was the establishment. It held the edge in the business world with its Apple II running *VisiCalc*. But in 1981 IBM stumbled onto the scene and simply took charge of a marketplace that Apple couldn't maintain. Other pretenders such as DEC, Texas Instruments, and even Hewlett-Packard couldn't figure out what to do right; hence they were left in the dust by IBM then rudely stomped down by Apple, which steadfastly followed in the mammoth IBM wake. When the dust cleared, it was IBM and Apple setting the standards. Anyone else who wanted to make any money had to copy one or the other and hope to scrounge sales from a group of frugal buyers looking for a better deal.

OPEN ARCHITECTURE Here's where IBM got all the attention. Apple had always protected itself with proprietary patents and made cloning next to impossible. The Apple strategy was risky, since it opened the possibility that Apple's proprietary system would not be popular and might simply die on the vine—as did those of dozens of companies before them who followed this tactic.

Everybody waited to see what would happen. Well, they didn't exactly wait. IBM was open game, so the cloners went to work. Moreover, the PC had an open system, and add-in card makers geared up for a bonanza. Soon there began an IBM feeding frenzy that continued through the release of the PC-XT and the AT. Apple II sales were lagging, and Apple knew that for the company to survive, the Mac would have to become a true second standard.

Apple knew the weak spots in the Mac. Critics had pointed them out from day one: no color, no expansion slots. Apple hoped that an IEEE 488 port in the back of the early Mac would do the job. It could be used as a quasi-bus, and peripherals could be daisy-chained off the thing. All it did was run slowly and anger the critics. This old trick didn't work for the early HP micros or the Commodore CBM machines either. Why should it work for the Mac? It didn't.

Apple countered by employing a fast SCSI port as I/O. It was fast, but still not fast enough for the performance maniacs. So, in the wings, the development team was designing the Mac II. Some jokingly called it the Lisa II, and, like the Lisa, we all knew about it for a year before it was finally shown.

CHEERS AND YAWNS When the Mac II was announced in March, the Mac community went wild, and the IBMers yawned. I was amused by two friends, one in each camp, who had seen both the new Mac II and the PS/2 machines a few months before release. Each of them said exactly the same thing. "The new

MAC VS. PC: AN ONGOING BATTLE

In July 1985, a year and a half after Apple released the first Macintosh, *PC Magazine* compared this relative newcomer with the IBM PC (Volume 4 Number 15, "PC vs. Mac: An Unfair Match?"). Technologically speaking, that was a long time ago, when most software for the Mac had not yet reached maturity and when the PC was still using the 16-bit, 8088 processor. Our reviewers, Diane Burns and S. Venit, pitted a 512K-byte PC-XT against a 512K-byte Macintosh in several applications and found that the Mac was indeed a formidable contender in all areas.

To make the machines as similar as possible for testing, both were equipped with a mouse and a graphics card, and the XT system included a color monitor to improve its graphics capabilities.

The reviewers began by comparing *Microsoft Word* on the two computers. In all the time tests the two machines performed similarly, with the Mac slightly ahead. One of the most noteworthy differences between the word processing capabilities of the two machines was that while the Mac could display custom fonts on the screen, the fonts on the PC all appeared alike until they were printed. Still, the reviewers did not consider the differences between the two machines important enough to suggest that a user switch from one to the other.

The other tests produced similar outcomes. The reviewers noted that *Crunch* on the Mac was more powerful and easier to use than *1-2-3* on the PC, although it was faster to use the PC because of its Pg-
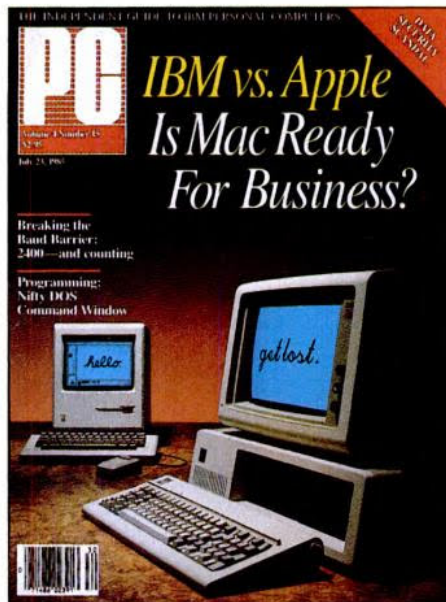
Two years after our first IBM vs. Apple cover story, the battle is hotter than ever.

Up/Dn keys and its quicker access time.

Using *Powerbase* on the PC and *Omnis 3* on the Macintosh to test database capability, the Mac was judged as the PC's equal with limitations stemming from the software rather than the hardware. The lack of database programs for the Mac made it less desirable to use than the PC, with its large library of database software.

The Macintosh's lack of color capability was brought into focus in the business graphics test, but its high-resolution screen was actually preferred to the PC's fuzzier color resolution. Once again, the reviewers found the Mac easier to use, but they recommended the PC for users

who insisted on color for presentation graphics.

The Mac was already well-known for its outstanding drawing capabilities, so it was no surprise that in drawing tests the biggest differences between the two machines came to light. Aside from the PC's color advantage, the reviewers saw no reason to choose the PC over the Mac and its easy and sophisticated *MacDraw* program.

The Mac's graphics capabilities also came in handy in the telecommunications packages. At the time these tests were run, however, communications software was not well equipped to handle graphics, so this feature was not utilized to its full potential. On other counts in the telecommunications category, the differences between the two machines were barely discernible.

Overall, the friendly Mac held its own against the powerful PC. Questions arose as to whether the simple-to-use software of the Mac was a bonus or actually a disguised curse that would render its users incapable of mastering more complex programs. Rather than pass judgment, the reviewers described their hope for a future in which the two machines could work side by side in the office. Today the open architecture of the Mac II and innovations in connectivity technology are bringing us closer to that vision.
—**Rachel Miller**

Rachel Miller is a history major at Barnard College in New York City and a PC Magazine *intern.*

Mac/IBM [choose one] is fantastic. I guarantee you'll want one. I got to see the IBM/Mac [choose the other one] too. Let me tell you—junk!''

But it looks like the Mac II wasn't even necessary. Apple's doggedness and the endearing quality of the little Macintosh kept the dream alive. Apple *has* managed to produce a second standard, and they did it mostly through goodwill. They decided to be nice guys. Arrogant, but nice.

Without clones to juice up the Mac market and make developers think there was big dough to be made, Apple had to do things differently to put dollar signs in the eyes of developers. So it catered to the third party with glad-handing and encouragement. Special teams were staffed to help the programmer who wanted to put his software on the complex Macintosh operating system. The company loaned machines like there was no tomorrow.

Even more interesting is Apple's ability to get tons of free publicity by means of a technique known as event marketing. Apple's product line consists of just a few dozen products. But every time Apple rolls out something new, it throws a huge party with attendant publicity. A new product from Apple is an event. Nobody in the IBM camp does this with Apple's flair.

Apple now has a lot more going for it in its battle than it did in the days when the

Lisa went up against the PC. Besides friends in the software industry and the media, it has a clear vision for its users and for its developers. They know what to expect from Apple. Apple tells them. Meanwhile, there is confusion and disarray in the IBM camp.

GETTING INSIDE Remember that early in the battle, the closed box and proprietary software of the Lisa, together with its high price, doomed the machine from the beginning. While the Mac II's price isn't going to be popular, its open NuBus architecture, which was developed for the most part at MIT and more or less standardized at Apple, has earned wide praise.

The IBM PS/2 family uses its proprietary Micro Channel Architecture. This bus has everyone confused because of a perceived threat of litigation if anyone clones it. Confusion reigns even in the add-in card business. What to do? Nobody knows. For example, each card requires an embedded ID number so that the system can configure itself. IBM is supposed to assign the numbers to independents, but no stable system seems in place yet.

To make matters worse, Compaq has its own design for a 32-bit bus, Phoenix Software has another, Tandy still another, and so on. It's a laugh riot. The strength of the IBM side in this never-ending battle lies in compatibility and clonability, which combine to create a larger market for software and attract a greater number of talented software designers, thus making the machines more attractive because of extensive software, thus creating more interest, thus . . . you get the idea.

Now it seems that Apple's proprietary tactic has paid off, at least for the moment. There are no cloners on the Apple side going every which way to confuse things, so it's a calm, serene world. A disadvantage remains, though: no cloners means no independent boosters. It's boosters and cloners who will always account for most of the noise made on the IBM side of the spite fence. In contrast, Apple hopes to keep its third-party independents and its users vocal. That's all it has.

Then again, there are the children. Apple pushes its machines into schools relentlessly in the hope that the graduate raised with an Apple in the dorm will maintain some loyalty when he or she ventures into the cruel world dominated by icy blue IBM machines. IBM hasn't been able to crack Apple's stranglehold on this market, though it recently launched a new attack with its August introduction of the 8086-based PS/2 Model 25.

The marketing battle between these two camps will not be over in this decade, and when it ends, it will be the users who decide who wins. If Apple has a shot at the victory, it will be because of (or despite) its

> **The biggest difference between the two worlds might simply be an attitude—an attitude that is reflected in the number of users in each camp who are having fun with their computers.**

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advanced operating environment with its mouse and icon interface.

A FRIENDLY ENVIRONMENT The Mac operating system is a marvel little understood by the IBM world. The file structures and the design of the system are so complex that a $35 book the size of the Manhattan phone directory is needed just to begin to understand what you can or cannot do in a Mac environment. The fortunate thing is that it's the developers who need the book. The user sees nothing but a breezy, easy-to-use program. The result of the additional effort needed to make Mac software work properly benefits the users in ways not understood in the IBM world. Good programs running on a Mac are genuinely intuitive. Rarely is documentation required to operate a software package.

The operating system on a Mac is also smarter than DOS. For example, on a Mac, you can have a document created with *MacWrite* and a document created with *WriteNow*, two popular Mac word processors. You can edit either one with any number of programs, but the file header (unknown to the user) tells the computer which program originally created the document. If you execute the document, it immediately informs the operating system that it's not a program but a document created by, say, *WriteNow*. The operating system fishes through the entire hierarchical database of directories, folders, and folders within folders to find *WriteNow*, then executes it and loads the document. After all, it figures that this is what you really want. And, in fact, it is.

The IBM world has *Microsoft Windows*, which naive users assume is similar to the Mac interface. It's not. The *Windows* Executive is laughable when compared with the Mac operating system and interface. IBM devotees think that the Mac must be a clunker because of their familiarity with the *Windows* Executive, which they assume is like the Macintosh. Conversely, Mac users who have encountered the *Windows* Executive think that IBM users must be fools to use such a thing. Hence the gap between the two camps widens.

Another difference between the machines lies in their microprocessors: IBM with its Intel 8088 to 80386 chips and Apple with its Motorola 68000 to 68020 chips. Deciding which family of chips is best is difficult, but nobody can deny that Motorola has an edge when it comes to addressing scads of memory effortlessly and letting programs use that memory without a lot of rigmarole. While we hear about the eventual breaking of the ludicrous 640K-byte barrier for contiguous addressable memory on the IBM family of computers, the fact is that except for convoluted schemes such as the Lotus/Intel/Microsoft EMS and other fancy footwork, we're stuck at 640K for at least 6 more months, while many Mac IIs are being shipped with 4 megabytes of main memory today. The smaller Macs have been managing 1 to 4 megabytes of usable memory for more than a year.

The ease with which the Mac accesses gobs of memory is due to the 68000 family of chips, which do not require the complicated manipulation of segmented memory pages that the Intel chip does. This is the big gripe you hear over and over about the Intel chip.

IBM vs. Apple: Product Developments

Apple Computer beat IBM to the starting line in the personal computer market by 4 years with the introduction of the Apple II in April 1977. It soon became a favorite of hackers and video gamers, and, with the arrival of *VisiCalc* spreadsheet software, it started showing up in offices as well.

In September 1980, Apple introduced the Apple III, targeted at business users. Its subsequent failure revealed that the business world was not quite ready to let go of its CP/M machines—at least until the next summer, that is, when IBM entered a young but increasingly crowded market with its own creation, the IBM PC.

With the announcement of the PC in August 1981 (and the development of word processing, spreadsheet, and database software to go with it), corporations became receptive to the idea of a personal computer on every desk. And while IBM sold out its PC inventories, Apple geared up for its second attempt to reach the business market with the Lisa.

Introduced in January 1982, the Lisa was a revolutionary machine, with pull-down windows and menus, icons, and a mouse. But it was expensive (almost $10,000), and it lacked the software library and brand name recognition that the less sophisticated IBM PC enjoyed.

While Apple engineers were developing a new machine that would incorporate many of the ill-fated Lisa's advanced features, Apple fortified its presence in the home and education markets with the successful marketing of two new Apple II models: the Apple IIe in January 1983 and the slim IIc a year later.
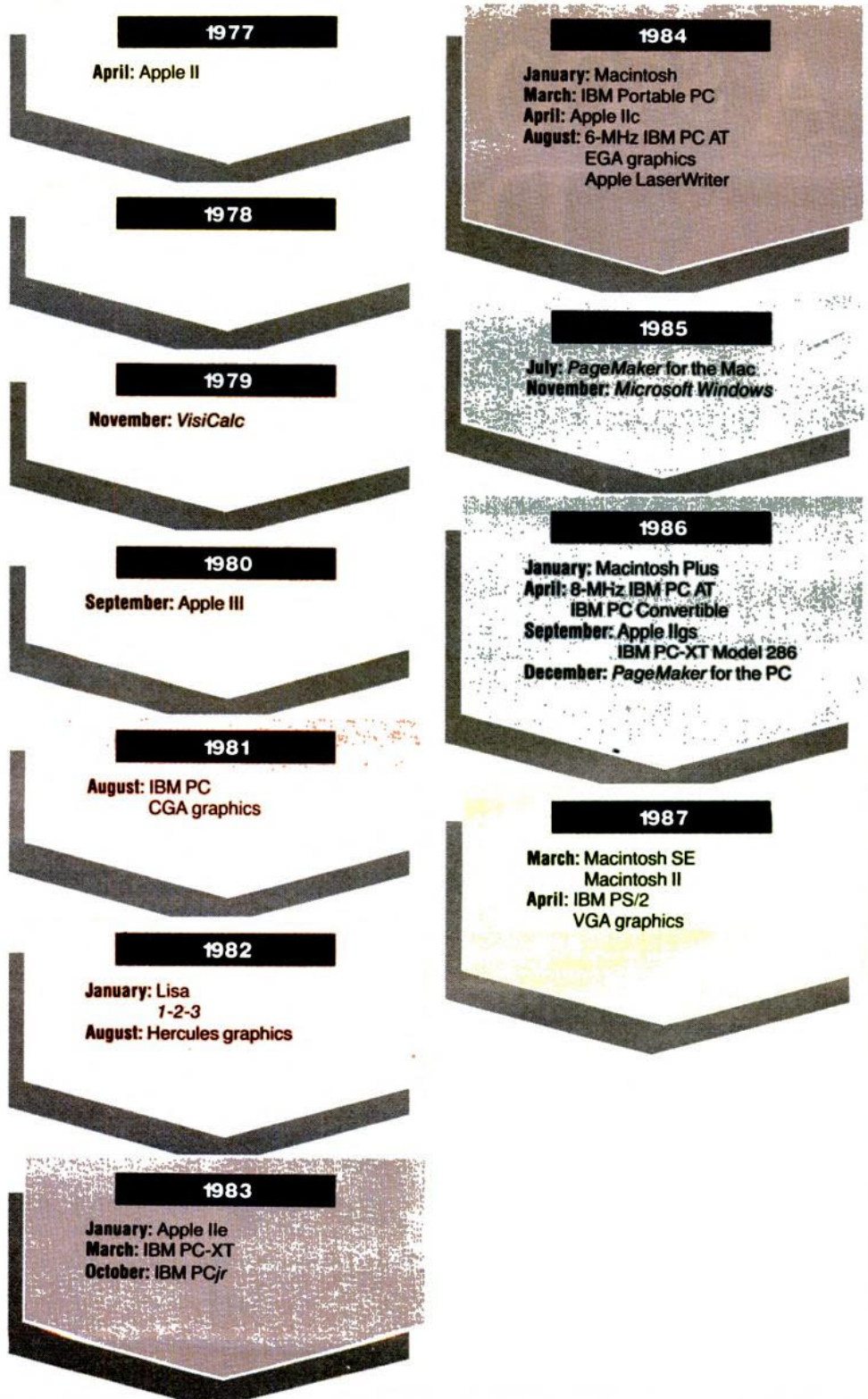
On January 24, 1984, the Macintosh, a direct descendant of the Lisa, was introduced. The Macintosh impressed buyers with its sharp monochrome graphics, simplicity of use, and Lisa-inspired pull-down menus. Three months earlier, IBM had launched a preemptive strike at the Mac with the introduction of its PC*jr*, but the underpowered machine could not compete with the sleek Mac.

At about the same time, in March 1984, IBM introduced its first portable computer, the Portable PC; almost 2 years later IBM's first laptop, the PC Convertible, hit the shelves. To this day Apple has not attempted to design a portable or laptop that might incorporate some of the features of its desktop models.

In August 1984, IBM's PC AT made its first appearance and quickly set a new standard of computing power, especially in the business arena, where its speedier database searches and spreadsheet calculations were welcomed enthusiastically.

Apple extended its two lines of computers with the MacPlus in January 1986 and the Apple IIgs, with enhanced graphics and sound, in September 1986. In March 1987, a month before IBM announced its PS/2 family, Apple presented the flagships of its new generation: the Macintosh SE and the Macintosh II—**Alan Cohen**

Alan Cohen is a computer science major at Columbia University in New York City *and a* PC Magazine *intern.*

1977
April: Apple II

1978

1979
November: *VisiCalc*

1980
September: Apple III

1981
August: IBM PC
CGA graphics

1982
January: Lisa
1-2-3
August: Hercules graphics

1983
January: Apple IIe
March: IBM PC-XT
October: IBM PC*jr*

1984
January: Macintosh
March: IBM Portable PC
April: Apple IIc
August: 6-MHz IBM PC AT
EGA graphics
Apple LaserWriter

1985
July: *PageMaker* for the Mac
November: *Microsoft Windows*

1986
January: Macintosh Plus
April: 8-MHz IBM PC AT
IBM PC Convertible
September: Apple IIgs
IBM PC-XT Model 286
December: *PageMaker* for the PC

1987
March: Macintosh SE
Macintosh II
April: IBM PS/2
VGA graphics

Putting all the technicalities and marketing schemes aside, the biggest difference between the two worlds might simply be an attitude—an attitude that is reflected in the number of users in each camp who are literally having fun with their computers. That many PC owners do have fun with their machines is attested to by the brisk sales of IBM PC games—although the PC's CGA makes it a poor excuse for a game machine.

Games aren't the whole picture. The Macintosh, for example, has programmable screen backdrops, programmable

> It is not unusual to hear an elephant blurt or an *aaa-ooogah* horn sound in the office of a Mac user.

noises it makes when it's booted, and a programmable error beep. It's not unusual to hear an elephant blurt or an *aaa-ooogah* horn sound in the office of a Mac user when that's his or her choice for a beep sound on the machine. Individuality is a key element of Mac usage. When you sit at a Mac used by someone else, you see the heightened level of customization and pronounced individuality as soon as you boot the machine. Since the Mac is oriented toward graphics images for everything, the view of someone else's desktop is always fascinating. There's no comparison to the pedestrian IBM list of files within carefully constructed subdirectories.

Make no mistake about it. These are two worlds. The personalities are different. The attitudes are different. One side may be a little too cutesy, and the other tending a bit too much toward gray. When Mac users are playful, they may be too silly. When IBM users are playful, they may be too boring. When Mac users are serious, they are arrogant. When IBM users are serious, they are arrogant, too. That seems to be all they have in common. **PC**

John C. Dvorak is a contributing editor of PC Magazine.