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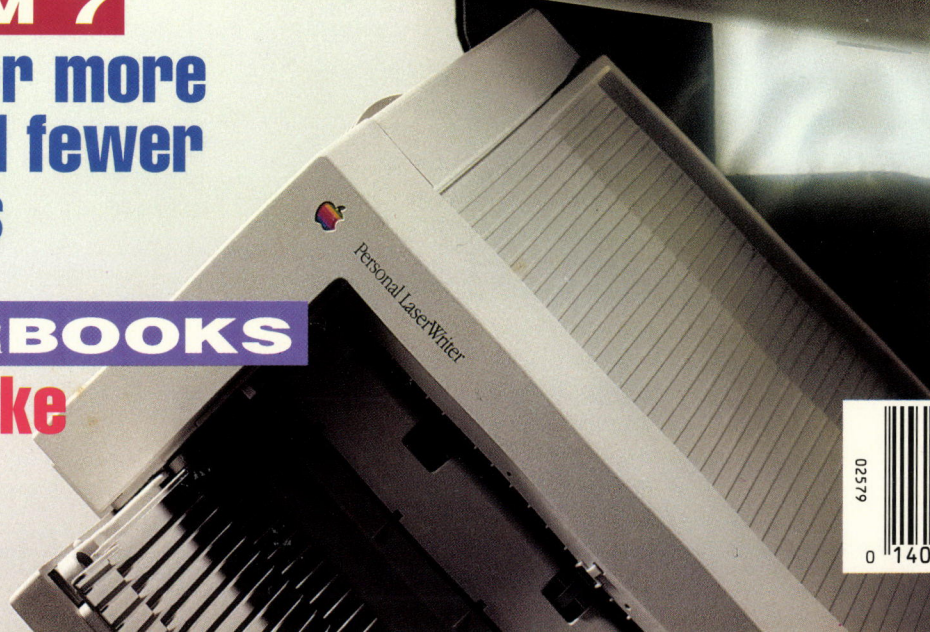
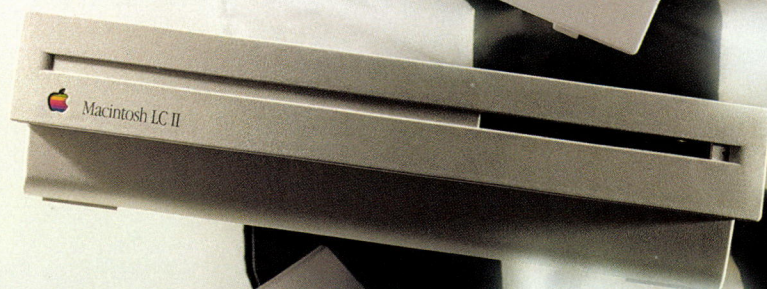
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# A Conversation with Casper



**If you think QuickTime is hot, brace yourself for a flood of new system extensions from Apple — including Casper, an intelligent agent you can really talk to.**

**A**pple-watchers have been deluged with a downpour of new hardware for the last two years. Low-cost Macs. PowerBooks to go. High-powered Quadras. Easy-to-use printers and scanners.

But over the next few years, the big story from Apple is going to shift from hardware to system software. The software enhancements we've seen from Apple in the last year or two have been significant but subtle. Most of the benefits of System 7, for example, have been transparent to most users, applicable to a small number of users, or dormant while users wait for developers to release new applications that take advantage of them.

But Apple is gearing up to open the floodgates on a torrent of new system extensions. And the new capabilities they will bring will be as immediate and obvious as the profound prowess of QuickTime. Some of the big stories you'll be reading in *MacUser* in the next few months will be about

- AppleScript, a powerful language based on Apple events, which will automate and customize your applications to do precisely what you want.

- Open Collaboration Environment, a clearinghouse of tools for consolidating, simplifying, and extending all your communications services.

- Customizable interface options for the Finder (and elsewhere) that'll make things as simple or as intricate as you want them to be.

- A new imaging model that will combine elements from the worlds of typography, printing, graphics, 3-D modeling, and animation — all compatible with QuickDraw and PostScript but fundamentally different from both.

You will also be seeing some changes in the way system software is distributed and marketed:

- System extensions will be released often, thanks to a modular architecture that doesn't require Apple to hold pieces of the system because one component is behind schedule.

- Apple will adopt an à la carte strategy, letting you buy just the specialized system extensions you need.

- Certain familiar Mac functions will follow the lead of QuickTime to other platforms.

But of all the software marvels coming soon, there's one that will really make your ears perk up: speech-based input.

"Mr. Watson, come here . . . I want you." Alexander Graham Bell's urgent but polite request marked one of the most important

turning points in the evolution of spoken communications, the very first practical telephone transmission.

A few months ago, another spoken statement marked what may prove to be an equally significant turning point. The phrase was: "Casper . . . 36-point bold."

Earlier this year, Apple CEO John Sculley spoke these words to Casper, a software "agent" living inside a Mac Quadra. Casper responded instantly to Sculley's spoken commands, changing the type on-screen as directed. Like his ghostly namesake, Casper is friendly, swift, and nearly invisible, but this Casper is more than mere ectoplasm and should be materializing on desktops within a year.

The man who gave Casper the ability to hear and respond to his master's voice is Dr. Kai-Fu Lee, the manager of Apple's Speech & Language Technologies group. At a recent preview of Casper, after Sculley had knocked the socks off the crowd up by asking Casper to change fonts, Dr. Lee continued to wow the suddenly sockless audience when he instructed Casper to make a phone call, pay a bill, and — perhaps most impressively — program his VCR.

## Can We Talk?

Speech recognition on the Mac is not science fiction; it's not even new. The Voice Navigator, from Articulate Systems, brought speech recognition to the Mac years ago, with its ability to translate spoken commands into actions.

What's new is three things: the accuracy and speed with which Casper performs, the kinds of tasks Casper was designed to handle, and the interface design for making users feel comfortable talking to a machine.

Apple set out to develop technology that anybody could use without having to train the system with examples of a user's particular speech idiosyncrasies — regardless of whether the speaker is male or female, speaks quickly, or has an accent.

Apple wanted Casper to understand sentences spoken naturally and fluidly, not as artificially articulated separate words. Apple needed speech recognition that doesn't force you to reroute your train of thought to think about the fact that you're using speech input or to worry about fluctuating levels of ambient noise and background sounds.

Apple also gave Casper the intelligence to understand what you're really asking for. For

example, when you tell Casper to "Call John Sculley," Casper knows that "Call" means to "look up the telephone number for the name I'm about to say, and establish a voice connection to that number." The catch is that the speaker must also

know the rules. You need to know that the correct phrase to make Casper do your bidding is "Call John Sculley," not "I need to talk to the ol' Scullmeister."

There's a trade-off between building more flexibility in to the syntax you can

use and the speed and certainty with which the agent responds. Without sufficient constraints, Casper's performance wouldn't be good enough to earn your trust.

Although Apple does plan to incorporate speech technology into the Macintosh, it really needs this technology for its forthcoming line of personal electronics, what John Sculley calls PDAs (personal digital assistants)—low-cost, vest-pocket-sized tools for accessing and organizing information and communicating with other electronic devices (everything from Macs to telephones to VCRs).

In the world of PDAs, there's no room for keyboards or mice. They're too big and too heavy and make you think too much. You need something more intimate, more off-the-cuff. Speech recognition fits the bill nicely but only if it works seamlessly and doesn't require exorbitant additional hardware beyond the power of a 68030 processor. In other words, Apple wants speech technology that will appeal to the least common denominator.

**Lease Comedy Nominator**


The fundamental reason computers have problems understanding free-form speech is that language is filled with ambiguities. Even a human listener hearing an isolated snippet of speech may not be able to understand it out of context.

Try this simple test: Ask a few people to read only one of these sentences aloud to you but not tell you which one they're reading:

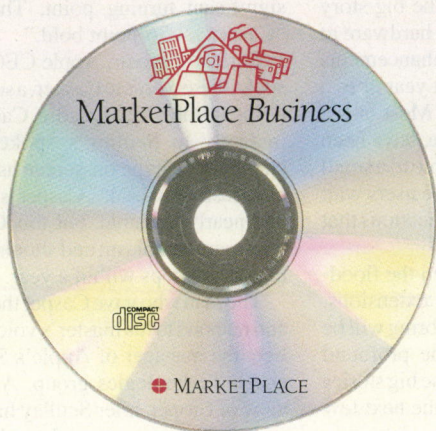
1. The least common denominator puts man in control.
2. The lease comedy nominator puts mannequin troll.

If you could tell which sentence they were reading, it had little to do with the actual sounds they were making. It had more to do with their facial expression. If their expression was one of mild confusion, they were reading the first sentence. If they looked utterly baffled, they were reading the second.

Recognizing the actual sounds of speech is not enough for free-form speech recognition. You also need to collect and understand clues about the context of a sentence or phrase.

But at the rate speech-recognition technology is progressing, the only remaining bottleneck will soon be the awkwardness of talking to a machine. Start practicing now. Holler at your VCR, and make sure to tell your Macintosh to "Have a nice day." 

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