

Forget about adding “bells and whistles” that the average person doesn’t want, need or know how to use. The hot-selling Palm V series is broadening Palm Inc.’s vast market lead by emphasizing qualities that were previously unavailable in handheld computers – namely, sleekness and style.

Beyond Techno Gadget

The desire to be beautiful as well as useful may not seem like a radical idea. But as recently as four years ago, it seemed like a bold, if not frivolous, goal to high-technology manufacturers who were convinced that consumers were only interested in functionality and not in how the product looked. It took the transformation of the chunky but likeable Palm Pilot into the sleek and ragingly popular Palm V to move great design from an afterthought to a necessity.

The odyssey toward this design awakening begins back in March of 1996, when Palm Computing unveiled its original Palm Pilot, a handheld computer based around the novel idea of simplicity – or what its inventor, Jeff Hawkins, described as “Do one thing. Do it well.” For an industry that loves to flaunt its technological prowess by packing layer upon layer of functions onto its products, such restraint was virtually unprecedented. But consumers loved it. The Palm Pilot became the fastest-selling computer product ever.



Of course, the Palm Pilot’s success quickly drove new competitors into the field, all with the intention of one-upping Palm with features like vibrating alarms, voice recording elements and greater memory.

But Palm didn’t waver from its belief that simplicity was its competitive edge. Even with giant Microsoft threatening to make inroads in Palm’s market share by offering PDAs (personal digital assistants) with four times more memory, Hawkins resisted going *mano-a-mano*, byte-to-byte. “Who cares,” Hawkins recalls thinking. “I don’t need eight megabytes; I can’t even fill up two. Let’s show the world that this isn’t about speeds and feeds.... It’s about simplicity.”

Hawkins reached that conclusion early on when he was still trying to envision what features the original Palm Pilot should include. Back then, he carried a crude wood prototype, about the

size of a deck of cards, in his pocket as he considered how customers would use such a device throughout the course of a day. At staff meetings, he sometimes even pulled out his wood block to scrawl imaginary notes on the “screen.” The experience convinced him that the product should compete with paper rather than larger computers, and stick to basic functions, i.e., storing addresses, phone numbers, a calendar and to-do list, but do it faster and more conveniently.

As Palm considered enhancements to its original product, simplicity remained key to its strategy. Instead of adding features just for the sake of adding features, the company again took the road less traveled by focusing on style and elegance. At the time, the customer base for handheld computers was largely early techno-adopters and men fascinated by electronic gadgets. Female users represented a vast and virtually untapped market. Palm realized that if its product

was ever to gain mass consumer appeal, it would have to look and feel less like a machine and more like an accessory.

To accomplish this, in late 1996 Palm turned to IDEO, known for contributing to the design of thousands of new products from the computer mouse to a portable heart defibrillator. Within IDEO, Dennis Boyle, Palo Alto studio manager and a senior project leader, was seen as a natural choice to lead the Palm V project. Boyle was known at IDEO as the guy who introduced the firm to the “Tech Box,” a treasure trove of hundreds of odd objects and materials, from teeny switches and Kevlar swatches to mood rings, that IDEO designers and engineers could rummage through for ideas and inspiration. Boyle led off the Palm project by showing his team a range of sleek products that he admired: a Sony MiniDisc player, a Canon Elph camera, a Panasonic minitape recorder, Pentax opera glasses. Placed next to these, the putty-gray Palm Pilot looked clunky and homely.

It also paled when compared to the thin, ultralight Motorola StarTac cell phone that debuted about the same time, and sold for upwards of \$1,000 at a time when many cell phones were being given away. Boyle recalls that Hawkins walked into one of their first meetings with a StarTac. “Jeff remarked that there was something about it that had visceral impact. It’s so small and beautiful. It really grabs you. He asked if we could create something with the same emotional quality.”

For the Palm project, code-named Razor, as in “thin as a razor,” IDEO outlined plans for a slimmer, sleeker version of the existing handheld organizer. Two major goals were to reduce the thickness from 19mm to 11mm and the weight by one-third.

What other changes should be made, the IDEO team asked itself. To learn more about user preferences, Boyle distributed dozens of Palm Pilots to colleagues, business friends, soccer moms, physicians and other potential users. Inside IDEO, more than 200 staffers started using Palms and providing feedback through email and informal hallway discussions. Along

with praise for the product, “testers” reported problems, ranging from design flaws to minor annoyances. The product was prone to breaking when dropped. The case was too rigid. The battery door was badly placed. The stylus storage was inconvenient. Boyle’s team took note of all of these complaints.

Special attention was paid to female comments, since Palm’s initial research showed that at least 95% of Palm users were men. To gain more insight into what appeals to women, Boyle brought two female design engineers – Amy Han and Trae Niest – onto the team

as project leaders. They, in turn, corralled 15 female IDEO workers to critique the product.

They peppered Boyle’s team with all kinds of questions. “They asked, why does it have to be square and corner-edged? Why gray? Why not curved, tapered and graceful?” Boyle recalls. “They even asked why these things have to be sold in electronics stores. That’s a guy kind of place. Why not places where women shop, like Nordstrom?” Even the Palm

Pilot ad showing a man slipping the product into his breast pocket bothered them. Guided by their responses, the IDEO team determined that the new Palm V should have more universal appeal and softer edges.

The team also recognized that it had to solve three major design issues: 1) how to attach the stylus and other accessories without resorting to the makeshift holders many users had developed on their own, 2) power management and 3) the casing. They addressed these issues by following IDEO’s standard practice of rapid prototyping, which stems from the firm’s philosophy that you learn as much from a model that’s wrong as you do from one that’s right. Or as IDEO founder David Kelley says, “Failure is part of IDEO’s culture. We call it enlightened trial-and-error.” Encouraged not to hold back, IDEO staffers go through dozens of design iterations, producing crude but fast prototypes that they can critique and build on.

Boyle, who holds to the philosophy “Never go to a client meeting without a prototype,” made sure that his staff always had something new to show at weekly

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PROTOTYPE PHOTOGRAPHY: COURTESY OF IDEO

Design Philosophy

IDEO considers frequent, rapid prototyping the key to innovation. Founder/CEO David Kelley explains, “[Researchers at larger companies] are afraid of looking bad to management, so they do an expensive, sleek prototype, but then they become committed to it before they really know any of the answers. You have to have the guts to create a straw man.” Fast prototyping, IDEO believes, quickly eliminates bad ideas, letting the best funnel through to the end.



Stylus Prototypes

Through prototyping, IDEO designers explored ways to make a stylus that felt comfortable in the hand yet attached unobtrusively to the Palm V. Among the features they considered were weights to make the pen heavier; springs to make it longer or thicker; and grooves, grips, or magnets for attaching.

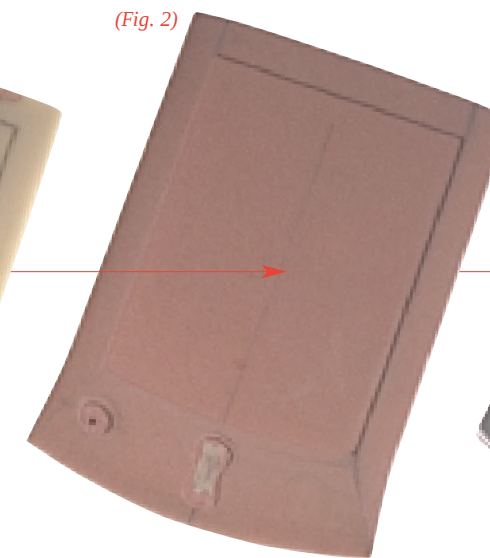
Prototype Progression As the prototypes become more detailed and finely rendered, the final model looks very close to the actual product.

(Fig. 1)



Low density foam form study

(Fig. 2)



High density foam ("red stuff") form study

(Fig. 3)



Phase One industrial design prototype with stylus concept

(Fig. 4)



Machined engineering check prototype

(Fig. 5)



Final industrial design prototype

(Fig. 6)



Preproduction prototype

Thin Is In

Small enough to fit into a purse and attractive enough to pull out at a party and not come across as a geek, the Palm V proved that consumers would be willing to pay more for a beautiful organizer, even if its functions and processing power basically stayed the same as its predecessor.

Stylus Rail

The Palm Pilot is thicker than the Palm V and has only one rail for the stylus. The Palm V's two rails accommodate a stylus and removable leather cover, which can be placed on either side depending on whether the user is right- or left-handed.

Top-Edge Functions

The top edge of the Palm V incorporates ● a green on-off button as well as ● an infrared device to beam data from one Palm to another, and ● a software control button to adjust screen contrast.

Batteries Required

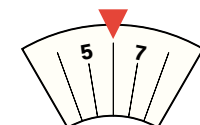
The need for two AAA batteries dictated the minimum thickness and weight of the Palm Pilot and the placement of the enclosed stylus holder. The Pilot is held together with screws, while the Palm V is secured with industrial glue to retain its smooth surface.



shadow
wrong
side

← .65" →

4.7"



Weight: Six Ounces

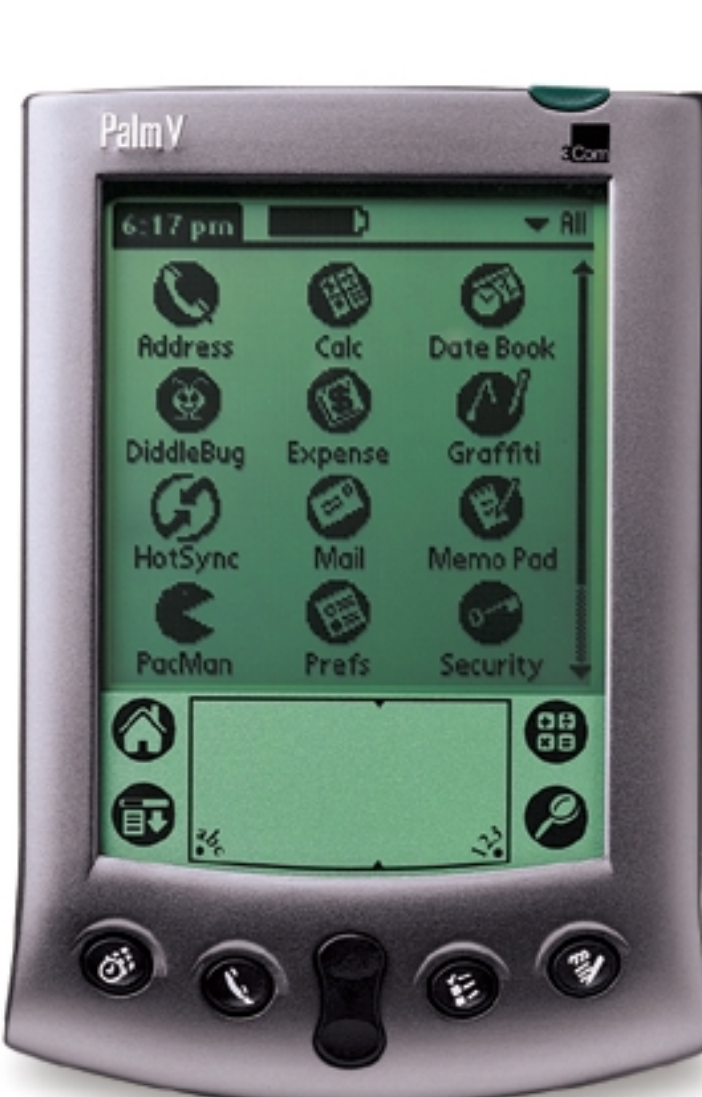
← 3.25" →



Boxy Appearance

Both the Palm Pilot and Palm V perform basically the same task-based functions, but the Pilot is boxier, with a less elegant battleship-gray plastic casing and an LCD screen that is difficult to read at certain angles.

← 3.1" →

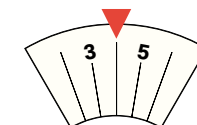


A More Elegant Form

Not only does the Palm V have a smaller footprint, it features contoured edges, recessed buttons, brushed aluminum finish, crisp backlit screen and removable embossed leather front cover.

← .4" →

4.5"



Weight: Four Ounces

HotSync® Cradle

A convenient way to keep the Palm V in view, the HotSync cradle recharges the lithium ion battery automatically and supports the transfer of data between the Palm V and desktop computer. At left, notice how the stylus fits the curve of the Palm.



Palm Pilot: 1996

Palm V: 2000

meetings with Palm. The prototype could be a one-inch square that demonstrated the on-off button, a selection of different LCD panels or styluses of various thicknesses, lengths and shapes. “This process ensures that even the smallest details are considered and the client feedback is continuous,” says Boyle.

Rough and rapid prototyping of stylus attachments, for instance, led the IDEO team through fabric pockets, hinges and eventually to a dual-rail system solution that allowed the secure attachments of peripherals without the use of moving parts, and without adding to the Palm V’s dimensions.

The power source was more problematic. To ensure a very thin product, the team knew it had to replace the two bulky AAA batteries in the Pilot with rechargeable lithium ion ones. But in 1997, lithium ion was a new technology and battery makers weren’t sure it would function properly in a device requiring frequent and brief recharging. It was left to Frank Canova, Palm’s

director of hardware engineering, to coax reluctant battery makers into helping Palm develop a solution.

The brittle and thick plastic casing had to go too, and the IDEO team identified thin-yet-rigid anodized aluminum that was being used for Japanese cameras and binoculars as an ideal alternative. But U.S. manufacturers had little experience working with the material, so IDEO turned to Japanese companies to create the working prototype. In order to avoid screws (which were considered aesthetically undesirable), IDEO arrived at a binding device never before used for a handheld organizer – industrial glue. “It took plain old trial-and-error with dozens of adhesives to get a satisfactory solution,” Boyle admits. “But in the end, it worked out well.”

Another unforeseen challenge for the project team was the change in product ownership: Before starting the Palm V, Palm Computing had been bought by U.S. Robotics, which, in turn, was bought by 3Com. (In

March 2000, 3Com spun off Palm into its own company through an initial public offering.) With the Palm V development almost complete in 1998, Hawkins also left 3Com on amicable terms to start up Handspring, a PDA that licenses the Palm operating system.

Still the project moved forward, and after almost three years in the making, the Palm V was finally introduced. The reception was as enthusiastic as for the rollout of a new luxury car. People didn’t hesitate to pay the higher asking price for the product, even though cheaper models, including the Palm III, were available. In fact, the primary differences between the Palm V and its sister product, Palm III, are its cool anodized-aluminum skin, rechargeable battery, and ultrathin, ultralight form.

Next to other handheld computers, the Palm V clearly looks like an elegant accessory and not an electronic gadget. Early Palm V advertisements worked to reinforce that perception, with fashion-oriented

images by portrait photographer Timothy Greenfield-Sanders, who photographs for such publications as *Vanity Fair* and *Vogue*. One showed a female dancer, naked and kneeling, with the Palm V resting in her hand. Block letters read “Simply Palm.”

Presenting a handheld computer like a fashion accessory is a radical departure from the typical marketing pitches aimed at geeks and early techno-adopters. In significant ways, the ad signaled a coming of age for technology. Now that computers are found in everything from cars to toys, they are no longer their own distinct category. “Technology is integrating into designed products that we use, wear, and ride in,” Boyle agrees. “It has become like the wristwatch which has a very sophisticated mechanism inside but has evolved to a stage where people take that for granted. People buy the watch that looks beautiful and is a pleasure to use. Now they are coming to expect that of computer devices too.”

The Palm Line

Evocative of BMW’s 3, 5 and 7 series, Palm’s numbering system for its product series captures some of the glamour of the luxury car industry while targeting different market segments. The Palm III series appeals to the young, sporty crowd. The sleek Palm V exudes style and taste. The Palm VII with its wireless Internet access suggests power and success.



Personalized Accessories

Palm’s success has spawned an array of accessories, including a broad choice of carrying cases. Designed by IDEO, this case matches the contour of the Palm V.

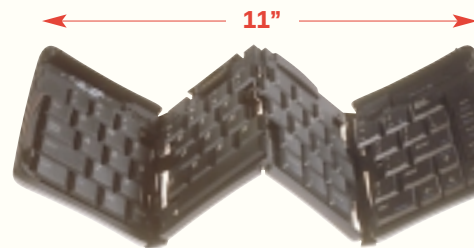


Portable Keyboard



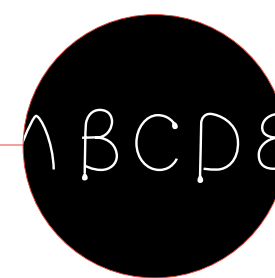
(Actual size relationship)

To date, more than 100,000 developers are creating software and hardware applications for the Palm OS platform. This portable keyboard, designed by Pentagram for Think Outside, lets Palm users type into a full-size keyboard while on the road. It folds down neatly into its own aluminum case, which is small enough to tuck into a purse or pocket.



Graffiti Symbols

Users can write on their Palm organizer by using a built-in handwriting recognition system, called Graffiti. The handwriting strokes made with the stylus appear as printed characters on the screen.



Palm V Modem

The Palm V’s modem echoes its shape and thin, lightweight design. With the modem attached, the organizer is still small enough to slip easily into a shirt pocket.



Website

On Palm’s website, e-tailing begins right on the home page with a lively pitch for Palm’s new budget-priced “m100” handheld organizer aimed at entry-level customers.

