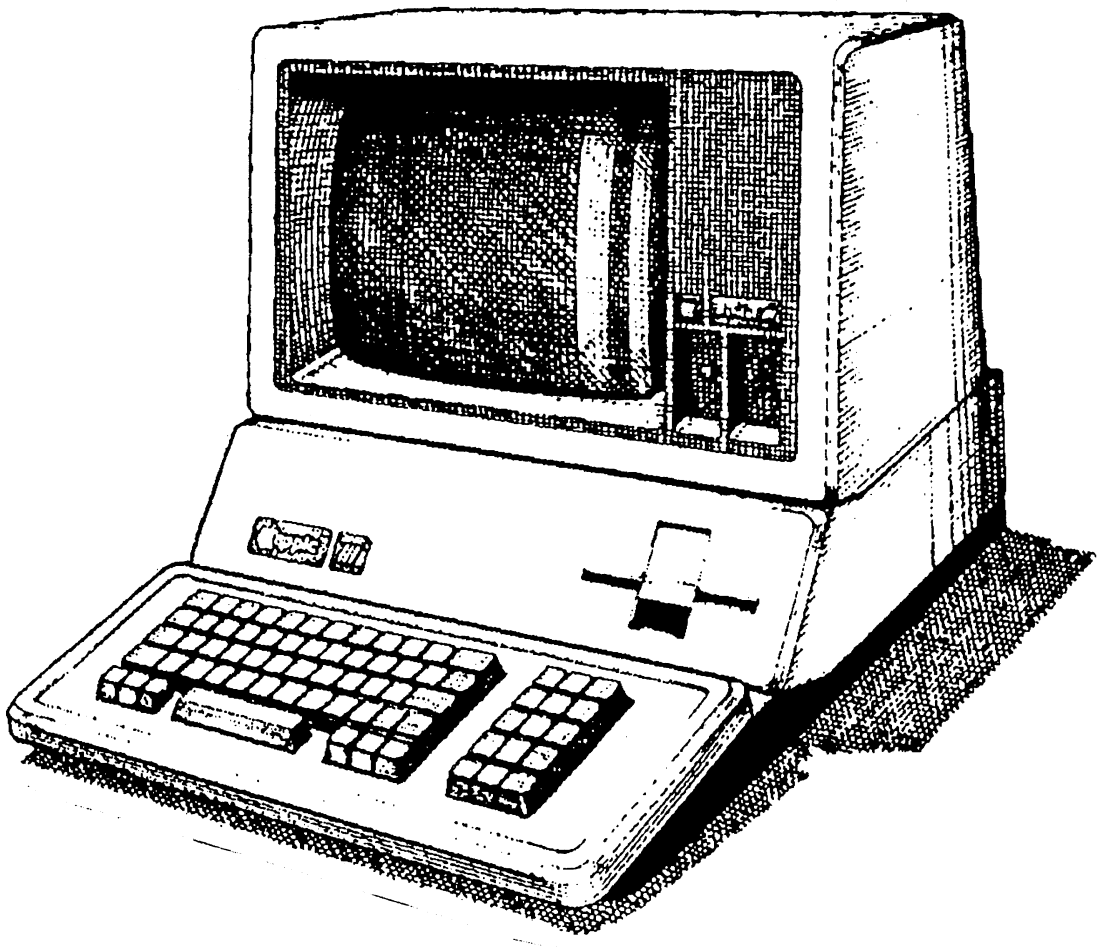
Apple /// Computer Information



DOCUMENT NAME

Apple 3 Industrial Design History
Book "Apple Design", Paul Kunkel, 1997

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Ex Libris David T. Craig

"_01.PICT" 758 KB 2001-08-20 dpi: 600h x 600v pix: 4445h x 5973v

Apple III Computer History

AppleDesign: The Work of the Apple Industrial Design Group

BY PAUL KUNKEL

Library of Congress Cataloging in Publication Data
Main Entry under title:
AppleDesign: The Work of the Apple Industrial Design Group
1. Design—United States—History—20th Century.
2. Apple Computer—Design.
I. Kunkel, Paul. II. Apple Computer, Inc.
97-71233
ISBN 1-888001-25-9

10 9 8 7 6 5 4 3

PHOTOGRAPHS: RICK ENGLISH

PUBLISHER: GRAPHIS INC., NEW YORK, NY

DESIGN: B. MARTIN PEDERSEN

JOHN JEHEBER, JENNY FRANCIS

EDITOR: CLARE HAYDEN, KIRSTEN KEPPEL

ASSOCIATE EDITOR: PEGGY CHAPMAN

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AppleDesign: The work of the Apple industrial design group. As the first personal computer maker to incorporate world-class industrial design in its products, Apple Computer spearheaded the design of every key feature found on the modern computer. The first to introduce a mass-market PC with a plastic case, the first to popularize the graphical user interface and adopt a consistent industrial design language, Apple's designers created signature products such as the Macintosh, PowerBook and Newton, which transformed the way we think about and use personal computers. □ This comprehensive twenty-year history details the role that great design has played in the rise of Apple from a suburban garage to a billion-dollar international enterprise. With more than 400 full-color photographs, the book analyzes the design of every significant Apple product, uncovers concepts that were designed but never released and reveals the passion, the turmoil and the triumph of a small group of designers who shaped and gave meaning to the most important technology of our time. The effort and sacrifice expended to keep the Apple dream alive has been enormous. This is the story of that dream.

By Paul Kunkel □ Photographs by Rick English

ISBN 1-888001-25-9
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SARA APPLE III PLATE 8

Industrial Design: Apple Computer: Jerry Manock, Bill Dresselhaus; Hovey-Kelley Design (Palo Alto, CA): Dean Hovey

Dates of Design: October 1978–July 1979

Introduced: September 1980

Intended as a follow up to the Apple II, the Apple III was the company's third major product and could have been its third major success. Having more memory than the II, a faster processor, a built-in floppy disk drive, four internal expansion slots, and a monitor capable of displaying 80 characters across, its features should have given Apple a toehold in the fast-growing business market for personal computers. But instead of being Apple's third runaway success, the Apple III was something less, the result of an often fatal combination: over-confidence and inexperience.

One of Apple's early engineers, Richard Jordan, recalls the scene: "At the time, the Apple II wasn't merely a success, it was a phenomenon. It was cheap to produce and selling so fast that designers and engineers in the Valley were falling over each other to work for Apple ... many of them taking pay cuts in order to receive stock options." One of them was Jordan, who quit Hewlett-Packard to join Apple during the summer of 1978, just before the Apple III development began. "As Apple's stock price took off, we all felt like geniuses, even though most of us had nothing to do with the Apple II." Every time Apple's stock split two- or three-for-one, "it made us feel like supermen," says Jordan. "Pretty soon, we figured that it was *impossible* for us to fail, no matter what we did. When the time came to do the Apple III, we were convinced that every decision we made would be right." This atmosphere made the Apple III very different from the Apple II.

Long before the circuitboard had been laid out and components such as the floppy drive and power supply selected, the Apple III's industrial designers Jerry Manock and Dean Hovey had already designed the internal chassis and case without being certain that the components would fit inside. The engineers had already given Manock the maximum board size they thought they would need, and Manock designed accordingly. But as the project evolved, the engineers needed more space than Manock could give them.

For months, the whole PC industry had been waiting for the Federal Communications Commission to issue guidelines for shield-

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ing electromagnetic and radio frequency interference (EMI and RFI) to prevent home-based personal computers from interfering with local TV and radio reception. Yet rather than wait for the guidelines, which could take months to finalize, Manock decided to make the III "bulletproof"—designing a cast aluminum chassis that was so massive, it would pass the most stringent standards. In addition to shielding the computer, the aluminum would also act as a heat sink to keep the internal components cool. Since everyone expected the Apple III to ship in huge volume, Manock then contracted Doher-Jarvis, a Toledo-based auto parts manufacturer, to supply the cast aluminum chassis.

On the outside, the Apple III's blocky design, 45-degree chamfers, keyboard wedge on the front and brown color were intended to establish a "house style" that would inspire the look of future Apple products. But inside the case there was trouble. As the project evolved, a phenomenon known as "feature creep" took hold—in which every member of the team (marketing, engineering, industrial design, manufacturing) suggested some new feature, forcing the product to grow beyond its original size.

Unlike the Apple II, which had an efficient interior layout, "the Apple III was designed by committee," says Randy Wigginton, who joined Apple in 1977 to write software for the Apple II. "Everybody had certain ideas about what the III should do ... and all of them were included." Ordinarily, that would not be a problem. But since Manock had already designed his cast aluminum chassis, there was little inte-

rior space in which to expand. Rather than cut back on the hardware, the engineers designed a circuitboard with pathways that were only seven-tenths of a millimeter apart, packed the heat-producing components together very tightly, yet did not install a fan for ventilation. (Since fans made noise, Jobs considered them "inelegant" and wouldn't allow the Apple III to have one, even though it was needed.).

For months, the Apple III team had heard rumors of another personal computer of similar size and price being developed in Boca Raton, Florida by the three most formidable initials in the history of American business: IBM. Known throughout the world for its size (more than 300,000 employees), strict dress code (white shirts, dark suits and ties) and immense revenues (larger than the GNP of many countries), IBM was the model of success through ordered bureaucracy. Because of its size, IBM was often slow to react but always delivered on schedule. Therefore, when the Apple III team learned that IBM's first PC would come out at the same time as Sara, "we all decided to work flat out and make sure that the Apple III shipped first," says Richard Jordan

For Steve Jobs, the prospect of IBM entering the PC market was both frightening and invigorating. "Big Blue epitomized everything Jobs hated ... faceless corporations selling computers that only experts could understand," says Manock. IBM promised stability by using its size to create a de facto standard. Yet Jobs viewed that as a way to stifle innovation and extend its control from mainframes to

the desktop. "Steve figured the only way to beat IBM at its own game was to build a computer for people who didn't understand computers, a computer for the rest of us," says Manock.

But the one essential ingredient missing from the Apple III was Jobs himself. When the program began, says Richard Jordan, "he [Jobs]would sit on your desk and talk to you ... sometimes all day." Yet once the general outlines of the project were set, Jobs moved on, assuming that the managers would handle the handle the details. By the time Jobs returned, with IBM now breathing down Apple's managers' their necks, "all the major decisions had been made, and it was too late for Steve to do anything." Even so, Jobs spent as much time as he could on the Apple III, adopting a technique that colleagues later called MBWA ("Management By Walking Around"), in which he would show up unannounced and walk from cubicle to cubicle, inspecting each person's work, praising those who were doing a good job and challenging those who weren't, even if he didn't fully understand what the person was trying to do.

"In his quest for perfection, Steve liked to put others on the defensive," says Manock. "He'd fix his eyes on you in an intimidating stare, then bear down in a way that would make you break out in a sweat ... then praise you later in the day to make you work harder still."

After a few weeks of MBWA, Jobs realized that the Apple III was in trouble. Yet because it had been mentioned in Apple's initial public offering, the company had no choice but to ship it on schedule. As the date approached, the project entered 'crash and burn' mode, forcing Jerry Manock to bring in another designer—Bill Dresselhaus,

who had just been hired to begin work on Apple's next project, the Lisa—to help finish the case. Dresselhaus's assignment was simple: give the Apple III an angled front bezel and appropriate detailing around the floppy disk slot using the same 45-degree chamfers and brown color that Manock had used on the Apple II. Yet Dresselhaus suggested a sleeker case with tighter corners and no chamfers. When Dresselhaus showed his sketch to Jobs, "he [Jobs] seemed to like it ... then changed his mind, saying that it looked too much like Olivetti, which I considered a strange comment, since Olivetti's design was at that time considered the best the world." Rather than experiment with the design at the last minute, Jobs fell back on the tried-and-true style that had worked so well on the Apple II, which Dresselhaus implemented, then moved on to the Lisa.

As the engineers warned of trouble, they were told "any problems that hadn't been fixed by the ship date could be ironed out during the first month of production," says Jordan. "But that proved a fatal mistake."

Another problem was software. Because of the rushed schedule, Apple's programmers didn't even see the computer until nine weeks before it was supposed to be shipped. As a result, programming and operational manuals had to be reviewed on the same day that mechanicals shipped to the printer, allowing so many errors to slip through that an addendum had to be published. To make matters

worse, Jobs was so obsessed by secrecy that he revealed as little as possible about the Apple III to outside hardware and software developers. Thus, no add-on products or "killer applications" appeared when the product was introduced.

After a fitful ramp-up, production went forward in May 1980, even though half the units coming off the line wouldn't function. Those that did work were shipped to dealers, functioned for a short time, then displayed the words: "SYSTEM FAILURE." Whenever technicians removed the circuitboard from the case, the computer would come back to life. Yet once the circuitboard was put back, it went dead again. Initially, the engineers blamed the problem on manufacturing, then on Manock's aluminum chassis. Yet further analysis showed a range of problems: connectors that wouldn't connect; screws in the case that pierced cables inside the machine; and a circuitboard that was so densely packed, it tended to short out. The real problem, however, was not the machine. It was the culture of invincibility that had grown up inside Apple.

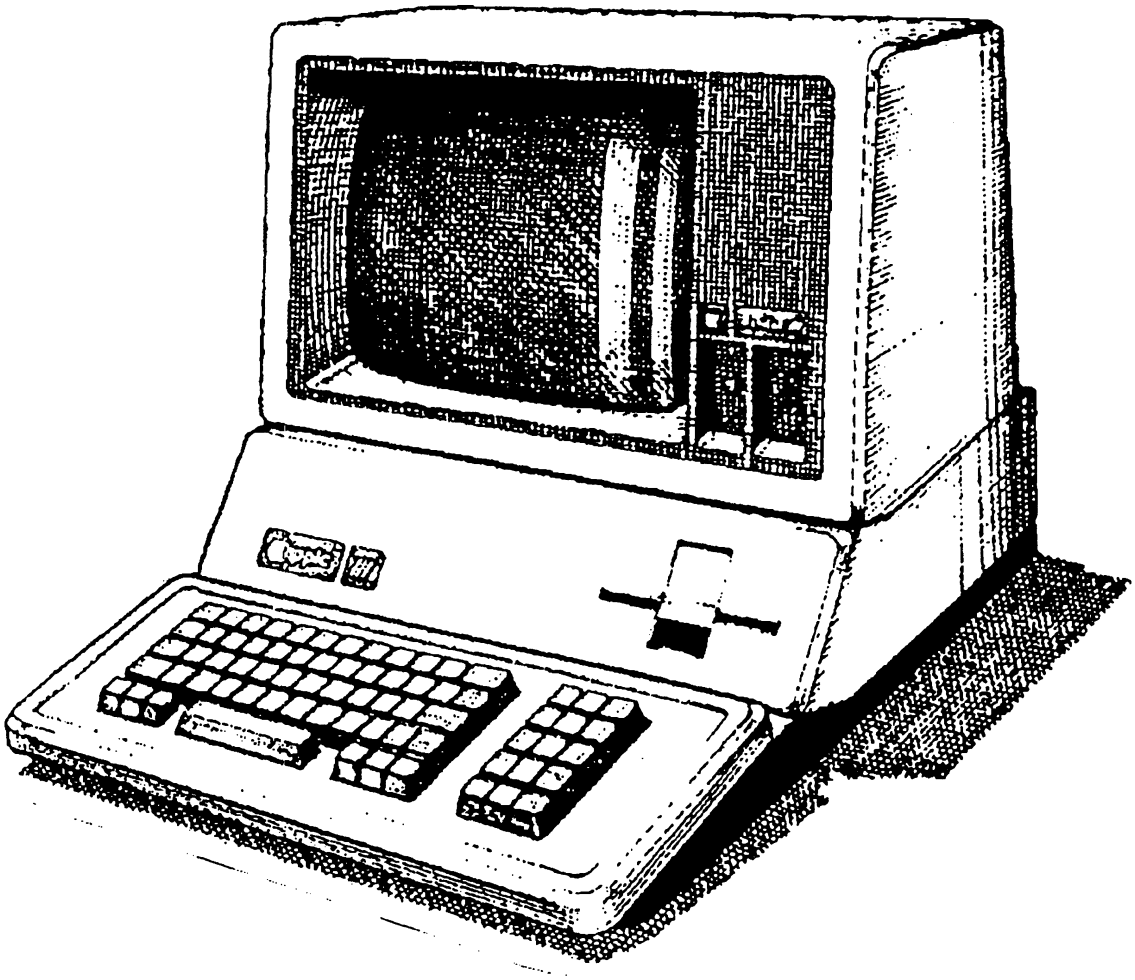
"When Jobs realized what had happened, he was dumbstruck," says Jordan. "After the Apple II, he never imagined we could fail." Eventually, the assembly line was stopped, the problem corrected, and the product relaunched—leaving a gap in the market that IBM filled with its first PC computer in August 1981, giving Big Blue a toehold in the desktop computer market at a critical moment.

Despite the Apple III debacle, Apple's initial public stock offering on December 12, 1980—4.6 million shares priced at $22 per share—quickly rose to $29 and sold out within minutes. By the end of that first day of trading, Apple had a combined market value of $1.778 billion, which made it the largest IPO since the day Ford Motor went public in the 1950s. Going public not gave Apple the funds it needed to pursue future projects, it earned Jobs, Wozniak, Markkula, and a handful of Apple employees and insiders a huge windfall. Jobs' fifteen percent share would soon be worth more than $250 million.

Meanwhile, in a bid to end the confusion that had attended the Apple III, president Mike Scott conducted Apple's first reorganization (known as a "reorg") in January, splitting product development into three groups—Personal Office Systems (Apple II/III), Accessory Products (disk drives, printers, modems) and Professional Office Systems (the Lisa division)—while increasing product R & D spending to $21 million, three times the amount spent in 1980. By March, however, the reorg had created such a backlash among employees that Mike Markkula—the stabilizing force in every crisis during Apple's early years—replaced Scott as president, causing Jobs to replace Markkula as chairman, and Scott to become vice-chairman, a ceremonial role that he eventually quit.

Ironically, Scott's reorg came at the perfect time. After two years of uncontrolled growth, when tiny one-product companies sprung up like mushrooms across Silicon Valley profiting from the boom in personal computers, the first industry shakeout was under way. Like most downturns, it was brutal. But Apple's reorg, plus news that the company had shipped $1 million worth of products on a single day in March 1981, persuaded Wall Street that the company would turn itself around, which it soon did. Paradoxically, the arrival of the IBM-PC in 1980 was good for Apple, since it brought the legitimacy of the world's largest computer firm to a market that needed some stability. To thank Big Blue, Apple ran a full page advertisement in *The Wall Street Journal,* with tongue firmly planted in cheek, proclaiming: "Welcome IBM, seriously." By May 1981, the shakeout was over, by which time Apple was already into its next major development.

Apple III Computer Information



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