

AQUA AND BONDI:
**The Road to OS X
& The Computer
That Saved Apple**



by Stephen Hackett

Introduction

About Me

Hello. My name is Stephen Hackett. I live in my hometown of Memphis, Tennessee. My wife and I have three children and a dog named Eva Corndog.



I've long been fascinated by things that light up and make noise.

As such, I write and make podcasts for a living. I'm the co-founder of **Relay FM**, a podcast network for people who are creative, curious and maybe even a little obsessive — just like its hosts. I currently host **three shows** on the network.

I have been blogging at **512 Pixels** since 2008 about Apple, technology, journalism, space, design and whatever else makes me smile. As of 2015, Relay FM and my writing are my full-time job.

My introduction to the Mac — and Apple — took place in the early 2000s when I was a student in high school.

More often than not, if a teacher had a computer at my school, it was an iMac G3. More importantly, we had a couple of them in the room we used to produce the school newspaper. Even though they weren't brand-new at that point, they were *amazing* compared to the beige Macs that the district was slowly phasing out as we killed them with QuarkXPress and Photoshop.

The first time I used Mac OS X, it was on a Strawberry iMac. When I saw the colorful interface, I was blown away by how rich everything was. Better yet, the technology below the surface was robust and impressive, even in those early days. In the blink of an eye, the Mac OS I had been used to felt outdated.

The lessons I learned on those computers go beyond the skills of page layout and graphic design. That high school newspaper room is where I discovered my passions for writing, story-telling, photography, design and more.

That's *exactly* what Apple wants people to experience with its products. The iMac G3 deserves a spot in the Hall of Fame for products that changed the landscape.

But the iMac is only half the story. It came to market at a time when Apple was barely treading water. There are a lot of reasons for Apple's missteps in the 1990s, and they all revolve around poor decision making when it came to the Macintosh.

The operating system that made up the heart of the Mac languished. Apple struggled to keep it updated in an evolving marketplace. Several major attempts were made to re-write it, with a goal of delivering a modern, stable OS that could power the Mac for the next decade. Those failed attempts ended in Apple buying NeXT for its operating system.

As part of the deal, Steve Jobs returned to the company he founded and began the process of replacing Mac OS with something new: Mac OS X.

OS X and the iMac's stories are intertwined, but are often told separately. Apple's strength is most obvious when its hardware and software are working in harmony, and that's what was needed to save Apple in the late 1990s. Turns out, it worked.

Aqua and Bondi shares that story for those who haven't read it before. It's a consideration of Apple at a very interesting time in its life and the products it shipped.

Note that it is not chronological; it approaches Apple in the 90s, the iMac, and the creation of Mac OS X as distinct sections.

I have many people to thank.

No project comes into being without sacrifice, this book included.

First and foremost, I am indebted to my wife, Merri. I already work too much, and this project just added to that. She was forgiving as I worked long nights writing and laying this out. Her support is critical in allowing me to do this crazy stuff for a living.

Thanks to Myke Hurley, Federico Viticci, Jason Snell, John Siracusa, Christina Warren, David Sparks, Ed Cormany, Brian Sutorius, John Vorhees and Jeff Abbott for their feedback throughout this process. Their fact-checking and editing have proven invaluable.

It was hard to know how technical the book should be in certain places. I'm sure some of you will know more than what is contained in these pages, but I hope it can educate those who haven't read the story of how Apple pulled itself out of the ditch. Like all great Apple products, it is a story of software and hardware working together.

So, thank you for deciding to spend a few bucks on this book. Without your support, none of my work would be possible. I hope you enjoy it.



Aqua and Bondi: The Road to OS X & The Computer That Saved Apple

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made with love in Memphis, Tennessee

Apple In The 1990s

Steve Jobs was gone, and the company was struggling. The Mac's software was falling behind, and all attempts to revive it were failing.

The software woes are just part of the story. There was boardroom drama and a failing hardware strategy as well.

Macintosh System Software

Systems 1-5

When the Macintosh was introduced in 1984, its system software was revolutionary. While it was not the first computer to eschew the command line for a graphical user interface, it was the first time a computer with menus, windows and a mouse was accessible to the masses.

The original Macintosh was a uni-tasking machine. Like early versions of iOS decades later, the System could only run one application at a time. However, mini-apps called Desk Accessories could run alongside normal programs. These Desk Accessories ran as drivers so that the system could periodically allocate resources to them. Early examples include Calculator and Alarm Clock, but even the Control Panel (with its amazingly dense UI that really showed off the power and whimsy a graphical user interface could bring) was implemented in this way.

It may be hard to believe now, but the original Macintosh did not ship with a hard drive. The entire system had to fit on a single 400 KB, 3.5-inch disk with room to spare for user data.



System 1.1. Image via [The GUIdebook Gallery](#)

Apple was quick to update the original System Software. The initial release had several bugs that made folder management and disk copying more burdensome than they needed to be. System 1.1 brought a big speed increase to disk copying. The System could also boot faster, with Finder launching more quickly after boot than before.

As subsequent Macs became more powerful, so did the software they ran. System 2.0 introduced a revised Finder (whose version number had jumped from 1.1 to 4.1) that brought support for multiple folders, the now-popular List view and the ability to eject a disk by dragging it to the Trash, a feature that survives to this day.

System 3.0 shipped with the Mac Plus in January 1986 with the Hierarchical File System in tow. HFS allowed nested folders, which was a huge change. The Macintosh File System, which HFS replaced, only allowed folders at the root level of a volume. System 4.0 added file sharing and dropped support for the Mac 512K.

October 1987 marked the next major release of the Macintosh System Software. 5.0 added MultiFinder, which meant the Mac could appear to run more than one program at a time. (Andy Hertzfeld's **Switcher** application allowed this as early as March 1985, but was incompatible with many software titles.)

This was implemented as cooperative multitasking. Unlike what we are familiar with today, this didn't *actually* allow more than one program to run at once. Resources were given to the background applications only when the running application yielded control.

(To allow more than one application to run at once on a system with cooperative multitasking would require more than one CPU.)

This meant that users could print documents while working on other tasks, applications could complete limited tasks in the background and more. A small icon in the upper right corner of the screen indicated which application the user was currently working within.

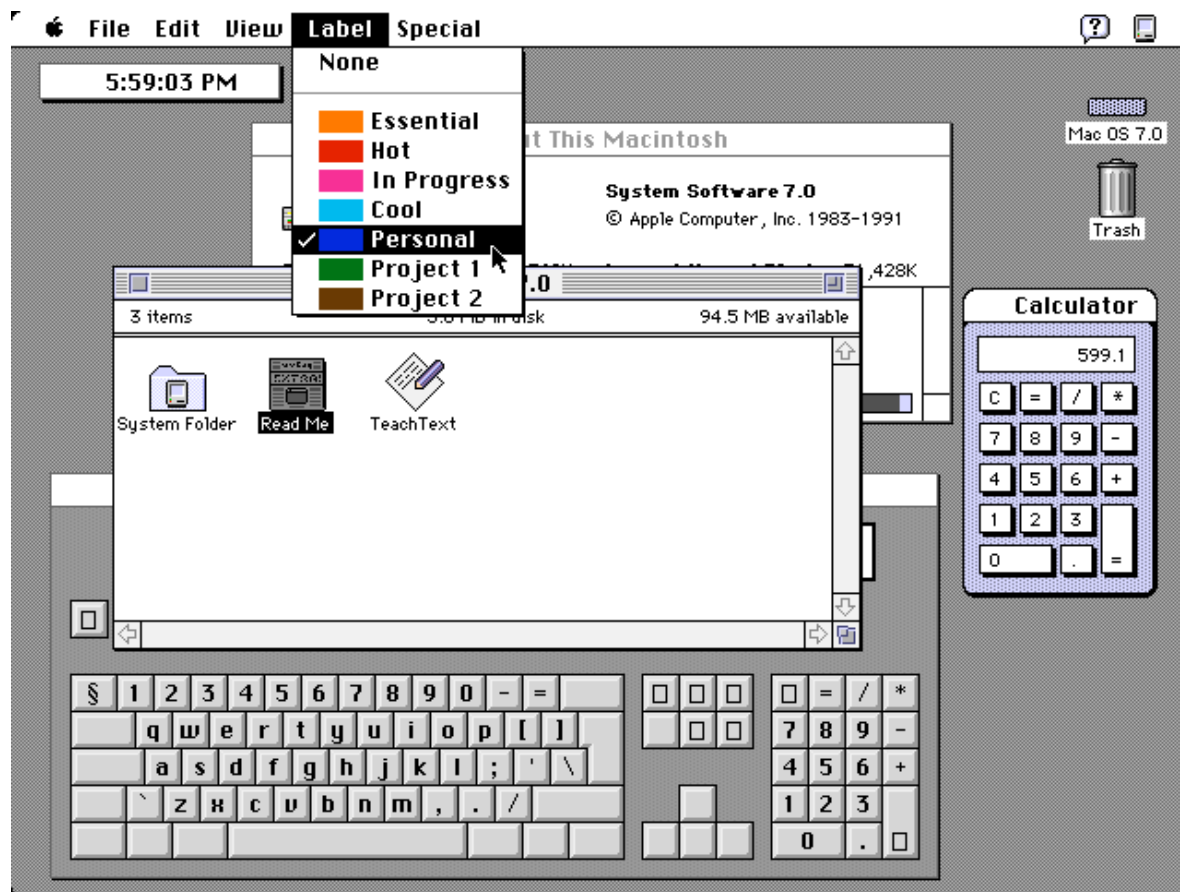
MultiFinder was a big step forward for the OS. **Apple's COO at the time, Delbert Yocam, wrote:**

The new operating system provides a smooth transition to a multitasking environment, offering users real productivity gains now. MultiFinder re-emphasizes the expandability and flexibility of the Macintosh software architecture.

System 5.0 was the first Macintosh operating system to be given a "Macintosh System Software" version number. While I have been using them here for clarity's sake, "System 2.0" was really Mac System Software 0.3 and Finder 4.1 and so on.

Systems 6 and 7

In April 1988, Apple shipped System 6, the most comprehensive update to its software to date. It brought more robust MultiFinder and support for many more printers. It powered computers like the Macintosh IIx, IIfx, Macintosh Portable, Macintosh Classic and the original PowerBook.



System 7.0. Image via [The GUIdebook Gallery](#)

In May of 1991, System 7 — codenamed “Big Bang” — was introduced. The Mac community had waited three years for this release, which seemed like an eternity after seeing five updates in four years.

System 7 brought built-in cooperative multitasking (essentially MultiFinder, but folded into the OS), virtual memory, better file sharing and a revised user interface that made better use of color.

Updates would include the ability for a user to organize their fonts in Finder, a clock in the menu bar, Stickies and an Extensions Manager that made troubleshooting startup problems easier.

System 7.1.2 was the first to support PowerPC-based Macs and shipped with a built-in 68k processor emulator for non-PowerPC programs and parts of the OS that were not rewritten to natively support PowerPC. Later, 7.5 bundled MacTCP, enabling any Macintosh to connect to the Internet out of the box.

The next update — named **Mac OS 7.6** — brought more native PowerPC code to the system itself, increasing stability and performance.

By this time, however, it was more than clear that the Mac OS was aging and in need of some serious work.

Pink & Taligent

ALTERNATIVE PATHS

While System 7 in particular worked to bring new features to the Mac's operating system, Apple had not done enough work to keep its operating system modern.

It wasn't for lack of trying. While Pink and Taligent may not be the most well-known attempts by Apple, they were projects designed to replace the Mac's System Software with a more modern, stable and forward-looking operating system.

Pink

In March 1988 — a month before shipping System 6 — Apple software managers held an offsite meeting to work on the roadmap of future Mac operating system releases. Ideas were written on two colors of index cards. Simple features that could be implemented in the short term were written on blue cards. Pink cards were used for longer-term projects like true multitasking. Ideas that were too big to be put on a timeframe were put on red cards.

Many of the Blue features were addressed in Systems 6 and 7, including cooperative multitasking and virtual memories, but the more ambitious (and resource-intense) Pink cards were taken aside as a special project.

At the end of 1987, software engineer Erich Ringewald was given control of the Pink operating system and two years to implement the features in a future version of the Mac's operating system.

As the deadline approached, it was clear Pink was not ready. It was unstable and slow, and as a result, many of the original team had left. However, it was seen as an important project internally, and many new developers joined the team.

The Pink team was secretive. When CEO John Sculley demanded more visibility into the project, reports were bleak. Pink was far from complete and in need of help.

Taligent

In 1991, under Michael Spindler, Apple entered a partnership with IBM and Motorola to work on reference hardware based on the PowerPC architecture. Apple needed to move past the old 680x0 line of Motorola chips it had used since the early 80s, and would eventually move to the PowerPC platform for its Macs.

A new company named Taligent was also born.

The goal was to complete the shuttered Pink project and sell it as a cross-platform operating system.

By 1992, IBM persuaded Taligent to replace the Apple-built microkernel at the heart of Pink with its own object-oriented microkernel called Opus.

This would allow Pink to run on IBM's Workplace OS, and would open the door to Pink being the glue between multiple operating systems, including OS/2 (a joint project between IBM and Microsoft) and Mac OS. The idea was that any combination of operating system aspects could be bundled together in new ways.

It was soon clear that this new OS — now nicknamed TalOS — simply wasn't wanted by the market. Taligent pivoted to building an object-oriented programming environment. IBM planned the system to be a set of cross-platform tools. Developers on OS/2, Mac OS and beyond would be able to download and use these tools to build applications.

By 1994, few customers had signed up to adopt the new technology when Taligent shipped the first version of the environment, now called CommonPoint.

By this time, it was clear Apple had lost interest, as it had little to gain from development tools that would put Mac OS on the same playing field as other operating systems. Pink was dead.

A couple of years later, Taligent would be folded into IBM, and Apple would still be left without a next-generation OS.

Apple would try again, and this project would be far more public: Copland.

Copland

In 1995, Microsoft shipped Windows 95 to great fanfare. While Apple was confident in its user experience and GUI chops, Windows 95 ran circles around the Mac in terms of multitasking and stability. System 7 was suddenly feeling very old and creaky.

With Pink still a pile of flaming wreckage in the rearview mirror, Apple set out to replace Mac OS. The Copland project was launched in March 1994. The goal was to ship this OS as System 8 in late 1996.

This was to be an all-new operating system with several new features under a new theme for the UI named Platinum. This design brought 3D shading and color to all interface elements, leaving behind the flatter, black and white design of previous System releases in the past.

(Platinum was to be just one of the themes in Copland. Available in the Appearance Manager, these themes would re-skin the OS to take on different looks.)

Copland's Finder would learn several new tricks, including an automated backup system to copy user documents, applications and system files to a backup hard drive.

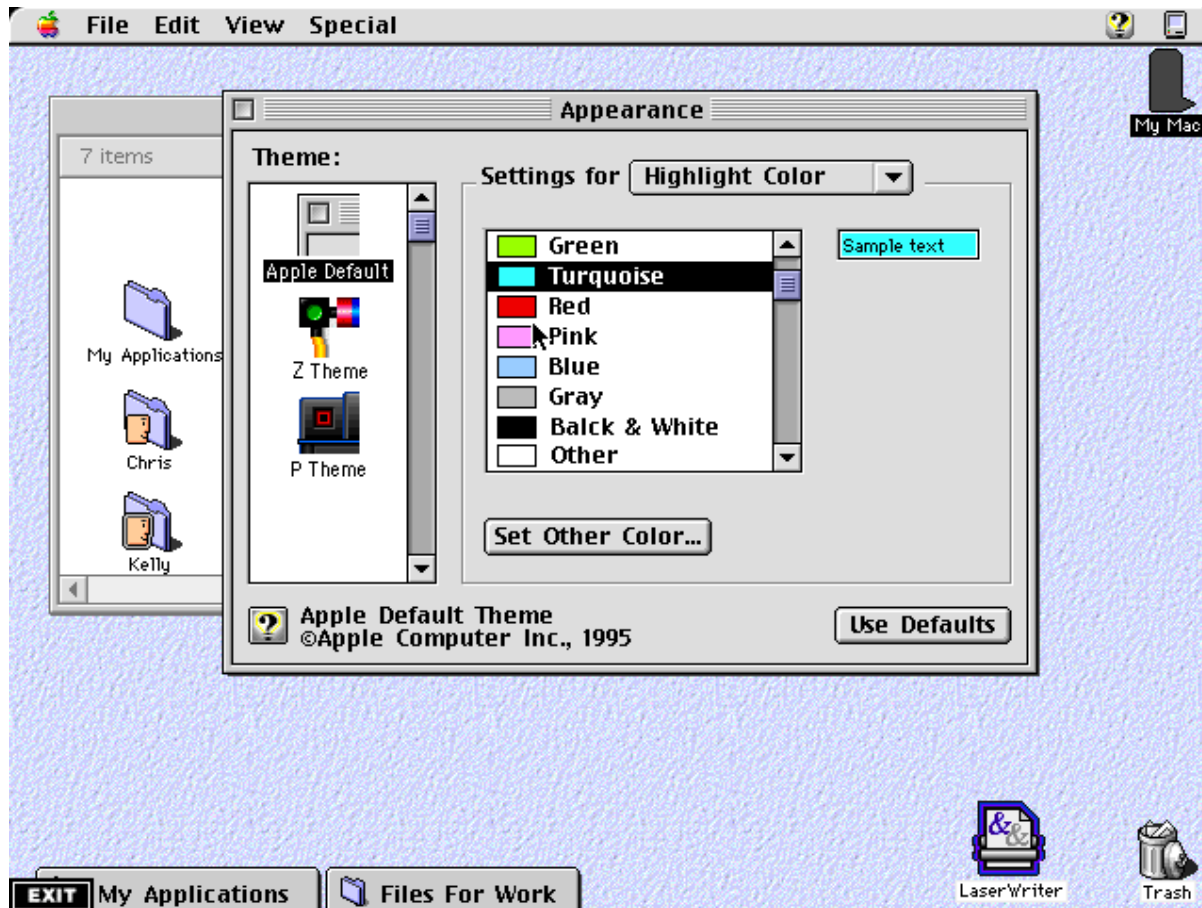
What Apple meant by a “modern OS”

While Copland didn't deliver on all of these fronts, they would be requirements for what came next — Mac OS X.

Preemptive Multitasking: The system would be in charge of access to resources, ensuring all applications have access to the CPU at any one time. For example, without this technology, when a user clicked down a menu in the menu bar, everything on the computer would stop until they let go of their mouse. Preemptive multitasking made a computer faster and more stable.

Protected Memory: RAM claimed by an application or process would not be interfered with by another process or application. This not only would make the system more secure, but means that a single bad application cannot crash the entire machine.

At the time, the Macintosh was a single-user system. Copland was to change that, supporting multiple user accounts. An administrator could set permissions and access levels per user.



Copland would include a new look and feel, and features such as themes and Finder tabs that could be pinned to the edge of the screen. While individual features would be rolled out in later Mac OS updates, Copland on the whole never shipped. Image via [LowEndMac](#)

For example, students may not be allowed to see certain items in the menu system and be limited to a simplified Finder layout appropriate for their expertise level.

Copland was to be PowerPC native, top to bottom. System 7 had lots of 680x0 code, leading to crashes and slowdowns. To support legacy third-party applications, Copland would include an emulator that would run 68k apps seamlessly.

It would also support OpenDoc, Apple's software framework for creating documents from smaller modules and components. It's as confusing as it sounds.

Most importantly, Copland was to support preemptive multitasking. At the time, the Mac had cooperative multitasking, but it forced applications to yield time and resources when they were not in use. Copland's multitasking would allow Finder to make multiple copies, empty the trash and launch an application all at once.

To do this, Copland was to include a microkernel, not unlike NeXTSTEP or Windows NT. However, Apple wanted to do this while preserving compatibility with existing Mac software. This would require additional time and energy to an already sprawling project.

If this all sounds ambitious for Apple circa-1995, it was.

Even before Windows 95 spurred Apple to add even more features to Copland, the project was behind schedule. By early 1996, some 500 developers were working on the release. The team working on Mac OS was dubbed "Maintenance Engineering" as Apple focused on the future. However grand its plans, Apple was soon stuck in the mud. An expanding feature set, poor management and unrealistic deadlines were grinding Copland into the ground.

At WWDC 1996, Apple's new CEO, Gil Amelio, spoke about Copland. Instead of a single release, he said that Copland's features would roll out across a range of updates.

During the course of the conference, it became clear Copland wasn't nearly far enough along. Third-party developers who got their hands on demos reported it to be incredibly fragile, lacking basic features like the ability to input text into Open and Save dialog boxes.

After WWDC, Apple commented that the Copland-based Mac OS 8 would be coming later than expected, but did not commit to a ship date.

By the fall of 1996, it was clear that Copland was too far off-track to ship in any reasonable time. Even breaking Copland's user-facing feature list into smaller chunks and rolling them out in a staggered release wouldn't be possible. Copland was collapsing under its own weight. There was too much to do, and no clear direction on what should be prioritized.

In August 1996, Copland was cancelled, joining Pink on the list of failed attempts to write a modern Mac operating system. The Mac development community was up in arms, upset that another OS re-write project had failed as the Mac's OS sat aging.

Apple went shopping for a new operating system outside of its Cupertino walls, where it found Steve Jobs' NeXT Computer waiting with just the technology it needed.

The CEO Parade & NeXT Purchase

Jobs & Sculley

In 1983, Steve Jobs hired John Sculley away from Pepsi with a line that is seared into business and computer history:

Do you want to sell sugared water for the rest of your life? Or do you want to come with me and change the world?

Sculley was to serve as "adult leadership" at Apple, which was enjoying great success thanks to the Apple II line of computers. By late 1983, Sculley and Jobs were called the "dynamic duo," guiding Apple to increased stability and profitability.

A big step in that plan was the Macintosh. Unveiled with great fanfare in January 1984, the computer was a direct representation of what Jobs thought computers should be like. The Mac was quiet and small, and operated as a closed system. A computer that was more appliance than hot rod.

Apple was expecting the Mac to fly off the shelves, but a few months after launch it was clear that it hadn't resonated as clearly with customers as anticipated. The \$2,495 price tag — set by Sculley to maintain a healthy profit margin — didn't help.



Steve Jobs and John Sculley. Image via [The Telegraph](#)

Sculley helped create a **"Test Drive" campaign** for potential Mac buyers. Anyone with a credit card could borrow a Macintosh from a dealer for 24 hours. Some 200,000 people participated, but most didn't purchase the computer. Instead of having machines flying off the shelves, dealers struggled between having enough inventory for the campaign and being stuck with machines that they couldn't sell.

The Apple II was still the company's bread and butter, accounting for some 70% of revenue in 1985. The Mac's high price tag, limited software selection and lack of hard drive space or even a printer doomed it with businesses.

The Lisa computer was in bad shape, too. The forerunner to the Mac was seen as too expensive by the public. In an attempt to move units, Apple released MacWorks, software that allowed the Lisa to emulate the Mac's system software. This solution was based entirely on the floppy drives; it could not use a hard disk drive for storage. While Jobs had been removed from this project before Sculley was hired, it was still seen as a black mark on his record.

Through all of this, Apple's board gave Sculley a directive: contain Steve Jobs. His hardware projects were struggling, and the tension between these divisions and the Apple II team were causing problems within the company.

Tension between the two men boiled over. In May 1985, Sculley was tipped off by Jean Louis Gassée — who had been running Apple France — that Jobs wanted to seize control of the company when Sculley was overseas.

Sculley confronted Jobs, and then challenged the board to vote on who would lead Apple.

They chose Sculley, and several days later Jobs was officially stripped of all responsibilities. He was named Chairman, and was moved to an out-of-the-way office dubbed “Siberia.”

In September 1985, Jobs notified the board that he and several “low-level” employees would be leaving to start a company to serve the higher education market:

- Susan Barnes (Senior Controller for U.S. Sales and Marketing)
- George Crow (Engineering Manager)
- Dan'l Lewin (Higher Education Marketing Manager)
- Rich Page (Apple Fellow)
- Bud Tribble (Manager of Software Engineering)

Sculley was understandably upset, as these were key employees with deep knowledge of Apple and its products. Before the Board could vote to let Jobs go, he tendered his resignation.

Apple sued Jobs and Page, but settled out of court in January 1986.

Team Sculley

Sculley now firmly in command, he reorganized the company. Under Jobs, each product was run as an island, with parallel marketing, design and development efforts for each computer sold. Sculley moved Apple to a more functional model.

Development was now one large team, with sub-groups working on various projects. Likewise, there was a single marketing team and a single sales group. (This is how Apple works today.)

Gassée was brought to Cupertino and put in charge of product development. He was a popular choice with employees, thanks to his hands-off style and penchant for generous praise and bonuses.

“Coach” Bill Campbell and Michael Spindler (who had been in Apple’s European marketing team) were tapped as executives. Coach helped usher in an era of growth for Apple's hardware in businesses and schools, while Spindler focused on strategy and uniting Apple internally behind a new goal of company-wide (not product-based) success.

The Macintosh II

Jobs had begun work on a project dubbed "BigMac." This computer, slated to be the Mac's successor, was to be a "3M" computer. This meant it would have at least one *megabyte* of RAM, a *million* pixels on its display and a *megaflop* of processing power.

Jobs and his team wanted BigMac to be backwards-compatible with the Macintosh, but it was planned to use a UNIX-based operating system, not the system software built for the Mac. Prototypes were buggy, but some of its technology — like the ADB port, which was used to connect keyboards and mice —



would survive after Gassée canceled the project in 1985.

Out of the ashes of BigMac rose the Macintosh II. It was actually a skunkworks project hidden from Jobs by his team, but blessed by Gassée after Jobs left the company.

Released in early 1987, it was the first modular Mac. This was in direct violation of Jobs’ principles of design, but it allowed the company to reach a wider audience. It's PC-like case included a 16 MHz Motorola 68020 with a floating point unit, up to 8 MB of RAM and an optional internal SCSI hard drive. It brought the Woz-inspired flexibility of the Apple II to the Mac for the first time.

Perhaps the most beloved of these machines is the Macintosh IIfx, the most powerful Mac at the time of its release in 1990. It had a 40 MHz 68030, six **NuBus slots** and supported up to 128 MB of RAM. Fully loaded, it cost \$12,000.

Enter Spindler

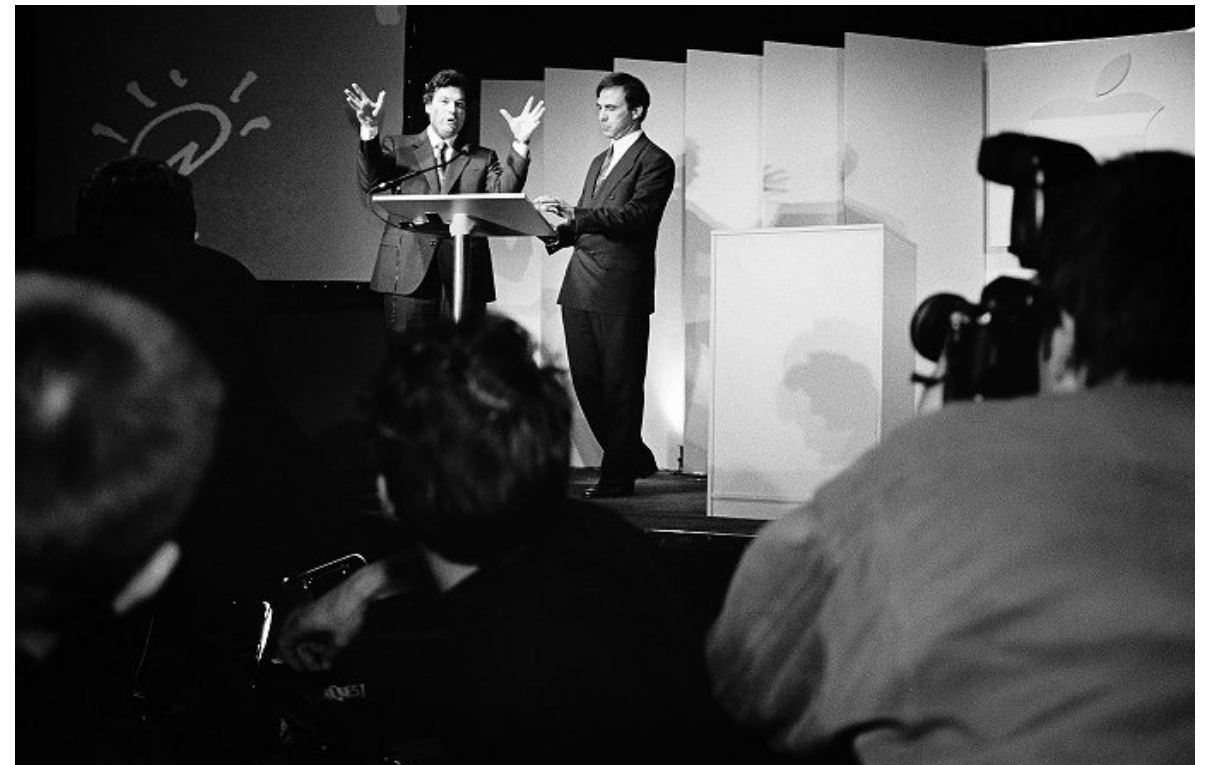
Michael Spindler was promoted to CEO after Sculley was ousted by the board for a laundry list of reasons in 1993.

The end of Sculley's time as CEO is highlighted by his coining of the term “personal digital assistant” in reference to the Newton.

In many ways, the Newton was Ground Zero for a political fight within Apple. Part of the company thought it should focus on the Macintosh line only, while others — Sculley included — thought Apple should move past the personal computer and offer a growing range of other consumer electronics. This rift only grew wider after the initial Newton MessagePad stumbled in the marketplace.

While Apple was fragmenting, Sculley was on the road campaigning for Bill Clinton. Rumor had it that Sculley would be tapped for Secretary of Labor, and when that didn't pan out, Sculley entertained talks to become CEO of IBM. He had checked out of Apple.

All of this considered, coupled with bad Q1 1993 results, meant the time had come. Sculley stepped down as CEO. He would remain Chairman until October, when another disastrous set of



Michael Spindler (left). Image Credit: **Stanford**

quarterly results — and a parachute of \$10 million dollars — sent him on his way from Apple for good.

Spindler had been President and COO through this time, and was no stranger to the growing struggle inside Apple and on Wall Street. Sculley had instructed Spindler as early as 1990 to work on finding a buyer for Apple. As Apple's value fell in Sculley's later years, Spindler was unable to close a deal, despite talking with Kodak, Sony, Compaq and IBM at various points. In 1990, he left Sun Microsystems at the negotiating table when he learned the deal would lead to his own demotion.

Out of the gate, Spindler oversaw a large layoff and a reorganization based on markets served. Business, education and

consumer products were all powered by a central operating system development team, but marketing and product development were split apart, as they had been before Sculley.

Bonuses and perks were cut to save costs, and morale continued to sink. The outlandish R&D budget was trimmed, and more people were let go.

While this was horrific for morale, it did slow the bleeding. Apple's stock price doubled.

Fulfilling a deal cut by Sculley, Spindler oversaw the Taligent project and the launch of PowerPC Macs. As the OS project was failing, he entered talks to sell Apple to IBM. After he countered IBM's initial offer with a number that was too high, Big Blue walked away from the table.

Spindler's executive team misjudged product demand for the 1994 holiday season, and left resellers without enough high-end Power Macs on their shelves. At the same time, the company slashed prices on their cheaper models, leading to a \$80 million product write-off.

By mid-1995, Apple was still struggling to meet demand for some of their products, while others struggled to sell.

As the company lurched from one production problem to another, Microsoft launched Windows 95. The world's eyes were on the Redmond company and its new operating system just as reports

broke that two **PowerBook 5300s** had caught fire. It was yet another hardware and production problem on Spindler's watch. By January 1996, shareholders were demanding a change. While Sun Microsystems had made an offer to buy Apple — after the reverse had been true just a few years earlier — Spindler continued to misjudge the Macintosh's market potential.

At the end of the month, Spindler was fired by the Board.

Gil Amelio

Amelio was the CEO of National Semiconductor. He came in as a “turnaround guy,” positioned to save Apple from the death spiral it had entered with Spindler at the helm. Amelio was on the board when they turned down the Sun offer, and was one of the only board members who seemed to understand the problems that were plaguing Apple.



Gil Amelio. Image Credit: Apple

Amelio would be CEO for only 500 days, but in that time he made several moves to help save the company.

Amelio's time was plagued by troublesome products and internal politics. He set out to fix both.

He issued statements concerning the product line. Cheap, low-margin Macs would be replaced with ones Apple could actually make money selling.

Amelio then hired Fred Anderson as the new CFO. Anderson was a good hire, and served under Steve Jobs until 2006. His primary objective in the early days was to stabilize Apple's financials. Bonds were sold and capital was infused into the company to help keep the lights on.

Amelio also brought Ellen Hancock from National Semiconductor as Apple's new CTO. The Copland project, that had been started under Spindler's administration, was already behind. Hancock suggested breaking the ever-growing OS project up into chunks, releasing components of it across multiple System updates.

After it became clear that wasn't a possibility, she and Amelio cancelled the ill-fated Copland project altogether and began shopping for a third-party operating system to replace Mac OS.

After Copland was cancelled in August 1996, Apple began to shop for technology it could use as the base of its next-generation operating system. It was clear that Apple could not

produce anything of the necessary caliber internally, and the clock was ticking. Amelio had promised the Mac community that Apple would unveil its newest OS strategy in January 1999.

As a side note, Hancock is probably one of the best executives Apple had at the time. She did more than almost anyone to save Apple from extinction.

As she greatly preferred Sun Microsystems's Solaris over NeXT's NeXTSTEP, she didn't last long after Jobs returned, but that shouldn't discount the value of her early work to see the truth behind the promises of Copland.

The group looked at Windows NT, and even entered conversations with Bill Gates. There was a variant of NT that would run on PowerPC chips, but there was a big political problem. Apple creating its next-generation OS from Microsoft technology would have been a very bitter pill to swallow for the Macintosh faithful who were still upset that Gates and company had ripped off the Macintosh's GUI.

The group also looked at Solaris. Like NT, it would require Apple to write a new GUI on top of the core OS, but Sun was much smaller than Microsoft, so the required work on its end would take longer than Apple would consider.

Another option was BeOS, written by Be Inc, a computer company run by no other than Jean-Louis Gassée, who had left Apple in the Sculley days.

The company had shipped a computer named the BeBox, an expensive but powerful machine. It featured dual PowerPC processors that were more powerful than anything Apple was shipping at the time. Apple wouldn't need to rewrite BeOS to run on PowerPC-based Macs.

BeOS itself was fast, and far more modern than Mac OS was at the time. It featured pervasive multithreading, preemptive

multitasking and included a 64-bit journaling file system. It was all a step up from Mac OS, but lacked in other areas, like robust printer support, file sharing and localization for use in languages besides English.

Be's \$300 million price tag was thought to be too high by Apple leadership at the time, and they began to look elsewhere.

Word of the failed deal had leaked, and — without Steve Jobs' knowledge — a NeXT marketing manager scheduled a call with Hancock. Initial talks went well, and Jobs was pleased when he found out.

Things began to move forward in late 1996 when a report came out that Gil Amelio had been charging Apple for fuel and maintenance costs associated with the use of a jet that Amelio owned (and flew himself) on official business. Costs were around \$100,000 a year. Amelio hadn't done anything illegal, but it was a fatal blow to his reputation in and outside of the company.

On December 10, 1996 both Gassée and Jobs were invited to Apple to make their final pitch. NeXT was the favored prospect, and Gassée showed up without a presentation, which upset Apple leadership. The next day, Amelio proposed the NeXT acquisition.

The deal was worth \$400 million. Jobs' big investors in NeXT got cash, but Amelio demanded Jobs take Apple shares as payment as a sign of confidence in the new Apple. In the end, Jobs made



BeOS. Image Credit: [Toasty Tech](#)

\$120 million in cash and held 1.5 million shares of Apple. He refused to be named Head of Engineering, instead opting to be a special advisor to the Chairman of the Board.

During this time, Jobs advised Amelio on numerous items, including product cancellations. Famously, instead of cancelling the Newton, Apple briefly spun it off as its own company.

At Macworld San Francisco 1997, Apple began to lay out its operating system strategy in what would be Amelio's swan song. His keynote was a mess of poorly-shared plans, a far cry from the initial confidence he shared when hired as CEO. When he finally got around to announcing Steve Jobs, Jobs looked like a literal savior to the journalists and developers in the room.

After a disastrous quarterly report to close out 1996, Amelio and his team led another round of layoffs. While the dust was settling, Jobs sold the Apple stock he acquired in the NeXT deal.

This was a very public display that Jobs had no confidence in Apple's leadership, but his plan to remove Amelio went further than Wall Street.

Jobs had been working within Apple to get rid of Amelio. He even asked his friend Larry Ellison (the CEO of Oracle) to initiate a hostile takeover.

This made the spring of 1997 difficult for Amelio. He was fired in July. The Board's statement said it was because Mac sales had

not rebounded as Amelio promised they would, but he insisted it would take time and that once the company was healthy, the Mac would turn the corner as well.

The Board wouldn't have it, as Apple had suffered over \$1.5 billion in losses under Amelio's reign. It's unfair to blame him for all of it, however.

When he was hired as CEO, Apple was in terrible shape. The Macintosh line was confusing and uninspired. The OS was behind, and all attempts to replace it were failing.

Despite that, Amelio had set things in place for Apple to recover. Product quality was improving, the Macintosh family was simplified (to a degree) and he had led the charge to purchase NeXT to build a next-generation OS. Of all Apple CEOs, Amelio isn't the worst.

It wasn't enough, and Jobs had painted himself the savior of the company, albeit quietly. CFO Fred Anderson would run the company until a suitable replacement could be found.

In September 1997, Steve Jobs was named interim CEO. In 2000, he would make the title permanent **to thunderous applause**.

A Macintosh Mess

The Boardroom drama at Apple was a rollercoaster for employees, but the company's products were suffering as well during the 90s.

After the Macintosh II line, things got complicated in a hurry. The Mac lineup was fragmented into several families of machines.



Macintosh LC. Image Credit: Apple

LC

Introduced in October 1990, the Macintosh LC was Apple's consumer line of computers.

The LC — which stood for Low Cost — started life as an affordable, modular, color-capable Mac. To keep costs down, **Apple cut some pretty serious corners** in its design of the computer.

The original LC was designed to help prop up sagging Mac sales. Apple would follow with the LC II and then a whole line of LC machines in slim “pizza box” desktop cases. Eventually, the line would branch out: the Macintosh **LC 500 series** shipped as an all-in-one.

The LC line slowly faded from shelves. By 1996, they were mostly gone after being shifted to the education-only market.

Centris

In 1993, the Centris line was introduced as the mid-range Mac family. More expensive — but more powerful — than the LC, the Centris was designed to be a prosumer machine.

Shipped in a horizontal desktop case that looked like a beefed-up LC, the Centris used a 20 MHz 68LC040 CPU.

The Centris line didn't last very long. Only three Macs wore the Centris badge: the 610, 650 and 660AV. This family of computer didn't see the end of 1993, being abandoned before 1994 rolled around.

Quadra



Quadra 950. Image Credit: Apple

The Macintosh Quadra line was introduced in 1991 as Apple's machine for professionals with high-end needs. Powered by

Motorola 68040s, Quadras came in both desktop and tower configurations.

Several models wore the "AV" badge in their name. Quadra AVs included video input and output capabilities (via S-Video and composite video ports) as well as more robust audio support and a revised startup chime. These machines were the first to ship standard with CD-ROM drives and served as the Mac of choice for power users until 1994.

Power Macintosh

In March of 1994, Apple shipped the Power Macintosh 6100/7100/8100 family, the first Macs to use the new PowerPC CPU from Motorola. Replacing outgoing Quadras, the 6100 shipped in a pizza box case, the 7100 in a desktop case and the 8100 in a traditional tower layout.

Over the years, Apple iterated on these form factors, adding power and features as the line matured.

Workgroup Servers

If you skim lists of old Macs, the name "Workgroup Server" pops up several times. The name was given to select models that came with additional server software and — usually — larger hard drives.

Most Workgroup Servers were re-badged Power Macintosh models, but two Quadras and even a Centris were enlisted in 1993.

In addition to the LC, Centris, Quadra, Power Macintosh and Workgroup Server (not to mention the **Network Server**), Apple had a seventh line of Macs for sale in the early and mid-1990s.

The Performa

The Performa line is the epitome of everything wrong with Apple in the 90s. After the Macintosh IIs went away, it wasn't hard to see what Apple was doing with the LC, Centris and Quadra groupings: by separating the low-end and professional models (with Centris briefly in the middle), Apple could direct consumers and professionals to their respective product lines.

The Performa brand blurred those lines, plunging the Mac lineup into madness. It poached from the other product lines to have a family of computers to sell directly to consumers via department stores and big-box stores.

While professional users would order Macs through Apple's network of resellers, Apple believed that consumers were more comfortable in stores they already knew, like Sears.

On the hardware side of things, Performas were often bundled with keyboards, mice and displays to make the systems more consumer-friendly. On some models, hardware features were removed to bring prices down.

For example, the initial line up consisted of these machines:

- Performa 200 (Based on the Macintosh Classic II)

- Performa 400 (Based on the Mac LC II)
- Performa 600 (Based on the Mac IIvx)

This really confused the product line. The best examples of this are the Performa 475 and 476. They are identical machines except for hard drive size and bundled third-party software. Today they would share a common model number, but Apple sold them as competing SKUs, side by side.

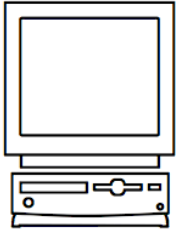
While the other lines would come without bundled software, the Performas came with many applications such as ClarisWorks, Mavis Beacon and even America Online. The system software on these computers would be labeled with a *P* in the version number, but this practice would end with System 7.5P.

Apple produced Performas of all shapes and sizes. This diversity led to further confusion, as some retailers would only carry a subset of what Apple had to offer as to differentiate from their competitors.

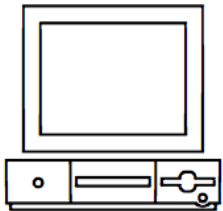
The Performa plan didn't go well. Mass-market retailers were ill-equipped to sell computers. After Windows 95 shipped, things got worse as retail employees would often wave off would-be Mac buyers from purchasing a machine "incompatible" with the rest of the world. The expense of building and shipping these machines just didn't pay off for Apple.

Macs for Sale in 1997

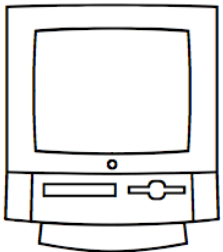
Desktops:



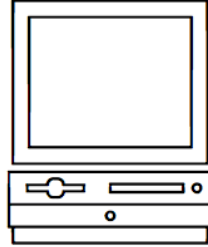
- Performa 6360
- Power Macintosh 6200



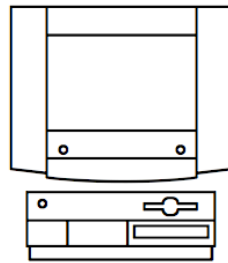
- Power Macintosh 6100
- Workgroup Server 6150



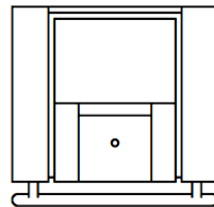
- Performa 5200, 5270, 5280, 5400
- Power Macintosh 5260, 5400, 5420, 5430, 5440, 5500



- Power Macintosh 4400



- Power Macintosh 7215, 7300, 7500, 7600
- Workgroup Server 7350
- Power Macintosh G3 (Desktop)



- 20th Anniversary Mac

Notebooks:



- PowerBook Duo 2300c

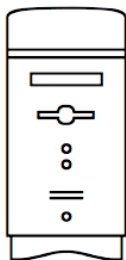


- PowerBook 1400cs, 1400c, 2400c, 3400c

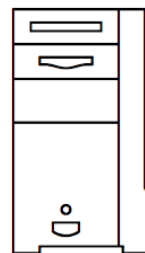


- PowerBook G3

Towers:



- Performa 6400, 6410, 6420
- Power Macintosh 6400, 6500



- Power Macintosh 8200, 8500, 8600, 9500, 9600
- Workgroup Server 8550, 9650
- Power Macintosh G3 (Minitower)



- Network Server 500, 700

The company would end up having to write down a huge amount of Mac inventory, most of it sold to resellers who were unable to move the products off store shelves.

The Clones

There's no doubt the Macintosh family of products was a confusing mess in the 1990s. Things were made even worse when one considered non-Apple hardware that could run the System 7.

That's right. **The clones.**

The idea behind the clone program was simple. Apple would make the Macintosh more than a line of products, but evolve it into a platform.

Bill Gates had floated the idea as early as 1985. In a letter to Apple that summer, he argued that by Apple allowing other companies to build “Macintosh” computers, consumers would have more choices in hardware. That, in turn, would increase the value of Apple's operating system and allow third-party developers to sell software into a wider, bigger ecosystem.

The idea didn't move forward in the 80s, thanks to input from Jean-Louis Gassée. However, by the time Michael Spindler took over the company, the call for licensing the Mac's operating system had become louder than ever. Claris, Apple's software spin-off, even had working hardware prototypes, but it took IBM showing off its PowerPC reference designs to tip the scales. This

hardware was shown to be running OS/2, Windows and the UNIX-based AIX. Mac OS support was nowhere in sight, and Spindler felt slighted.

At January 1994's shareholder meeting, Spindler announced that Apple was looking to license its operating system. He believed this strategy would allow Apple to better combat Windows in the marketplace. By the fall, Apple announced it would sign contracts with up to six companies and would not limit them in terms of the hardware they would be able to ship running Apple's operating system.

Companies weren't lined up at Spindler's door to sign up. It took a year before a startup named Power Computing — which employed former Apple engineers and was located down the street from PC-builder Dell — entered a license agreement. Around the same time, display maker Radius signed up. They would market their machines as “SuperMacs.”

There was also Daystar Digital, which specialized in high-end Macs built for design professionals. They shipped the first multiprocessor Mac, and Apple ultimately licensed Daystar's API for multiple processors and rolled it into System 7.

Power Computing is perhaps the most interesting of the clone makers. Steve Kahng was an executive in Daewoo's PC division in the 1980s and wanted to jump back in the business. He partnered with Elsireno Piol, an executive at the Italian computer

company Olivetti. Together, they put \$9 million into their company, with the goal to build killer PowerPC machines.

In December 1994, Spindler signed Power Computing's contract. The next May, the first clone shipped to rave reviews. Their first



year in business, Power Computing shipped 50,000 machines, mostly to customers who chose their machines over Apple's.

In July 1996, Power Computing shipped the first PowerPC 604e machines. Clocked at 225 MHz, Apple couldn't best this speed until the following year. In fact, Power Computing's machines consistently out-performed Apple's Macs.

Outside of Power Computing, the program continued to expand. Motorola won the right to sublicense the OS and motherboard designs. In 1996, scanner company UMAX bought out Radius and started marketing their clones with a newfound energy, increasing pressure on Apple in the high-end market. Between UMAX and Power Computing, Apple was losing Macintosh customers to their partners at an alarming rate.

Like today, Apple made its money on its hardware. The company made a flat \$50 fee for most clones that were sold. That \$50 was a far cry from the profit made with each Mac sale.

Instead of expanding System 7's install base and benefitting from it, Apple had shot itself in the foot. The overall Mac market was shrinking by the time 1997 rolled around. The failure of Copland and pressure from clone makers was just too much.

In short, the clone program wasn't working. Apple was in trouble. The company signaled that it was going to charge more per license, and started charging \$150-\$350 per license by June 1997, depending on the speed of machine the clone maker was

applying it to. That was on top of a new \$5,000 fee to certify any new system design with Apple before it could be put on sale.

While these changes were designed to raise capital for Apple — and put pressure on clone makers — it was just a stopgap.

In a filing with the SEC that year, Steve Jobs spilled the beans on his actual plans:

The benefits to the company from licensing the Mac OS to third parties may be more than offset by the disadvantages of competing with them. The company is currently in discussions concerning the nature of such licensing arrangements going forward, including whether or not to extend such arrangements.

Apple would end up terminating the clone agreements in the fall of 1997. The license contracts allowed clone makers access to System 7.5 and its successors. This included Mac OS 7.6 and the planned Mac OS 7.7.

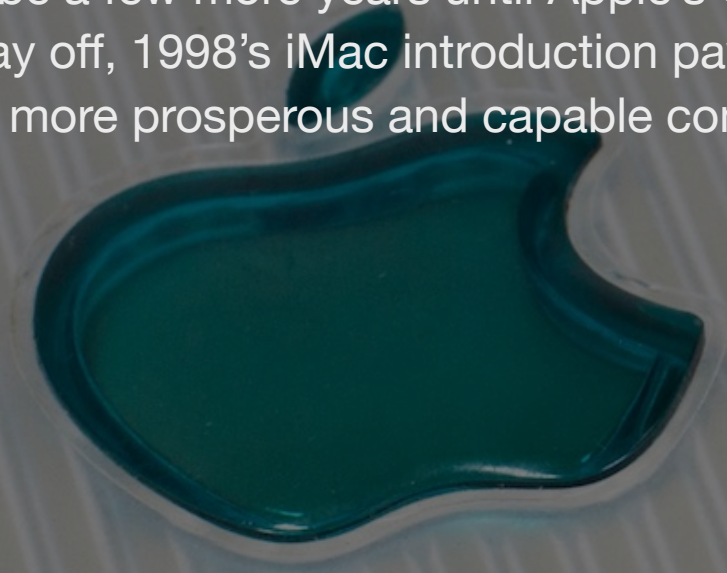
After Apple branded this release Mac OS 8, several companies were out of luck. IBM and Motorola wrapped up their clone programs, and UMAX was restricted to selling in Asia only, but its clone program died out quickly as well.

Power Computing was a different story. Not only was it shipping fast, popular clones, but it had the rights to use Mac OS 8.

Apple ended up buying Power Computing for \$100 million and shutting them down before they could ship the notebook and G3-powered systems they had in development. Starting January 1, 1998, Power Computing customers had to contact Apple for support and service.

The iMac Introduction

The iMac was born in troubled times. The company was still reeling from a decade of failed operating system strategies and a troubled product line. While it would be a few more years until Apple's OS work would pay off, 1998's iMac introduction paved the way to a more prosperous and capable company.



Hello (again)

APPLE IN 1998

Steve Jobs had come back as part of the NeXT acquisition. Shortly after his arrival, he started killing many Apple's product lines to simplify the Macintosh family.

Behind the scenes, Apple was now basically taken over by NeXT leadership and was hard at work on the company's next-generation operating system.

The finished product would still be several years away, and Apple needed something to excite its customer base and generate revenue. With its back to the wall, the company was working on a new desktop computer that would eventually be called iMac.

In May of 1998, Steve Jobs took to the stage to announce the new computer.

Apple was back.

The announcement of the iMac mirrors **the original Macintosh introduction** in several ways. Both times, Steve Jobs was unveiling a consumer machine for the masses with a friendly, all-in-one design. Both introductions took place in the Flint Center, and each greeted the audience with a cheerful “Hello” on the screen.



Image Credit: Apple

Jobs outlined the vision behind the computer in simple terms:

The excitement of the Internet. The simplicity of Macintosh.

The iMac was more than a mere computer; it was designed to be a vessel with which users could travel to the 21st century. The “i” in the name stood for several things:

- Internet
- Individual
- Instruct
- Inform
- Inspire

Jobs described the machine as better than PCs in terms of speed, design, I/O and display size. The 233 MHz G3 was coupled with a 15-inch, 1024×768 CRT display. It shipped with a modem, Ethernet port and an IR port, but the real I/O story came in the form of USB and the lack of a floppy drive.

Getting data in and out of an iMac seemed like a royal pain. Gone were the legacy Apple ports like ADB, and the only disc that the computer could read was a CD.

The lack of a floppy drive wasn’t mentioned in the keynote, but soon became a point of contention among analysts and even users, as was the dropping of legacy ports in favor of USB.

Here’s Andrew Gore and Anita Epler for **Macworld in May 1998**:

Considering all these amenities, the most shocking part of the iMac isn’t what it offers, but what it lacks. The iMac has no floppy drive, which might be forgivable if there were a Zip drive or other removable-media option, but there isn’t.

And most dramatically, this new consumer offering has no SCSI ports, no standard serial ports, and no ADB ports. Apple has opted to replace these familiar connections with USB, a high-speed serial architecture that has suffered from slow adoption on the Wintel platform despite its technical advantages. Currently, no USB devices exist for the Mac.

ABOUT THIS MAC

August 1998 - January 1999

Processor Speed: 233 MHz

System Bus: 66 MHz

Cache: 64 KB L1, 512 KB backside (1:2) L2

Max RAM: 256 MB

Storage: 4 GB

Media: Tray-loading CD-ROM

Original OS: Mac OS 8.1

Maximum OS: Mac OS X Panther 10.3.9

Note: There are actually two “original” iMacs. Revision A had a lower RAM ceiling and less VRAM than “Revision B” that shipped in October 1998. The above specs are for Rev. B machines.

While it's easy to smirk at this reporting now, it's an important point. There were virtually no USB devices when the iMac was announced, and very few when it shipped a few months later.

On episode 91 of Upgrade, Jason Snell and I spoke at length about the original iMac and the response to the radical move away from legacy I/O and to USB. Here is Jason, who was at Macworld at the time:

Those things we used to connect devices to the Mac were replaced by USB. That was it. We had never seen it before. The funny thing is that the devices didn't exist.

Fortunately, we did have those four months or whatever where Apple announced this. Basically, Apple was saying, "People are going to want this computer. You should build USB devices for it." Everybody was scrambling. There were a lot of companies that were working on USB peripherals for the PC market because it was starting to happen, but this was the importance for people to use USB. USB was a standard, really owed its existence to [the iMac.] Maybe it would have happened anyway, but the iMac made it happen.

The iMac made USB a thing.

The race to get devices out the door by the time the iMac actually went on sale led to a lot of blue-colored peripherals entering the market, as Jason went on to explain in that episode:

We were trying to do a feature about USB stuff. We literally in the next issue of Macworld had a table named "Here are products that people say they are going to make that are USB."

It is not that big of a list. I remember it as this huge table. It is like 25 products. Literally, here is every USB product that anybody has announced.

We had a couple of them. Two or three of them that we got were in non-working condition. We didn't have any USB devices to plug it into anyway. iMac had not shipped yet ... iOmega sent us a Zip drive where instead of it being the opaque blue enclosure, it was a translucent blue plastic enclosure around the Zip drive.

They said, "See? It's for the iMac."

With time, Apple's customer base moved on from serial, SCSI and ADB accessories, and USB began to take off.

In many ways, the design of the computer was more important than the technology it brought with it.

It was how the thing looked and how it made people feel.

The Design

Simplicity was a big point in Jobs' pitch of the original iMac. All-in-one designs, he said, were far superior and easier to set up than traditional desktops.

Apple still sold them, but they were geared for pro users, while the iMac was made for the masses.

Here's the Power Mac G3 that was for sale at the time:

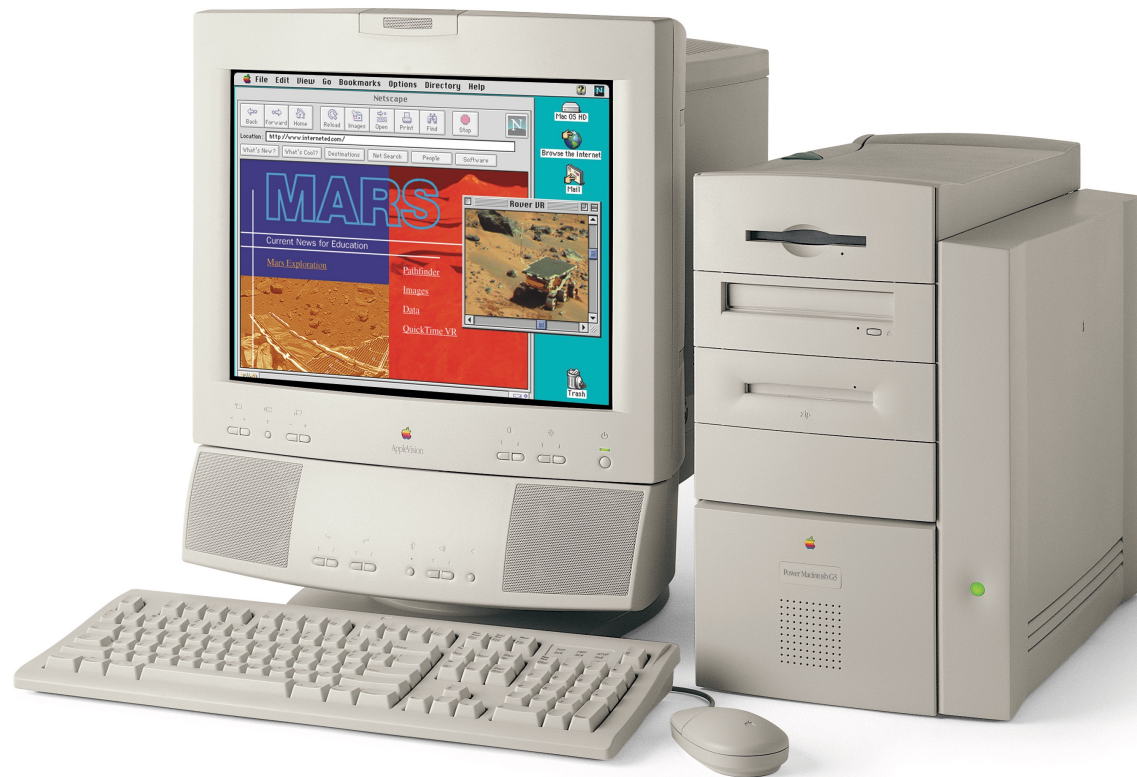


Image Credit: Apple

With its Bondi blue plastic and sweeping curves, the iMac looked like nothing else on the market.

(Except maybe the defunct eMate, but that's a story for a different time.)

On stage, Jobs couldn't help but gush over the computer. "It's from a different planet," he exclaimed with a laugh. "A planet with better designers."

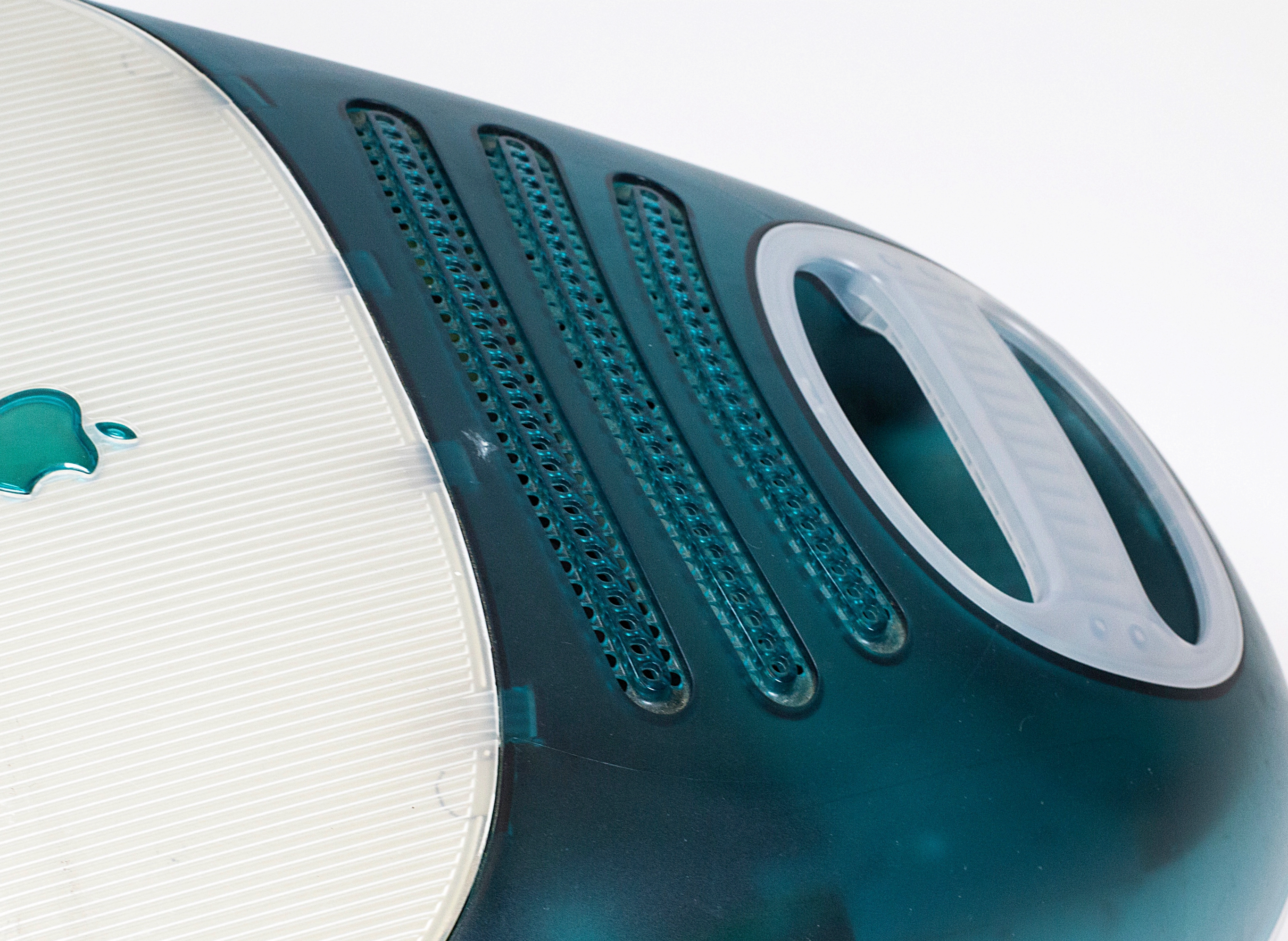
The front of the machine was dominated by a CRT, sitting above a tray-loading CD drive and a set of speakers. The ports were all stashed away behind a small door on the side that allowed for clever cable management.

Just like the original Macintosh, there was a handle to make it easier to move and reposition on a desk.

The whole thing was approachable and friendly in a way that computers — even the Mac — had lost.

I mean, just look at the thing...







Behind the Scenes

James Thomson is the developer at **TLA Systems**, home of the venerable **PCalc for Mac** and **iOS**, as well as **Dragthing**.

In the 1990s, James worked at Apple. You can hear all about it on **Episode 77 of the Debug podcast**. He was kind enough to share some of his experience working at Apple during the time of the iMac G3.



When he announced the machine on May 6th, 1998, Steve Jobs was just 43 years old, exactly the same age I am now, which is a terrifying thought in itself.

I was quite surprised to find out that I was working on the iMac. I think most of the people in the room were.

Back then, I was a young fresh-faced Apple engineer, standing at the back of the Flint Center watching the introduction. About halfway through, our team turned to each other, and said "Do you think this is our project?" When Steve got to the part when

he said it was shipping in 90 days, we were positively incredulous.

Let's rewind slightly. I was working for Apple in Cork, Ireland. I'd moved over from Scotland in late 1996, a few years after I finished university, to take a development job in the small R&D group there. It was based out of what was primarily a manufacturing and assembly plant.

As I arrived, the next-generation OS project, Copland, had just been cancelled. People were still working on it then, out of sheer disbelief — I was on the Installer team myself for about a week.

After NeXT arrived and staged a mostly-bloodless coup, I wanted to work on the new OS, and requested something — anything — to do on it.

I was primarily a UI guy. I liked creating user interfaces more than I liked writing what was underneath them.

The project I was given however had literally no user interface at all. Mac OS X back then was known as "Rhapsody," and was really aimed at servers. I was writing an authentication

component for the **At Ease** product, a simplified Macintosh environment, mostly used for kids in classrooms.

There was an existing traditional Mac OS server component codenamed "Fred" that kept track of users logging in, checking their passwords, and so on for At Ease clients.

My job was to write the Rhapsody equivalent dubbed "RhapFred." There was a Flintstones theme to the naming — I also made a test tool for my server called "Bam Bam."

Some time into the project, we began to hear murmurings of a new hardware project called Columbus, and three machines called Niña, Pinta, and Santa Maria. They were going to be diskless workstations; they would boot off the network from a server. I figured RhapFred might be involved somehow to log users in across the network.

As one might imagine, under the new management, projects were very compartmentalized. Everything was on a need-to-know basis. I was also many thousands of miles away, so I knew even less about what was going on.

On one of my extended stays over in Cupertino, however, I got to see one of these Columbus machines in person. It was in a **Power Macintosh 7500 case** with holes crudely cut in the top. Ports were sticking out through the holes, making it look like some kind of beige hot rod. On the next trip, we were told to go to the Flint Center for an announcement. One of the people on my team

asked me if I wanted to go see something the day before — I think he had a friend on the industrial design team. I declined. Who cares about another beige box?

My software was nowhere near ready. I was a UI guy writing networking code. It would take me six months to finish this, at least. Steve stood up and said the iMac would ship in 90 days.

There's no way this was Columbus, right? It was, but as things turned out, the iMac was *not* fated to be a diskless workstation. (Even though Mac OS X Server 1.0 would eventually enable diskless clients.)

As the OS X transition moved forward, I was moved off onto another project that was all UI — this thing called "The Dock." I have no idea to this day if my code actually shipped as part of Mac OS X Server, but briefly, very briefly, I was on the iMac team.

A close-up photograph of a colorful, perforated iMac G4 case. The case is made of a material with a grid of small circular holes, giving it a mesh-like appearance. The color is a vibrant orange or red. The lighting is warm, highlighting the texture and the circular patterns. The background is dark, making the bright color of the case stand out.

Chapter 3

iMac Evolution

Not content to stand still, Apple released new iMacs every nine months or so from 1998 until 2001.

Many were quite colorful.

Five Flavors

ABOUT THIS MAC

January - October 1999

Processor Speed: 266 or 333 MHz

System Bus: 66 MHz

Cache: 64 KB L1, 512 KB backside (1:2) L2

Max RAM: 256 MB

Storage: 4 or 6 GB hard drive

Media: Tray-loading CD-ROM

Original OS: Mac OS 8.5.1

Maximum OS: Mac OS X Panther 10.3.9

Note: Like the Bondi machine before it, this generation of iMac is made up of two machines. “Revision C” machines launched in January 1999 with a 266 MHz G3. “Revision D” iMacs are virtually identical, except for a faster 333 MHz CPU.

In January 1999, Steve Jobs **took the stage** to announce the first big revision to the iMac.

On the technical side of things, these iMacs weren't drastically different from the Bondi before them. The processor was bumped to 266 MHz, but the rest of the specs matched the previous system.

The real story was about the colors. Gone was Bondi, replaced with five new colors.

Here's a quote from Jobs' keynote address:

In our consumer surveys, [color] is far more important than most of the mumbo-jumbo associated with buying a consumer computer. Megabytes, megahertz, gigabytes — people don't care about that stuff. They want to trust us to give them a really great computer ... They want to express themselves and pick the color [they] want.

This marks Apple's first efforts to offer a wide range of options to its customers in terms of how a product looked. This strategy would play out for years to come in products like the iPod mini, iPod nano and even iPhone and now the MacBook.

Jobs understood that people want their purchases to say something about them. It's a huge reason the company's brand equity is what it is. Carrying a gold iPhone today or a blue iPod nano back in 2006 made a statement to others.

Lime

Grape

Blueberry

Strawberry

Tangerine



(Don't tell the others, but
Tangerine is my favorite
of these machines.)

Slot Loading

ABOUT THIS MAC

October 1999 - July 2000

Processor Speed: 350 or 500 MHz

System Bus: 100 MHz

Cache: 64 KB L1, 512 KB backside (2:5) L2

Max RAM: 512 MB

Storage: 6, 10 or 13 GB hard drive

Media: Slot-loading CD-ROM or DVD-ROM

Original OS: Mac OS 8.6

Maximum OS: Mac OS X Panther 10.3.9 or Mac OS X Tiger 10.4.11 (400 MHz only)

Note: The 400 MHz iMac G3 was the first to ship with FireWire ports and a VGA port for video out.

In October 1999, nine months after the Five Flavors machines shipped, **Apple revved the iMac family again.**

These new iMacs all had three main new features: a slot-loading optical drive, Airport capability and a tweaked case that allowed for fanless operation.

Jobs opened the iMac pitch with the optical drive. Gone was the tray-loading drive, replaced with a slot-loading drive. This may seem odd now, but according to Walter Isaacson's official biography, **it was important to Jobs:**

*Jobs had not seen the final product before, and when he looked at it onstage he saw a button in the front, under the display. He pushed it and the CD tray opened. "What the f*** is this?!?" he asked, though not as politely.*

[...]

"Steve, this is exactly the drive I showed you when we talked about the components," Rubinstein explained. "No, there was never a tray, just a slot," Jobs insisted. Rubinstein didn't back down. Jobs' fury didn't abate.

"I almost started crying, because it was too late to do anything about it," Jobs later recalled.

Beyond the optical drive, the October 1999 iMacs all shipped with slots for an optional \$99 Airport card, bringing wireless networking to the iMac for the first time. (Tray-loading iMac users were stuck with modems and Ethernet cables.)

Next, Jobs highlighted the fact that this model of iMac shipped without a fan. The updated iMac came in a slightly redesigned case that included a much larger area for ventilation around the

handle, as you can see on the tray-loading Grape (left) and slot-loading Indigo (right) iMacs pictured below.

Compared to the tray-loading models, these computers were quieter and more power efficient.

October 1999 marked the first time Apple sold multiple levels of iMacs. Unlike the Five Flavors, which were all the same computer with differing colors, the Slot Load iMac brought a big departure in strategy.



OCTOBER 1999

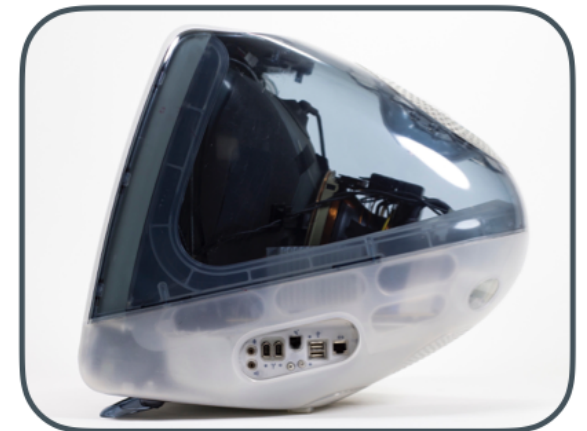


Slot Loading



DV

DV Special Edition



The 1998 **iMac** — available only in Blueberry — sold for just \$999, the first Mac to ever ship with a sub-\$1,000 price point since a handful of Macintosh LCs from the 1990s. It came with a 350 MHz G3 and a 6 GB hard drive.

The second machine in this new “Good, Better, Best” arrangement was the **iMac DV**. It came in slightly revised Five Flavors colors, and a whole lot more for \$1,299:

- A faster 400 MHz G3
- A larger 10 GB hard drive
- VGA video out for mirroring
- A DVD-ROM drive
- iMovie
- Two FireWire 400 ports

The VGA port was stashed behind a removable panel on the back of the iMac. You could replace it with a second panel that included an opening that exposed the port. Fiddly, but I guess Apple didn’t want to show that ugly port off to the world.

Bringing FireWire to the iMac was a big deal. While this was before **the Digital Hub strategy** had a name, it gave regular consumers access to digital camcorders.

This computer marked the introduction of iMovie. Built on the back of QuickTime, it allowed users to import and edit videos right on the desktop. DVD burning was still a little ways off, but

ABOUT FIREWIRE

FireWire was developed by Apple starting in 1986 as a high-speed serial bus to replace the clunky and problem-prone SCSI interface found on Macs of the time.

With help from Sony and other companies, FireWire entered the market in the mid-1990s. Commonly used for transferring digital video and other large files, FireWire was a major part of Apple’s computer lineup and feature set for many years, eventually giving way to Thunderbolt.

these movies could be exported to a QuickTime file, back to the camcorder (and out to a VHS recorder) or published online.

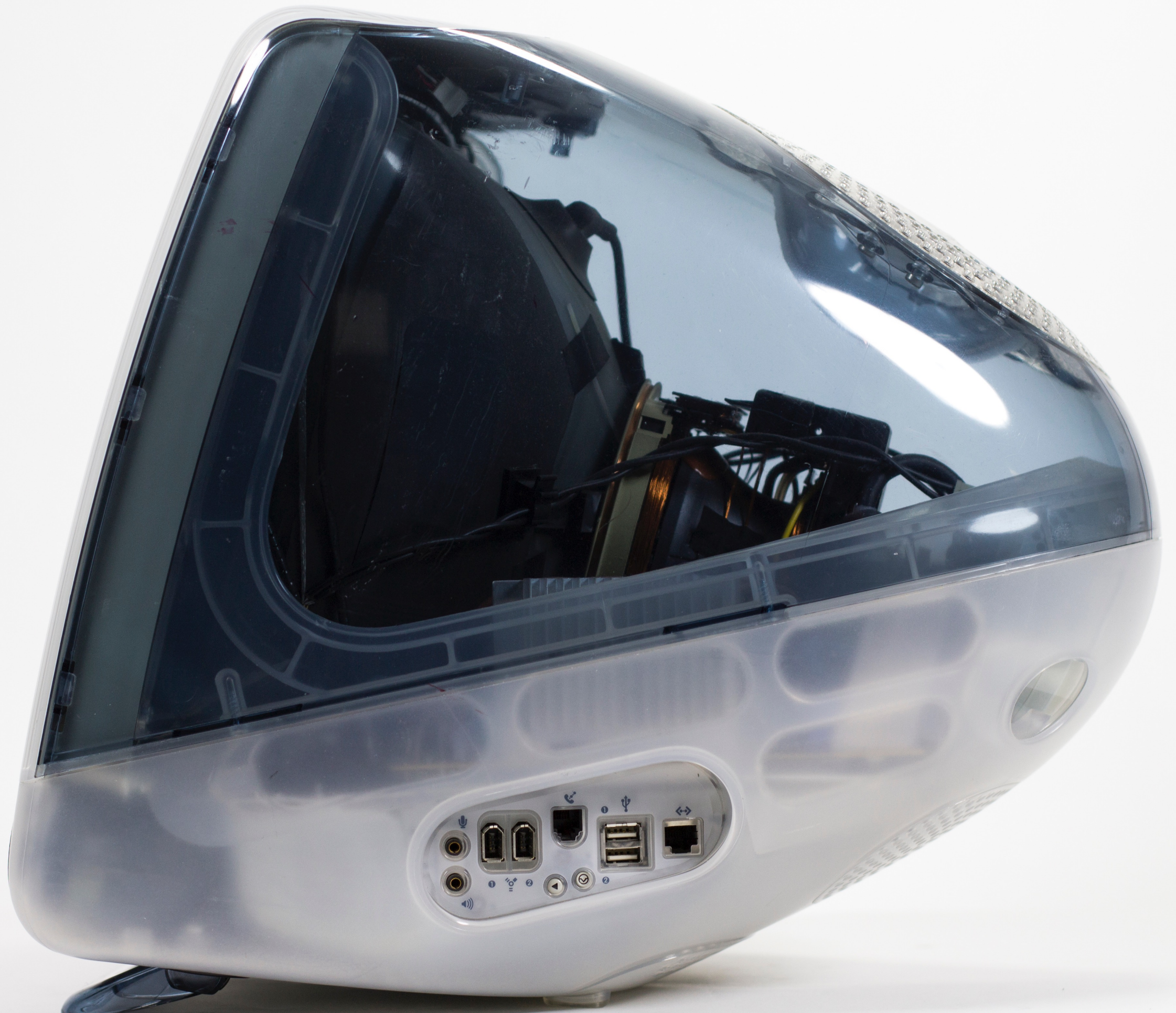
“Desktop video,” Jobs said, “will be as big as desktop publishing.”

In his demo of iMovie, Jobs imported footage over Firewire to a Grape iMac DV. Once imported, he stitched a short video together with some transitions with just a few clicks.

There was one more thing, however: the **iMac DV Special Edition**.

This machine was an upgraded iMac DV with 128 MB of RAM and a 13 GB hard drive that sold for \$1,499. It came in a new stunning color named Graphite.





Summer 2000

ABOUT THIS MAC

July 2000 - February 2001
Processor Speed: 350, 400, 450, or 500 MHz
System Bus: 100 MHz
Cache: 64 KB L1, 512 KB backside (2:5) L2
Max RAM: 512 MB
Storage: 7, 10, 20 or 30 GB
Media: Slot-loading CD-ROM or DVD-ROM
Original OS: Mac OS 9.0.4
Maximum OS: Mac OS X Panther 10.3.9 or Mac OS X Tiger 10.4.11 (400 MHz and faster)
Note: Another generation with multiple models, this group of iMacs is perhaps the most confusing. The entry model was a re-badged Slot Loading iMac in a new color, while the other models were separated by minor spec differences.

On July 19, 2000, Steve Jobs took the stage at Macworld New York. In this keynote, he unveiled updated PowerMac G4s, the G4 Cube and updated iMacs.

This marked the iMac’s second birthday. In the two years since the first machine shipped, Apple had sold 3.7 million iMacs. He then put that into some perspective:

5,064 per day	211 per hour	One every 18 seconds
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Of these iMac customers, 30% were first-time computer buyers. Another 14% were switching from Windows. The most staggering number? 89% were using their iMacs to browse the Internet.

I think all of this goes to show that the iMac was working. It was helping stabilize Apple by bringing new people to the Mac, and it was helping put Internet access in homes and schools around the world.

Bolstered by this success, Apple launched a new line of iMacs that took Jobs quite a bit of time to walk his audience through.

The iMac (Summer 2000) was sold in Indigo and priced at an all-time low of \$799. To hit this price point, this iMac lacked FireWire and an AirPort card slot. It was slightly better than 1999’s entry-level iMac, shipping a 350 MHz G3, 64 MB of RAM and a 7.5 GB hard drive.

JULY 2000

iMac



DV (Summer 2000)



DV+



DV SE (Summer 2000)



Indigo would become the new default color for the iMac. These later iMacs were all toned down and a little more professional looking than the bright Five Flavors that came before.

They also came with **a new keyboard and optical mouse.**

One rung up was the **iMac DV (Summer 2000)**. Like the iMac DV before it, it came with FireWire ports, a 400 MHz G3 and a 10 GB hard drive and a bundled copy of iMovie. It came in Indigo and Ruby, and at \$999, was Apple's attempt to bring iMovie to everyone. However, unlike 1999's iMac DV, it came with a CD-ROM drive instead of a DVD-ROM for cost savings.

Up next: the **iMac DV+** came in Indigo, Ruby and Sage. This \$1,299 iMac came with a 450 MHz G3 and a whopping 20 GB hard drive and a DVD-ROM drive, but still shipped with the standard 64 MB of RAM.

Sadly, this generation would be the only to feature Ruby and Sage. It's a shame, as they are really nice colors.

At the top of the line with a \$1499 price tag was the **iMac DV Special Edition (Summer 2000)**.

Jobs called this the "ultimate iMac," and with a 500 MHz processor, 128 MB of RAM and 30 GB of disk space, it was certainly more powerful and more flexible than the machines before it. It cost \$1,499, and like in 1999, this iMac came in Graphite, but also shipped in a new color called Snow.

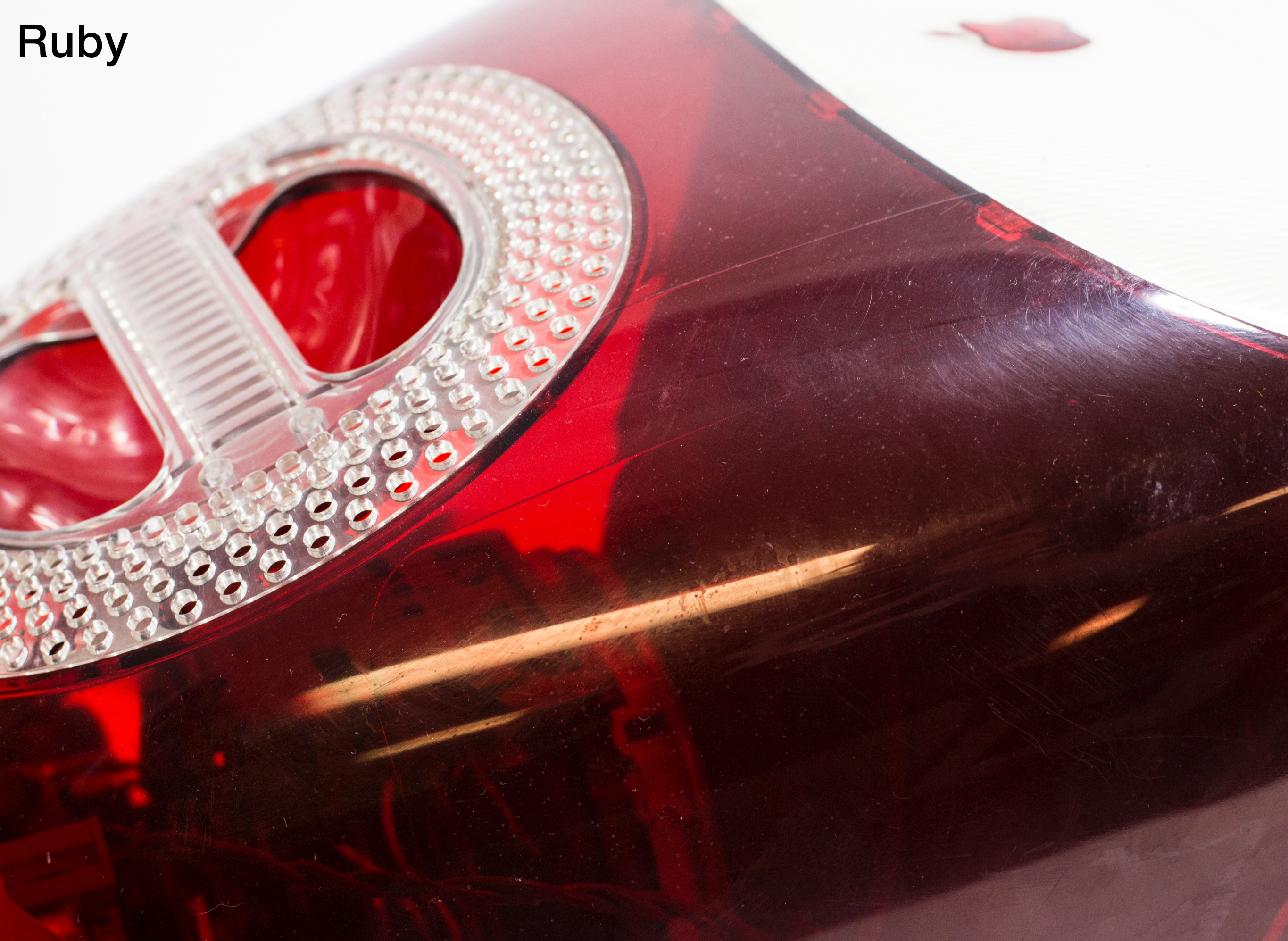
This new case would stick around until the very end of the iMac G3's run, and offered just enough translucency to give a hint to what was beneath the plastic.

The Summer 2000 lineup would be the most complicated one Apple would offer. It was an expansion of the Good, Better, Best strategy announced 9 months before this event, and while the building of case colors between the iMac, DV and DV+ lines helped, I think this sort of thing was confusing to customers.

A lot of people didn't care exactly what CPU came in their new home computer, they cared about the color. In hindsight, locking Sage or Snow to certain price points seems like an odd choice, but I think Apple was trying to pull people upstream to the more expensive models. I can't blame Apple for that, but I think it emphasized specs over color in a way that didn't resonate for many consumers.



Indigo



Ruby

Sage





Graphite



Snow

Section 4

Early 2001

Let's just get to the point here. This is when the iMacs got weird.

Like Sage and Ruby before them, Blue Dalmatian and Flower Power were used for just one generation of iMac.

According to Jobs, the new cases took 18 months to develop. They weren't "colors," but rather patterns molded "right into the plastic." While some companies may have just used a graphic wrap, Apple wanted something special with these machines.

There's no denying that the designs were a line in the sand. A lot of people liked them, but even today, it's easy to poke fun at them.

This is Blue Dalmatian. Flower Power may be more recognizable.





ABOUT THIS MAC

February 2001 - July 2001

Processor Speed: 400, 500 or 600 MHz

System Bus: 100 MHz

Cache: 64 KB L1, 512 KB (400 MHz) or 256 KB (500/600 MHz) backside L2

Max RAM: 1 GB

Storage: 10, 20 or 40 GB

Media: Slot-loading CD-ROM or CD-RW

Original OS: Mac OS 9.1

Maximum OS: Mac OS X Tiger 10.4.11

Note: This generation of iMac brought FireWire and Airport support to the entire line, and introduced a CD-RW drive. It was advertised with iTunes with the tag line of “Rip. Mix. Burn.”

Blue Dalmatian features a pattern of white blobs on a blue and green background. It’s a little bit like a cartoon disco ball.

Flower Power is way out there. The pattern of simplistic flower shapes may have been colorful, but it soon picked up nasty nicknames comparing the design to moldy bread left in the refrigerator too long.

Both of these machines were a big departure from the previous colors used, and it feels a bit like **Jobs really wanted them to exist.**

All **Early 2001** iMacs came with FireWire and iMovie, but Apple still shipped multiple lines of iMacs within this generation.

Our old friend Indigo sat at the base of the line with a 400 MHz G3, a 10 GB hard drive and an \$899 price tag.

The \$1,199 mid-range Blue Dalmatian and Flower Power machines ran at 500 MHz with 20 GB of storage.

The high-end **iMac SE** (sold in Graphite, Blue Dalmatian and Flower Power) came with a new 600 MHz G3, 40 GB of storage and CD-RW optical drives for burning music and data. They sold for \$1,499.

I think people were starting to wonder how long the iMac G3 would stick around. At this point, the PowerMac, PowerBook and Cube were all running with G4 chipsets, leaving just the lower-cost iMac and iBook with the G3. The division made the overall product line a little easier to understand, but some wanted more power out of a consumer machine.

The G3s used in these models was markedly better than before, and the inclusion of CD-RW drives came months before the iPod would arrive; however, the G4 was the future.

The iMac G3 would have one more round in the ring after these extra-colorful machines.

Summer 2001

ABOUT THIS MAC

July 2001 - March 2003
Processor Speed: 500, 600 or 700 MHz
System Bus: 100 MHz
Cache: 64 KB L1, 256 KB backside (1:1) L2
Max RAM: 1 GB
Storage: 20, 40 or 60 GB
Media: Slot-loading CD-ROM or CD-RW
Original OS: Mac OS 9.1
Maximum OS: Mac OS X Tiger 10.4.11
Note: The final generation of iMac G3 was a simpler one with CD burners across the board. It stuck around after iMac G4 was introduced in 2002.

By the time the summer of 2001 rolled around, Apple was well into the OS X transition. Mac OS X 10.0 Cheetah had shipped, and 10.2 was around the corner.

The company itself was just a few months away from shipping the iPod, but was already on the road to recovery. The Digital Hub Strategy was taking shape. Apple’s notebook line was also maturing, but of course, a lot of this success was built on the back of iMac G3.

At Macworld New York 2001, Steve Jobs took the wraps off the fastest-ever lineup of iMac G3s:

\$999	\$1299	\$1499
500 MHz	600 MHz	700 MHz
128 MB RAM	256 MB RAM	256 MB RAM
20 GB HDD	40 GB HDD	60 GB HDD
CD-RW	CD-RW	CD-RW
Indigo & Snow	Snow & Graphite	Snow & Graphite

These machines were on sale from July 2001 until January 2002 when Jobs announced the iMac G4. The iMac G4 was a huge break from the CRT-based design of the G3, and is one of my all-time favorite iMacs.

The G3 did survive this announcement, though. The 600 MHz model was available in either Snow or Graphite for \$999, while a 500 MHz Indigo could be picked up for \$799. Eventually, the

Graphite and Indigo were silently dropped from the lineup, leaving just the Snow.

This machine stayed on sale until March 2003.

That's *five years* after the original Bondi machines showed up. It's really incredible how much better the iMac became using that original design. Apple iterated on them, making them more capable and cheaper over time. The original machines ran Mac OS 8.1, while the last ones are capable of running Mac OS X 10.4 Tiger. The iMac carried the Macintosh platform into the 21st century on its curved, colorful Mac.



iMac G4. Image Credit: Apple

iMac Impact

The iMac G3 is perhaps one of the best examples of an Apple product that left a ding in the universe.

The Apple that Steve Jobs came back to was a mess. It couldn't ship meaningful updates to its OS, and it wasn't producing hardware that made people excited to buy and own a Mac. Apple needed a computer that would fire up its user base and bring it back from the edge of financial disaster.

	Consumer	Professional
Desktop		
Portable		

The software story would take time, and that's what the rest of this book is about. The hardware problem was easier to solve. Jobs cut almost every line from the catalogue and worked on filling out the famous 4x4 product matrix.

The consumer desktop market was huge in the late 1990s, and it was also a space where Apple needed to score big. The original iMac did just that.

The company didn't stop with that first Bondi machine. Every 9 to 12 months, it released new iMacs. Each generation was faster and more capable, adding technology like FireWire, AirPort networking and CD burning, all while keeping prices affordable.

By the time the G4 was announced, Apple had sold 6 million of them.

The most important lesson Apple learned in this era, however, wasn't about the inside of a computer. Starting with the Five Flavors, the company gave customers choices based on color and aesthetics. Suddenly, homes, schools and small businesses were filled with Grape and Strawberry computers, and then later with Ruby and Sage ones. People chose their computer based

on personal taste; the color of iMac a person purchased said something about them. Technology suddenly became a way to express oneself.

That lesson stuck. Apple Stores in the 2000s were filled with iPods of all colors. The Apple Watch can be matched with a near-endless number of bands and faces. Customization has become expected, and that freedom has a lot to do with the iMac G3.

As important as the iMac G3 was, it wasn't the only thing going on at Apple at the time. The company was righting itself under the new leadership of Steve Jobs. Consumers and professionals alike were discovering that the company could be trusted again after a long line of broken promises and lackluster products.

The majority of those promises were centered around the Macintosh operating system.

The Road to Mac OS X

The iMac G3 shipped during a time of great change and upheaval in Apple's software division. Moving from the classic Mac OS to OS X was a multi-year project that ran in parallel to the early iMacs.

This journey would not be as straightforward as Apple initially pitched to developers, but the work was eventually successful.

Mac OS 8 & 9

THE OLD FAITHFUL

While Apple worked on the future, a team kept the classic Mac OS up and running. They delivered several major updates after the NeXT acquisition was announced.

These releases were planned every six months or so, and not only kept the Mac running long enough to make it through the transition, but added substantial value to the aging platform.

Mac OS 8

After NeXT was acquired by Apple in December 1996, the biggest item of business was how to move forward in merging the operating systems of the two companies.

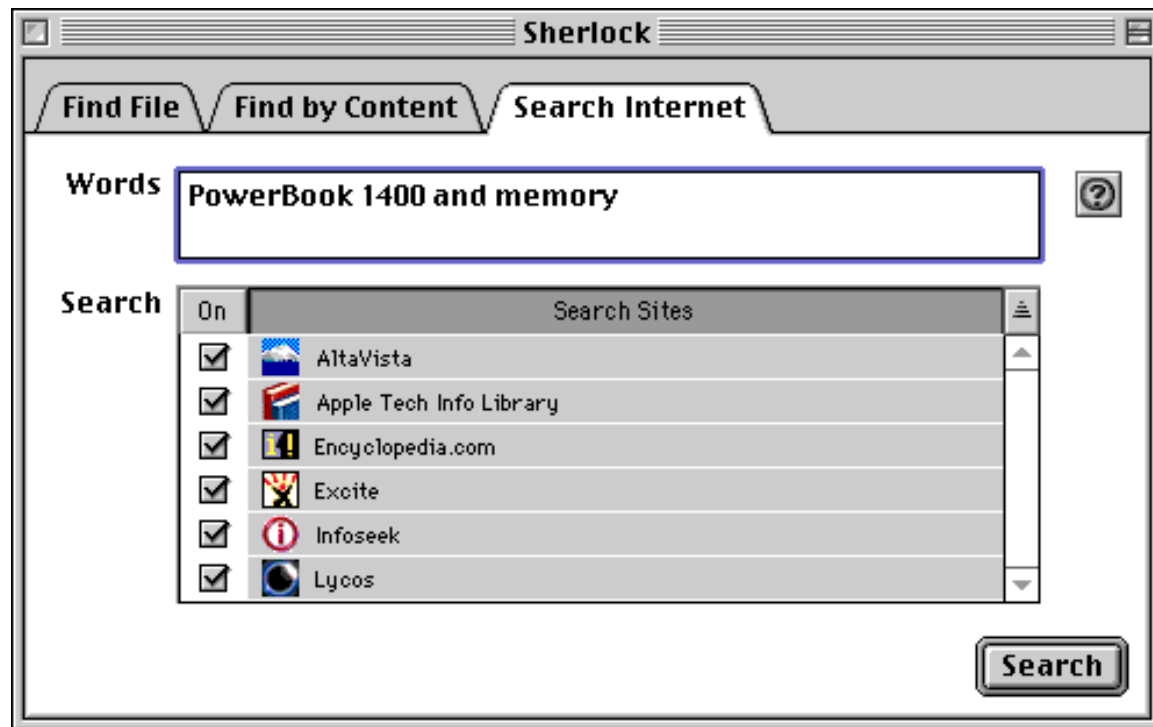
The company put forth a dual-track plan. While Apple was building its next-gen OS by adopting NeXT tech, the “classic” Mac OS would carry on, being updated on regular, 6-month intervals.

It was into this rough world Mac OS 8 was introduced. It brought with it some major improvements. Most noticeable was the Platinum theme that had been seen as part of Copland. It retained the shape and elements of System 7, but added a depth and richness not seen before. The font Charcoal replaced Chicago as the system typeface, but both are chunky and dark.

8.0 brought more than a new look to the Mac, however. It came with a revised Help system, improvements to startup time, contextual menus, spring-loaded folders and a multithreaded, PowerPC-native Finder that allowed users to execute more than one file-related command at once. For example, copying a file while navigating a separate folder in another window.

8.1 shipped in January 1998, and it was the last version of Mac OS to run on 68k processors. More importantly from a historical standpoint, it introduced the HFS+ file system.

HFS+ supported much larger files, longer file names and Unicode. It was the file system used on all Apple devices for nearly 20 years. At WWDC 2016, Apple unveiled its replacement, APFS, which is expected to ship in 2017.

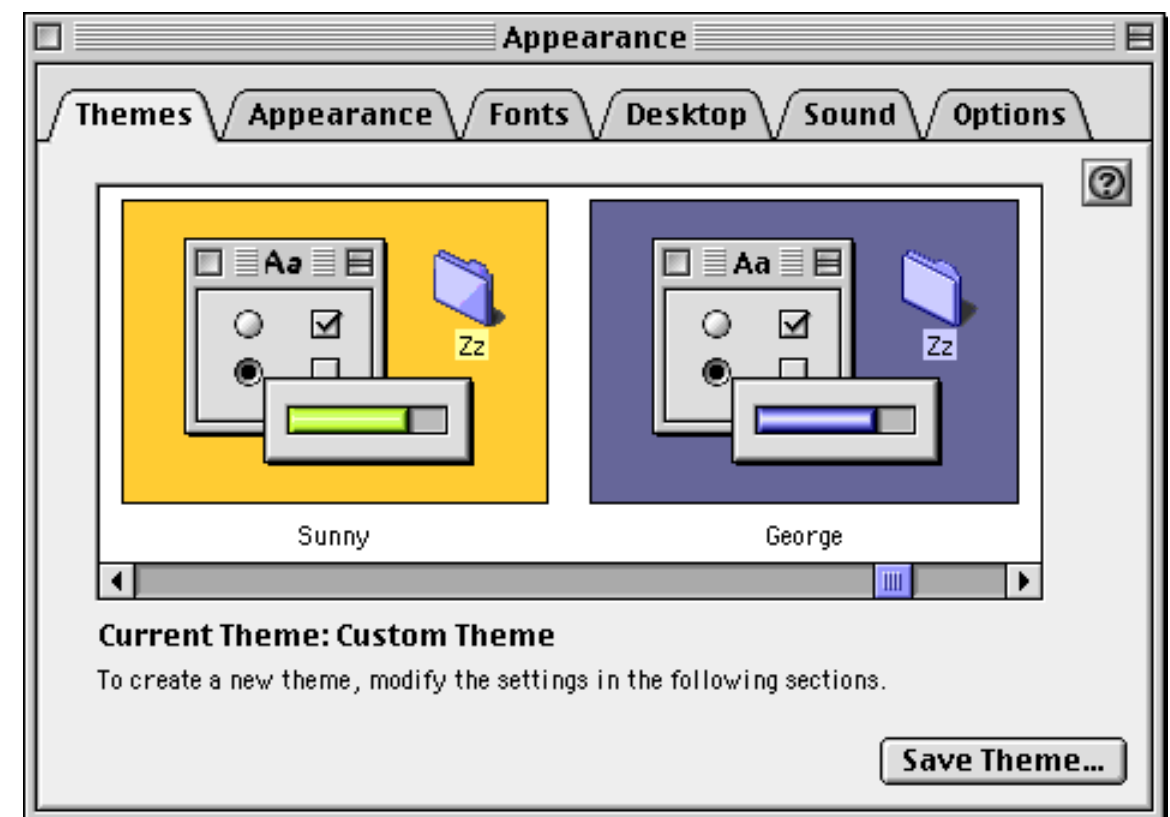


In October 1998, Mac OS 8.5 “Allegro” shipped with **Sherlock**, Apple’s desktop application for searching local disks and the Internet via a series of plug-ins. Sherlock was described this way in the marketing copy for Mac OS 8.5:

The Find File application, previously located in the Apple menu, has been expanded and renamed Sherlock in Mac OS 8.5. It includes two additional features: Find By Content and Search Internet. In addition, Sherlock allows you to save search settings into a settings file which can be used to quickly perform searches.

Beyond Sherlock, Mac OS 8.5 brought substantial performance increases to the platform as Apple developers were able to strip out unneeded 68k code.

While Mac OS 8 shipped with the Platinum theme, more of Copland appeared in Allegro. The release brought the Appearance control panel, and while the “High-Tech” and “Gizmo” themes were not included, the control panel let users tweak what highlight color Platinum would use:



The release also brought the Application Palette, a new way to switch between running applications. While the name of the running app would appear in the menu bar, users often didn’t know they could click on it to switch to another app. In Allegro, a

user could expand that menu into a small window that listed all running programs. Switching to a different one was just a click away.

The final release of Mac OS 8 came in May 1999 with 8.6. “Veronica” was a free update to 8.5 owners, with improved battery life for PowerBook owners in addition to shipping with an updated Sherlock.

Under the hood, 8.6 brought support for preemptive tasks. However, as the system still used cooperative multitasking between processes and applications, users didn’t see a huge benefit to the stability or usefulness of their Macs.

While it may not be well-remembered today, Mac OS 8 was an important chapter in the history of the Mac. It brought improvements to the aging platform, buying Apple time to work on its next-generation operating system.

It also proved that Apple’s engineering team could deliver. Mac OS 8 was updated on a regular schedule, and the team even found things from Copland to apply when appropriate.

It’s important to remember that Mac OS 8 powered the first few generations of iMac. It’s easy to conflate the iMac and the introduction of OS X, but only the very last machines would come with OS X on their hard drives.

8.6 wasn’t the last version of the classic Mac OS, however.

Mac OS 9

At an event in October 1999, Mac OS 9 was hailed the “Best Internet OS ever” by Apple. Complete with **iTools**, a new version of Sherlock, auto-updating system software, Internet file sharing and a network browser, the release lugged the almost-replaced Mac OS into the Internet era.



OS 9 was about more than the Internet, though. It brought support for multiple user accounts, something that had only been available for **At Ease** users.

With this advancement, the OS gained a Keychain application. Like Keychain.app today on macOS, this meant users could save passwords and other text-based data in an encrypted way that was unlocked with their user password.

OS 9 shipped with VoicePrint. This was a system that allowed users to unlock their computers by speaking a password. Here’s how Apple marketed the feature:

Record yourself speaking a phrase—it can be the default phrase “My voice is my password,” or even something fanciful like, say, “Afghanistan banana stand”—and Mac OS 9 stores your voiceprint for comparison. Later on, when you want to log in

without the effort of typing in your password, Mac OS 9 analyzes the waveform of your voice to make sure you are who you say you are.

This feature never shipped with Mac OS X. While it still seems futuristic, it had obvious problems. Saying your password out loud wasn't the *most* secure thing in the world, and Macs would often mis-hear the user, thanks to low-quality microphones.

Mac OS 9 and its 21st-century features served Apple well. It was perhaps the most stable version of the classic Mac OS. Some thought Apple shouldn't have invested so much in Mac OS' swan song, but I think it was needed.

Many users held off on Mac OS X for several years while the new OS went through some growing pains. OS 9 also became the base of Mac OS X's Classic mode, a critical step in moving the user base forward.

OS 9 holds the honor of being the only operating system Steve Jobs **laid to rest in a coffin.**

Rhapsody & OS X Server

AND THE TWO SHALL BECOME ONE

Rhapsody was Apple's initial attempt to modernize Mac OS.

The idea was simple: the new OS would support legacy Mac OS programs while also giving developers a platform to build new, modern applications for the future.

As it turned out, this idea was somewhat short-sighted and didn't go far enough in helping developers with the transition to a more modern, secure Mac operating system.

In 1997, Apple laid out a plan for how to move forward with its OS.

First, Rhapsody would require a PowerPC system. The company promised compatibility with all shipping Macs and clones. This left older systems behind, but in doing so, the company had a much smaller target of machines to support with its initial versions.

The "Core OS" layer was based on the same Mach microkernel in use at NeXT. It was designed to grant low-level system features like networking, I/O, protected memory and more. This software was PowerPC native, delivering a performance increase right out of the box.

Atop the core OS would sit two major services.

The first was called "Blue Box." Apple stressed that Blue Box was not an emulator, but rather an environment in which current Mac OS applications could run, unmodified, on the system. Programs would never know they were part of Rhapsody; to them, they were running on the same operating system as before. Rhapsody was a mere host for Mac OS; fonts, extensions and Control Panels all just worked.

Blue Box did come with some limitations, however. Programs that needed direct hardware access would not be supported, as hardware drivers would be different,

thanks to the new core OS underneath the Mac OS environment. Apple was quick to ease people's worries, though, claiming that the number of affected programs would be quite small.

The big news was Yellow Box. Here, developers could build applications using NeXT's object-orientated language and tools. These programs were not held back by limitations found in the old Mac OS, and they could take advantage of modern OS features like memory protection and primitive multitasking.

While most Mac OS technology would be left stranded in Blue Box, some select services like QuickTime would be rewritten for the new environment.

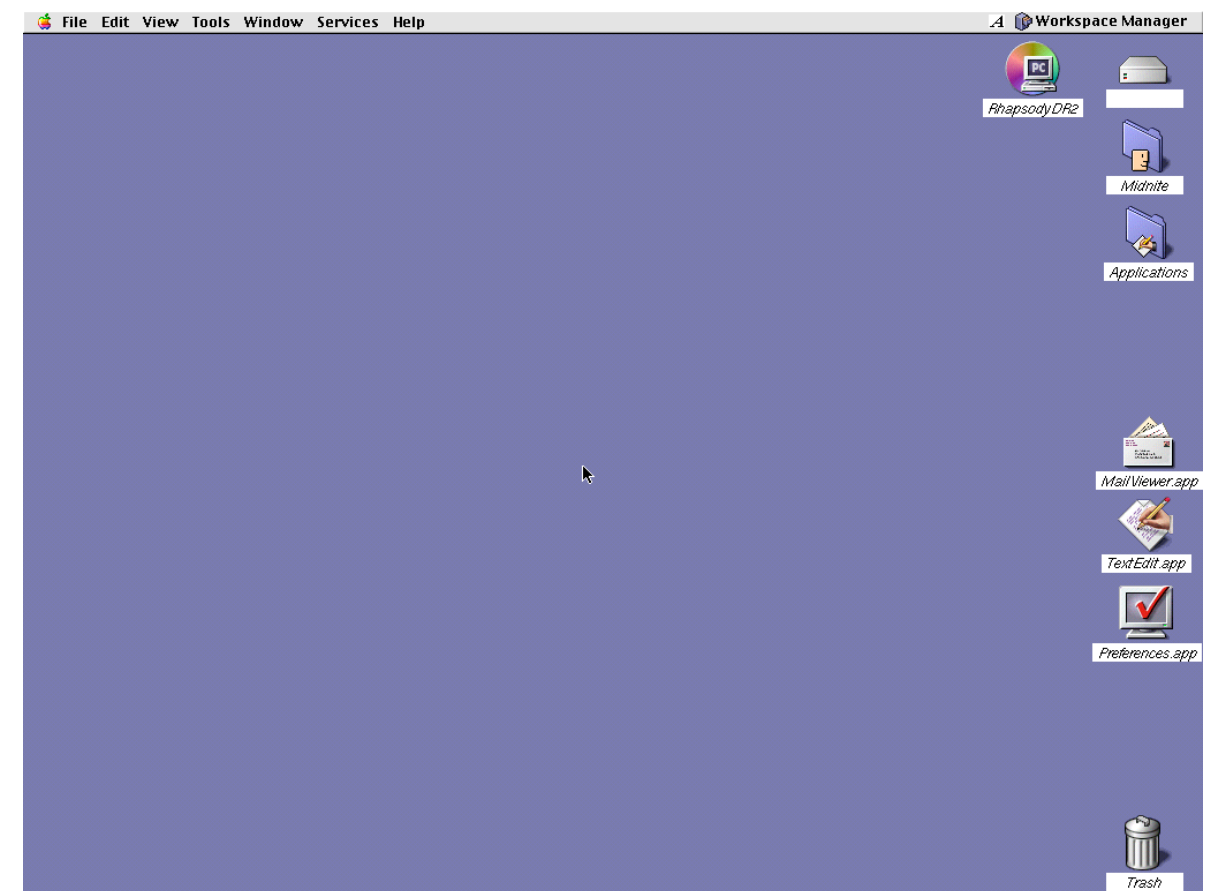
(For a time, there was talk of Yellow Box for Windows, which would allow developers to write programs that would run on both Rhapsody and the PC. While NeXT had the technology within their OPENSTEP operating system to do this, Apple would ultimately abandon this plan.)

Lastly, developers could run Java apps atop the new system, taking advantage of the operating system's stability while benefiting from Java's cross-platform nature.

All of this was going to be presented with an updated and refreshed user interface that was designed to make Mac users feel right at home on the new operating system.

Apple announced its plan to develop Rhapsody alongside the current Mac OS. Initially, Apple promised three builds of the OS: a Developer-only release that would bring the NeXTSTEP environment to PowerPC hardware, a Premier Release for beta users that would include the basics of Blue Box, and lastly the Unified Release. Promised for mid-1998, it would come with full support for existing Mac apps on Blue Box, and new apps built for Yellow Box.

In August 1997, Apple shipped its first build of Rhapsody to developers. It ran only on Intel machines, not the PowerPC as promised. By 1998, there was a PowerPC version, but it didn't



Rhapsody R2. Notice the Mac OS 8-inspired user interface. Image via [GUIdebook](#)

Rhapsody System Architecture

GUI with an “Advanced Look and Feel”

Blue Box

Mac OS Compatibility
for existing Mac apps

Yellow Box

OPENSTEP APIs
(Memory protection, etc.)

Java

Core OS: Microkernel, I/O Architecture, File System

PowerPC Hardware

matter all that much. Developers were unhappy that they were unable to migrate their applications to Apple's new operating system without re-writing them.

Rhapsody did not go far enough in giving developers tools to transition to the new platform. They could do nothing and have their apps run on Blue Box without any of the benefits of the new OS, or they could write new programs in the Objective-C language to run on Yellow Box. There was nothing in between.

For yet another time, Apple's attempt to build a next-generation OS was in trouble.

OS X Server

While Rhapsody **would never ship to consumers**, it would be released as a server product in 1999. At Macworld that year, Steve Jobs introduced it as "Mac OS X Server 1.0."

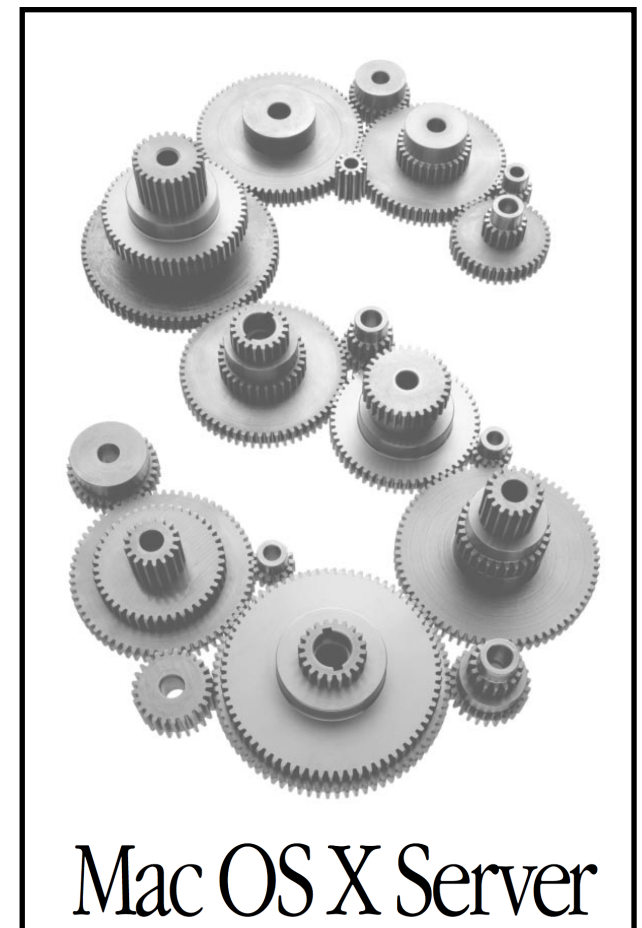
This operating system ended up being a one-off. It had all of the same low-level OS stuff as OS X, but was built with the server in mind. It shipped with features like file and web hosting, the ability to boot a Mac from across the network, and more. It came bundled with **WebObjects**, Apple's server-side application framework.

Jobs **showed a rack of 50 iMacs on stage** streaming individual QuickTime videos from a single G3 server in one of my all-time favorite demonstrations.

With NetBoot, an entire lab of diskless iMacs could be run from a central server. WebObjects allowed developers to write powerful web applications.

Under its OS 8 Platinum theme, OS X Server was more or less NeXT's OPENSTEP operating system with some Apple services on top. It was designed to be a showcase of the technologies Apple got from NeXT. Thanks to multitasking and memory protection, the OS could run multiple services to many clients all at once.

Even though Rhapsody didn't ship directly to consumers, and the \$999 OS X Server that was based on it never saw huge commercial success, this was an important step. OS X Server showed just how powerful the technology under Apple's new operating system was, as well as the potential it brought to the Mac.



The OS X Strategy

ANOTHER REBOOT

Rhapsody was ultimately a flawed operating system. It's two-in-one approach of having legacy Mac OS applications running beside newly-written Objective-C applications didn't grant developers a clean way to migrate to the new OS.

Just five days after the launch of the original iMac, Steve Jobs took the stage at WWDC 1998 to talk about Apple's operating system strategy.

With 22 million customers and roughly 40 million users, Steve Jobs called Mac OS Apple's crown jewel. Rhapsody was going to leave those users and the 12,000 programs at their disposal behind, and Jobs now claimed that wasn't worth it.

Apple's newest vision was a way to bring existing Mac apps to an updated platform. Apple wanted to give developers access to a modern operating system without requiring them to completely re-write their applications. This new plan was named Mac OS X.

Mac OS X was the blending of Mac OS 8 and Rhapsody. Like Rhapsody, it consisted of different environments.

The first, Classic, was reminiscent of the old Blue Box. It ran existing Mac OS apps in a self-contained Mac OS environment. Programs here did not receive any of the benefits of the new operating system, but promised backwards compatibility for years to come. In fact, Classic was supported on PowerPC machines until OS X Leopard in 2007.

The artist formerly known as Yellow Box was present as well. If developers rewrote their apps in Objective-C or used Java, their programs would receive every new feature of the operating system, including things not only like memory protection, but the new GUI as well.

The genius of the Mac OS X strategy, however, was something named Carbon.

It's easiest to think about Carbon as a “cleaned up” collection of legacy Mac OS APIs and technologies. Out of the 8,000 APIs available, 2,000 were considered “bad news” by Apple and were dropped from Carbon. If an app could run using the remaining 6,000 — plus a few new ones to replace some of the bad ones — they could run natively on OS X.

According to Apple, most major Mac OS apps could be “tuned up” to run on Carbon within just a few weeks. While that timeframe would prove optimistic for most, Carbonizing an application meant it could run outside of the Classic environment, putting it on level footing with fancy new Cocoa applications.

To help get things started, Carbon was included in Mac OS 8. This allowed developers to get their apps ready for the future by using the new API set on the existing, shipping OS. Apple's Carbon Dater application could be downloaded and run to help identify what parts of an application would need to be changed to make it Carbon-ready.

This was a major breakthrough. While some developers were relegated to Classic for some time, many applications (including some major ones from Adobe and Microsoft) were updated to support Carbon.

With this move, Apple gave developers a way forward.

Carbonizing an app was far less work than re-writing one, which is what Rhapsody would have required. Carbon apps could take advantage of everything that Apple had been working for — protected memory, true multitasking, multithreading and more. This plan gave Mac apps a way to survive well beyond the OS they had originally supported.

On OS X, Carbon apps weren't as polished as Cocoa ones, but they ran just as smoothly in most cases. Text rendering wasn't as crisp, and they couldn't take advantage of OS X's Services subsystem, but it allowed older apps to keep running, giving OS X access to a library of hugely important applications like Office and Photoshop right out of the gate.

Carbon would end up leading a long life, but suffered a slow death.

When OS X added 64-bit support in OS X Leopard, it was only for Cocoa. **Carbon was left behind**, despite promises to the contrary.

Then in 2012 — with OS X 10.8 Mountain Lion — most of the Carbon APIs were deprecated. The APIs are still accessible to developers and all Carbon applications will run, but Apple recommended developers update their applications. As of macOS Sierra, Carbon is still present.

Mac OS X System Architecture

Aqua GUI

Classic

Mac OS environment
for existing applications

Carbon

“Cleaned up” classic
Mac APIs coupled with
new system features

Cocoa

Objective-C and Java
with new system
features

Quartz: Windowing System Based on PDF

Darwin: Core OS, Microkernel, BSD Subsystem

At WWDC 1998, Jobs shared Apple's new schedule. Apple continued to make progress on Mac OS 8, promising several more releases that would end up as Mac OS 8.5 and Mac OS 9. These updates were planned on a regular 6-month schedule.

Rhapsody 1.0 was teased, but Jobs was quick to note that it was being replaced by OS X. He then promised that Mac OS X would ship in Q3 1999. In reality, that timeframe would slip, but the basic outline would prove true.

Mac OS X Betas

Ultimately, Apple would ship four developer previews and one public beta of Mac OS X.

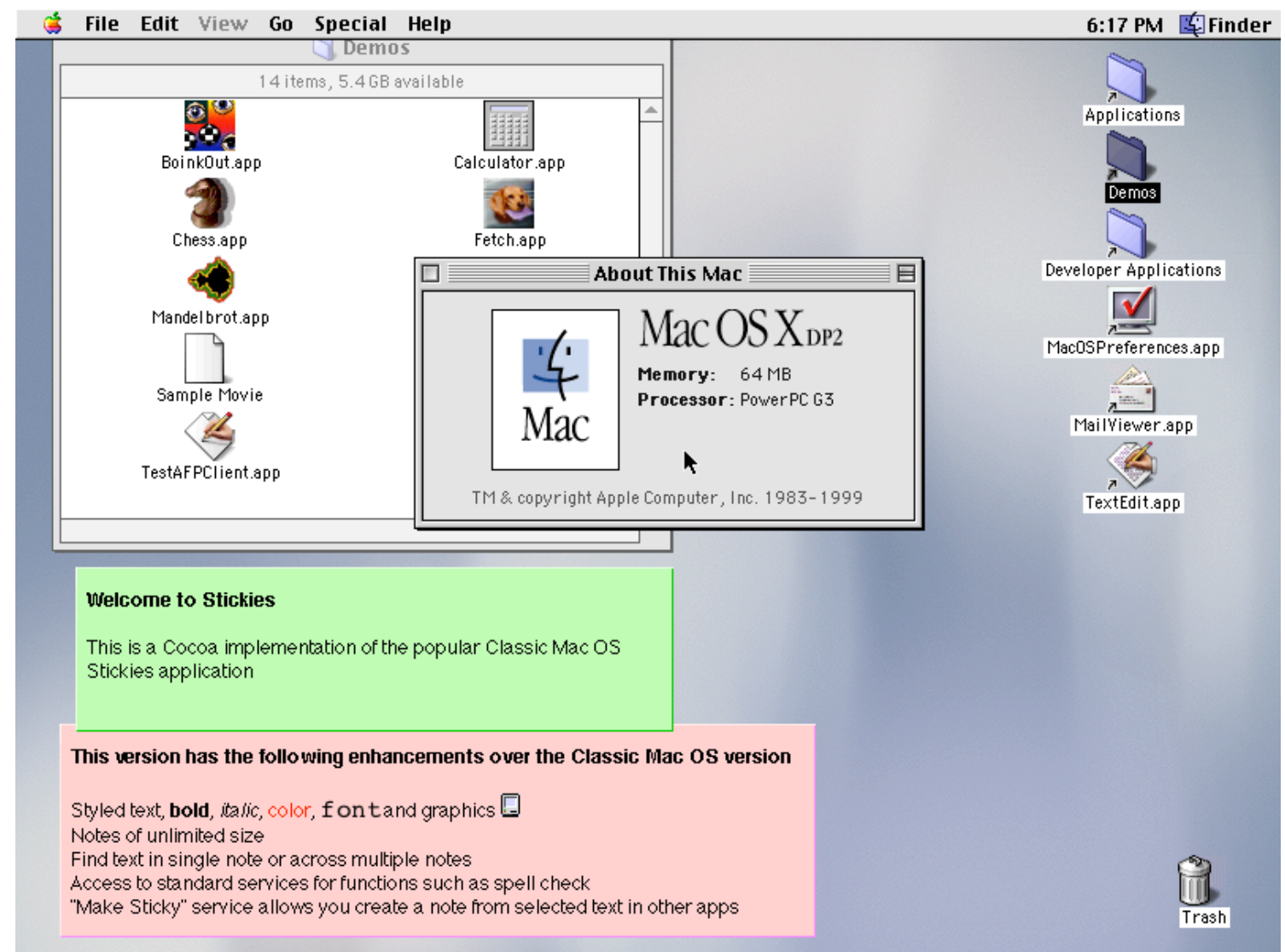
The first two developer previews were critical steps toward a workable release. The beginnings of a new operating system are often humble, and that was the case here.

DP1 and DP2 both shipped with an OS X Server-like user interface; it looked like OS 8's Platinum theme had been bolted to NeXTSTEP.

While they may have not looked like much — and behaved very strangely to Mac OS users — the environment they created allowed developers to get their Carbon and Cocoa apps up and running.

At Macworld 2000, Steve Jobs revealed that this user interface was a mere placeholder.

The *real* interface — named Aqua — was a whole new world. Platinum, the Chicago font and even the window controls Mac users had been so used to were all gone as of DP3.



Mac OS X DP2. Image via [The GUIdebook Gallery](#)

Steve Jobs said one of the design goals with Aqua is that it should look so good, you want to lick it.

The entire demo is worth the time to watch. Aqua was defined by transparency and bright colors. It was anything but drab.

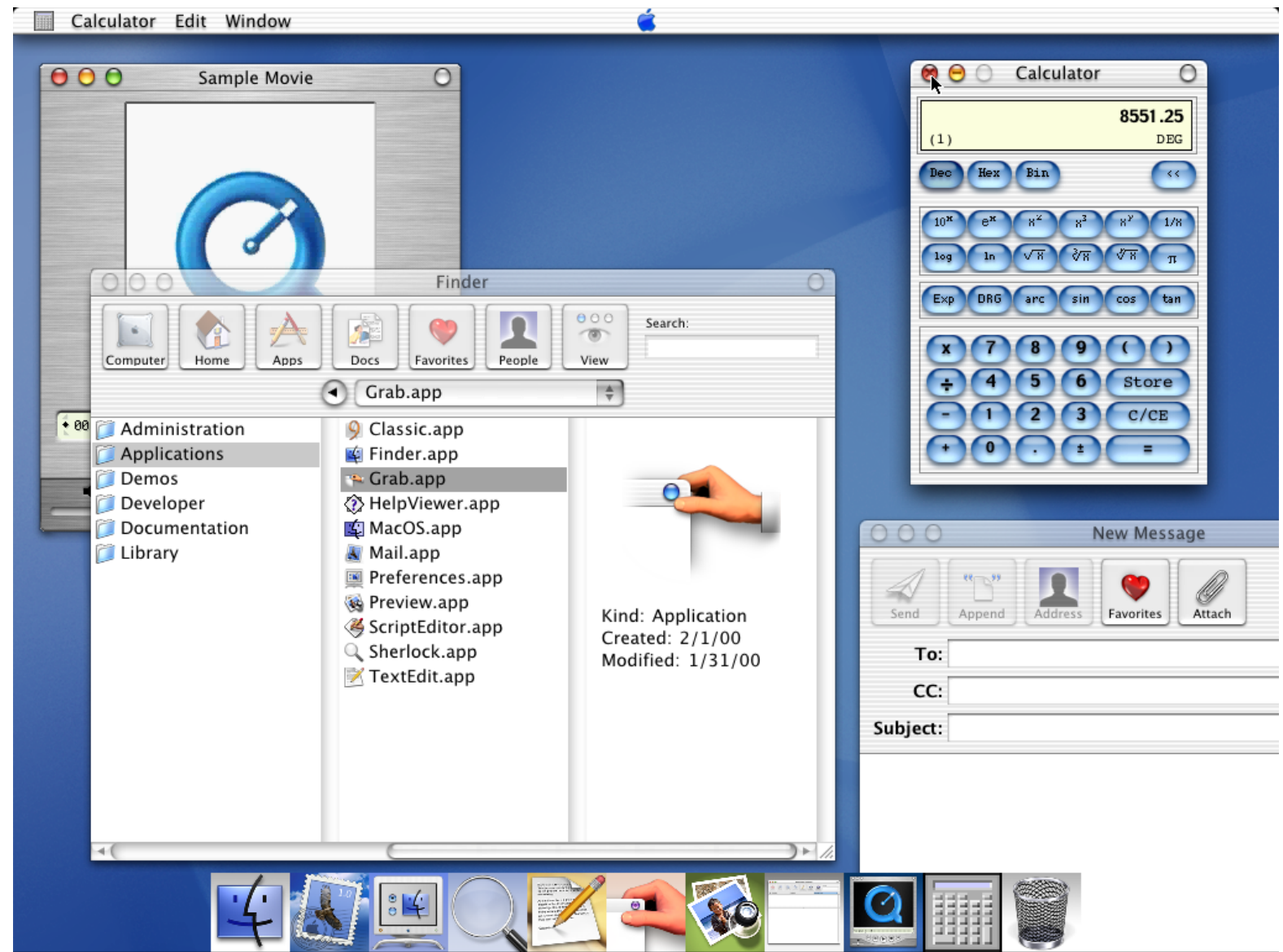
The buttons looked like liquid-filled lozenges. Window controls were fashioned after stoplights. Non-active windows were made slightly translucent. The Dock and menus had a sheen to them.

Here's how Jobs introduced it:

We wanted to give a much more powerful user interface to our pro customers, but at the very same time, we wanted to make this the dream user interface for someone who has never even touched a computer before.

That's really hard to do. It's like when we do films at Pixar. It's a lot easier to make a film that appeals to five year olds and under. It's very difficult to make a film that five year olds love and that their parents will love also.

It was all very reminiscent of the colorful iMacs. While the lineup was more Graphite than Grape by the time 2001 rolled around,



Mac OS X DP3. Image via [The GUIdebook Gallery](#)

OS X looked like an extension of the candy-colored iMacs Apple was shipping while developing the new look.

This initial version of Aqua included some features that didn't make it into the shipping version of Mac OS X.

The first is "single window mode." All windows had a single

button in the upper right corner. Clicking this button would make everything else on the screen minimize to the Dock.

While conceptually this is close to the fullscreen mode macOS apps can use today, power users who were unlikely to use it were upset that it was taking up precious screen real estate, and it was subsequently dropped.

Secondly, the Apple logo was found in the *center* of the menu bar. This was not the Apple menu from Mac OS 9 or what we know today in OS X. It was just the logo, getting in the way of apps with many menus. Mercifully, it was dropped after the Public Beta.

DP4 brought refinements to the system, and the company shipped a \$29 Public Beta in September 2000. (That amount could be credited to the purchase of 10.0.)

Codenamed “Kodiak,” it was the first time non-developers spent time with a beta version of the OS. Feedback was mixed, and much of it would be echoed later with 10.0.

Interestingly, Mac OS X Public Beta expired on May 14, 2001. Running it today requires setting the system clock to before that date.

Good times.

Mac OS X ‘Cheetah’



Mac OS X 10.0. All the great pinstripes!

Mac OS X 10.0 Cheetah shipped in March 2001. It was several years late, but the company said that it was worth the wait. It cost \$129, and for that money, users got an all-new Mac.

As discussed, Mac OS X was a complicated operating system. It shipped with three environments so it could support unmodified

legacy applications via the Classic environment as well as “Carbonized” Mac apps and all-new applications re-written using Objective-C and the technology brought from NeXT. Even Java developers could get in on the fun.

Underneath these environments was a stable core. The Mach microkernel gave the Mac the UNIX underpinnings that are still present today. For the first time, Mac users could enjoy true multi-tasking. Protected memory meant that if an application crashed, the system would keep running.

On top of it all was Aqua, the Mac’s new user interface. Finally, after a decade of attempts, the Mac was modern.

Cheetah wasn’t perfect, however. It was criticized for being slow, even on the best Macs 2001 had to offer. Here is John Siracusa, [in his review of the release:](#)

Overall, the user experience of OS X is not as pleasant or as simple as that of classic Mac OS. The number and severity of bugs alone would likely turn a novice off, especially those surrounding the still-necessary classic environment. Novice users shouldn't have to know or care what classic is, why it's frozen,

and how to recover. And much of the time, the provided GUI methods (force quit, etc.) don't work as expected anyway, leaving a trip to the command line and the kill command as the only alternative.

The unresponsive interface will be noticed by everyone. Many features are slow enough that even plodding grandmothers will be confused by the apparent lack of response to their input (when resizing a list-view window, for example). And there's still the "why can't I do anything now?" experience, especially in the Finder during network-related operations. Grandma doesn't care that she can still switch to another application and continue working if the next thing she needs to do is in the Finder, which is currently locking her out because she chose to mount her iDisk.

Cheetah ran on a wider selection of Apple hardware than some had predicted. It required 128 MB and 1.5 GB of hard drive space, and was compatible with these systems:

- Power Macintosh G3 and “Blue and White” Power Mac G3
- Power Mac G4
- Power Mac G4 Cube
- iMac
- PowerBook G3 (all models sans the original)
- PowerBook G4
- iBook

Cheetah brought many of the hallmark features we are used to on the Mac, including the Dock, Terminal, Mail, TextEdit, system-wide PDF support, OpenGL and AppleScript.

While these applications look very simple compared to what ships today, they laid the groundwork for a full-featured OS. Mac OS 9 and earlier relied on third-parties for many of the apps that OS X would ship with.

10.0 proved unstable for some. Many users were soon well-acquainted with kernel panics that left them with no choice but to reboot. While this was more tolerable than a single app being able to take down the whole system in Mac OS, it led to complaints. Likewise, the Classic environment would often lock up, taking the entire user interface with it.

Cheetah's speed and other issues were a big problem. It pushed Macs to their limits, and it left curious users with a bad impression of Apple's new OS. Even startup time was over twice as long when compared to Mac OS 9.

Mac OS X 10.1 was released in September 2001 as a free update for all users. Macworld called it the first version of Mac OS X ready to use. It was a gesture of apology on Apple's behalf, and set the ball rolling on future releases that would continue to add features and stability.

But Apple had done it; the Mac had a modern OS. It was a hell of a milestone.

Epilogue

The work Apple did in the late 1990s and early 2000s set the stage for one of the greatest comebacks in American history.

Sometimes people ask me why I'm **so interested in Apple history**. The answer is pretty simple; if we don't know where we have been, we can't know where we are going. I think that's true in a lot of different parts of life, including technology.

Apple is a fascinating company. You wouldn't have made it this far in this book if you didn't agree. Its story arc — from the heights of igniting the personal computer revolution, to being just weeks away from bankruptcy, to being the world's most valuable company — is too good to be made up.

The upswing Apple is currently enjoying is thanks to the iPhone, but if traced back, the line leads to the iPod, then back to the Macs of the early 2000s, then to the iMac in 1998.

The Bondi iMac — and the family of colorful computers that came after it — brought some much-needed clarity and excitement to the Mac line.

More importantly, it bought Apple time to integrate NeXT's technology and build Mac OS X from the ashes of the aging Mac OS.

Today, the technology provided by NeXT is inside our computers, tablets, phones and even watches. Replacing Mac OS with something new took more than hard work — it took guts and some lucky timing.

Thankfully, it worked.