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Jef Raskin Information

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CANON'S CAT COMPUTER:

THE REAL MACINTOSH

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Canon's Cat Computer: The Real Macintosh

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This paper was written for *Historically Brewed*, the newsletter of the Historical Computer Society of El Paso, Texas. Contact Mr. David Greelish at CompuServe address 100116,217 if you're interested in old computers and want to read fascinating stories about such computers and the people behind them.

If many faultes in this paper you fynde,
Yet think not the correctors blynde;
If Argos heere hymselfe had beene,
He should perchance not all have seene.

Richard Shacklock   (1565)

INTRODUCTION

In 1987 Canon USA Inc. released a new computer named the Canon Cat. This computer was targeted at low-level clerical workers such as secretaries. After six months on the market and with 20,000 units sold Canon discontinued the Cat. The Cat featured an innovative text-based user interface that did not rely upon a mouse, icons, or graphics. The key person behind the Cat was Mr. Jef Raskin, an eclectic gadgeteer, who began the design of the Cat during his work on the first Macintosh project at Apple Computer in 1979.

The design and history of the Canon Cat is a fascinating story which this paper attempts to tell. I am not a Cat owner nor have I been fortunate enough to have used a Cat. All facts within this paper are based on various documents relating to Jef Raskin and his work at Apple Computer and Information Appliance, Raskin's company that created the Cat.

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CAT HARDWARE

The Cat was a 17-pound desktop computer system containing a built-in 9-inch black-and-white bit-mapped monitor, a single 3.5-inch 256K byte floppy disk drive, and an IBM Selectric-style keyboard.
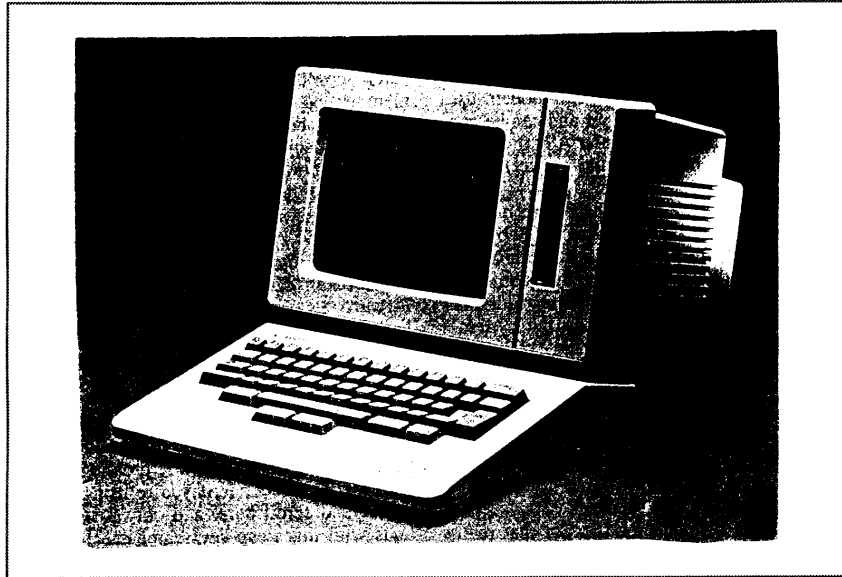

Figure 1 - The Canon Cat hardware

The product specs follow (*A Spiritual Heir to the Macintosh*):

Size	Dimensions	10.7 by 13.1 by 17.8 inches
	Weight	17 pounds
Components	Processor	Motorola 68000 running at 5 MHz
	Memory	256K bytes
	Mass storage	One 256K byte internal 3.5-inch floppy drive
	Display	9-inch black-and-white built-in, bit-mapped
	Keyboard	Compatible with IBM Selectric typewriter plus control functions on front face of the keys
	I/O Interfaces	One Centronics parallel port, one RS-232C serial port (DB-25 connector), two RJ-11 jacks (for telephone connections)
	Modem	Internal 300/1200 bps, Hayes compatible
	ROM	256K bytes
Price	$1495	

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CAT SOFTWARE

The Cat came with an extensive collection of applications stored in ROM. These applications supported word processing, spell checking, mail merging, calculator calculations, communications, data retrieval, and programming in the FORTH or 68000 assembly languages. Also present in the ROM was a spelling dictionary based on the 90,000 word American Heritage Dictionary. System setup information and a small personal user dictionary were stored in 8K of battery-backed up RAM.

The Cat's user interface made this computer unique when compared to other computers. The user interface was based on a simple text editor in which all data was seen as a long stream of text broken into pages. Special keyboard keys allowed the user to invoke various functions. An extra key titled "Use Front" acted as a control key. You pressed Use Front and then a special key to activate a specific feature. For example, the L key was marked Disk, the J key was marked Print, and the N key was marked Explain (Cat's context-sensitive help facility). Other commands existed which let you change the system's various parameters (Setup key) and reverse your last action (Undo key).

When you powered on the Cat you were presented with a display that looked like a typewriter with a sheet of paper. Black characters appeared on a white background. A ruler bar appeared at the bottom of the screen. The Cat's memory held around 160K of data which was equivalent to 80 single-spaced printed pages.

You moved through your data using two extra keys called Leap keys located in front the spacebar key and by typing strings of characters. The Cat jumped to the next occurence of that string. Raskin claimed that the Cat's Leap-key search method to scroll from the top to the bottom of a page took 2 seconds, a mouse took 4 seconds, and cursor keys took 8 seconds. Larger documents increased these search ratios.

The Leap keys also controlled text selection (indicated by hilighting), deletion, copying, and moving. If the selected text was a mathematical formula one keystroke with a special key calculated the mathematical result and the answer appeared on the screen with a dotted underline overlaying the original formula. If the selected text was a computer program written in either FORTH or 68000 assembly language, then a special key let you execute the program (I don't think many Cat users did any Cat programming). You performed mail merges by selecting columnar text data and pressing another special key. Repetitive command sequences could be automated by assigning commands and text strings to the Cat's numeric keys. One special key let you dial a selected telephone number either for voice or modem communications. Data received from the built-in modem flowed into your text as if you had typed it.

The Cat used a 256K floppy disk for storage. Each disk held the entire contents of the Cat's memory in addition to system configuration parameters, the user's personal spelling dictionary, and the bit-map for the screen. When you inserted a disk the Cat read the disk's entire contents into the Cat's memory including the last saved screen image. This feature allowed users to transfer their entire Cat environment to another Cat by just taking their disk from one Cat and inserting it into another Cat.

The Cat's simple but powerful user interface received many PLAUDITS. For example, Bruce Tognazzini, a computer user interface guru who worked for Apple (he now works for Sun Microsystems), had the following to say about the Cat (*TOG on Interface*, 2nd printing, 1992, p. 182):

There are some really good abstract interfaces, ... Jef Raskin's Canon Cat interface is another. ... Before he left the (Macintosh) project, Macintosh was far more dependent on the keyboard, and Raskin knew what to do with the keyboard, too. For example, the Find function on the Canon Cat is some 50 times faster than the same function on the Macintosh. Raskin didn't use "Command-key equivalents": he designed a true keyboard interface from the ground up.

Ezra Shapiro in his *A Spiritual Heir to the Macintosh* article had the following to say about the Cat:

The Cat represents an eye-opening new approach to data storage and retrieval; it will surprise anyone who thought that interface design was a dying art. Though the basic configuration appears on the surface to be a flexible word processor, the Cat's computational, macro, and programming capabilities make it quite possible to build data structures that emulate spreadsheets and databases.

Raskin had the following to say about the Cat and the Apple Macintosh in a personal letter dated July 1987:

It is as advanced (in terms of human interface) over the Mac as the Mac was an advance in its day.

Raskin's thoughts on the Cat's user interface and other user interfaces from the perspective of 1994 follow (*The Mac and Me: 15 Years of Life with the Macintosh*, Draft copy, May 1994):

The current paradigm of using application programs is inherently wrong from an interface design point of view. This is widely recognized, but the solution offered is to make them interoperable, which solves some of the problems but by no means all. GUIs as presently designed and used are an interface dead end. Though they can be patched endlessly, a large jump in usability can only come from a completely different approach. The Cat computer, which I developed for Canon, demonstrated that my alternate approach is implementable and both more productive and more pleasant than GUIs.

JEF RASKIN AND THE FIRST MACINTOSH

One can say that Jef Raskin began designing the Cat during his tenure at Apple Computer. He started at Apple in January 1978 as head of its publications department. From 1979 to 1982 Raskin was responsible at Apple for a research project called Macintosh. He resigned from Apple in February 1982 when he was Manager of Advanced Systems over a disagreement with Steve Jobs, one of Apple's founders, concerning the Macintosh's direction. Steve Jobs took over Macintosh development and the Macintosh became a mini-Lisa computer which was totally opposite of Raskin's ideas for the Macintosh.

In Raskin's paper *The Genesis and History of the Macintosh Project* (February 1981) he provided his thoughts on the main software design criteria for the Macintosh:

> *My concepts in designing the software were extreme ease of learning, rapid (and thus non-frustrating) response to user desires, and compact and quickly developable software. Key elements in designing such a system are freedom from modes, the elimination of "levels" (e.g. system level, editor level, programming level), and repeated use of a few consistent and easily learned concepts. Such software also leads to simple and brief manuals without having to sacrifice completeness and accuracy. The editor is similar to the LISA editor but does not require the expensive mouse. A careful study showed that it is probably faster to use than a mouse-driven editor -- although it is probably not as flashy to see when demonstrated in a dealer's showroom.*

In 1994 Raskin had the following to say about the original Macintosh's software design (*The Mac and Me: 15 Years of Life with the Macintosh*):

> *My unifying software originally was to be a graphics-and-text editor within which applications could run as additional commands (via menus), all input and output being through the interface designed for the editor. Later, the PARC desktop metaphor was adopted from the Lisa group (and that from the Xerox Alto and Star computers). Due to the incredible work of the Mac software team, the necessary code was designed and squeezed into a Toolbox that fit into a relatively small ROM (Read Only Memory) that we could afford to put into the product.*

Raskin also had some interesting comments to say in one of his many Macintosh design memos concerning the intended users of the Macintosh (*Design Considerations for an Anthropophilic Computer* , 28-29 May 1979):

> *This is an outline for a computer designed for the Person In The Street (or, to abbreviate: the PITS); one that will be truly pleasant to use, that will require the user to do nothing that will threaten his or her perverse delight in being able to say: "I don't know the first thing about computers".*

The Macintosh's early hardware design was very similar to the Cat's design. One early Macintosh design from January 1980 provided a small screen, a keyboard, and two vertical built-in disk drives. Also present in this early Macintosh design was a built-in printer.
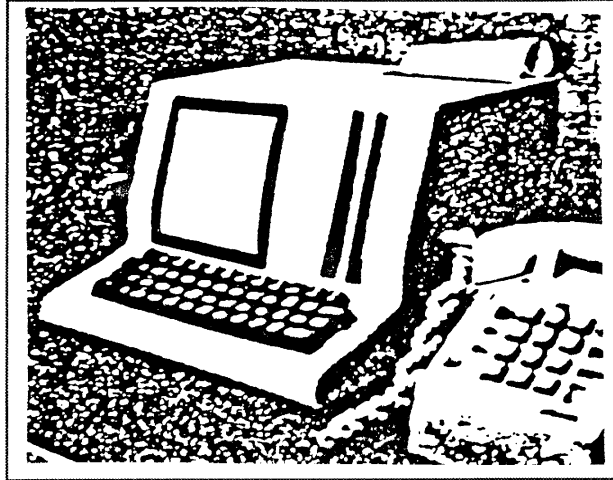
Figure 2 - Preliminary Mock-up of Macintosh computer (circa January 1980)

INFORMATION APPLIANCE, THE SWYFTCARD, AND THE CANON CAT

The company that Jef Raskin founded in 1984 to implement his computing ideas was located in Menlo Park California and was named Information Appliance Inc. Raskin's ideas about computers and the basic concepts for this company are summarized in his white paper *Information Appliances: A New Industry* (February 1986):

> *One of the prophets of the personal computer industry, Alan Kay, has said that the true personal computer has not yet been made. I disagree. We have, as the ancient curse warns us, gotten what we asked for. We do indeed have computers being bought by individuals for themselves; they are "personal computers". The problem is that many of us didn't want computers in the first place -- computers are merely boxes for running programs -- we wanted the benefits that computer technology has to offer. What we wanted was to ease the workload in information-related areas much as washing machines and vacuum cleaners ease the workload in maintaining cleanliness.*
>
> *By choosing to focus on computers rather than the tasks we wanted done, we inherited much of the baggage that had accumulated around earlier generations of computers. It is more a matter of style and operating systems that need elaborate user interfaces to support huge application programs. These structures demand ever larger memories and complex peripherals. It's as if we had asked for a bit of part-time help and were given a bureaucracy.*

Information Appliance's goal was to create a computer system that would be both powerful and easy to use. The company developed a prototype Cat system code-named "SWYFT". Doug McKenna, a former company director and now the key person behind the Macintosh development tool Resorcerer, said that he proposed that "SWYFT" be read as "Superb With Your Favorite Typing" (personal phone call, 15 June 1994). Funding for this company came from around a dozen venture capitalists.

Raskin's business plan was to create and market the Cat using only Information Appliance. But the company's backers thought Information Appliances could not do this as well as a bigger and already-established company. As such, the venture capitalists talked with several computer companies that had an interest in the Cat and selected Canon to market the Cat. Canon was responcible for giving the "SWYFT" the product name "Cat" (Doug McKenna, personal phone call, 15 June 1994).

While the Information Appliance engineers developed the Cat the company's venture capitalists thought it would be beneficial for the company to release some of the Cat's technology as a small board-based product. The result of this was an add-on plug-in board for the Apple //e computer. This card was called the SwyftCard, a name which obviously was based upon the Cat's code name. The SwyftCard's retail price was $90. It is interesting to read Raskin's comments concerning the origins of the SwyftCard (*Programmers at Work*, p. 237):

> *We didn't get into business to produce a board for the Apple //e, but it seemed like such a good idea that I would have felt very bad not to have released the product. I saw a lot of good products at Apple and Xerox pass from desktop to desktop, and never get to the market.*

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Information Appliance wrote the SwyftCard's on-board software in FORTH, a computer language which Raskin saw as ideal for this product since it was compact and inexpensive to implement. Raskin's comments about how he hired a FORTH programmer show the distance Raskin had traveled from Apple, at least from a legal perspective (*Programmers at Work*, p. 238):

> *I went out and hired a FORTH programmer and a few other people, mostly personal friends of mine. Nobody from Apple. I didn't touch the company. I didn't want to get into any legal hassles, and Apple was nasty enough then that I worried about such things.*

The SwyftCard was well received by those who used it. One magazine reviewer had the following to say about the SwyftCard (David Thornburg, *The Race goes to the Swyft*, p. 86):

> *SwfytCard is a small, multipurpose circuit board that plugs into slot 3 on an Apple //e, turning it into one of the most useful tools you could ever want for word processing, information retrieval, calculation, BASIC programming, and -- if you have a modem -- communication. SwyftCard has accomplished something that I never knew possible. It not only outperforms any Apple II word-processing system, but it also lets the Apple //e outperform the Macintosh.*

The SwyftCard reviewer also had the following to say about the philosophy behind the SwyftCard (p. 89):

> *SwyftCard was the result of extensive thought about how people might want to use computers if they had a choice in the matter, and as a result is a spectacular piece of programming.*

THE CAT'S DEMISE

After six months as a product, Canon discontinued the Cat in 1987. Bruce Tognazzini, a computer user interface guru, had the following to say about the Cat's demise (*TOG on Interface* , 2nd printing, 1992, p. 182):

> *The Canon Cat did not sell well, but this should be attributed to the hardware on which it ran, as well as Canon's decision to target this ideal interface for professional writers almost exclusively to low-level clerical workers, who didn't need its functionality and were confused by its "invisible" interface.*

Some people have said that the reasons for the Cat's demise were political. One story says Canon's electronic typewriter and computer divisions fought for control of the Cat. Canon's president learned of this fight and ordered the divisions to resolve the matter soon. The matter was not resolved and the president canceled the Cat to teach the divisions a lesson. Another story contends that when Canon wanted to invest in Steve Jobs' new post-Apple company, NeXT, Jobs told Canon that it could invest only if Canon dropped the Cat. Jobs supposedly was very hostile toward Raskin since Raskin had created the Macintosh and Jobs could not stand to be associated with him in any way. Canon did buy around 16% of NeXT stock in June 1989 for $100 million. (These last two reasons were told to me by Owen Linzmayer, the author of the forthcoming Macintosh book *The Macintosh Bathroom Reader*).

Raskin's thoughts on the Cat's demise follow (*The Mac and Me: 15 Years of Life with the Macintosh*):

> *Canon, possibly because the moribund Electronic Typewriter Division had been given the task, failed to market the product effectively, and it is now a dead Cat.*

When interviewed in 1986 Raskin answered the interview question "What do you think is the biggest problem your business faces?" (*Programmers at Work*, p. 239):

> *How in the world do you sell something that's different? That's the biggest problem. The world's not quite ready to believe. It's like in the early days at Apple, they said, "What's it good for?" We couldn't give a really good answer so they assumed the machine wasn't going to sell. But I do know the way I plan to sell my product is by word of mouth. Some people will try it and say, "This product really gets my job done. It doesn't have fifteen fonts. I can't print it out in old gothic banners five feet long, but I sure got that article finished under the deadline." That's how I can sell it. Later, people will understand it.*

In retrospect, it appears that most computer users just didn't get it when it came to the Cat.

In 1989 Information Appliance ended. Doug McKenna, one of the company directors, claimed that the venture capitalists behind Information Appliance no longer wanted to be part of what they considered a risky venture so they pulled out their financial resources causing the company to close its doors (personal phone call, 15 June 1994).

Information Appliance also had on the drawing boards at the time of its demise a 2-lb. Cat laptop. Only around two were ever built, none exist today (personal phone call with Doug McKenna, 15 June 1994).

Jef Raskin currently owns the patents that formed the Cat's core technolgy. These include a patent for the Cat's LEAP method and the saving and loading of all the Cat's RAM to disk and from disk. Information Appliance licensed several of these patents to other computer companies, but these companies did nothing with this technology.

One other comment about Information Appliance and the Cat deserves mentioning. Raskin claimed that the Cat was made on budget and on schedule, a claim that is very rare in the computing industry (*The Mac and Me: 15 Years of Life with the Macintosh*).

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REFERENCES

The following documents are useful in understanding Jef Raskin's work with the Macintosh computer, the SwyftCard, and the Cat computer. Document arrangement is by how useful I found them for this paper. Documents marked with * are present in the Historical Computer Society's library. The size of each document in pages appears at the end of each entry and is enclosed in ().

* Ezra Shapiro, "A Spiritual Heir to the Macintosh", BYTE Magazine, October 1987, pp.   121-123 (3 pages)

Susan Lammers, "Jef Raskin", Programmers at Work, 1989, pp. 226-245 (20 pages)

* David Thornburg, "The Race Goes to the Swyft", A+ Magazine, November 1985, pp. 86-89 (4 pages)

* Jef Raskin and Apple Computer, The Genesis and History of the Macintosh Project, February 1981 (5 pages)

Jef Raskin and Apple Computer, The Macintosh Research Project: Progress Report of July 1980, July 1980 (9 pages)

Jef Raskin and Apple Computer, The Macintosh Project: Selected Papers, February 1980 (171 pages)

* Jef Raskin, Information Appliances: A New Industry, February 1986 (7 pages)

* Jef Raskin, The Mac and Me: 15 Years of Life with the Macintosh, Draft copy, May 1994 (42 pages)

Owen Linzmayer, The Macintosh Bathroom Reader, Draft copy, 1994

Bruce Tognazzini, TOG on Interface, 2nd printing, 1992

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The End