



# AppleDirections

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## Apple News

### Gilbert F. Amelio Succeeds Michael Spindler as Apple CEO

On February 2, the Apple Computer, Inc., board of directors appointed Dr. Gilbert F. Amelio, formerly chairman, president, and chief executive officer of National Semiconductor Corporation, as chairman and chief executive officer of Apple. Dr. Amelio, 52, joined Apple's board in November 1994.

Dr. Amelio succeeds Michael Spindler as chief executive; Mr. Spindler had served as CEO since 1993, culminating a 16-year career with Apple. Mr. Spindler will no longer serve as a member of Apple's board of directors. A.C. Markkula, Jr., founding member of Apple Computer, Inc., and former chairman of the board, will continue to serve Apple as the company's vice chairman.

In assuming the positions of chairman and CEO of Apple, Dr. Amelio has resigned from his management roles at National Semiconductor, which he joined in 1991. The transformation at National Semiconductor under his leadership resulted in that company becoming highly focused on specific lines of business while achieving record financial results for the past two years.

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## Strategy Mosaic

### The Future of Mac OS Graphics

#### Compatibility Is in Your Future, but Your Future Is in Going Forward

*By Gregg Williams, Apple Directions staff*

Without graphics, your software doesn't exist. No matter how brilliant your program's computations are, if you can neither display their results on some screen or print them on some output device, your program is worthless to any prospective customer. That's why your choice of graphics system is so important: It shapes—and can even limit—what your program can display to your customer.

As Apple engineers are in the process of reengineering the Mac OS for the next decade, many aspects of the Mac OS are in flux, and some of them will present you with some difficult choices. However, in the very important realm of graphics, the situation is not as perilous—you won't lose what you have today, but you will gain important advantages if you make the transition to the newest technology.

In plain language, the QuickDraw graphics architecture (and its associated printing model, represented by the Printing Manager) will not go away—not now, not in the Copland

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# AppleDirections

Volume 4, Number 3

*Apple Directions*, the monthly developer newsletter of Apple Computer, Inc., communicates Apple's strategic, business, and technical directions to decision makers at development companies to help maximize their development dollar. It is published by the Apple Developer Periodicals group within Apple's Developer Press.

## Editor

Paul Dreyfus (AppleLink: DREYFUS.P)

## Technical Editor

Gregg Williams (GREGGW)

## Business & Marketing Editor

Kris Newby (NEWBY.K)

## Associate Editor

Anne Szabla (SZABLA)

## Production Editor

Lisa Ferdinandsen (LISAFERD)

## Contributors

Peter Bickford, Dave Curbow, Alex Doshier, Elizabeth Dykstra-Erickson, Kerry Ortega, radar pangaeon, Caroline Rose

## Manager, Developer Press

Dennis Matthews

## Manager, Apple Developer Periodicals

Mark Bloomquist

## Production Manager

Diane Wilcox

## Prep and Print

Consolidated Publications, Inc., Sunnyvale, CA

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## Editor's Note

# A Game of Telephone

Dr. Gil Amelio has replaced Michael Spindler as Apple Computer's chief executive, I hope halting the recent feeding frenzy the news media has enjoyed at Apple's expense, at least for the time being. For a few weeks after Apple announced its loss for fiscal year Q1 1996 (that is, October through December 1995), it seemed as if the business press was competing to see who could write the most sensational story about Apple and its apparent demise. This came even at a time that the company registered its highest unit sales—1.3 million Macintosh computers sold, including 1 million Power Macintosh systems—and revenues—\$3.1 billion—ever. In the words of *MacWEEK* magazine, Apple was “pilloried by the press as much as Hillary Rodham Clinton.”

Through it all, I was reminded of a game called “telephone” that I play with my children. That's the game in which several people sit in a circle and one person thinks up a complicated phrase, like “World Wide Web hypertext markup language.” That person whispers the phrase into the ear of the next person in the circle, who does the same thing to the next person, and so on, until it's announced out loud by the last person. As it's passed around the circle, the phrase is subjected to misinterpretation and miscommunication, until the last person thinks he heard something like “Webelos merit badge.”

As the story of Apple's Q1 1996 results were passed from one report to the next, facts were blurred, rumor became fact, and outsiders' guesses became Apple strategy. Let's follow the course of one such miscommunication, that “Apple was getting out of the consumer business.”

Soon after the original Q1 1996 announcement on January 10, a variety of newspapers reported that, in response, Apple would have to get out of the low-end computer market. On January 11, for example, the *Wall Street Journal* reported, “People familiar with [Apple's restructuring] plans say Apple proposes to . . . abandon or significantly retreat from the entry-level PC market. . . .”

That's when the game of telephone began: In the days following, some people interpreted that to mean that Apple would no longer manufacture systems designed for consumers, presumably finding another hardware company to license the Mac OS and manufacture Mac OS systems for the home. Next, analysts quoted in a wide number of journals said that that's what Apple would have to do to survive.

Then things really got “fun.” *Apple Directions* readers started writing me to ask if Apple was getting out of the consumer market, or at least to find out when there might be a definitive announcement. One night, as I pulled my car into my driveway, my neighbor—who works for a company that develops chips for Macintosh systems—stopped me to say, “So Apple's not going to make computers for consumers anymore.”

By the time of the January 23 Apple shareholders' meeting, by the sheer weight of the number of people saying it was true, it seemed more than plausible that Apple would retreat from its consumer business and focus only on high-end systems, presumably with higher profit margins.

During the January 23 meeting, the question arose: Was Apple getting out of the consumer market? Michael Spindler gave the definitive answer: “No,” he said. “Apple is absolutely not getting out of the consumer market or the education market.”

The lesson here is that the only way to get definitive news about Apple is to listen to what Apple says. As an Apple platform developer, you and your business depend on knowing what's going on at Apple. It might be tough to await official word from Apple on its direction, and it might be tempting to take the printed word of the daily newspaper as fact. As Apple restructures and rebuilds under Dr. Amelio, though, I think you'll want to chart your course based on what you hear from Apple—whether it's from *Apple Directions*, Guy Kawasaki's EvangeList server, Apple's Web site, or the other sources Apple provides for official Apple information.

Paul Dreyfus  
Editor

## IndustryWatch: News and Perspective

# Plenty of Business Opportunities

## Distributing Software on the Internet

Several fledgling programs will soon begin to indicate how viable the Internet is as a distribution channel for software. For example, CyberSource, a reseller in Menlo Park, California, set up a World Wide Web "Internet software store" called "software.net" (see "Internet Resources" on page 5 for the location), which sells more than 10,000 technology products. More than 300 of the products listed at software.net—many of which are software components—can be purchased and downloaded over the Internet. Also, Kantara Development is in the process of launching Part Merchant, a service for distributing OpenDoc parts from their Web site. Similarly, ObjectSoft Corp. of Englewood, New Jersey, with backing from Microsoft, has launched a subscription-based Web site called OLE Broker to distribute OLE-based development technology.

Many of the products offered at these and similar software distribution Web sites come from smaller developers, who often encounter difficulties getting their products into traditional retail channels. Larger developers, though, are moving into this new channel slowly and cautiously. A key issue for them: how to price products that flow over the Internet without endangering margins for the existing retail channel. Microsoft, for example, is testing the waters with an Internet distribution pilot program for its most popular titles. Claris, on the other hand, says that it views the Internet mostly as an information conduit for its component and template software rather than as a distribution medium.

*Implications/Opinions:* It looks to us as if the Internet is an ideal channel for distributing smaller products, especially OpenDoc-based and other component software—small chunks of reusable code created to meet a customized need. A component's small size means that Web users won't have to pay the connection fees they'd incur if they downloaded large monolithic applications. The fact that traditional channels might have difficulty figuring out how to stock and sell component software means that component developers will have to seek alternative distribution means.

Eventually, larger developers and publishers with established relationships in the traditional retail channel will solve the channel conflict issue and follow their smaller colleagues' example, if only to obtain incremental sales. For the time being, though, it appears the Internet will mostly serve as a useful marketing mechanism and electronic

distribution pipeline for smaller developers, especially if they can keep the prices of their products low.

## CD-ROM Takes Off as a Distribution Medium— At Least in the Home Market

While it remains to be seen whether the Internet will become a significant channel for distributing software, it's clear that the CD-ROM is quickly becoming today's distribution medium of choice. According to *Consumer Reseller News*, shipments of CD-ROM discs tripled between June and November last year. During that period, shipments of CDs by Verbatim Corp., a top supplier of discs, increased from 1.5 million per month to nearly 5 million per month. Signs are that CD-ROM discs may soon surpass floppy disks for software distribution, if they haven't already: The CD-ROM version of Windows 95 has so far unexpectedly outpaced sales of the floppy disk version, accounting for about 60 percent of Windows 95 sales.

*Implications/Opinions:* Shipping your product on CD-ROM can result in lower in-box costs, and the extra storage space on CDs can be used for electronic catalogs and demos that can help drive sales of your other products. But does this mean you should ship your product on CD-ROM? We think this depends on your market. If you market products to home users, you'll have a very receptive market for software shipped on CD: According to multimedia market research conducted by In-Stat and BIS Strategic Decisions, of the CD drives shipped worldwide between 1993 and 1995, approximately 75 percent were purchased by home users, a trend that's expected to continue. Similarly, the research firm INTECO concluded that entertainment, educational, and other non-work-related titles made up nearly 65 percent of the CD-based software sold in 1994 in the United States and Western Europe, a number INTECO expects to grow to 75 percent by 1998.

In other markets—namely education, business, and government—you should probably go more slowly when it comes to using CDs. Acceptance of CD technology in those segments hasn't been as high as it's been in the home market. We'll assemble more complete data on CD-ROM usage across the Macintosh customer base for a future issue of *Apple Directions* to help you make this difficult decision.

## DVD—The Future of CDs?

Apple Computer, Inc., and many other prominent computer/consumer electronics firms, including Sony, Philips, Toshiba, and Time Warner, recently announced their support of a new standard for CD-based content and software. It's called DVD, and it's supposed to let you store up to 17 gigabytes of data in a wide variety of formats on a single two-sided disc. The companies backing DVD—which officially stands for nothing, as of yet, even though some people are using the name *digital video disc*—are working together to define a specification for CDs that can be used with personal computers, televisions, stereo hi-fi systems, and video game players. Based on recommendations made by the Hollywood studios and the computer industry, specifications have now been finalized for a DVD movie player that hooks up to televisions and a

## March Apple Directions Online

March's *Apple Directions* will be available by February 15 at the following locations:

AppleLink: path—Developer Support:Developer Services:Periodicals:Apple Directions

Internet: <http://dev.info.apple.com/appliedirections/adtoc.html>

eWorld: in the Apple area of the Computer Center

DVD-ROM for computer applications. Specifications for music applications will be finalized after opinions are heard from the music industry.

DVD may create myriad opportunities for you to greatly enhance multimedia titles and application software. It's possible to present soundtracks in eight different languages or to include multiple versions of the same movie (for example, a family version and an adult version) on a single DVD disc. Because DVD discs can contain so much data, the format holds great potential for delivering applications that include far more data than today's software. Additionally, DVD is supposed to represent a leap in quality over previous CD technology.

DVD represents the merger of two groups who previously were competing to launch their own standards for the future of CD technology, MMCD (for *multimedia CD*) and SD (for *super density*); Apple had been a member of the group pushing SD, demonstrating a Power Macintosh computer using a Toshiba SD-ROM drive at COMDEX Las Vegas last November. Toshiba has announced it will ship its first DVD movie players in the second half of 1996, and it's expected that more than 100 movie titles will be available by then on DVD discs. The first DVD-ROM drives for computers are also expected by the end of the year at prices at least \$200 more than current CD drives; we haven't yet learned when the first DVD-ROM drives for Macintosh systems will be available.

*Implications/Opinions:* What's a developer to do? As if it's not hard enough to decide whether to ship your product on floppy disk or CD, soon you may have to decide whether you want to make the leap to the spiffy new DVD CD technology or if today's CD-ROM technology remains sufficient for your product. Fortunately, DVD-compliant disk drives will also read today's CDs, so your current products won't be incompatible with computers that are equipped with DVD-ROM drives. However, many industry analysts expect the new devices to catch on quickly, because for a relatively small additional cost, DVD-ROM drive customers will purchase a far more flexible technology. We urge you to read up on the new technology by visiting the unofficial DVD home page we discovered on the Web (see the "Internet Resources" box on page 5 for its location); while we can't guarantee the accuracy of the information collected at the site, at least you'll gain some familiarity with this potentially dramatic new technology.

### **DayStar's New Genesis MP—A Great Reason to Support Multiprocessor API**

DayStar Digital recently shipped its Mac OS-compatible Genesis MP computer, a workstation based on four 132-MHz PowerPC 604 processors designed for high-end media and publishing professionals. When they run applications that support Apple Computer's multiprocessor application programming interface (API), first described at the 1995 Worldwide Developers Conference, Genesis MP systems can achieve up to four times the performance of computers using single PowerPC 604 processors and up to seven times the speed of machines based on the PowerPC 601 chip. DayStar and Apple have been working together to add multiprocessor support to System 7.5 through the multiprocessor API, the final version of which Apple expects to release by March 1996. Both companies have also announced that they'll ship multiprocessor upgrade cards for PCI-based Macintosh systems early this year.

*Implications/Opinions:* We think these developments give you strong reasons to adopt the multiprocessor API in your products for

high-end professional customers, especially those in graphics, publishing, and multimedia content authoring. The first dozen products to be able to take advantage of multiprocessor performance on Macintosh and Mac OS-compatible systems are being released in the first calendar quarter of 1996, with a dozen more to follow soon. DayStar says that it's working with more than 200 developers to bring multiprocessor performance to power-hungry programs. Adobe's Photoshop, Kodak's color processor management system, Deneba's Canvas, and Apple's QuickDraw 3D are among the early products to use the multiprocessor API. If you want your products to be able to take advantage of multiprocessor performance, visit the DayStar Web page (see "Internet Resources" for the location) and request that the latest version of their Multiprocessing API software development kit be sent to you electronically, or send e-mail to [dmethven@daystar.com](mailto:dmethven@daystar.com). We'll let you know as soon as Apple's multiprocessor API is ready for release.

### **IBM Replies to Windows 95 Study**

Late last year, Microsoft released a study it conducted with International Data Corporation (IDC) that compares Windows 95 favorably to the Mac OS and IBM's OS/2. Walter W. Casey, director of marketing in IBM's Personal Software Products Division, recently responded to the study on behalf of IBM. In his response he says, "It seems clear that Microsoft carefully crafted this study to portray Windows in the best light." He goes on to say that the study's performance metrics, test conditions, and test subjects were biased, listing as examples that the study didn't include operations that involved multitasking, accessing the Internet through popular service providers, or updating spreadsheets, fax, or file documents.

*Implications/Opinions:* It's vital that this questionable study not be taken at face value. Apple issued its own critique of the study this past December, saying that it contains "serious technical and methodological flaws . . . and was not implemented well." Among Apple's concerns about the study, which concludes that Windows 95 users are "19 percent faster" than Macintosh users and somewhat more accurate in their work, are the following:

- The user sample was biased. The Microsoft users in the study were participants in the Windows 95 Preview Program, suggesting that they were early adopters or technology enthusiasts. At least 20 percent of the Macintosh users in the study were selected from a list provided by Microsoft.
- The tests were biased against Macintosh users. One test asked the user to install PostScript™ printer drivers off a floppy disk, even though Macintosh users don't normally have to do this since the printer involved in the test is automatically supported by the standard Macintosh PostScript driver. Another test asked users to determine the amount of "free disk space" and the "capacity" of the hard drive. Windows 95 uses those exact labels on screen, while the Macintosh computer uses the labels "MB in disk" and "MB available."

You can read Apple's complete response to the study at the Macintosh Advantage Web site listed in the "Internet Resources" box; the IBM Web site with the IBM response is also listed there. If you hear any of your colleagues or customers quoting the Microsoft/IDC study, you'll want to have the facts at your fingertips to disabuse them of the notion that Windows 95 is somehow superior to the Mac OS.



### In Case You Missed It . . .

Amid all the bashing Apple has taken from the press lately, there have also been some welcome positive reports in the past few weeks. We're excerpting a few of them here.

- From the January 1996 online edition of *U.S. News & World Report*:

"From a software publisher's point of view, releasing a Macintosh version makes good business sense. Production costs for Mac software are lower than those for Windows titles; less testing is required because there is a single standard for Mac hardware and software. And Macintosh owners buy 30 percent more software than their Windows counterparts."

The article also reports that Best Buy, CompUSA, Egghead Software, and other retailers have decided to dedicate more shelf space to Macintosh software and lists U.S. mail-order sources—and their toll-free phone numbers—for Macintosh software products.

- From *MacWEEK*, January 15, 1996:

In a story called "Mac Vendors Rebound as Sales, Earnings Jump," *MacWEEK*'s Jon Schwartz reports how a variety of Macintosh developers "considered moribund just a year ago have . . . taken advantage of the Mac market and . . . are bouncing back." He quotes Rick Wyand, CEO of STF Technologies, Inc.: "Despite all the bad news . . . people overlook that Apple is a \$12 billion company and there are plenty of business opportunities for developers. Plus, the Mac's development and support costs are significantly lower than those for Windows-based machines."

- From the *San Francisco Examiner*, January 18, 1996:

"The whole PC industry is moving toward becoming more 'Mac-like,' which means that buying a Macintosh is a good choice since it is already where the other PC makers would like to be. The Macintosh has been around since 1984, and it still offers a better user interface. Also, virtually every major software package is available in a Macintosh format."

- From the January 23, 1996, online edition of *MacWEEK*:

In his Off the Record column, Editor Mark Hall writes about a dinner he shared with two Macintosh hardware vendors in which his guests indulged in some light-hearted Apple bashing. He writes: "Their tone was light, even humorous. They were enjoying themselves.

"The reason for their good humor became obvious when I guided the discussion away from Apple and to the CEOs' own operations.

"'Best year ever,' bragged one.

"'Me, too,' chimed in the second. 'Record sales and profits.'

"'I don't give a hoot if Apple ever makes a dime,' said the first, 'so long as they keep selling all those Macs.'"

- From the *San Francisco Chronicle*, January 22, 1996:

In a letter responding to the Chronicle's negative reportage about Apple, a reader writes:

"When you say something nice about the Macintosh, you still manage to say something nasty at the same time, complaining about the 'continuing dearth of software.'

"Continuing dearth? Seen a *Mac Warehouse* catalog recently? It's 200 pages long! There's typically two or three products available, off the shelf, in every category!

"I suppose you'd rather have the situation that exists in the DOS/Windows world, where there's such a glut of half-baked, half-implemented, and half-supported products that companies doing development are going under left and right."

*Implications/Opinions:* When a company adds 30 percent in one year to its customer base—already the most loyal group of customers in the personal computer market—it must be doing something right. Last year, Apple sold approximately 5 million Macintosh systems, giving the Macintosh computer an installed base of more than 20 million. These huge numbers are creating a phenomenon marketeers like to call "pull" in the marketplace: That is, customers are demanding more Macintosh computers, and more Macintosh products. We're glad to see that some writers are avoiding the rumor, and innuendo, and, instead, are reporting Macintosh success stories.

### Two New Japanese Macintosh Magazines Hit the Stands

Two new Macintosh magazines recently began publication in Japan. The first, *Mac People*, is aimed at first-time Macintosh buyers. It's published by ASCII Corporation, which also publishes *Mac Power* magazine. *Mac People* rolls out with a monthly controlled circulation of 150,000 readers, and its editors hope eventually to publish it biweekly, then every week. The second magazine is called *Beginners' Mac* (nicknamed *B'Mac*). *B'Mac*, published by SoftBank, includes a CD-ROM, and starts off with a circulation of 100,000.

*Implications/Opinions:* These two magazines join an already crowded field of some 14 Japanese magazines for Macintosh users that, combined, have a circulation base of more than 1 million. This is one more sign of just how robust the Japanese Macintosh market has become in a very short period of time. If advertisers are so anxious to reach Macintosh customers that they'll support this many magazines, Japanese Macintosh users have truly become a force to be reckoned with. ♣

## Internet Resources

- See CyberSource's Internet software store, [software.net](http://www.software.net) (<http://www.software.net/tech.htm/>), for an example of how the Internet can be used as a software distribution channel.
- See the Part Merchant Web site (<http://www.partmerchant.com>) for more information about Kantara Development's Part Merchant service.
- See the DVD home page (<http://www.usa1.com>) for information about the new DVD technology.
- See the DayStar Digital Web page (<http://www.daystar.com/developer/dev-pageone.html>) to order a copy of their Multiprocessing API SDK electronically.
- At the Macintosh Advantage Web page (<http://www2.apple.com/whymac/idcresp.html>), you can find the entire text of Apple's response to the Microsoft/IDC Windows 95 study.
- At one of IBM's Web sites (<http://www.autstin.ibm.com/psinfo/msstudy.html>), you can find IBM's response to the Windows 95 study.

## Strategy Mosaic

*Mac OS Graphics**continued from page 1*

operating system, and probably not even in the time frame of Gershwin, the next version of the Mac OS after Copland.

The QuickDraw GX graphics architecture (and its associated QuickDraw GX printing architecture) is also available today. More important, QuickDraw GX will always be present in Copland and Gershwin, and it is the graphics architecture to which Apple will add most if not all of its future improvements. In addition, although QuickDraw will be supported in the more complex Copland environment, it will not be as flexible as QuickDraw GX—for example, in certain situations, you will be able to call QuickDraw GX but not QuickDraw routines.

Even though your QuickDraw-based software will continue to work with today's and tomorrow's Mac OS computers (see the figure on this page), QuickDraw GX is the graphics architecture that makes the most sense for the longest period of time:

- QuickDraw GX offers more powerful, resolution-independent graphics, superior typography, and too many other features to list here. (For details, see "Rethinking Your Applications for QuickDraw GX" on page 9 of the October 1993 issue of *Apple Directions*.)

- QuickDraw GX runs today on both 680x0-based and PowerPC processor-based Mac OS computers.

- QuickDraw GX runs on today's System 7.5 operating system, and it will run on tomorrow's Copland.

- In the future, Apple will enhance the Mac OS graphics architecture through QuickDraw GX. Therefore, if you adopt QuickDraw GX today, you will be able to take advantage of new

features with little or no extra work on your part, and customers will perceive your software to be among the most cutting-edge on the market.

- With Copland, Apple is making significant improvements to the Mac OS graphics architecture, and all those improvements will be made within QuickDraw GX. If you adopt QuickDraw GX today, your software's graphics performance will automatically improve under Copland.

QuickDraw GX is the graphics architecture you should adopt. It works with all Mac OS computers and with both today's and tomorrow's operating systems. In addition, code that uses QuickDraw GX will have the longest life span and will automatically improve in performance in future Mac OS releases.

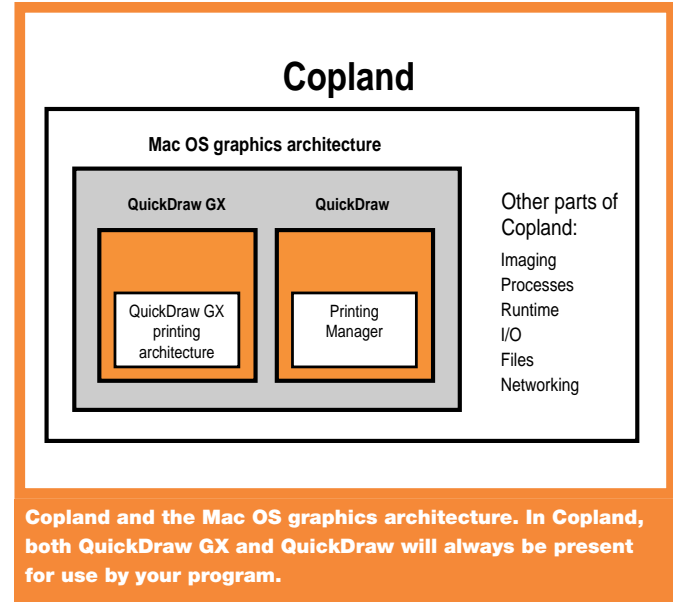
You may want to stay with the original QuickDraw for code already written, but is there any reason *not* to implement future projects using QuickDraw GX?

The rest of this article will describe the ways in which QuickDraw GX will improve under Copland and will sketch out some improvements expected in the Mac OS graphics architecture in the post-Copland time frame.

**Copland Makes Many Improvements Possible**

You can always rewrite your code to make it better, but many improvements are impossible without help from the underlying operating system. Apple engineers are using new Copland operating system features wherever possible to maximize the improvements they are making to QuickDraw GX. Here are some of the improvements being made to QuickDraw GX that depend on new Copland features:

- One of Copland's innovations is its ability to load and unload code routines as needed (in increments as small as 4K of



**Copland and the Mac OS graphics architecture. In Copland, both QuickDraw GX and QuickDraw will always be present for use by your program.**

code), thus minimizing the amount of code in memory at any one time. This feature is important to the Mac OS graphics architecture because it allowed Apple engineers to include both the QuickDraw and QuickDraw GX graphics and printing architectures without incurring a severe memory-footprint penalty. A program running under Copland will dynamically load graphics routines only as they are needed, so you can use any graphics routine (either QuickDraw or QuickDraw GX) without worrying about its effect on the memory footprint of your program.

- Under Copland, you can put blocks of code (but not applications) in their own separate address spaces, where they cannot be made to crash by any code in a different address space. The Mac OS graphics architecture takes advantage of this Copland feature to protect the font-drawing code from application crashes. Copland font scalers—the bodies of code that interpret and draw TrueType, Type I, and other fonts to screen and paper—will run as reentrant servers in separate address spaces. In addition to the memory protection that this method affords, Copland will be able to take some advantage of

the scalers' reentrancy. (Later Mac OS releases will be able to make more use of it.)

- Copland's file mapping feature will improve system performance by allowing system software to access fonts faster. File mapping "maps" the contents of a file so that they can be accessed as if they were stored in memory.

- QuickDraw GX will use Copland VM (virtual memory) to implement its backing store; the backing store stores graphics data that is used less frequently onto a disk file for recall as needed. This method will be faster, simpler, and more stable than the custom backing store that today's QuickDraw GX uses.

- Here's a case where software that uses the older QuickDraw-based Printing Manager will not look and behave as well in customers' eyes as software that has adopted the QuickDraw GX printing architecture. If you use QuickDraw GX, your printing dialog boxes will automatically be drawn using the current Copland Appearance Manager (which, among other things, allows windows and dialog boxes to be drawn in various graphic styles). Because of the unregulated method that developers must use to extend the older QuickDraw

printing dialog boxes, Copland will be unable to give them all the features of a given Copland appearance.

### More Performance Improvements

In addition to the performance improvements described in the previous section, Apple engineers are working on additional performance improvements to the Copland implementation of QuickDraw GX:

- QuickDraw GX printing under Copland will result in better system performance. All the QuickDraw GX printing code, including drivers and printing extensions, will be PowerPC processor “native” and will execute faster than QuickDraw GX currently does today on System

7.5. In those cases where the faster execution does not result in measurably faster printing—after all, printing performance is usually limited by the speed of the print engine—Copland’s multitasking will allow the time saved to be used elsewhere.

- Copland will use native Open Transport interfaces for AppleTalk access. The Copland implementation of QuickDraw GX will use Open Transport to make communication with printers faster than it is with today’s implementation of QuickDraw GX and Open Transport.

- The Copland implementation of the Mac OS graphics architecture will include a subsystem called a *type server*, which works with the available font scalers to draw text to the screen and out-

put devices. This new implementation of imaging functions will improve imaging performance in several ways.

- One such improvement is faster font downloading, which will improve printing speed over today’s LaserWriter 8.x printer drivers. This improvement will be most pronounced for fonts used for Japanese, Chinese, and Korean text.

- Another improvement comes from the fact that today’s QuickDraw GX has a fixed limit on the font cache size. The Copland implementation of QuickDraw GX will not limit the font cache size, which will increase the speed of drawing text to the screen.

### Integration Improvements

Performance is not the only way in which software can improve. The Mac OS has grown by increments for so long that the resulting operating system is harder to maintain and sometimes more fragile than Apple would like.

- A major redesign—which is what Copland is—is an excellent time to integrate add-on technologies into the operating system itself. This integration process will result in a more robust operating system and, in some cases, faster performance and better use of system resources. (In addition, Copland will grow more gracefully than the current Mac OS has, because Copland’s architecture includes various mechanisms for the stable extension of the operating system.)

Here are some ways in which Copland will improve the Mac OS graphics architecture through integration:

- The Copland graphics architecture will share code wherever possible. This will reduce the memory footprint of the operating system and will improve its reliability. One way that helps the Mac OS graphics architecture is

that both QuickDraw and QuickDraw GX will share the same type server. This will make it easier for Apple to maintain and enhance the type server’s code.

- Also, the Copland type server will include a plug-in architecture for multiple font scalers. This plug-in architecture will allow Copland customers to use any supported font, regardless of its format, in exactly the same way. Currently, the only font formats in use in the Mac OS community are TrueType, Type 1, and bitmapped fonts, but another font format, called *stroke fonts*, is especially attractive for Chinese, Japanese, and Korean fonts because it significantly reduces the font file size.

- WorldScript I (which supports scripts like Arabic and Hebrew) and WorldScript II (which supports scripts like Kanji, Korean, and Chinese) will be integrated into Copland. This integration will result in a more robust implementation of WorldScript support than is currently available under System 7.5.

- QuickDraw and QuickDraw GX will also use the same font cache, which will reduce Copland’s memory footprint by several hundred kilobytes. (Under System 7.5, both QuickDraw and QuickDraw GX use two font caches each—one for TrueType and one for Type 1 fonts—for a total of four font caches. In addition, each font cache requires separate code to access and manipulate it, thus adding to the overall memory footprint due to font caching.)

### Forward Compatibility for GX Printer Drivers

You’ve probably read that today’s device drivers will break under Copland and will have to be rewritten. That’s true, but printer drivers are separate from low-level device drivers; they live in the user mode (the same as applications) and manipulate the hard-

## Drawing Graphics to the Screen

One graphics-related question that always comes up is, “In the future, will I be able to draw video directly to the screen?” Apple recognizes that certain applications, including graphics-intensive games and multimedia titles, have a legitimate need for more drawing speed than QuickDraw and QuickDraw GX can deliver.

The official word is, “Don’t panic! You’ll still be able to draw directly to the screen under Copland.” However, two caveats bear repeating:

- Don’t write directly to the screen unless you need to. How do you determine whether you need to draw directly to the screen? Simple—write code to do the same drawing in a more “approved” method (QuickDraw GX, for example). Then, if the direct-draw code doesn’t give you a speed advantage you can’t live without, *use the “approved” method*. In many cases, the difference between the two methods is too slight to be worth the disadvantages of drawing directly to the screen.

- If you must draw directly to the screen, play by the rules. Apple has set up some guidelines that, when followed, will maximize the likelihood that your code will continue to work with future versions of the Mac OS. Believe it or not, the best set of guidelines for drawing directly to the screen were published in *develop* magazine in 1992, in the Graphical Truffles column titled “Writing Directly to the Screen” (*develop*, Issue 11, page 59). If you don’t have a copy of *develop* Issue 11 handy, you can find the article on the Web at location <http://dev.info.apple.com/appledirections/adextras/adextras.html>. You can also find it in the latest Reference Library Developer CD, using the pathname Periodicals:develop.

ware through the Open Transport driver family.

Apple engineers have designed Copland so that QuickDraw GX printer drivers and extensions, barring unrelated incompatibilities, will continue to work under Copland—a fact that is of interest to the relatively few vendors who supply printer drivers. For details on who is affected by this situation, see the “Errata and Clarifications” on page 36 of the January 1996 issue of *Apple Directions*.

### Beyond Copland

Although Apple is quite occupied (thank you very much) with getting Copland out the door, its plans for the Mac OS go beyond Copland to include features that cannot be accomplished—especially with backward compatibility in mind—in one step. (Two such features are protected address spaces for each application and full multitasking.) Still, I can pass along some goals that Apple has for future operating systems with

regard to the Mac OS graphics architecture:

- Future versions of the Mac OS beyond Copland will offer more reentrancy in graphics routines. QuickDraw will become reentrant across applications (or, more precisely, processes), but because of its internal design, it can never be reentrant across tasks within a single application. QuickDraw GX, on the other hand, will be reentrant across both processes and tasks.

- Apple expects to add low-level hardware graphics acceleration—that is, hardware assistance in drawing simple geometric shapes—to the Mac OS in the Copland time frame. After Copland, Apple has plans to add high-level graphics acceleration—that is, hardware support for drawing more complicated graphic objects—to the Mac OS.

- Finally, expect to see more integration between QuickDraw, QuickDraw GX, and the Toolbox in future versions of the Mac OS,

both in Copland and later operating systems.

### Clear Choices

Before I started researching this article, I was unsure of QuickDraw’s status in the Copland time frame and beyond. But the message I got from Tom Dowdy, the Macintosh System Software graphics technical lead, was clear: QuickDraw will be present in Copland and probably for the foreseeable future after that, but QuickDraw GX—which is also available today—is the architecture within which future innovation will take place.

Frankly, QuickDraw GX looks like a pretty attractive technology to adopt right now. It runs on today’s Mac OS computers (both 680x0 and PowerPC processor-based models). It runs today under System 7.5, and in the future, it’ll run even better under Copland. It gives you some very attractive features (look at Lari Software’s LightningDraw GX for

one good example). Finally, QuickDraw GX will keep you in sync with future improvements to Mac OS graphics—while QuickDraw will not.

In short, QuickDraw GX is the closest to a no-risk, no-brainer new technology as I’ve ever seen Apple make available. Yes, you’ll still be able to sell your existing QuickDraw applications, but for new projects, QuickDraw GX looks to me like both the smart and prudent choice. ♣

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*Many thanks go to Tom Dowdy, the Macintosh System Software graphics technical lead, for providing the raw material for this article and for numerous clarifications, all on a tight deadline.*

## Apple News

### Amelio

*continued from page 1*

Dr. Amelio said, “As an avid Apple user since the days of the Apple II, I am delighted to be joining the management team of Apple, a company with an outstanding reputation for superior technology and customer loyalty.”

Prior to joining National Semiconductor, Dr. Amelio was president of the Communications Systems Group at Rockwell International Corporation from 1983 to 1991 and had extensive experience as a scientist and engineer at Bell Labs and Fairchild Camera and Instrument Corporation. Dr. Amelio holds 16 patents, including a patent for the coinvention of the industry’s first charge-

coupled image sensor, which is used in most consumer video cameras produced today. Dr. Amelio was the recipient of the 1991 Masaru Ibuka Consumer Electronics Award for his work in the development of charge-coupled devices.

Michael Spindler established Apple’s international operations, which now account for more than 50 percent of the company’s business. In 1990, he was appointed chief operating officer and moved to Cupertino to assume that position. Appointed CEO in 1993, Mr. Spindler led Apple’s efforts during a difficult time for the company and guided Apple through important milestones. His tenure included some of the company’s most significant achievements, such as the development of its RISC-based technology and the

smooth transition of the entire Macintosh product line to the PowerPC microprocessor.

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## Apple Appoints Heidi Roizen as VP of Developer Relations

Apple Computer, Inc., recently named Heidi Roizen vice president of Apple Developer Relations (ADR), reporting to David Nagel, senior vice president in charge of Apple research and development. Roizen, who assumed her responsibilities in early February, becomes the first official ADR vice president; she

replaces Shirley Stas who, as acting vice president, took the first steps to build ADR after it was formed last August.

The formation of ADR united all of Apple’s developer-related activities in a single organization including Evangelism, Developer Support, Developer Marketing, Developer Press, Developer University, and International Developer Relations. Under Stas’s stewardship, ADR implemented a variety of enhancements to Apple’s developer support programs, including the following:

- reduced pricing for program membership across the board
- new levels of technical support for smaller developers
- better access to and greater discounts on Macintosh hardware
- renewal of the It Shipped! program; since its late 1995 kick-



off, more than 150 new Macintosh products have been entered into the It Shipped! database

- the appointment of Brian Gentile to be director of Apple Evangelism and David Krathwohl as manager of International Developer Relations

- access to Mac OS technologies, Developer University courses, and developer publications through the Internet

- kick-off of Apple Directions Express—the online component of *Apple Directions*—and other methods of increasing communications between ADR and developers

During this period, Guy Kawasaki, one of the original Macintosh evangelists, rejoined the company as an Apple Fellow, and has been facilitating communications among Apple developers, customers, and Apple staff members.

“As a result of the efforts of our developer relations staff, interest in the Macintosh has increased among developers,” said David Nagel. “We have more members in our developer program than we have ever had, attendance at our conferences and training sessions has increased, and we’re seeing lots of developers coming to the Mac for the first time.”

“We’re delighted that Heidi Roizen is joining the Apple Developer Relations team,” Mr. Nagel added. “We already have made significant progress in improving Apple Developer Relations. With her experience both in building a successful software company, as well as in representing the entire software industry, Heidi is well suited to lead Apple Developer Relations through the next level of enhancements.”

Roizen was the cofounder and CEO of T/Maker Company, an original Macintosh development firm. T/Maker shipped its first Macintosh title in February 1984, just after the first Macintosh computer shipped. Roizen was also a

member of the board of directors of the Software Publishers Association from 1987 to 1994, and served as its president from 1988 to 1990. She was recently named one of the top 100 women in computing by McGraw Hill. Roizen holds an M.B.A. degree from Stanford University.

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## Copland Communications and Collaboration to Rely on Internet Protocols, OpenDoc

With the release of Copland, the complete rewrite of the Mac OS in “native” PowerPC code due later this year, Apple Computer, Inc., will migrate its communications and collaboration (C&C) architecture from PowerTalk and the Apple Open Collaboration Architecture (AOCE) to industry standard Internet protocols and OpenDoc.

Although Apple remains committed to providing communications and collaboration technology as an integral part of the Mac OS in Copland and beyond, any software you’ve developed based on PowerTalk and AOCE will not work with the new version of the Mac OS. PowerTalk will, however, remain a part of System 7.5. Apple will also continue to sell and support PowerShare 1.1. Some enhanced PowerTalk features will be released in the next Mac OS update, but will not be made part of Copland.

If you’ve developed software based on PowerTalk and AOCE, Apple needs to hear from you as soon as possible to determine the best way to implement the

change in its C&C architecture. The Copland team understands that the change means some of you will have to undertake a fair amount of work to redo C&C software so that it works under Copland. As a result, they’re seeking your input to be sure that the new architecture meets your needs as closely as possible.

Apple is making the change because of the explosive growth of Internet use and because of several technical and business realities. When Apple undertook development of AOCE in the early 1990s under pioneering Macintosh engineer Gursharan Sidhu, one of the inventors of the AppleTalk network system, no one could have predicted the phenomenon the Internet would become. When Apple released PowerTalk and PowerShare in 1993, the Mac OS became the first personal computer system to integrate C&C functionality—including e-mail, messaging, and directory services. Even then, Internet communications were limited primarily to technical, scientific, and government computer users.

PowerTalk and PowerShare were greeted enthusiastically by many developers, who set to work incorporating the PowerTalk mailer into their applications and developing innovative software that relied on other AOCE services. However, developers found the PowerTalk application programming interfaces (APIs) complex and, at times, hard to use. Meanwhile, the surge in Internet use offered developers and customers alike new ways to communicate and collaborate.

As a result, Apple decided that under Copland, industry standard Internet protocols (such as SMTP, POP, and MIME) would offer developers a better way of providing C&C services to their customers. Additionally, Apple will encourage developers to use OpenDoc to provide the human interface

aspects of their Copland-based C&C software. By the time Copland is released, OpenDoc will ship as a standard part of the Mac OS.

In making this transition, Apple engineering intends to provide a set of simplified, modernized APIs to make it far more convenient for you to build C&C features into your software. Similarly, Apple hopes to preserve much of the functionality introduced with PowerTalk and PowerShare, although it will have to be reimplemented. For example, early feedback suggests that many developers would like to be able to retain the PowerTalk Mailer feature in their Copland-based software. Apple engineers are investigating having Copland provide automatic Mailer-like mail services to all applications.

To help Apple make the transition from PowerTalk to the Internet and OpenDoc for Mac OS C&C software, we urge you to send your feedback to Vince Hunt, product manager for Apple C&C technology ([vhunt@applelink.apple.com](mailto:vhunt@applelink.apple.com)) or Apple’s C&C evangelist Mark Altenberg ([altenberg@applelink.apple.com](mailto:altenberg@applelink.apple.com)).

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## Developers Show OpenDoc Support at Macworld

OpenDoc had a large presence at the Developer Central booth at Macworld San Francisco last January: Of the 48 companies that exhibited there (not counting Apple), almost a quarter of them were showing OpenDoc-related products and services. In addition, Apple handed out 3,000 OpenDoc DR4 (Developer Release 4) CDs to people who filled out a questionnaire and, when all supplies were gone, took orders for 1,000 more. (The

OpenDoc DR4 CD includes OpenDoc 1.0 for Macintosh, tools and code for doing OpenDoc development, and a developer release of Cyberdog, Apple's OpenDoc-based Internet solution.)

Here is a brief description of the companies that exhibited OpenDoc-related products:

- **AppWare.** This product, described as "a rapid network application development tool," is a development environment that allows nontechnical users to create stand-alone applications by visually manipulating icons that represent prebuilt software components. A future version of AppWare will allow users to save their work as OpenDoc parts.

- **B&E Software.** This company was demonstrating RagTime 4.0, a new version of its page-layout application. This new version will be one of the first major applications to be a container application; as such, it will allow users to embed OpenDoc parts into any RagTime 4.0 document. B&E Software plans to release a German version of RagTime 4.0 by March 1996, with support for other languages to come soon thereafter.

- **C-Ware.** This company demonstrated several OpenDoc parts that handle graphics and tables.

- **Eclipse Services.** This company, which is involved in delivering OpenDoc-based client/server database technologies, demonstrated OpenDoc query, data dictionary, data access, and form design parts that allow component-based access to SQL databases. The company says it hopes to have commercially available products by Macworld Boston in August 1996.

- **Kantara Development.** The Part Merchant is a service that allows users to find needed OpenDoc part viewers and editors and download them over the Internet. At Developer Central, Kantara

showed PM Finder, an extension to OpenDoc. When a user attempts to open an OpenDoc document and OpenDoc discovers content that it cannot display, PM Finder searches a World Wide Web database of parts and lists appropriate parts that the user can then download.

- **LizardTech.** MrSID (Multi-resolution Seamless Image Database) is a file-compression format used for compressing very large images and image databases. LizardTech demonstrated an OpenDoc viewer for files compressed in MrSID format; it plans to make the viewer available in the second quarter of 1996.

- **Oberon microsystems, Inc.** This company demonstrated a prototype OpenDoc implementation of Oberon/F, a cross-platform framework for the creation and integration of software components. Oberon/F for OpenDoc, due later this year, will enable programmers to create OpenDoc parts without having to write any C++ code. Instead, programming is done in Oberon. Oberon is a dynamic language, and like its predecessors Pascal and Modula-2, it was designed by Professor Niklaus Wirth of ETH Zurich. Oberon/F includes an integrated development environment, which is simply a collection of Oberon/F components.

- **OnBase Technology, Inc.** DragNet is an "address book" for capturing, organizing, and searching collections of Internet addresses. The DragNet technology was designed as a replacement for the Cyberdog Notebook part and is currently commercially available as a Mac OS application. The OpenDoc version of DragNet will become available when the Cyberdog technology is available to the public.

- **Pharos Technologies.** This company is involved in using component software (in particular, OpenDoc) to provide customer-specific software to

enterprise clients. For Pharos's view of the component software market, see "The Business Case for Component Software" on page 19 of the February 1996 issue of *Apple Directions*.

- **Swift Consulting.** This company provides software development services, including expertise in OpenDoc development, for the Mac OS and other platforms.

- **theta group.** The dtF Database Toolkit is a suite of tightly integrated OpenDoc parts. It will enable end-users to create documents containing data from relational databases like Oracle, 4th Dimension, or FileMaker by using standard OpenDoc techniques like linking and drag and drop. It will also allow customers to connect to and query SQL databases without extensive knowledge of SQL. The dtF Database Toolkit was released to dtF developers at Macworld; theta group plans for its next release, due by the Apple Worldwide Developers Conference in May, to include connectivity to additional database systems.

In addition, Apple hosted five OpenDoc stations. One gave an overview of OpenDoc, while the others covered engineering issues, Cyberdog, the OpenDoc Development Framework (a cross-platform framework for developing OpenDoc parts), and human interface issues.

Apple was also showing at Macworld the new *Inside Macintosh: OpenDoc Programmer's Guide* (available from Addison-Wesley). This book includes the *OpenDoc Class Reference and Samples* CD and is the first title in the new Apple Press book line.

For more information on OpenDoc, go to Apple's OpenDoc Web page (see the "Internet Resources" box on page 14 for the location). To get a copy of the OpenDoc DR4 CD, send a request to Internet address [opendoc@apple.com](mailto:opendoc@apple.com).

## OpenDoc Wins "Landmark Technology" Award

*InfoWorld* magazine, a leading news magazine for the computer industry, recently awarded its Nicholas Petreley Landmark Technology Award for 1995 to OpenDoc, the component software technology from Component Integration Labs, Inc. The award, which appeared in its January 29, 1996 issue, is given to "the most significant original idea or advance in a current technology each year." (For the location of the Web page containing the full text of the award, see "Internet Resources" on page 14.)

Quoting from the award, "OpenDoc has become easily the more flexible, powerful, extensible, and forward-looking object model when compared with its closest business competitor, Microsoft Corp.'s OLE. . . .

"[T]he greatest advantages to OpenDoc are technical, because it was designed to be an open, extensible, and network-enabled object architecture. Unlike Network OLE, complex technical issues such as version control, real-time inheritance, and security have been addressed. . . .

"Although the industry as a whole may be reluctant to adopt OpenDoc, it behooves developers to embrace it. The problem is that the monolithic application model and consequent continual incremental upgrade pattern has gotten out of hand for both consumer and vendor. . . . Component architecture, especially that of the quality of OpenDoc, can solve . . . these problems. . . .

"From Microsoft to the smallest start-ups, and from home consumers to IS managers planning for large corporations, it appears there is the potential for everyone

to win with a technology such as OpenDoc.”

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## It Shipped! Program Restarts

The It Shipped! program, which Apple Computer, Inc., reinstated in late 1995, provides a free opportunity for Macintosh developers to let others in the development community know about the shipment of new products. The program is designed to increase your product's visibility and open up possibilities for comarketing and merchandising opportunities, as well as publicity and sales referrals.

By letting Apple know about your newly shipping product, and sending a copy of it to Apple's Cupertino headquarters, your product is entered into the It Shipped! database. The database is then shared throughout Apple, published in *Apple Directions*, and broadcast to other key industry publications.

The master database is used by Apple employees when they prepare advertising, collateral, or white papers and when they help customers find the right solutions. The copy of the product you provide will be maintained in Apple's main software library so Apple employees can have access to your latest software, documentation, and other product information.

Since the program started again, more than 150 new Macintosh products have been entered into the database, most of them having shipped since October 1995. For a complete list of products in the It Shipped! database, see page 33.

To submit a product to the program, use the It Shipped! Web page's electronic submission form, which you can submit electronically with the click of a

button. (For the location, see the "Internet Resources" text box on page 14.) Also, send a copy of your product to the following address:

Apple Computer  
1 Infinite Loop, M/S 301-1ES  
Cupertino, CA 95014  
USA

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## Apple Media Tool 2.0 Is Power Macintosh Native, Supports QuickTime VR, QuickTime 2.1

Apple Computer, Inc., recently announced a new Power Macintosh "native" version of the Apple Media Tool and its companion product, the Apple Media Tool Programming Environment. Version 2.0 of the Apple Media Tool is the company's object-based, cross-platform multimedia authoring tool that enables users to create interactive titles without programming or scripting. Once created on the Mac OS platform, Apple Media Tool projects can easily be converted to run on both 680x0 and PowerPC processor-based Mac OS computers and Windows-based environments.

Apple Media Tool 2.0 incorporates many new features, including support for QuickTime VR (for viewing virtual reality scenes and objects), QuickTime 2.1 (for MIDI music support and higher quality video playback), an improved user interface browser, extensive use of Macintosh Drag and Drop, custom color palettes, support for AppleScript and RTF (Rich Text Format), and hypertext links.

The Apple Media Tool is designed for a wide range of

users, including creative designers, producers, educators, and business communications professionals. The Apple Media Tool Programming Environment is designed for programmers who want to break into object-oriented multimedia programming. Version 2.0 of the Apple Media Tool Programming Environment includes the required subset of MPW (Macintosh Programmer's Workshop software) bundled at no additional charge. The Apple Media Tool Programming Environment works in conjunction with the MPW Shell for debugging multimedia projects, allowing programmers, for example, to inspect objects, step through code, and set breakpoints while a project is running.

### Licensing, Pricing, and Upgrades

Apple currently provides a special license for free distribution of titles created with the Apple Media Tool. There is no charge for the license or for distribution rights on the Apple software it covers. For more details, call Apple Software Licensing at 512-919-2645, or send e-mail to SW.LICENSE (AppleLink) or sw.license@applelink.apple.com (Internet).

Apple Media Tool 2.0 (\$495) is available in stores or through Claris (800-950-5382). You can also purchase Apple Media Tool 2.0 (\$495), the Apple Media Tool Programming Environment (\$995), or a bundle of both products (\$1195) from the Apple Developer Catalog, which you can obtain by calling 800-282-2732 (United States), 800-637-0029 (Canada), or 716-871-6555 (international). The prices listed here are for the United States market only and may vary internationally.

Current customers can upgrade to Apple Media Tool 2.0 (\$149 in the United States) through Claris or the Developer

Tools Catalog. You can purchase upgrades to version 2.0 of the Apple Media Tool Programming Environment and the Apple Media Tool 2.0 bundle in the United States for \$195 and \$295, respectively, through the Developer Tools Catalog or by sending e-mail to APDA (AppleLink) or apda@applelink.apple.com (Internet).

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## Apple Positions Cross-Platform 3D File Format as Internet Standard

Leveraging its expertise in cross-platform 3D technology, Apple Computer, Inc., recently announced 3DMF, the platform-independent file format for 3D objects used by QuickDraw 3D, as a proposed standard for 3D graphics exchange across the Internet. The 3DMF (3D metafile) technology is fully cross-platform across Mac OS, Microsoft Windows, and UNIX® platforms; it enables applications and operating systems to exchange 3D graphics with no loss of image quality or information.

Apple is in discussions with leading browser companies to incorporate 3DMF into their software; a number of 3D graphics applications already support 3DMF as a way to easily share 3D models and images. To accelerate the implementation of 3DMF across the World Wide Web and the software industry, Apple is licensing 3DMF at no charge for use in commercial and noncommercial applications.

Apple is also proposing 3DMF as a file extension to VRML (Virtual Reality Modeling Language)—the new Internet standard for 3D online "worlds." Apple has



proposed 3DMF to the VRML Architecture Group (VAG) as an open file exchange format and has started an ongoing dialogue with members of the VAG on 3D strategies for the Internet.

### 3DMF Information

3DMF is the file format supported by QuickDraw 3D, which is currently available for the Power Macintosh platform and is scheduled to be available for Microsoft Windows in the second calendar quarter of 1996.

3DMF represents a standardized format for displaying and saving 3D models—a standard that preserves not only the object's geometry and color, but also its shading, lighting, and texture, as well as its relative "position" in 3D space. Without 3DMF, 3D models must be converted between different file formats, frequently resulting in the loss of visual information and data.

Equally important, 3DMF allows unique attributes to be saved and exchanged among applications. For example, if a 3D graphics application uses a custom effect to create a 3D object, it would normally be impossible to view that object in any other program without the loss of that information. When saved as a 3DMF file, this same object would retain the attributes created by the original application and would display identically in any other QuickDraw 3D-aware application, even though the latter application knew nothing of the original application's custom effect.

### Support for QuickDraw 3D and 3DMF

"The development community has expressed tremendous interest in QuickDraw 3D and in the QuickDraw 3D metafile specification," according to Kai-Fu Lee, vice president of Apple's Interactive Media Group. Lee added that over 50 developers have expressed

support for QuickDraw 3D, including Adobe Systems, Macromedia Inc., Specular International, and Strata Inc.

Another indication of QuickDraw 3D's merit came from *MacUser* magazine, which recently selected QuickDraw 3D as the 1995 Editor's Choice Award winner for Breakthrough Technology of the Year.

"3DMF represents an important step in Web-oriented 3D file exchange," said Tony Parisi, founder and Chief Technical Officer for Intervista Software, Inc. Mr. Parisi is the co-creator of VRML and a lead developer of the WorldView VRML Web Browser for Power Macintosh and the PC. "Intervista is actively evaluating 3DMF and we believe that Apple is making the right move in offering this open standard to the online community."

"Apple has taken a bold step in creating the 'lingua franca' of 3D graphics," said Neil Trevett, vice president of marketing for 3Dlabs, Inc. 3Dlabs is the source for the industry-leading GLINT and PERMEDIA 3D chip designs. "The 3D graphics market has long needed a standard format to exchange data. With 3DMF, users can now easily cut and paste 3D graphics between applications and across the Web with no loss of data or visual impact. We congratulate Apple on taking the leading role in this area and look forward to a continued close relationship with them for QuickDraw 3D and 3DMF."

### Developer Information

You may obtain 3DMF developer information by visiting the QuickDraw 3D home page (see "Internet Resources" on page 14 for the location) or by sending e-mail to ESCHER.DEV (AppleLink) or [escher.dev@applelink.apple.com](mailto:escher.dev@applelink.apple.com) (Internet). The 3DMF specification and the cross-platform parser are also available from the QuickDraw 3D home page.

The October 1995 issue of *Apple Directions* contains "QuickDraw 3D—The Future Is (Virtually) Here," an overview article on QuickDraw 3D. You can find this article on the World Wide Web (see "Internet Resources" for the location).

Another source for information on QuickDraw 3D is *3D Graphics Programming With QuickDraw 3D*, from Apple Computer, published by Addison-Wesley.

## Apple Response to Industry's Concerns

To address industry concerns (and inaccurate press reports) that surfaced in the weeks leading up to the Apple shareholders' meeting on January 23, 1996, Apple released a Q&A publicly over the World Wide Web the day after the shareholders' meeting. Here are excerpts from that announcement:

### Is Apple getting out of the consumer market?

No. Apple is absolutely not getting out of the consumer market or the education market. Apple does plan to simplify its product line and expand the number of ways in which customers can choose a Mac OS computer. First, our plan is to design and market products in our key segments—the home, education and business (publishing, scientific, technical, small business)—that represent the best, most advanced implementation of our technology. These are what we call the "best-of-class" products, the ones which have the most features and the most advanced technology. Second, we will make sure that Macs are available at other price points

and in other parts of these markets by helping others license Macs more broadly than we ever have before.

### What is Apple's strategy for going forward?

On January 17, Apple announced the first phase of a major restructuring. The first order of business is a headcount reduction and an effort to consolidate, streamline and focus Apple's resources on targeted markets. In addition, the company has outlined a systematic evaluation of its strategic investments and business portfolio and development of strategies to fundamentally change Apple's business model. Specific initiatives underway are related to simplifying the product portfolio, broadening licensing efforts and expanding business alliances. It's the company's goal to return to profitability as soon as possible. In the near-term, management is focused on moving inventory and taking further steps to reduce operating expenses.

The goal of Apple's restructuring is to redesign Apple's business so that the company can carry out its most important strategic missions and match its resources accordingly. These missions include ensuring the continued superiority of the Macintosh platform, especially in the areas of multimedia and the Internet; vibrant support from developers; the highest customer satisfaction and brand loyalty; leading positions in markets where Apple competes; and, in turn, increasing shareholder value.

Growing market share in key markets remains Apple's strategy. Apple will focus primarily on innovative, differentiated, "best of class" products in the key markets of home, education and business in order to balance market share and profitability.



*The challenges Apple faces today are viewed not merely as a business cycle, but rather as a fundamental set of issues that need to be addressed in order for Apple to flourish in the years ahead. Apple's is an extremely complex business and the requisite changes cannot be implemented overnight. The company will implement changes on a phased basis, allowing for reassessment of industry and business conditions on an ongoing basis.*

### **Why should I buy a Macintosh now?**

*Although Apple is facing business challenges, the company's superior products and technologies remain the compelling reasons to buy a Macintosh. Apple has now shipped more than 22 million Macintosh systems, and the popularity of Macintosh is as strong as ever. In fact, Apple shipped more Macintosh systems last quarter—including more than one million PowerPC processor-based Macintosh systems—than it has in any quarter in its history. During that same period, education sales were up 28 percent, and a report just out from Quality Education Data shows that 65 percent of all the computers school districts plan to purchase this year will be Macintosh.*

*Apple remains the number one vendor in terms of ease-of-use, reliability, and customer loyalty. Apple is leading the way in publishing, multimedia, video, and component software, as well as the creation of and access to information on the Internet. Macintosh is the number one platform for World Wide Web authoring and the number two platform for Web servers.*

*Further, we expect the Mac platform to continue to grow, with broader licensing of the Mac OS. That means continued support from developers and an*

*ever expanding variety of products for the Macintosh market.*

### **Apple to Stay in Consumer Market**

In addition to the above statement, the full text of Michael Spindler's remarks at the January 23 shareholders' meeting are also on the World Wide Web (see "Internet Resources" on page 14 for the location).

In his remarks, Spindler discussed what went wrong in 1995, recent good news (for example, the first quarter sales of over 1 million Power Macintosh computers), and what Apple's strategy will be for 1996.

Because of inaccurate reporting from the press, one quote from Spindler bears repeating here: "Let me make one thing very clear—and to our friends from the media, please quote me extensively—Apple is *not* getting out of the consumer market. We plan to expand the Mac platform in a number of ways, and our consumer products will continue to be an important part of our business. We will continue to serve the business, education, and consumer sectors in every region of the world where Apple participates." Elsewhere in his remarks, Spindler acknowledged that one of the actions Apple will be taking will be "streamlining our product portfolio by reducing the number of design centers and the number of models in our product line."

## **Partial Text of Apple's Q1 1996 Earnings**

### **Announcement**

To give you the facts behind the latest rumors and inflated press reports, we're reprinting part of

the official Apple Computer, Inc., announcement about its results for the first fiscal quarter of 1996, October to December. The announcement was released January 17, 1996. The entire announcement, including a detailed financial statement, can be found on AppleLink (path—News Break:PR Express:Apple Press Releases:January—March 1996:Apple Announces Financial Results).

*Apple Computer, Inc., today announced financial results for its first fiscal quarter of 1996, [which] ended December 29, 1995. For the quarter, Apple's net revenues were \$3.1 billion, an 11 percent increase over the first quarter a year ago. Unit shipments for the quarter grew by 12 percent to 1.3 million. Both net revenues and unit shipments represented Apple's highest quarterly totals ever.*

*As Apple previously indicated on January 10, the company's gross margins as a percentage of net sales declined significantly during the quarter, resulting in a net after-tax loss for the quarter of \$69 million, or a loss of \$0.56 per share. This compares with a net profit of \$188 million, or \$1.55 per share in the same quarter a year ago.*

*Consistent with its previous disclosure, Apple also announced a company-wide restructuring of its operations. The initial phase of this restructuring, which has begun, will result in the layoff of approximately 1,300 full-time, temporary and contract employees worldwide over the next 12 months, representing a reduction of at least 8 percent of Apple's total work force. As a result of these specific planned actions, the company expects to record an associated charge of at least \$125 million before taxes in its results for the second fiscal quarter, which ends March 29, 1996. The company said that*

*additional restructuring actions and additional charges against earnings are possible in the second fiscal quarter and in future quarters, reflecting a continuing implementation of its restructuring process.*

*"Our results for the first quarter do not reflect the tremendous intrinsic strengths of the Apple franchise, including our brand equity, loyal customer base, undeniable technology leadership, outstanding products, and solid competitive advantages in key markets and growth sectors such as education, consumer, multimedia, publishing and the Internet," said Michael Spindler, Apple's [former] president and chief executive officer. "The task in which Apple management and its Board of Directors is currently engaged is to utilize Apple's strengths in order to position the company for long-term strength and success.*

*"The most immediate and obvious work we must undertake is to quickly streamline operations. The workforce reduction is a necessary first step, and will begin primarily in sales, marketing and administration.*

*"In addition, we have started a systematic evaluation of our strategic investments and business portfolio. To date, this has resulted in a divesting of our investments in Kaleida and Taligent, while retaining access to the technology these firms produce. We have also refocused our online services strategy away from a stand-alone proprietary business to one which uses and integrates with the Internet, which means we don't have to develop a costly infrastructure ourselves.*

*"Next, we have begun to develop strategies to fundamentally change our business model. In products, we intend to simplify our product portfolio so our offerings focus primarily on*

innovative, differentiated and best-of-class products in our key market segments in education, business and the home. Our strategy will be to build brand preference around these offerings. In order to assure a full selection of Mac OS-based products in all parts of the market, we will pursue a much broader licensing of the Macintosh operating system.

"In addition, we are pursuing expanded business alliances to further promote and extend our platforms, evolve new businesses that utilize our strengths in multimedia and the Internet, and better manage our assets by leveraging the expertise and capabilities of our business partners.

"Addressing the strategic issues before us and restoring the company to profitability will take time. Based on our current internal forecasts, we expect to report an operating loss for our second fiscal quarter, independent of further restructuring charges.

"Our goal is to ultimately redesign Apple's business so that we can carry out our most important strategic missions. These include ensuring the continued superiority of the Macintosh platform, especially in the areas of multimedia and the Internet; vibrant support from developers; the highest customer satisfaction and brand loyalty; leading positions in markets where Apple competes; and increased shareholder value," said Spindler.

### Financial Results

Revenues and unit shipments increased during the quarter as the company shipped more than 1 million PowerPC processor-based Macintosh units during the quarter—the biggest number of RISC processor-based systems ever in a single quarter.

For the period, international revenue accounted for 51 per-

cent of net sales, compared to 47 percent of net sales in the year-ago period. International revenues grew 19 percent compared with the first quarter of last year. These results included 26 percent growth in revenues and almost 50 percent in units in Japan, and approximately 18 percent growth in European revenues. The growth in European revenues and profits represented the fastest revenue growth rate in that region in the last few quarters.

Gross margins as a percentage of net revenues dropped to 15.1 percent of net sales for Q1 1996, a sequential drop of 5.6 percentage points from 20.7 percent of net sales for Q4 1995 and a 13.6 percentage point decline from 28.7 percent in the year-ago quarter.

The company attributed the decline in gross margins to more aggressive pricing across its markets during the competitive holiday selling season, particularly in Japan—the company's largest market outside of the U.S. Apple's gross margins were also impacted during the quarter by inventory adjustments of approximately \$80 million before taxes to reflect current pricing pressures.

## "Why Mac?"

### Contest Winner

Apple Computer, Inc., recently announced the winner of a contest asking customers to state why they preferred the Macintosh platform over a PC running Windows 95. Thousands of contestants participated in the contest, which began last August to coincide with Microsoft's Windows 95 launch. David Caren, a Los Angeles computer consultant, was selected as the grand prize winner and walked away with the prize—a Power Macintosh 7500 computer.

## Internet Resources

- Apple Directions, October 1995 issue: <http://dev.info.apple.com/appledirections/oct95/quickdraw3d.html>
- Apple Multimedia Program Web site: <http://www.amp.apple.com>
- Developer Tools home page: <http://devtools.apple.com/>
- It Shipped! Web page: <http://dev.info.apple.com/itshipped.html>
- Newton Web site: <http://newton.info.apple.com/newton/>
- OpenDoc's Landmark Technology Award: <http://www.infoworld.com/pageone/product/poy3.htm>
- OpenDoc Web page: <http://www.opendoc.apple.com/>
- QuickDraw 3D home page: <http://www.info.apple.com/qd3d/>
- Michael Spindler's remarks at the January 23 shareholders' meeting: <http://product.info.apple.com/pr/speeches/1996/q2/960123.pr.sp.spindlersh.html>
- WWDC Web site: <http://wwdc.carlson.com/>

"David Caren clearly articulated what was probably the most common theme in the entries: the Macintosh is easier to use, expand, and troubleshoot than PCs running Windows 95," said Dave Garr, Apple marketing manager and contest supervisor. "In addition, Mr. Caren recognized the Mac's advanced multimedia capabilities that he could 'only dream about' with the PC."

Mr. Caren, a former Windows 95 beta tester, was enticed by the Macintosh computer after a friend showed him its multimedia and graphics capabilities. But it was also the system's user interface and reliability that convinced him to convert from Windows 95.

"At work, I am a network administrator. I manage a Windows 95 network and a Mac network," said Mr. Caren. "I spend all day fixing crashes on the Windows 95 network but I never get one call from the art department to fix the Macs because they just work."

One hundred and fifty "Been There, Done That" T-shirts were also awarded to contestants for their innovative entries, including a videotape of a 20-month-old girl starting up and using her family's Macintosh system.

## Register Now for 1996 WWDC

Each May, Apple holds the Worldwide Developers Conference (WWDC) in San Jose, California, to keep you up to date about the state of Apple technology. It's the best place to meet with Apple engineers and executives and hear details about Apple strategy, technology, and products, including Copland, OpenDoc, Newton, and PowerPC, as well as Apple's Internet solutions. It's also a great opportunity to network with your colleagues; this year, Apple expects more than 4,500 attendees from all over the world. You can also get a first-hand look at myriad developer support tools at the WWDC Vendor Exposition.

If you register by April 5 for this year's WWDC, to be held May 13–17, you can save \$100 off the \$1,095 registration fee. The WWDC Web site provides complete details (see "Internet Resources," above). You can also send an e-mail message to [WWCREG@cmi.carlson.com](mailto:WWCREG@cmi.carlson.com) for more information. ♣

# Technology

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## develop Issue 25: VR, 3D, GX, and More

Issue 25 of *develop*, Apple's technical journal, explores hot new topics such as QuickTime VR, QuickDraw 3D, and QuickDraw GX. In it you'll find these articles:

- "Generating QuickTime VR Movies From QuickDraw 3D"—QuickTime VR movies don't have to be created with a real camera; you can instead generate the necessary images with a 3D graphics system like QuickDraw 3D.
- "Flicker-Free Drawing With QuickDraw GX"—This article discusses the causes of flicker in graphics and animation applications and presents a package for doing memory-efficient, flicker-free drawing with QuickDraw GX.
- "NURB Curves: A Guide for the Uninitiated"—QuickDraw 3D includes NURB curves among its geometries, but you need to understand a little about the underlying NURB model to use them effectively. This intuitive treatment of NURB curves tells you what you need to know.
- "Using C++ Exceptions in C"—Exceptions in C++ provide a powerful and useful way to handle errors and other unexpected conditions. But C programmers can take advantage of them as well, since C is (mostly) a subset of C++.

*please turn to page 18*

## CD Highlights

# Reference Library Edition, March 1996

As part of Developer Press's continuing efforts to provide technical documentation in HTML format, we're introducing a prototype HTML search engine on this month's disc. This application, called Apple HTML Local Search, provides a fast indexed search for local HTML documents, similar to Apple DocViewer's "Query" and Adobe™ Acrobat's "Search" features. See the file Open Me First.html or Search Read Me in the Prototype HTML Documents folder (within the Technical Documentation folder) for details.

Apple HTML Local Search is a very early prototype, and your feedback and comments are extremely important if we are to improve it to the point that it can become a regular part of the Reference Library CD. Please take a few minutes to complete the survey included in the Apple HTML Local Search folder. The first 100 respondents who include their shipping addresses will receive a useless—yet sure to be cherished—small token of our appreciation.

To use Apple HTML Local Search, follow these steps:

1. Launch the application; an alias is located within the About This CD folder at the top level of the March '96 disc.
2. The default browser has been set to Netscape. If you are using a browser other than Netscape, then use the Preferences command (in the Edit menu) to change the default browser. If you are using Internet Config, your HTML helper application will be used.
3. Enter your search criteria and click the Search button.
4. Double-click a file in the returned list of documents to launch that file with your

Web browser (or select the file and click the Open button).

In addition, you can select one or more of the files listed and click on the Find Similar button. Find Similar will search the current database for files that most closely match the currently selected documents.

If you want to browse some local HTML content, a good place to start is the Developer Services home page.

**Warning:** This content is provided for the purposes of testing the prototype search application. Some hypertext links may be "broken," and some may connect to other Web servers on the Internet. Also, links to local PDF (Acrobat) files may result in your Web browser opening the PDF file rather than launching Acrobat.

Here are some highlights of the local HTML content:

- selected *develop* magazine articles
- recent *Apple Directions* issues
- a prototype of the QuickDraw 3D book
- Developer University online courses and course information
- Macintosh Technical Notes
- Macintosh Technical Q&As

In addition to a new version of Macintosh CD-ROM Setup and some new Technotes, here's what's new and revised on this month's disc.

### About Developer University

This folder contains information on Developer University, the self-paced products that are available, classroom courses, field courses, topics available on the World Wide Web, course outlines, prerequisites, target

*please turn to page 24*



## Human Interface


 Tabs

# Progressive Disclosure and Tabs

By Peter Bickford

I read your column in Apple Directions, and noticed the invitation at the end that if I have an interface gripe I should sent it to the Doc. I thought I'd take you up on the offer:

Here's my interface gripe: There does not appear to be a standardized way for tabbed dialog boxes to work on the Mac. Windows 95 has a system whereby you can flip pages within a dialog box by clicking on named tabs, but the Macintosh human interface guidelines do not define a consistent, standardized way to do anything comparable. The beauty of tabbed dialogs is that you can dramatically cut down on the number of separate windows and the corresponding menu items necessary to bring them up and save a lot of screen real estate in the process.

Any ideas on the Mac way to do Microsoft one better?

—Bruce Alsbaugh  
Software Engineer, SchoolWare

Hmm . . . “the Mac way to do Microsoft one better,” huh? It sounds like an answer on *Jeopardy* where the question is “What is Copland '96?” (cue rim shot).

But seriously, tabs are something of a rising star in the Macintosh interface, popping up in everything from Adobe Photoshop to Lotus Notes. As you've pointed out, they're a handy way of organizing information that otherwise might take up many separate windows. Moreover, there's no doubt we'll be seeing a lot more tabs in the future, especially since Copland will be adding Toolbox support for them. Still, I'll admit to being a little skittish about the whole subject. On one hand, there are situations when tabs are exactly the right interface element for the job. All the same, there's a natural tendency for us to overuse the latest interface gizmo simply because it's the year's Cool Interface Thing. So, before we repeat the tool-bar craze and start deliriously adding rows of tabs to every dialog box in sight, let's try to get some perspective by looking at the problem that tabs were created to solve.

## Limiting Complexity

In the beginning, the dialog box was invented. And just after lunch that same day, the programmer began looking for a way to cram a few more settings into it.

The traditional approach to adding more settings to a dialog box was to simply shrink the font size down and squish the various fields incredibly close together. An alternative technique used by an insurance company I once knew was to make the dialog boxes really huge and just buy two-page monitors for all their users. Clever as these approaches were, there was always some old ingrate stuck with a 13-inch monitor who would whine persistently about having to read screens of 5-point Geneva type all day.

The answer was *progressive disclosure*—a technique by which you give users access to the information as needed instead of trying to blast everything at them at once. Since users only have to deal with some of the information at a given time, they feel less overwhelmed. Not surprisingly, the interface to display it all also becomes cleaner and takes less space.

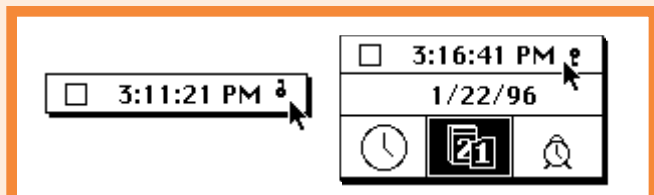
Most VCRs implement a rudimentary form of progressive disclosure by using little doors in their facings that hide the advanced controls. The idea is that main functions such as Play, Rewind, Stop, and Eject should be out in the open where it's easy to get at them, and where they're unlikely to get lost among a mass of other buttons. Less frequently used controls such as those for setting the clock are then hidden behind the door where they don't clutter the interface until they are actually needed. Sony even incorporates similar doors on the remote controls of many of their models, reducing the number of buttons you have to search through when the phone rings and you're diving for the “mute” button.

By using progressive disclosure, you're limiting the apparent complexity of the system and helping the user avoid information overload. In doing so, keep the following general rules in mind:

- Make sure the most important or frequently used information is the most accessible. VCR users would not be amused if they had to hunt through several control layers to find the Play command.
- Show as *little* information as possible. Try to group information so that the only items visible are the ones that are relevant at the time. Bury or omit unimportant settings. The less information overload users encounter, the more quickly they will work and the fewer errors they will make.
- Let users know how to find what they don't see. Don't make it so hard to find the other settings that users don't realize they exist. Use visible controls to expose the hidden settings.

## Progressive Disclosure on the Macintosh

Progressive disclosure techniques have been a big part of the Macintosh interface from the very start, from the menu bar's pull-down menus to the funny little latch on the Alarm Clock desk accessory.



Alarm Clock and Calendar, showing the latch human interface element.

When it comes to dialog boxes, any number of ways have been used to pack more options into them without overwhelm-



ing the user. Here's a brief rundown of some of the most popular ones.

**More Choices/Fewer Choices Buttons, Disclosure Triangles.**

Like the VCR doors, these dialog boxes use a button (usually, More Choices) to reveal the advanced choices. Many applications use a small triangle instead of a button (like the ones that show folder contents in the Finder's list views). In either case, the dialog box simply grows to display the new options along with the previously visible ones. (For an example, see the Find File dialog box, below.)

A subtle yet important touch is that the dialog box should remember whether the advanced settings were shown the last time it was closed, and it should open to the same state the next time it is displayed.

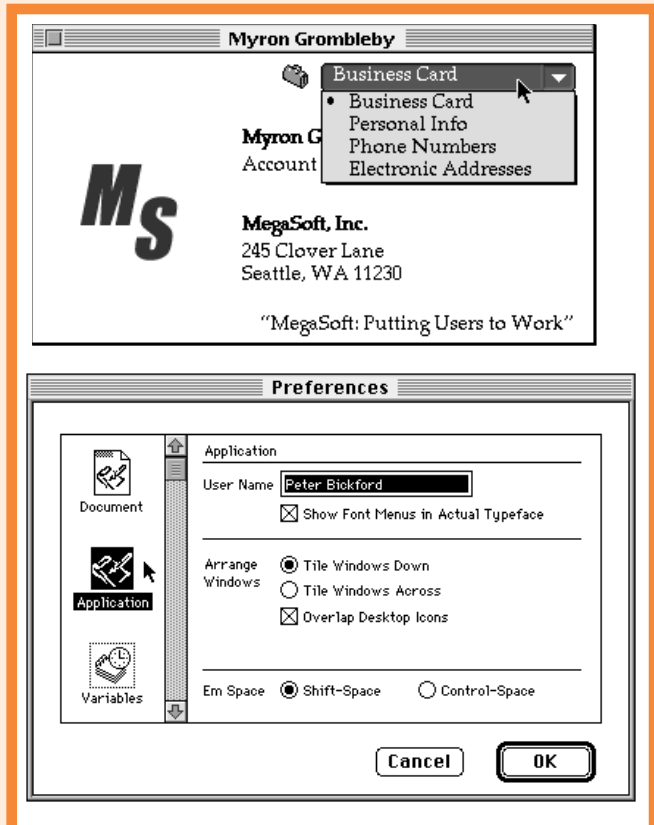
*Advantages:* This is one of the simplest and most readily understood methods of progressive disclosure. The dialog box remembers whether the advanced settings were hidden or displayed, so it can show the appropriate level of information for different types of users.

*Disadvantages:* The dialog box must be able to grow large enough to display all the possible options.

*When to use it:* Use this approach when there are very few advanced settings, especially those that some users will usually want to see, and others will not.

**Spring-Loaded Dialog Boxes.** Instead of expanding the dialog box itself to show more options, you can include a button that displays a modal dialog box containing advanced settings (like the Options button in the LaserWriter Page Setup dialog box shown below [and yes, it should be labeled "Options..."]). Once users have chosen the advanced settings they want, they close the subsidiary dialog box, which returns them to the main dialog box.

*Advantages:* Spring-loaded dialog boxes are great for setting advanced options. Clutter is kept to a minimum, and users' attention



Examples of pop-up menus (above) and icon lists (below).

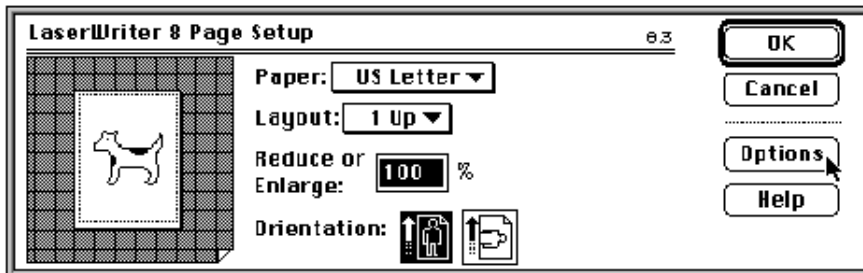
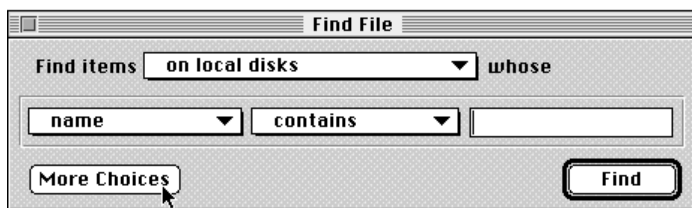
can be focused on the main dialog box. If users feel the settings in the subsidiary dialog box are over their head, they can simply click Cancel and ignore them.

*Disadvantages:* This approach is bad for setting multiple pages of frequently used options; it makes browsing of settings difficult.

*When to use it:* Use this approach when the most important and frequently used settings can be displayed in a main dialog box, but when the user may occasionally want to tinker with other, more obscure options.

**Pop-Ups.** You can get a multipage effect for a dialog box by putting a pop-up menu near the top, then designating the area underneath as a "magic" space that fills with the contents of whatever "page" you've chosen from the pop-up. PowerTalk uses this to good effect in its business cards, with the pop-up menu being used to choose which type of information to view. (See the first screen shot at the top of this page.)

*Advantages:* Pop-up menus give instant access to any area, don't



Examples of a button offering users more choices (above) and a button that leads users to a spring-loaded dialog box (below).

take up much screen space, and can handle a large number of items.

*Disadvantages:* The pop-up menu is sometimes mistaken for a title instead of a page-flipping control. It also doesn't show the possible options unless it's pulled down.

*When to use it:* Use this approach when you have several pages of information, all of which is of the same relative importance.

**Icon Lists.** Many applications (such as MacWrite Pro) have adopted the old System 6 control-panel-style dialog box, where a scrolling list of icons is displayed along the top or left side. (See the Preferences dialog box on page 17.) Clicking one of the icons takes you to the corresponding page of the dialog box.

*Advantages:* The list of icons makes it clear that there are multiple pages. Design can be graphically appealing.

*Disadvantages:* The icons take up a fairly large amount of screen space. The need to scroll frequently can be annoying when there are many pages. Some users don't realize that you can scroll the list at all, and they miss out on pages as a result.

*When to use it:* Use this approach when you have a few pages of information with about the same level of importance.

### And Then There Were Tabs . . .

And now, at long last, I actually answer your question about how to use tabs. As you can see (below), tabs are just one way to access the information in a multipage dialog. They do, however, have some very nice features:

- All the option groups are visible at once.
- Any option groups can be accessed with a single click.



A dialog box showing the use of tabs.

- The metaphor of tabbed folders is physically concrete and familiar to novices.
- Compared to icon lists, tabs take up fairly little screen space.

These strengths make tabs a natural choice for dealing with multipage setup dialog boxes and other groups of related information. In user testing, they tend to fare somewhat better than pop-up lists in helping users find various settings. All in all, they're a welcome new addition to the Macintosh human interface.

Of course, like any other interface element, tabs have their limits. The biggest problem is that they're limited in number by the widths of their titles. Some programs step around this problem by adopting an algorithm that abbreviates tab titles after a certain number of tabs are present (for example, "Notification" might become "Notifica. . ." if there's little screen space). This solution gives you a bit of extra breathing room, but not much. And, of course, there's always the problem of localization into languages like German, in which words can take up much more space than their English equivalents.

Of course, you *can* use multiple rows of tabs, but in doing so, the tabs' features start to work against you. The display of all the option groups becomes just another clump of screen clutter. The tabs begin consuming a good chunk of your available screen space. And when you click a tab in the background, the concrete physical metaphor of file folders bends into an impossibility as you show the clicked tab leaping ahead of the row it was behind. (If you do implement multiple rows, you can alleviate this problem somewhat by making sure a whole row of tabs moves together—this looks slightly less bizarre. Don't be surprised, however, if users think of the tabs as randomly shuffling after a selection is made.)

The bottom line: Tabs are great, but they're not great for everything. Use them for limited numbers of related settings, but when there are so many that you feel you need a second row, look into using a pop-up menu or other paging mechanism instead.

*Till next time,  
Doc*

*You, too, may see your words (edited for space and litigiousness) in print. Just send a good interface question or comment to Peter Bickford at the.doktor@applelink.apple.com.*

## develop Issue 25

*continued from page 15*

• "Country Stringing: Localized Strings for the Newton"—Although version 1.5 of the Newton Toolkit provides some built-in support for localizing strings, organizing the different sets of strings is still problematic. Or rather, it was until now.

In the columns in this issue of *develop* you'll learn about how QuickDraw GX breaks the font-downloading "space hack," how the

Display Manager can help simplify gathering information about the computer's displays, and how to use ToolServer from CodeWarrior. There's also a Veteran Neophyte column (by an alternate Johnson) on time-saving programming habits, and the usual barely solvable (but edifying) Puzzle Page. And that's not all: a preliminary article about QuickTime Conferencing can be found on the CD.

We're pleased to announce that *develop* has been chosen by Internet Valley, Inc., as one of the top 100 computer-related magazines and

journals on the World Wide Web (see <http://www.internetvalley.com/top100mag.html>). So don't miss out on this valuable resource: Take a look at *develop* on this month's Developer CD, on the Web at <http://dev.info.apple.com/develop.html>, or in print if you've subscribed to *develop* through the Apple Developer Catalog. As always, your feedback is welcome at AppleLink DEVELOP or [develop@applelink.apple.com](mailto:develop@applelink.apple.com).

*Caroline Rose  
Editor, develop*

# New Developer Tools Announced at Macworld

January's San Francisco Macworld Expo featured significant Mac OS development tool announcements by Apple Computer, Inc., and 15 third-party developers. Since your development plans—and your ability to deliver top-performance Mac OS software products—depend on knowing about the latest tools, we're summing up all the Macworld announcements here. Because space doesn't allow us to go into great detail, we've provided contact information in this article. (Addresses for Web sites mentioned in this article are listed in the "Internet Resources" box on page 21.)

Apple has just opened its official Developer Tools home page as a focal point for information about Apple's and other companies' Mac OS development tools. The page is currently under construction and, as of this writing, only includes details about Apple tools. We suggest you visit this Web site from time to time in the coming weeks, since Apple expects to expand it to include information about third-party tools and connections to those companies' Web sites.

## Apple Announcements

- *Release 19 of E.T.O. (Essentials • Tools • Objects) and MPW Pro.* New software components included in these products make it easier for you to adopt key Mac OS technologies and to develop higher-performance applications while shortening time to market. To make these tools more accessible for all developers, Apple has lowered their prices. The MPW Pro price has been reduced from \$295 to \$195; new subscriptions to E.T.O.—including three mailings a year—have been lowered from \$795 to \$595, while renewals now cost \$195, down from \$295.

Here are some of the important new features:

- MrC/MrCpp 1.0, highly optimizing C and C++ compilers that you can use to create "native" Power Macintosh applications with considerably faster run-time performance

- MacApp 3.3, a significant upgrade to Apple's popular object-oriented application development framework

- Power Macintosh Debugger 2.0, an even easier-to-use version of Apple's standard one-system and two-system debugger

- CFM-68K, the first release of Code Fragment Manager for 680x0 Macintosh systems—runtime software that enables you to create shared libraries and drop-in code modules for 680x0-based applications

- The first release of SOMobjects™ for Mac OS, an object-oriented programming technology for building, packaging, and manipulating binary class libraries

- SC/SCpp, Symantec's new C and C++ compilers (based on the MrC/MrCpp compiler technology), which generate 680x0 code and support the new CFM-68K run-time model

- An early development release of MrPlus, a new performance-tuning environment for accelerating native Power Macintosh applications

For more information, visit the Apple Developer Tools home page.

- *Apple Media Tool (AMT) 2.0 and AMT Programming Environment 2.0.* Apple Media Tool 2.0 allows you to create projects that run in native mode on Power Macintosh computers and lets you incorporate many new features, including support for QuickTime VR, Macintosh Drag and Drop, AppleScript, and hypertext links. Apple Media Tool

is designed for a wide range of users, including creative designers, producers, educators, and business communications professionals. The Apple Media Tool Programming Environment is a programming language and framework that provides the benefits of object-oriented, cross-platform programming to multimedia developers.

For more information, see the news story on page 11 and the Apple Multimedia Program Web site.

- *New and updated tools for the Newton 2.0 platform.* Apple announced the availability and shipment of the latest version of the Newton Toolkit (NTK 1.6) for the Mac OS as well as a set of application programming interfaces (APIs) and desktop integration libraries (DILs) for both the Mac OS and Windows. These tools fully support Newton 2.0 and enable you to create custom solutions and products for the Newton platform that easily integrate with applications and data on both Mac OS and Windows-based personal computers.

For more information, go to Apple's Newton Web site.

## Third-Party Announcements

- *Absoft: First FORTRAN 90 compiler for Power Macintosh.* Absoft Corp. demonstrated the first FORTRAN 90 compiler for Power Macintosh computers. (FORTRAN 90 is the latest FORTRAN standard.) With FORTRAN 90, Power Macintosh computers become the most economical development platform for researchers, scientists, and engineers who want to develop front ends for Cray systems and high-end Sun workstations. It makes FORTRAN easier to write and maintain, and, in many cases, it makes FORTRAN code run faster,

as well. Absoft will begin shipping a beta "early adopter" version of its FORTRAN 90 development system in February 1996. It will be available only as a native Power Macintosh application but will also include a 680x0 code generator to allow building either 680x0, Power Macintosh, or "fat" binaries.

For more information, contact Wood Lotz (e-mail—sales@absoft.com; phone—810-853-0050), or go to the Absoft Web site.

- *dtF Americas: dtF version 1.6.* dtF Americas, Inc., announced dtF version 1.6 for C/C++, HyperCard, SuperCard, Pictorius Peregrine, Smalltalk Agents, and Apple Media Tool developers. This product includes support for native PowerPC and multiplatform development as well as OpenDoc, SQL, binary large objects, full transaction control, error recovery, and client/server architectures. The new features include numerous SQL enhancements, referential integrity, self-learning query optimization, HyperCard XCMDs for BLOB-handling, ODBC driver, OpenDoc part editors, and libraries for creation of OpenDoc database part editors. The dtF product is currently available for the Mac OS, DOS, Windows, and OS/2. The C/C++ API is identical across all platforms.

For more information, contact Brenda DeVries (AppleLink—DTF.AMERICA; phone—800-383-1790; fax—510-828-8755).

- *JYACC: JAM 7 for Power Macintosh.* JYACC previewed JAM 7, the Power Macintosh version of its cross-platform tool for building client/server and enterprise applications scheduled to ship by the end of January 1996.

For more information, contact Chris Sheik (e-mail—csheik@jyacc.com; phone—212-267-7722;

fax—212-608-6753) or visit the JYACC Web site.

- *Metrowerks: CodeManager, CodeWarrior Gold 8, Discover Programming.* Metrowerks announced CodeManager, a Macintosh-based source-code control system based on Microsoft technology and compatible with Microsoft Visual SourceSafe version 4.0. CodeManager is the first Mac OS product to let professional Macintosh developers visually manage large cross-platform software projects. For such projects, developers usually work in groups to manage millions of lines of code, all the while maintaining source code and version control. CodeManager aids this process by acting as a central repository that tracks version control during the development process.

CodeWarrior Gold 8, the new version of Metrowerks's award-winning development environment for the Macintosh computer, was also announced at Macworld. Version 8 enhances compiling performance for the CodeWarrior product line, and allows Macintosh-hosted application generation for Mac OS and Windows operating systems. CodeWarrior Gold 8 allows rapid application development with C, C++, and Object Pascal programming languages. An Integrated Development Environment (IDE), exclusive with CodeWarrior, allows applications to be written on the Macintosh computer and compiled for a variety of operating systems, including 680x0 Macintosh, Power Macintosh, Windows 95, Windows NT, Magic Cap, and Be systems.

Finally, Metrowerks announced that it is shipping an entry-level programming starter kit, Discover Programming for Macintosh, designed to teach beginning-level programmers C, C++, and Object Pascal coding techniques. It's the first in a series of programmers' training

products from Metrowerks.

Priced at \$79, it contains Metrowerks' C, C++, and Object Pascal compilers for 680x0 code generation on CD-ROM, as well as three online books, *Learn C on the Macintosh, Second Edition* and *Learn C++ on the Macintosh*, both by Dave Mark, and *Programming Starter Kit for Macintosh* by Jim Trudeau.

For more information about the new Metrowerks products, contact Jean Belanger (e-mail—belanger@austin.metrowerks.com; phone—512-305-0437), or see the Metrowerks Web site.

- *Natural Intelligence, Inc.: Roaster, Roaster Professional.* Roaster, the first Java "applet" development environment for the Macintosh, includes a hierarchical project window, a powerful source-code editor, and a Java compiler, debugger, and run-time engine. It currently supports Power Macintosh systems; a future version will include 680x0 support, as well. Roaster also features a run-time environment for testing your applets.

Natural Intelligence also announced that it's developing Roaster Professional, which will be the first integrated environment for developing full-fledged Java applications, not just Java applets. Roaster Professional evolved from Natural Intelligence's Roaster. It will inherit many of Roaster's features, including its hierarchical project window and source-code editor as well as the Java compiler, debugger, and run-time engine. Roaster Professional builds upon Roaster by adding three key components: the first Java class library specifically designed for creating stand-alone, cross-platform applications; a visual screen builder for rapid prototyping and interface construction; and native compilers that transform Java byte code into fast native code.

For more information about Natural Intelligence and its products, contact Hillel N. Cooperman (e-mail—coop@natural.com; phone—617-876-7680, ext. 1221), or go to the Natural Intelligence Web site.

- *Omniscience: Object-Relational Database for Macintosh.* Omniscience ORDBMS 2.2 is the first object-relational database management system (RDBMS) on Power Macintosh and 680x0 Macintosh computers. Omniscience ORDBMS is a high-performance database management system, and it includes native support for SQL-92 as well as C and C++. Omniscience's small footprint enables users to easily deploy their applications onto notebook computers and mobile devices but still maintain access to an enterprise database.

For more information, contact Carol Garnett (e-mail—carol@oot.com; phone—408-562-0752), or visit the Omniscience Web site.

- *Pictorius: Prograph CPX for Macintosh and Windows, ODBC support and Power Mac compiler for Peregrine, Internet Authoring Toolkit for Peregrine.* Pictorius demonstrated the cross-platform capabilities of Prograph CPX on the Windows 95/NT platform at Macworld. Prograph CPX is a visual, object-oriented application development environment, and it's designed to deliver dramatic productivity gains over more traditional programming environments. The Windows 95/NT version will be released in the spring.

Pictorius also announced that Peregrine, the client/server development environment for creating applications and databases, will be compatible with Open Database Connectivity (ODBC) in February. Then, Peregrine customers will be able to build front-end applications with Peregrine to any ODBC-compatible server. The Developer version of Peregrine currently supports Butler and dtF

databases. Additional connectivity to Oracle, Sybase, and MS SQL Server is available in the Corporate version.

Finally, Pictorius demonstrated a new add-on to Peregrine, an Internet authoring toolkit (IAT). The IAT will let users build interactive, flexible client/server-based applications that run over the Internet. The IAT is a powerful, fully integrated environment with editors and customizable classes.

For more information about Pictorius's products, contact Alex Kosarow (e-mail—akos@pictorius.com; phone—902-492-2880; fax—902-492-3409), or see the Pictorius Web site.

- *Powersoft: PowerBuilder for Macintosh, Infomaker.* Powersoft Corp. announced the shipment of PowerBuilder for Macintosh, the newest release of Powersoft's family of scalable client/server development tools. PowerBuilder's multiplatform architecture reduces development costs and boosts productivity by enabling developers to build a single application, deploy it across a heterogeneous environment, and provide users with a native look and feel in each environment. Features include support for AppleScript, and Apple SourceServer as a repository for source-code management and version control. PowerBuilder for Macintosh includes a single-user version of Watcom SQL 4.0 for Macintosh and Connectix's RAM Doubler. In addition, Powersoft announced availability of a Macintosh version of its complete personal data access and information management tool, Infomaker.

For information about Powersoft, contact Kathy Quirk (e-mail—kquirk@powersoft.com; phone—508-287-1882; fax—508-369-3997), or see the Powersoft Web site.

- *QKS: Smalltalk Agents, Power Macintosh version.* QKS announced that it will ship the



Power Macintosh version of its dynamic, object-oriented Smalltalk Agents development environment, previously available only for 680x0 Macintosh systems. The new version will be available in the first calendar quarter of 1996. It will include the CXBase Pro database engine, which QKS licensed from TSE International of Amsterdam, Holland. CXBase Pro is used for internal source-code management; it can also be used royalty-free in applications for outside distribution. QKS licensed THINK Reference for inclusion in the new version of Smalltalk Agents to improve the usefulness of its online documentation. Other enhancements to the upcoming release include reduced footprints for both the workbench and stand-alone versions and enriched features for the Platform Independent Portable Object (PIPO) mechanism.

For more information, contact Nabuko Isomata (e-mail—[QKS@applelink.apple.com](mailto:QKS@applelink.apple.com); phone—301-530-4853; fax—301-530-5712), or visit the QKS Web site.

- *Visigenic: ODBC Drivers for Macintosh/Power Macintosh.* Visigenic Software is now shipping ODBC Drivers for the Macintosh and Power Macintosh platforms. ODBC Drivers provide database access to a variety of databases from ODBC-enabled applications. Macintosh ODBC drivers currently available include Informix, Oracle, and Microsoft SQL Server drivers. With the ODBC DriverSet, you can provide cross-platform access to multiple SQL databases by using a single, standard API. Visigenic's ODBC drivers have been carefully designed to support the development of mission-critical applications. The drivers, based upon the ODBC 2.0 specification, are compliant with all Core, Level 1, and key Level 2 API functions. Visigenic drivers are released simultaneously on Windows, Windows NT,

680x0 Macintosh, Power Macintosh, OS/2, and UNIX platforms.

For more information, contact Terry Langlais (phone—415-286-2468; fax—415-286-2464), or visit the Visigenic Web site.

- *Willows Software: TWIN Cross Platform Developers Kit for Macintosh.* Willows Software is announcing the technology preview of the TWIN Cross Platform Developers Kit (XPDK) for the Macintosh. The product is a platform-independent programming environment based on the application programming interface for Windows (APIW), and it complies with the recently adopted APIW European Standard. It provides a simplified migration path for taking Windows-based applications to the Mac OS, leveraging the vast amount of Windows expertise available in the industry today.

For more information, contact Darcy Fowkes (e-mail—[darcy@willows.com](mailto:darcy@willows.com); phone—408-777-1820, ext. 234; fax—408-777-1827), or visit the Willows Software Web site.

### Other Recent Announcements Highlighted at Macworld

- *Microsoft: Visual C++ 4.0 Cross-Development Edition for Macintosh.* Announced in November 1995, the new release of Visual C++ includes an incremental linker and a new mfile utility as well as support for OLE and ODBC. It also supports the Power Macintosh Code Fragment Manager and provides a Power Macintosh native optimizing compiler.

- *Symantec: C++ for Power Mac version 8.* This new release, first announced in October 1995, generates highly optimized Power Macintosh executables. New features include the MrC/MrC++ compilers, which produce executable applications that are 22 percent faster; exception handling; and RTTI, MPW REZ, and PowerPC assembler and debugger

improvements. Symantec also announced new packaging and pricing for Symantec C++ for 68K Macintosh. Because of its comparatively low price, this product is ideal for hobbyists, students, teachers, or developers who still use 680x0-based Macintosh systems. Customers who start with this product can later upgrade to C++ for PowerMac, and all of their code can be easily ported to run native on Power Macintosh systems.

For more information, contact Elisheva Steiner (phone—408-446-7134), or visit the Symantec Web site.

- *Objectivity, Inc: Objectivity/DB Server for Macintosh.* The new Objectivity/DB Server for Macintosh, announced in November 1995, incorporates administrative tools with a native Macintosh look and feel, bringing Mac OS computers (often considered clients in client/server computing environments) peer-to-peer server capabilities in a distributed network of object-oriented information servers.

For more information, contact Vickie Clements (e-mail—[vickie@objy.com](mailto:vickie@objy.com); phone—415-254-7141), or visit the Objectivity Web site.

- *Planning Sciences, Inc: Gentium 3.0 for Macintosh.* Gentium, announced in December 1995, is an object-oriented development environment for decision support applications. Applications are developed from libraries of objects using point-and-click and drag-and-drop techniques. Because Gentium is designed for enterprise-wide decision support, it integrates multidimensional (OLAP), relational (through ODBC), and textual information. Gentium's 32-bit agency system allows intelligent agents to automate many labor-intensive tasks such as data mining or database administration. Gentium uses a distributed client/server architecture that facilitates Macintosh clients working with UNIX and Windows NT servers by sharing the same data and applications without the need for recompilation or porting.

For more information, contact Marc Gedansky (e-mail—[103046,2337@compuserve.com](mailto:103046,2337@compuserve.com); phone—508-898-9511). ♣

## Internet Resources

- Absoft Web site: <http://www.absoft.com>
- Apple Multimedia Program Web site: <http://www.amp.apple.com>
- Developer Tools home page: <http://devtools.apple.com/>
- JYACC Web site: <http://www.jyacc.com/index.htm>
- Metrowerks Web site: <http://www.metrowerks.com/>
- Natural Intelligence Web site: <http://www.natural.com/>
- Newton Web site: <http://newton.info.apple.com/newton/>
- Objectivity Web site: <http://www.objectivity.com/>
- Omniscience Web site: <http://www.omniscience.com/>
- Pictorius Web site: <http://www.pictorius.com/>
- Powersoft Web site: <http://www.powersoft.com/>
- QKS Web site: <http://www.qks.com/>
- Symantec Web site: <http://www.symantec.com/lit/dev/macdev/cpp80pm.html>
- Visigenic Web site: <http://www.visigenic.com>
- Willows Software Web site: <http://www.willows.com/>

# OpenDoc Human Interface FAQs

By Kerry Ortega, Dave Curbow, and Elizabeth Dykstra-Erickson, Apple OpenDoc Human Interface Team

## Viewers Versus Editors, and Some Clarifications

The OpenDoc human interface team frequently receives questions about OpenDoc that we need to answer in a public forum to help our partners' OpenDoc development efforts. We think you should know about the topics these questions address.

But first, a correction. There was an error in our answer to the second question in last January's "OpenDoc Human Interface FAQs" article. Since the OpenDoc shell implements Close, Save, and Save As, the root part is never given a chance to handle these events. This error in the article shouldn't affect how you implement your editors, however.

And now to this month's questions.

**Q. Why do we have part viewers, how do they work, and what are they supposed to do? I'm confused about how they differ from part editors.**

**A.** Viewers are a boon to users who don't have the editor required to manipulate some particular content. The purpose of a viewer is to allow users to preserve the appearance, at the highest possible fidelity, of the content in a document. An editor, of course, preserves this fidelity and gives the user the ability to manipulate the content. A viewer is not intended as a mechanism to "lock" a document and prevent it from being changed; instead, the viewer is one mechanism for enabling the user to see the content when the user doesn't own

the appropriate part editor. (Translation—that is, allowing an appropriate part editor to translate and display the content—is another mechanism, but the content may lose something in translation.)

You may, in fact, want to provide a part viewer as a promotion for your product—it's free for the user, it's easy for you to provide once your editor is market-ready, and it allows users to see what content they could create if they had your editor.

A viewer allows users to see and print all of the content of a document, and to view existing content in standard formats (for example, QuickTime movies, QuickDraw 3D objects, and bitmapped graphics). A viewer does not allow users to make changes that can be saved, but it may allow minor temporary edits, such as formatting or font changes. While the content that is intrinsic to the viewer may not be manipulated, any content embedded within a viewer, for which you have an editor, may be fully manipulated.

Because a viewer doesn't have all the functionality of the corresponding editor, you should simplify your viewer's menus by removing (not just dimming) the menu items that are exclusive to the editor.

**Q. I'm making an editor and a viewer for my part. Are there any guidelines for naming these items?**

**A.** Remember that end-users will use stationery pads (in the Stationery folder) to create new parts. So, first we'll remind you of the guidelines for stationery names.

The name of a stationery pad should indicate its purpose. For example, a stationery pad that

creates a medical form might be named *Medical Form*. For stationery pads that have no initial content, use the name of the category or the product name. For example, you might call a graphics part stationery pad either *Drawing* (its category name) or *SurfDraw* (its product name). Do not use the word *stationery* in the name.

By the way, many of our sample parts are using incorrect names for their stationery pads. This error will be fixed in the next release; we're sorry we missed it this time. For part editors, we suggest you use just the product name—for example, *SurfWriter*. Part viewers should have the word *Viewer* appended to the name—for example, *SurfDraw Viewer*. If your current application uses the term *Player*, then for consistency, you can continue to use the term *Player*; but you should move to using the term *Viewer* as soon as possible.

Remember that editors and viewers have slightly different icons. Read Chapter 12 of the *OpenDoc Programmer's Guide* for details.

**Q. What happens if I have the editor for content that is embedded in a viewer?**

**A.** In a word, if you have an editor, it will work on its own content, whether that content is embedded in a viewer or not. Consider the case in which only a viewer is present for a compound document's container, but the user has all the necessary editors for the document's embedded content. The embedded content can be changed, but the container's intrinsic content can only be viewed.

What? A viewer that lets me change things inside it? Here's the distinction: The viewer only

affects its own intrinsic content; any content embedded within it, for which the user does have the appropriate editor, may be fully manipulated.

**Q. What operations should my viewer support?**

**A.** You'll find these operations discussed in Chapter 12 of the *OpenDoc Programmer's Guide*. Your viewer should be able to read, display, and print its content. We also recommend that your viewer support selection, so that users can access Part Info or Link Info on embedded parts or links; this gives users more flexibility for changing editors for embedded parts. You also may want to allow users to drag content and parts out of your part, so that they can copy content to the Finder or to other documents. Remember that, in general, a single click should always activate the part and not select it; this guideline still applies when an viewer is being used.

Viewers should support all the commands in the Document menu except Insert. In the Edit menu, viewers should remove the Cut, Paste, Paste As, and Clear commands. In addition, a viewer should not support drag-and-drop operations that would modify or remove content. For example, don't allow the user to select some content and drag it to the Trash. Some viewers now allow this, but this is a bug. (We forgot to mention this case in the *OpenDoc Programmer's Guide*).

We'd like to reiterate that *a viewer should not be capable of adding, embedding, or removing content from a part*. Only an editor should have those capabilities. As we said earlier, your viewer should also remove any other content-editing commands in menus displayed by your editor. If

you enable any editing commands in the menu bar, make sure you notify the user that any changes made will not be saved.

**Q. Why can't I paste or drag and drop into a part handled by a viewer?**

**A.** With today's application-based viewers (Adobe Acrobat, for example), you're allowed to change the content of what you're looking at by completely replacing it. If you did that with OpenDoc viewers, you'd lose any embedded content. To prevent the loss of data, your viewer would need to follow all the rules for merging and embedding content. Once you provide this support, you have an editor (albeit one with limited capabilities) instead of a viewer.

Here's an example you may be familiar with. The PictureViewer part editor supplied with OpenDoc originally allowed a paste (or drop) of a new picture into the part; this replaced all the content. Although it appears that this behavior was popular, it was wrong and, after much debate, Apple changed PictureViewer so that it could no longer replace the graphics being viewed.

You may decide that your viewer will not support embedded content. In this case, you might think that, since you don't allow other content to be embedded in your viewer, you can support your viewer changing content because that would never be destructive—there would never be loss of embedded content. However, whether you support embedded content or not, we strongly suggest that all viewers should present a consistent user experience—namely, that the user can add content to a part using an editor but not using a viewer.

After all, a viewer is a viewer—and not an editor. If you're providing more functionality to your viewer, then perhaps you're really

delivering a low-level editor and should reconsider how you structure and name your part.

**Q. I plan to write a simple text editor. I will support plain but not styled text during drag and paste operations. This means that, if I follow your previous guidelines (see "OpenDoc Human Interface FAQs" in the October 1995 issue), I will have to**

problematic in a number of ways.

Because of this, there are times when this guideline may not apply to you; please use your best judgment. And the situation may not be that critical—after all, most of today's applications do not alert the user when data or formatting is lost, and users seem to easily recognize when they have lost data or formatting. With the multiple-level "undo" support

ument before the paste or drop operation.

3. We *strongly* recommend that your part editor support embedding. That way, if it can't do anything else, your editor will be able to accept the content as embedded content.

So, we've been enlightened. The suggestion in our previous FAQ of always notifying the user through an alert is certainly not the correct advice. It's good general advice, but your particular situation may prompt you to follow some alternative. ♣

**A viewer should not be capable of adding, embedding, or removing content from a part. But any embedded content for which you have an editor may be fully manipulated.**

**display an alert each time content is added to my part, to inform the user that some formatting or content may be lost. For repetitive drag or paste operations, it could become really annoying for users to have to continually dismiss the alert. Is this what you intended?**

**A.** We think you've got a very good point, and we have accordingly modified our guidelines (hey, we're always open to suggestions!). In our October 1995 article, we recommended that part editors display an alert to notify the user that some data might be lost during a copy operation. When your question came in, we thought about this situation some more and agreed that in some cases it could be very irritating to the user to have the alert displayed repeatedly. Therefore, we still believe in principle that notifying the user of loss of data is a good idea, but that consistent notification is

in OpenDoc, the user can undo a drop or paste operation to safely revert to the state of the document before the attempted drop or paste operation.

So, we need to clarify our previous guideline. Here's what we should have said:

1. If your editor chooses a part kind for a paste or drop operation, it must support it completely. For example, the part editor that is the destination for a paste or drop should not strip embedded content or links out of the data format. If you can't preserve the fidelity of the paste or drop, then you must choose a lower fidelity part kind. If there is no available lower fidelity part kind, then you must judge whether to accept the paste or drop and display an alert, or whether to reject the paste or drop.

2. Completely support the undo feature so that, if data is lost in a paste or drop operation, the user can undo the operation and recover the state of the doc-

## CD Highlights

*continued from page 15*

audiences, and the course schedule for January 1996 through June 1996.

### ADB Key Spy 2

This package provides a replacement for the GetKeys routine by maintaining a key map reflecting the state of each keyboard attached to the Macintosh computer through the Apple Desktop Bus. The package includes source code. In addition to solving the problem with the adjustable keyboard, this package is now a demonstration of several techniques, including

- building a system extension
- using the ADB API
- “patching” ADB service routines
- building, installing, and using a driver
- mapping physical key codes to virtual key codes

### AppleGlott 2.4b6

AppleGlott 2.4b6 is a text-translation tool used by Apple localizers to localize Apple software. AppleGlott extracts the text from a resource file and dumps it into a text file for translation. Once the text is translated, AppleGlott replaces the original text in the resource file with its translation. In addition to the regular translation, AppleGlott handles updates from one version to another, and copies over resizable items.

### At Ease WG 3.0.1 Updater

The At Ease 3.0.1 Updater will update your current version of At Ease for Workgroups 3.0 to the latest version, 3.0.1. The changes in version 3.0.1 include enhancements for the networking environment and bug fixes. A detailed list of the changes is included in the ReadMe file.

You can only use the Updater application on a workstation that has version 3.0 installed. The Updater will not run if you have an older version (2.x or earlier) installed. If you have an earlier version of At Ease for Workgroups, you should first update it to version 3.0, then use Updater.

### develop issue 25

This issue contains the complete text of *develop* Issue 25. For a summary of this

issue’s contents, see “*develop* Issue 25: VR, 3D, GX, and More” on page 15.

### Developer Notes

This folder contains descriptions of new hardware and software features, comparisons with existing computer models, and information about expansion card design.

### FindPrinter

This is a snippet showing how to determine the currently selected (network) printer. Includes a minimum test-harness to show that the code actually works. This snippet works with QuickDraw GX and Desktop Printing.

### HTTP Server

This is a functional Open Transport sample that implements a Macintosh background process that responds to simple HTTP requests through TCP/IP. It utilizes C++ , exceptions, IOStreams, the Macintosh Thread Manager, and Open Transport (accepting connections and no-copy reads).

### jGNE Helper

This folder contains jGNE Helper, formerly a monthly posting to the Usenet newsgroup alt.sources.mac. It provides an example for INIT programmers interested in filtering events before they are handed to applications calling GetNextEvent (which is called by WaitNextEvent).

The jGNE filter is the Apple-sanctioned method for filtering events. Although it’s possible, and sometimes even advisable, to patch event traps, you ought to attempt to use the jGNE filter before patching traps.

*Note:* Prospective users of this code should know that the current plan for Copland does not include support for the jGNE filter. However, it is likely that Copland will include some kind of global event-filtering service. If you carefully isolate your use of this code, you may be able to make the move to Copland without too much pain.

### MoreFiles 1.4.1

MoreFiles is a collection of high-level routines written over the last couple of years to solve File Manager problems developers have sent to Apple Developer Technical

Support. The routines have been tested (but not stress-tested), documented, and code-reviewed by Apple’s Developer Technical Support. This release adds new routines and fixes several bugs.

MoreFiles provides

- high-level and FSSpec-style routines for parameter-block-only File Manager calls
- useful utility routines that perform many common File Manager–related operations

- a robust file-copy routine

- a recursive directory-copy routine

- a catalog-searching routine

- high-level and FSSpec-style routines for Desktop Manager calls

- routines for dealing with pathnames

See the file !MoreFiles Read Me for a description of fixes and improvements in version 1.4.1.

### STD File Saver 2.0

StdFileSaver 2.0 is a sample print driver written in C. It’s based upon the STD File Saver 1.1 sample in Pascal that has been the only print driver sample available since 1991. StdFileSaver 2.0 writes to PICT resources, so it’s not too useful as is, but it illustrates what needs to be done with a minimum of extra work.

### Coming Next Month

Oh, who am I fooling. . . . Looking back over my wild guesses of the past year, I don’t think I’ve *ever* managed to predict correctly what’s coming up, and I’ll bet most of you out there have begun skipping this part entirely. So, this is the last appearance of the “Coming Next Month” paragraph; if you have a good idea for what to put in its place, drop me a line at [dev.cd@applelink.apple.com](mailto:dev.cd@applelink.apple.com).

*Alex Doshier*  
Developer CD Leader



# Business

## Special Market Report

# European Software Market Opportunities

By Kris Newby,  
Apple Directions Staff

If you're a Macintosh developer considering selling your software outside your native country, the European market is a good place to start. The improving European economy, healthy Macintosh sales in Europe, and ongoing technology investments by the European Union (EU) are creating promising market conditions for those looking to expand their worldwide market share.

Today, barriers to entering the European market are becoming much less daunting. The common European Currency Unit (called *ECU* or *EURO*) is due out in 1999, and it promises to lessen your monetary exchange hassles. And the growing use of the Internet is making it easier to communicate across oceans and multiple time zones. What's more, the Mac OS—which already offers you the best localization facilities in the industry—will include even more useful localization enhancements with

the "world-ready" Copland release. (For details on these upcoming improvements, see the article "International Development From Here to Copland" in the January 1996 issue of *Apple Directions*.)

This article aims to give you a quick overview of conditions in the European software market—think of it as your new year's dose of global awareness. It describes market-specific opportunities in Apple's top European country markets, and it tells you where you can find out more

### Inside This Section

Creating Shareware for Fun (and Profit?) 30

about European distributors and technology funding initiatives.

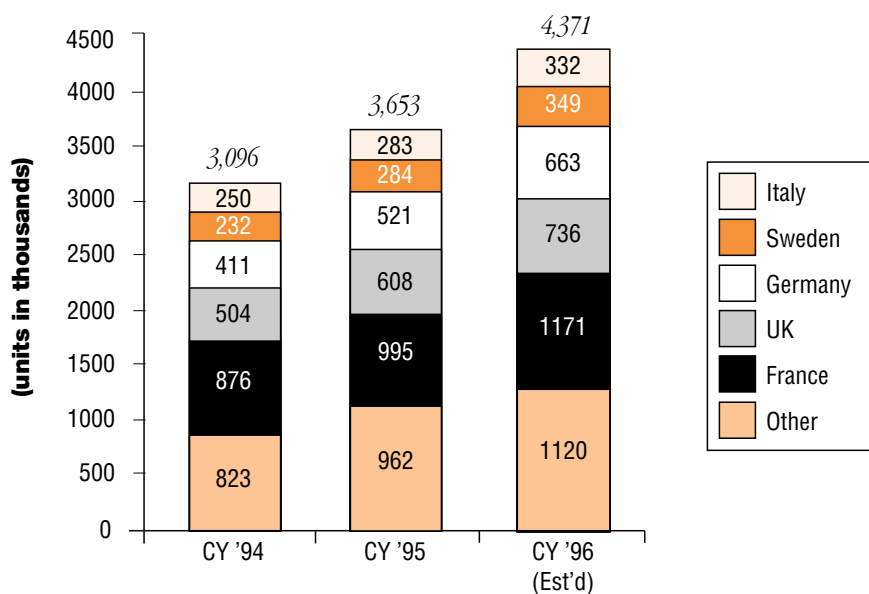
### European Software Market on the Upswing

Many economists believe that the European economy is on the upswing, climbing out of a recession that began in the early 1990s. A good indicator of how major software developers are doing in Europe can be gleaned from Software Publisher's Association (SPA) data, which is compiled quarterly from member companies such as Adobe, Borland, Claris, Lotus, Microsoft, Software Publishing, and Symantec.

According to this data, industry-wide European software sales grew 58 percent from Q3 '94 to Q3 '95, topping United States sales growth. During the first three quarters of 1995, double-digit growth was seen in all European countries except Switzerland, with the combined growth averaging 16 percent.

Gérard Gabella, managing director of SPA Europe, recently elaborated on these figures: "Overall, software sales in Europe were better than the sales of the previous two years. The 16 percent growth we're seeing for the first three quarters of 1995 is more or less in line with U.S. software sales growth. This is the

### The Macintosh Installed Base in Western Europe



Source: IDC, January 1996

Germany, France, and the United Kingdom have the largest installed base of Macintosh computers in Europe.

best growth since the beginning of the European recession, and I expect to see this growth continue as the antipiracy measures that the SPA and others are pushing gradually take effect.”

Although total Mac OS–based software revenues are lower than Windows-based software revenues, there is plenty of demand for innovative Macintosh software applications in Europe. European Mac OS software sales during Q3 '95 exceeded the industry average, growing from \$13.5 million to \$28 million—an impressive 107 percent increase. Apple computers are the third most popular brand in Europe, and in the coming year, more than 1 million Macintosh computers will flow into Europe. (For Macintosh installed base and market share estimates, see the charts on page 25 and 26.)

And we'd be remiss if we didn't mention that you typically earn more revenues from these Macintosh users than users of the competition: On average, software

developers earn 57 percent more revenues-per-unit for Mac OS–based software than Windows-based software in Western Europe, according to IDC Europe.

Another positive influence on European Macintosh sales is Apple Europe's relatively new president, Marco Landi, a 22-year veteran of Texas Instruments. In his first 11 months, Landi has brought about a series of positive changes, including speedier product deliveries, tighter business controls, and a more customer-oriented marketing approach. *Business Week* recently lauded his performance, saying “In fiscal 1995, he tripled profits—turning in the best performance of any Apple unit in the world.”

#### A More Perfect Union

An article about the European software market wouldn't be complete without an update on Europe's move toward a cohesive European Union (EU). The EU Single Market Program, which

began in December 1991, aims to unify Europe into a single market with fewer intercountry trade barriers and a common currency. Though the EU transition is somewhat bumpy and politically charged, the end result will be good for software developers for several reasons.

First, the removal of European barriers is even now making it easier and less expensive to move goods and people across country borders. Second, the single EURO currency will lessen the cost of multiple-currency foreign-exchange transactions and exchange-rate hedging (though Britain and Denmark have opted to keep their own currencies).

Another important offshoot of this transition is the European Commission's “Information Society” program, a series of technology and policy initiatives that aim to improve growth, competitiveness, and employment throughout Europe. These initia-

tives, which include funding for innovative research and development, open many technology partnership opportunities for local European and non-European developers.

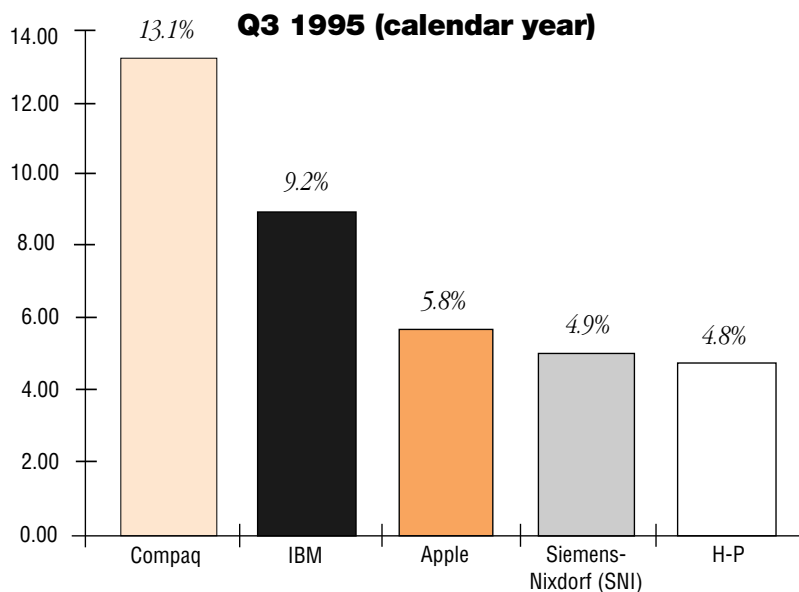
#### EU Initiative Opportunities

The European Commission's 13 billion EURO (about U.S. \$16 billion) research and development budget will provide a big boost to high-technology firms developing new software applications and business processes. And though the large EC contracts will go to indigenous EU developers, there are still opportunities for non-European developers to license or co-develop “best of breed” software solutions with European partners. (Though you probably have a better chance of participating if you have a European office.) Apple Europe is also actively pursuing some of these EC project proposals and they're helping to define Europe's emerging “information superhighway.”

The Internet has made finding out about these projects infinitely easier. A great place to browse through the latest EU requests-for-proposals and contract recipients is the “I'm Europe” site on the World Wide Web. (See the “European Market Resources” box on page 28 for more details.) Think of this site as your “personal dating service” for European partners: It enables you browse through hundreds of proposal requests and contracts initiated from all over Europe.

Macintosh multimedia and education developers, for example, will want to look over the LEONARDO vocational training initiative, which has a total budget of 620 million EURO over five years (1995–1999), and SOC-RATES, a 760 million EURO program for higher education, school education, and “distance” learning.

## Western European Personal Computer Market Share



Source: IDC Europe, January 1996

Apple is the number-three personal computer manufacturer in Europe, and with more than 1 million Macintosh computers expected to flow into Europe in 1996, many think that Apple's market share will rise in the coming months.

## Analyzing Europe's Regional Markets

If you're considering entering the European market for the first time, you're probably wondering which countries to tackle first. A logical place to begin is in Apple's "big three" European regional markets—France, Germany, and the United Kingdom. If you're based in an English-speaking country, and you can't afford to localize your products, you may want to consider just marketing to the United Kingdom and the Northern European region, which includes Sweden, Finland, Norway, Denmark, the Netherlands, and Iceland. These countries are fairly accepting of English-language software, and they also have a large installed base of Macintosh computers.

In the next several sections of this article, you'll find an overview of conditions and opportunities in Apple's European markets. (We've also covered the relatively smaller Italy market, because new antipiracy laws there are making it an attractive growth proposition for the next couple of years.) To obtain more details on these and other European country markets, see the "European Market Resources" box on page 28 or the Apple Web site <http://dev.info.apple.com/intl.html>.

### The France Market

- *Economic climate.* Industry-wide software sales in France rose 16 percent during the first three quarters of 1995, and sales increased 38 percent during Q3 '95, compared to the same period in 1994 (source: SPA). Recent labor strikes in this country, however, will temporarily lower follow-on software sales.

- *Apple's positioning.* France is Apple's largest market outside the United States. Its installed base of nearly a million Macintosh computers is expected to grow almost 18 percent this year. Apple also has a strong positive brand

image in France (among brand-aware respondents), tied for first place with Hewlett-Packard (source: Apple Brand Awareness Study). Overall, Apple France has achieved a healthy market share in small, medium, and large business segments. According to Apple France, market niches where Apple holds particularly strong positions include professional publishing, especially in the press market (60 percent market share) and the magazine market (80 percent share); Macintosh computers are also used extensively in hospitals (30 percent share) and in physician's private practices (35 percent share).

- *Unique selling propositions.* It's important to ally yourself with an established software distributor in France.

- *Market opportunities.* France has been an early adopter of many new computer and telecommunications technologies. With large business making up the largest segment of Macintosh sales in France, Apple France reports that there is a need for good systems integration, local area networking, and communication solutions.

- *Special requirements.* Distribution channels in France are highly structured, with increasingly powerful dealer chains dominating the distribution system. To avoid channel conflict, Apple France recommends that you give exclusive distribution rights to the distributor of your choice, and that you don't price your product more than 25 percent over the price of your U.S. product versions. The French government also has regulations that require developers to fully localize software sold in their country.

### The Germany Market

- *Economic climate.* The German/Austrian region reported the largest volume of software sales in Europe for the first three quarters of 1995, and sales rose an

impressive 98 percent from Q2 to Q3 of that year (source: SPA).

- *Apple positioning.* Though Germany has Apple's third largest installed base in Europe, computer sales in this country are dominated by local German PC makers such as VOBIS and ESCOM. In 1995, Apple Germany invested heavily in reaching the consumer market through TV campaigns and their Mac Today magazine and CD-ROM, which is distributed to 7 million homes a month. Apple Germany reports that about half of their Macintosh sales were low-end systems during this period. The Power Macintosh has also sold very well in this country, because its speed and power appeals to German buyers.

- *Unique selling propositions.* According to Apple Germany, "the German art" of purchasing goods is not one of spontaneity or compromise—Germans choose their suppliers based on product philosophy, financial strength, perceived longevity, and quality of service in the Germany market. German buyers tend to buy their computers at computer shops and authorized dealers—mail order isn't as important as it is in the United States. Because of these factors, Apple Germany recommends that you give exclusive distribution rights to a distributor who can provide your products with excellent local product support. In marketing to businesses, "power" and "compatibility" are important selling points to emphasize. If you sell home software, Germany is a good place to start, since 28 percent of all households have one or more computers at home, compared with 24 percent in the United Kingdom and 15 percent in France (source: IDC, March 1995).

- *Market opportunities.* This year Apple Germany will be working closely with developers to bring more CD-ROM multimedia titles to market. Apple is also

focusing on large accounts through its dedicated sales force and concentrating on high-end publishing solutions for small and medium businesses. Germany also has the highest ISDN penetration in the world, presenting a market opportunity to networking and communications developers.

- *Special requirements.* In Germany, competitive advertising is against the law. Ergonomic standards for computer products are more stringent than in the United States. (For example, larger monitor sizes are required.)

### The United Kingdom

- *Economic climate.* Leigh Darby, Apple's U.K. developer relations manager, describes his country's economic climate as "cautiously optimistic." Though unemployment is a major concern in the United Kingdom, January 1996 government figures show low inflation (3.2 percent), interest rates (6.25 percent), and labor costs are attracting many U.S. and Asian companies who want to set up Europe-based manufacturing organizations. The SPA reports that Macintosh software sales rose at a healthy rate during the first three quarters of 1995 (21 percent), and overall software sales grew 51 percent in Q3 '95, compared to the same period in 1994. Apple consumer channel sales are expected to double in 1996, and Apple U.K. has been successful in gaining a presence in major retail store chains such as Dixons, Comet, and Argos.

- *Apple positioning.* This is Apple Computer's second largest market in Europe, and it's an obvious growth opportunity for English-speaking developers since very little localization is required. According to IDC, the millionth Macintosh will ship in this country sometime in 1996. In the United Kingdom, Macintosh computers hold a strong position in the

drawing/illustration/desktop publishing markets. In fact, 67 percent of DTP software revenues in the UK are Mac OS-based and set to rise by the end of the decade (source: IDC). Another interesting bit of trivia for educational developers is that the Strathclyde district of Scotland is one of Apple's largest K-12 sites worldwide, with more than 15,000 Macintosh computers installed.

• *Unique selling propositions.* Significantly more U.K. buyers are sensitive to price/value issues in buying computer products, compared to German or French pur-

chasers (source: Apple Brand Awareness Study).

• *Market opportunities.* Apple U.K. expects its strength in DTP and professional publishing markets to continue, providing opportunities for developers selling related products such as plugins, extensions, and graphics utilities. Apple U.K.'s developer relations group is also actively working with established entertainment, "edutainment," and education developers to port successful titles over to the Mac OS platform. And Apple UK recently helped out the New Media division with the Abbey Road Studios

project to facilitate the production of CD Plus titles. (CD Plus is a data interface standard for creating integrated audio/interactive CD-ROM discs.)

• *Special requirements.* Apple U.K. recommends that you assign a single distributor to market your product within the United Kingdom, in order to make it worth this distributor's time and money to promote, support, and localize your product. To avoid "gray market" issues (the cannibalization of U.K.-based software sales by out-of-country dealers), don't price your product more than 10 to 15 percent higher than your U.S. version.

### The Italy Market

• *Economic climate.* Daniele Gennari, Mac OS and third-party marketing manager in Apple Italy, reports that overall the software market in Italy is good, and Apple Italy had a lucrative 1995 holiday season—in fact, SPA member companies marketing within Italy have enjoyed a 200 percent increase in software sales in the last 20 months. He believes that one reason behind this improvement is the recent passage of new software antipiracy laws.

• *Apple positioning.* In Italy, more than half of all Macintosh systems are sold to businesses, and small businesses are especially loyal to the Macintosh brand.

• *Market opportunities.* The Italian software market is still young, and software chain and warehouse stores are just beginning to appear. Gennari sees a large opportunity for developers in the publishing, imaging, new media, small-office productivity, Internet, and networking and communications categories. Italy is also busy evangelizing developers, dealers, distributors, and consultants on the advantages of OpenDoc, paving the way for developers interested in introducing localized OpenDoc parts.

• *Unique selling propositions.* Service and support are extremely important to Italian customers. Excellent support will help you gain more word-of-mouth advertising, which is a very important purchasing factor in Italy.

• *Special requirements.* Gennari recommends that you rely on Italian marketing consultants to help you with local sales and marketing activities *before* approaching a local distributor. (This is because mass market distributors aren't providing as many "value-added" distribution services as they once did.) Also, in order to discourage software piracy and gray marketing, try not to price localized versions of your product more than 30 percent over your U.S. prices. Setting up a site-licensing program with volume discounts may also help minimize piracy problems.

### Market Challenges—Diversity and Local Competition

The primary challenge in entering the European market is the diversity of the individual countries—you can't just "cut and paste" previously successful marketing strategies into Europe country markets and expect them all to work. In addition, increased competition and pricing pressures are making it harder for non-European companies to compete with local firms.

Competition and pricing were hot topics at the 1995 SPA European Conference, where Steve DeWindt of AmeriQuest (he was formerly co-president of Computer 2000, a large European distribution firm) said, "Though the European economy is strong, software margins have come down and competitive behavior has increased."

Here are some of the other market challenges to consider:

• *Local competition.* Local developers have a definite pricing advantage over out-of-country

## European Market Resources

Here's a short list of resources that can help you learn more about the European market.

• *Country-specific information.* For detailed lists of European country distributors, market consultants, events, and publications, browse through the information posted on Apple's international Web site (<http://dev.info.apple.com/intl.html>). To get the names and numbers of Apple Developer Relations people in Europe, see the Web location <http://dev.info.apple.com/adrcontacts.html>. And for useful U.K. information, check out the U.K. Department of Trade and Industry (DTI) Web site (<http://www.dti.gov.uk/>) or the U.K. site search engine (<http://www.emap.com/whatsnew/search.html>).

• *"I'm Europe" European Commission Web site.* This site (<http://www.echo.lu>) is a great place to start looking for European project and research grant information. From this site you can gather information on upcoming multimedia, communication, and information management proposal requests; browse through European research servers; and read over European technology standards descriptions.

• *Interactive Multimedia Projects (IMPACT) Web site.* To get an idea of the variety of project funding available through the EU, take a look at the IMPACT project list, which includes calls for projects as diverse as virtual reality Gothic cathedral tours to sex education tutorials. It's located at <http://www.echo.lu/impact/projects/imm/en/dbindex.html>.

• *SPA International Resource Guide.* The Europe edition of this semi-annual publication includes considerable information on legal considerations, market research, international trade associations, trade shows and conferences, manufacturing services, and export management in Europe. For pricing and ordering information, contact the SPA at 202-452-1600 or check out their Web site (<http://www.spa.org>).



developers, who incur additional localization, transportation, and brand-building costs. SPA data shows that at the wholesale level, the average delta between North American and European software prices has dropped 85 percent since 1992. This means that non-European developers are finding they can no longer afford to price their European shelf-keeping-units (SKUs) considerably higher than their local versions. Jennifer Neumann, president of Berlin-based Canto software, offers advice to developers wanting to compete effectively with local companies: "You have to cultivate each individual country market, and most likely you'll need to have your own people in each of the bigger markets to constantly evangelize your distributors, VARs, dealers, the press, and early adopters."

• *Software piracy.* "This is the single biggest problem in

Europe," says DeWindt of AmeriQuest. But though this problem is fairly large in some countries in Europe, on average the situation is improving as a result of efforts to educate consumers and pass software antipiracy legislation.

• *Higher cost of telecommunications.* For developers in the communications or Internet segment of the market, the high cost of telecommunications in Europe is a significant barrier to sales. Looking to the future, the price of local telephone calls may start coming down in 1997, when new rules that encourage telecommunications competition among the EU nations take effect.

• *Cultural differences.* Many obstacles that non-native developers encounter while selling software in Europe are cultural, so finding a local consultant or distribution partner who is knowledgeable in the ways of

specific countries can help you avoid these obstacles. Such local experts can help you with everything from identifying objectionable ad approaches to educating you on different purchasing behaviors (such as the fact that customers in Europe are much more resistant to using credit cards and mail order than are U.S.-based customers).

### Your European Campaign

An article of this length can hardly scratch the surface of a market as complex and diverse as Europe's, but we hope this article leaves you with two important messages. First, Europe country markets are a good place to begin a global marketing effort, because of their large Macintosh installed base and optimistic growth outlook. Second, marketing your products in European countries will only get easier in the near future, as Europe moves toward

a unified economic system and the Copland operating system provides you with more labor-saving facilities for localizing your products. ♣

*Kris Newby (newby.k@applelink.apple.com) is a technical communications consultant and freelance writer based in Palo Alto, California.*

## APPLE DIRECTIONS EXPRESS

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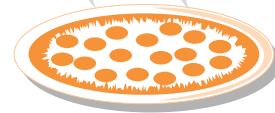
Tired of searching the 'net for Apple-related material? Apple Directions Express not only gives you the news, but points you to Internet locations for complete information about new Apple products and technologies, strategic initiatives, market opportunities, and other subjects that are important to the business of Macintosh development.

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**Developer Outlook**

# Creating Shareware for Fun (and Profit?)

By radar pangaeon,  
SpectraMediaTech, Inc.

Along with a group of friends and former business associates, I recently started a small company that develops Macintosh-based entertainment software. Because we have a limited production and marketing budget, we planned to gain an initial foothold in our target market by distributing our products as shareware—in other words, by making our products available on a trial basis, then relying on satisfied users to send us a licensing fee at the end of the trial period. We hoped to generate enough income from sales of shareware versions to finance the production and marketing costs of subsequent commercial versions.

To get feedback on this strategy, we described it to other developers through Guy Kawasaki's "semper.fi" Internet mailing list and the alt.comp.shareware.programmer newsgroup. (For information about subscribing to semper.fi, see the "Shareware Resources" box on page 31.) Overall, it was a real eye-opener. We heard from dozens of shareware developers, successful and not, and we found their advice to be enlightening and surprising. In this article, I present the collective wisdom of these shareware developers, along with their word of caution—distributing shareware software is definitely fun, but it may not be the fastest or best way to make a profit.

## **Shareware— Concept vs. Reality**

Shareware is software that users can try out for a designated period of time. At the end of that time period, a user is expected to pay a

licensing fee to the shareware author or discontinue use of the product. There are no hard-and-fast rules about shareware: The length of the trial period, the amount of the licensing fee, the additional benefits that registration delivers, and the payment methods vary.

Shareware is most often written by software hobbyists, who create a software solution or game for their own use or amusement. In most cases these authors are more motivated by altruism than profit, and they're not necessarily interested in providing long-term support for their software.

Shareware is distributed over the Internet, by user groups, on CD-ROM collections, and informally between individuals. Sometimes distributors of CD-ROM shareware collections charge users a fee ranging from \$5 to \$40 for shareware, but this fee often only covers production and distribution of the CD itself and usually does not provide any benefit to the shareware authors.

While the above definition states the theory behind shareware, in practice, most of the shareware developers with whom I spoke said that they rarely receive more than a few payments for products. Peter Lewis, for example (the author of many useful Internet shareware products, such as Anarchie), estimates that at most 20 percent of his products' users pay his licensing fee. Other shareware authors say that Lewis's 20 percent yield is much higher than average.

Lewis is one of the few shareware developers who make a living off shareware fees. So why has Lewis been relatively successful? I believe it's because he's been distributing shareware long

enough to have learned—and used—methods that optimize revenue returns and foster customer satisfaction. In the following sections, I'll summarize these methods.

## **Motivating Users to Pay**

Cary Farrier, a successful shareware author who now runs Laser Point (a software distribution company that specializes in shareware), provided a very detailed answer to my shareware inquiry, and forwarded me an information guide that you might also find useful. (See the "Shareware Resources" box on page 31 to find out where to download this document.) He summarized the biggest problem in collecting shareware revenues:

"People just don't seem to want to pay for something they already have."

The philosophy behind shareware—the try-it-before-you-buy-it concept—works against shareware authors because of this basic facet of human nature. After all, most of us are conditioned to buy things *before* we receive the benefits associated with using them. Once users have software in their possession, there really isn't much incentive for them to go to the trouble of actually paying for it. Many shareware authors address this issue by following one of two closely related strategies.

In the first strategy, a demo version of the shareware is distributed, and users only receive the full benefits of the software after registering. With the other strategy you provide users with a value-added component, such as printed documentation, after they register. This second strategy is only helpful if the additional component is sufficiently valuable to

motivate users to register. One shareware author recommended that the latter approach be used when add-on utilities, which increase the usefulness of the original software, are also available from the author.

Followers of the first strategy have a delicate balance to maintain. They must make sure that their demo version has sufficient functionality to make the user feel that it's worth owning, but not so much that they don't see any reason to pay. Those who adopt the limited functionality strategy are further divided between those who send an enhanced version of their products to registering users and those who "lock" in some shareware features that can be "unlocked" with a code or password after registration. None of the shareware authors with whom I spoke had strong opinions on which approach is the most successful, though it seems clear that it's cheaper and easier for an author to send out a code or password than to send out another version of the software. On the minus side of locking in functionality, you always risk having someone illegally hack open your product to activate features.

## **Gentle Reminders**

Many users don't notice when a shareware product's free trial period has ended. Fortunately, it's fairly easy to add a routine to your product that will track the trial period, then remind users to register. Most users won't go to the trouble of resetting their system clock or reloading fresh copies of the software (though some will) to avoid the consequences. When these types of reminders are used, those that are friendly in tone seem to get better results

than those that look like they were written by a team of lawyers on a bad day. The true hard-ball approach to getting users to pay up is to implement code that stops the product from working after the trial period. This approach is only recommended if your primary motive in distributing shareware is profit, rather than seeing that your product is widely used.

One effective reminder strategy is used by Bill Modesitt, the shareware developer of TimeTracker. (To read his recent *MacTech Magazine* article on this topic, see the "Shareware Resources" box on this page.) Modesitt ships a demo version of TimeTracker with two motivational mechanisms—an annoying alert that reminds users that they're using an unregistered version of TimeTracker, and a time-recording device that makes unregistered users continually create new documents to keep using it. Ten months after Modesitt began distributing TimeTracker, he was receiving close to \$1,000 per week in \$25 shareware checks. (And he gets to live in Maui!) He estimates that his registration rate is nearly 100 percent.

A gentler approach is to offer registered users frequent upgrades. This not only assures your registered users that your product will remain useful into the future, but it also provides an incentive for unregistered users to pay their shareware fee.

Another factor that seems to affect the probability of getting paid is the type of product that you're trying to distribute. In general, users tend to "pirate" (use without paying the author) fonts and games the most, and pirate utilities the least. Students are the least likely to pay, and educational institutions and small-to-medium businesses are the most likely to pay. Surveyed shareware authors observed that games appeal primarily to students, and many

users become bored with games before the shareware trial ends. Given these observations, it's pretty easy to see why most shareware game authors report dismal returns.

An interesting point made by a few authors was the reluctance of many corporations or medium-to-large businesses to use shareware. This may be because shareware authors aren't perceived as creating reliable software, in the sense that they may not be as committed to future product support as commercial authors. On average, this is probably a justifiable concern, though there are many professional shareware developers who have worked hard to overcome these biases.

### Pricing Your Shareware

Pricing shareware is one area where there is not consensus. By eliminating (or at least minimizing)

the costs of production, shareware authors can realize a profit on even a low price—but only if people actually pay for it. Some shareware authors feel strongly that most users won't pay more than \$25 for a shareware product. On the flip side, others suggest that a higher price will give the product a higher perceived value, thus making users more likely to pay for it. Yet another respondent stated that shareware that sells for \$10 or less won't be purchased, because users don't feel that it's worth the trouble to pay for it.

I have a personal perspective on this issue, since I use and pay for shareware on a regular basis. I recently paid for a few shareware products produced by Peter Lewis, all of which were under \$10. Given that Lewis is one of the few successful shareware authors, it's fair to say that the

only-charge-more-than-\$10 rule is not absolute.

One factor that all the respondents did agree on was the necessity of making it easy to pay for shareware. So ensure that the contact information that accompanies your software is easy to access and will remain current over the life cycle of your shareware product.

In addition, many pieces of shareware find their way out of their country of origin. The stronger the ties between the economies of the author's and user's countries, the less likely it is that the user will have to face obstacles associated with paying.

The CompuServe Shareware Registry (shortcut: GO SWREG) is particularly useful for anyone who wants to collect multinational revenues, as it handles payments from customers in all the countries in which it operates. There

## Shareware Resources

For general information on shareware and names of shareware distributors, browse through these online resources:

- *Laser Point Web site.* Laser Point, a software distribution company that specializes in Macintosh and PC shareware, has a useful information guide that you can download from their Web site (<http://www.laserpoint.com/>). I also highly recommend that you read their alt.comp.shareware.programmer newsgroup archives and discuss specific plans with some of their experienced shareware developers.
- *Kagi Shareware Web site.* Kagi Shareware, another distributor of Macintosh, Windows, and Newton shareware, has an informative Frequently Asked Questions (FAQ) document on distributing shareware. To get a copy, visit their Web site (<http://www.kagi.com/>).
- *MacUser 1995 shareware awards.* For inspiration, check out *MacUser's* list of best shareware products. Read about these products in the January 1996 issue of *MacUser*, which can be viewed from eWorld (shortcut: macuser).
- *The CompuServe Shareware Registry* (shortcut: GO SWREG) is particularly useful for anyone who wants to collect multinational revenues, as it handles payments from customers in any of the countries in which it operates.
- *Other Online Shareware Libraries.* You can also distribute your shareware through the major online services, including eWorld (shortcut: shareware) and AOL (path—Computer:Software Libraries), and the Apple Web site (<http://dev.info.apple.com/thirdparty>).
- *"How to Make \$1,000 Per Week Stuffing (Virtual) Envelopes."* This article, written by Bill Modesitt in the July 1995 issue of *MacTech Magazine*, provides aspiring shareware authors with more helpful shareware hints. You can download it from the MacTech Web site (<http://www.xplain.com>), or you can check out Modesitt's own shareware Web site (which has a link to the Maui Surfboarding report), located at address <http://www.aloha.net/~mauisw>.
- *Semper.fi.* This informative and entertaining Internet mailing list, run by Apple Fellow Guy Kawasaki, can be used to get feedback from other shareware developers. Subscribe by sending e-mail to [listproc@abs.apple.com](mailto:listproc@abs.apple.com); in the body of your message, type the string "subscribe semper.fi <your real name>".

are other similar services that accept worldwide shareware payments for a fee. One such service that was highly recommended by my respondents was Kagi Shareware. Their shareware FAQ contains a list of other companies that offer this type of service, as well as information on the use of “e-cash,” electronic funds transfers transacted over the Internet or e-mail. (See the “Shareware Resources” box on page 31 for more information.)

### **Getting Attention for Your Shareware**

Once you’ve made it easy for users to pay you, you still won’t receive a dime if users don’t ever get hold of your product. Shareware typically doesn’t “distribute itself” by word-of-mouth recommendations until it reaches a certain level of momentum.

As a first step, make sure that your shareware products are file-compressed (with documentation) and posted on each major online service. Various Internet sites allow you to post and advertise the release of your shareware product. Magazines associated with your target market or platform should all receive copies of your shareware product. (Make sure product reviewers receive registered, fully functional copies of your products, so that busy writers won’t have an excuse for not reviewing your product.) Supplying copies to user groups is also an excellent way to distribute your product.

If you’re willing to pay a distribution fee, you can sign up with software distribution companies that specialize in distributing shareware. These companies will handle some or all of the above tasks, and many of them will have their own distribution channels as well. Again, look at the shareware FAQ for the names of these firms.

### **Why Develop Shareware?**

On the whole, most software that is distributed as shareware is not produced with the expectation of making lots of money. Many students, professional programmers,

I believe it will be much easier to make money from shareware in the future because of two developments: e-cash and CPU-independent, object-oriented development frameworks, such as

market, he produced a commercial version of his product and discontinued support for the shareware versions.

Though my research has made it clear that I can’t expect the sales of my shareware product to fund the production of a commercial version, I believe that there are many good reasons to initially distribute my product as shareware. By providing a useful shareware product that appeals to my target market, I’ll be able to test and refine my plans for an enhanced commercial version, and I’ll be able to better assess the risks involved with personally financing and producing a full-scale commercial version. Alternatively, if the shareware version is a resounding success, I may be able to persuade someone to finance it (using some of the advice from the “Creative Financing” article in the December 1995 issue of *Apple Directions*). Mastering shareware distribution will earn me valuable experience in running my own software venture and will further build my professional reputation as a software developer. ♣

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*radar pangaeon spends most of his time playing games. Acting as president for SpectraMediaTech, Inc., is his least favorite game. Developing Macintosh entertainment software is his favorite game.*

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## **Those authors who have found success with shareware haven’t just stumbled into it—they’re deliberate about it.**

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and hobbyists produce a piece of useful software merely as an academic exercise, then slap an arbitrary price on it, knowing that most people who use it won’t pay. The infrequent checks that show up (and are quickly exchanged for beer or Mountain Dew) often do more to bolster a developer’s ego than bank account.

Sometimes shareware authors produce tools for their own use, then decide to make them readily available to their colleagues. This may be done for purely altruistic reasons, or as a way to improve their standing within a professional community. Some shareware authors have been offered jobs, contract programming assignments, or consulting opportunities because their skills have impressed the right person who just happened to have used their shareware.

Producing shareware is also one way to become famous in your field. In a recent e-mail message on getting consulting assignments in today’s highly competitive market, Gregory Charles Rivers of G&B Computers Limited in Hong Kong noted that “People don’t really seem interested [in hiring you] unless you’re famous or free!”

OpenDoc and the Java programming language. E-cash will make it more convenient for users to pay for shareware automatically through e-mail when their trial use period expires. And technologies such as OpenDoc will make it easier for users to integrate clever, unique shareware products into larger applications.

### **Examining Your Motives**

Most shareware is distributed by authors who have produced their products more as a labor of love than as a commercial venture. The various factors discussed above lead me to conclude that shareware is a good solution for developers motivated more by *sharing* the wealth than *building* wealth. And those authors who have found success with shareware haven’t just stumbled into it—they’re deliberate about it.

Just one shareware author reported success using the strategy I proposed in the beginning of this article—using shareware to finance costs of launching a commercial product. He initially produced a shareware product and continued to support it through a number of revisions. When he felt he had built a large enough following for his product in the



# Listings

## It Shipped!

The following Macintosh products have been entered in the It Shipped! database since Apple reinstated the program in late 1995. In the future, only newly shipping products will be listed here.

For more information about the It Shipped! program, see the news story on page 11, or visit the It Shipped! Web page (<http://dev.info.apple.com/itshipped.html>).

The It Shipped! database is used by Apple employees when they prepare advertising, collateral, or white papers and when they help customers find computing solutions; it's also broadcast to key industry publications.

To enter your Macintosh product in the database, use the form provided on the World Wide Web (at location <http://dev.info.apple.com/thirdparty/submission.html>). You must also send a copy of the product to Apple at this address:

Apple Computer  
1 Infinite Loop, M/S 301-1ES  
Cupertino, CA 95014  
USA

Company	Product	Version	Ship date
2Way Media, Inc.	LAUNCH Magazine No. 3	1	9/95
4-Sight (International) Ltd.	4-Sight AutoPS	1.0.2	5/95
4-Sight (International) Ltd.	4-Sight FAX	3.1	9/95
4-Sight (International) Ltd.	4-Sight iSDN Manager	3	11/95
4-Sight (International) Ltd.	4-Sight iSDN Manager 3.0	3	11/95
4-Sight (International) Ltd.	4-Sight OPi	1.1.5	11/95
A & E Information Systems	Med Easy: Medical Clinic Information System	4	N/A
Abraxas Software	CodeCheck/Mac	6	9/95
Abraxas Software	macyacc	6	9/95
Adaptec	PowerDomain 2940W	1	11/95
Adobe Systems, Inc.	PageMill	1	11/95
Adobe Systems, Inc.	Adobe After Effects	3	10/95
Adobe Systems, Inc.	Adobe PageMaker	6	8/95
Adobe Systems, Inc.	Adobe Premiere	4.2	10/95
Allegiant Technologies, Inc.	SuperCard 2.5	2.5	8/95
Ardenwood Software	Optical Disc Catalog	1	11/95
Argus Interware, Inc.	Argus Numerical Environments	2.5	10/95
Attachmate Corporation	Crosstalk for Macintosh	3.0.1	8/95
Avenza Software, Inc.	MAPublisher	1	10/95
B.U.G., Inc.	PerMan Note	1.0.3	1/94
Balloons Software	This Olde Disk Drive, Tape 1 (video/software)	1	11/95
Battery Technology, Inc.	MC-1950 high-capacity NiMH battery for PB 5300/190	1	11/95
Battery Technology, Inc.	PowerBook 140 through 180c series battery (MC-190)	1	1/95
Battery Technology, Inc.	PowerBook 5300/190 series AC adapter (MC-PS45)	1	11/95
Battery Technology, Inc.	PowerBook 5300/190 series charger (MC-SC1950)	1	12/95
Battery Technology, Inc.	PowerBook 5300/190 series DC adapter (MC-AP45)	1	11/95
Battery Technology, Inc.	PowerBook 5300/190 series NiMH battery (MC-1950)	1	11/95
Binari Sonori srl	Sound SuperEdit 1.0	1	1/95
Bowers Development Corp.	AppMaker CD #3	2.0b3	10/95
Brio Technology, Inc.	BrioQuery	3.5	11/95
C&K	Phrasia - Archiving & Retrieval Software	III	11/95
CH Products	FlightStick Pro, JetStick, Trackball Pro	N/A	12/94
CircleDream Software	InternetMemory	1	11/95

Company	Product	Version	Ship date
Coconut Info	Click Hawaiian Pocket Dictionary	1.0.6	11/95
ColorExpert Inc.	ColorCourse/Illustration	1.1	9/95
ColorExpert Inc.	ColorCourse/Imagesetting	1.1	9/95
Cypress Research	MegaDial	1.0.4	12/95
Cypress Research	MegaPhone	1.0.2	N/A
Dantz Development	Retrospect	3	11/95
Dantz Development	Retrospect Remote	3	11/95
Data Description, Inc	Data Desk 5.0	5	11/95
Data Encryption Systems Ltd.	DESkey DK8	1	9/95
Datapak Software Inc.	PAIGE 1.3	1.3	10/95
DB:Solutions, Inc.	DB:\$ Retailer's Edge	8.03	11/95
Digital Sprites	Digital Holiday Greetings	1	1/95
Digital Studios	Computer Music: An Interactive Documentary	1	11/95
Digital Studios	Coral Kingdom 1.1	1.1	10/95
E-magine	ProView 1.1	1.1	8/95
Eastgate Systems, Inc.	Eastgate Web Squirrel	1.0.0	4/95
Eberle Software, Germany	YPSOS Office	3.5	11/95
Electric Image, Inc.	ElectricImage Animation System Version 2.5.2	2.5.2	1/95
Electric Image, Inc.	The ElectricImage Scholastic Edition	N/A	10/95
EMAGIC	LOGIC AUDIO Extension Series	2.5.1	12/95
ExtraWare Intl.	CutXtra	1	12/95
ExtraWare Intl.	PlugOne	1	1/95
ExtraWare Intl.	RemoteScan	1	12/95
Fairfield Language Technologies	The Rosetta Stone Dutch Level I	2	12/95
Farallon Computing, Inc.	Fast Starlet 100TX/8 hub and 10/100 bridge	1	11/95
Farallon Computing, Inc.	Netopia Internet Router	1	11/95
Farallon Computing, Inc.	Timbuktu Pro for Networks (Macintosh Edition 2.0)	2	11/95
Fractal Design Corp.	Fractal Design Painter 4.0	4	11/95
FWB, Inc.	CD-ROM ToolKit 2.0	2	12/95
Gefen Systems	Touch The Music	2.9.1	1/93
Granit Technologies Inc.	Canadisk CD-ROM	95	10/95
Granit Technologies Inc.	Photon Search System - World's Fastest Engine	1	9/95
Graphical Business Interfaces, Inc.	DataWeb	1	12/95
Handmade Software, Inc.	Image Alchemy	2.1	11/95
Hash Inc.	Martin Hash's 3D Animation	3.18	11/95
Houlberg Development	Retail Engine	4.5	11/95
IMAGIC	Television Weather System	V7.5	1/95
Ingenious Technologies Corp.	PowerDesk—the Productivity Tool	N/A	12/95
InkWell Software, Inc.	FilmMagic Pro	1.02	9/95
Inroads Interactive	Multimedia Cats	1.0.1	1/95
Inroads Interactive	Multimedia Dogs 2.0	2	1/95
Inroads Interactive	Multimedia Exotic Pets: Horses, Birds, Aquatics & Pocket Pets	1	1/95
Insider Software	Font Box	1.7	9/95
Institute for Special Education	Training of Cognitive Strategies	2.1.2	10/95
Intelligent Resources Integrated Systems	Gyro for "Video Explorer"	3.3.6	11/95
International Transware, Inc.	InterTalk MP	1.2	9/95
intouch group, inc.	World Wide Music	1	11/95

<b>Company</b>	<b>Product</b>	<b>Version</b>	<b>Ship date</b>
Iowa State University Quantum Theory Group	MacMolPit	2.2.1	8/95
James Associates	MacGPS Pro	1.1	12/95
KCS Software	Grant Tracker	5.2	9/95
Kingston Technology Corp.	Memory	N/A	11/95
Kleinfen GmbH	ScanCBT	1.0.1	10/95
Krick TechnoLogic	CityTraveller Wuerzburg - VR Travel Guide	1	12/95
Lazerworks	All the Best MacGames '96	'96	8/95
Light Source	Colortron II	2	11/95
Lundeen & Associates	Web Crossing	1	11/95
Machina Sapiens inc.	Correcteur 101	2.01	NA
Machina Sapiens inc.	InfoScan	1	12/95
MacTel Technologie AG (Europe) & MTT Inc. (USA)	EtherNet Combo (BNC/TWP) PowerBook 5300/190 PCMCIA Interface	N/A	12/95
Mandli Communications, Inc.	Roadview IV	4.1	N/A
Matthews International	Matthco I bar coding software	2.1	9/95
Maui Software	TimeSlice	1.1	1/95
McQ Productions/Software Systems	MacAnimator Pro 2.0MacA	2	11/95
MDG Computer Services	Web Server 4D	1	11/95
Men & Mice	QuickDNS Lite	1.0.2	10/95
Men & Mice	QuickDNS Pro	1	12/95
mFactory	mTropolis	1	1/96
Micro Planning International	Micro Planner Manager	1.4	11/95
Micro Planning International	Micro Planner X-Pert	2.4	11/95
MicroMat Computer Systems	PhoneMaker FRS	1.0.1	10/95
Neptune Systems	Sniffer Dog* v1.1	1.1	10/95
NetWings, Inc.	NetWings Internet Server 1.1	1.1	10/95
Newer Technology	UltraDock - 16c & 16sc / MicroDocks - Ethernet, SCSI, Color	N/A	8/95
Niles & Associates, Inc.	EndNote Plus	2.1	10/95
Omniscience Object Technology, Inc.	Omniscience ORDBMS	2.2	12/95
Onyx Technology	QC 1.2	1.2	12/95
Optimus Solutions	MacOS	1.6	N/A
Orange Micro, Inc.	OrangePC	3.8.1	N/A
Pacific Coast Software	WebCatalog 1.1	1.1	1/96
ParcPlace-Digitalk	VisualWorks	2.5	10/95
Pedagoguery Software	GrafEq	2.02	9/95
Power Industries, Inc.	M*A*T*H CIRCUS	4.01	11/95
PowerProduction Software	Digital Box Office	1	12/95
QuickMedia Labs, Inc.	Living Album/Web	1	12/95
School Zone Publishing Co.	Alphabet Express	1.0.0	1/96
Semicolon Software	Solitaire Till Dawn	2.1	8/95
Shareware author/Individual	RZS ResBook volume 1 & 2	1.0.2	8/95
Sienna Software	Starry Night - a space and sky simulator	1.02	11/95
Simon Poisson	TarotWorks 1.1.4e	1.1.4e	10/95
Softron Media Services	OnTheAir Studio	4	11/95
Solltech, Inc.	DENDRON	2.1	11/95
Sonic Desktop Software, Inc.	SmartSound SHOWCASE	1	12/95
StepUp Software	Guide Composer	1	9/95

Company	Product	Version	Ship date
Street Logic Software	Wall Street Quest	1	12/95
Summit Productions	CallerID Remote	1.1.4	6/95
SYDNEY URSHAN MUSIC	KeyDisk TERMINATOR	2.1	N/A
Symantec Corporation	ACT! for Macintosh	2.5	9/95
Symmetry Software	NetBooks Small Business Accounting	2.6	10/95
Symmetry Software	NetBooks Business Accounting	2.5	9/95
Tandem Computers, Inc.	MacOffender	3.1.2	N/A
Taylor Electronics	PICT to Gerber 2.0	2	12/95
TECHKON	Color measurement device	1	1/95
TechPool Studios	Transverter Pro	3	6/95
Terran Interactive	Movie Cleaner Pro	1.1.1	10/95
True North, Inc.	Aimpoint 3.1	3.1	12/95
Type & Graphics Pty Ltd.	MacPGP Control	1.0b2	12/95
Vicious Fishes Software	Multimedia Tackle Box	1.0.1	11/95
Virginia Systems, Inc.	Sonar Image	3	10/95
Virginia Systems, Inc.	Sonar Professional	9	10/95
VISU Technologies	ICISS 1.0	1	1/95
WaveMetrics, Inc.	IGOR NIDAQ Tools	1.01	9/95
White Pine Software	eXodus for Macintosh	5.2.2	10/95
WillStein Software, Inc.	GC WorkMate	N/A	12/95
Wired Incorporated	Mason Macintosh MPEG decompression card	VII	11/95
WRQ	Reflection	4.2	11/95
xistor	xi.raid	C	10/95
xman software	xToolsOne Plug-ins	1	2/95

N/A—Not available

## Apple Internet Page

This feature is devoted to informing you about where you can go on the Internet for online information about Apple Computer, Inc.; its products, technologies, and programs; Mac OS and Newton programming; and other subjects that pertain to the business of computer product development. You'll find this feature particularly helpful when you view it at the *Apple Directions* Web page (located at <http://dev.info.apple.com/>). There, all the names of the locations listed in this article are linked to the sites themselves; clicking the names will take you directly to the relevant Internet locations. We'll update this feature every month, based both on what Apple is doing on the Internet and on your feedback.

### Apple Sites

This section lists World Wide Web sites maintained by Apple Computer.

### Apple Developer Services and Products

<http://dev.info.apple.com/>

The main page for Apple Computer's developer services.

### Apple Directions Express List Server

<http://dev.info.apple.com/appledirections/adexpresscurrent.html>

Apple Directions Express is our biweekly e-mail digest of business news and information from Apple, sent to you over the Internet and posted at this

Web site. It includes pointers—live links at our Web site—to other sources for more detailed information. Subscribe by sending e-mail to [adirections@thing1.info.apple.com](mailto:adirections@thing1.info.apple.com). In the subject field, type the string "subscribe <your real name>".

### Guy Kawasaki's EvangeList List Server

For information on how to join, send an e-mail message to [macway-request@solutions.apple.com](mailto:macway-request@solutions.apple.com) for an automatic reply. (Any message will work.)

### Key Apple Developer Relations Contacts

<http://dev.info.apple.com/adrcontacts.html>

Intended mostly for use when standard Apple feedback mechanisms aren't working.

### Apple FTP Sites

<http://dev.info.apple.com/ftpmain.html>

[ftp://ftp.info.euro.apple.com](http://ftp.info.euro.apple.com) Apple.Support.Area/Developer\_Services

Go to these sites to download Apple software and documentation; the second site is a mirror site of the main location, maintained specifically for European developers.



**Apple Computer**

<http://www.apple.com/>

The Apple Computer home page.

**Mac OS**

<http://www.info.apple.com/macOS/>

Go here for the latest information on the Mac OS.

**Technotes**

<http://dev.info.apple.com/technotes/Main.html>

Contains all Technotes—new and old—as well as author's guidelines in case you want to contribute your own technical notes.

**Apple Pacific**

<http://www.info.apple.com/pacific/>

Contains information about Apple offices and developer support in the Pacific region, including Japan, Australia, and Latin America.

**Apple Europe**

<http://www.euro.apple.com/>

The front door for information about Apple activities—including developer services—in Europe.

**Apple International Developer Services and Products**

<http://dev.info.apple.com/intl.html>

Contains the current list of international Apple Developer Services locations and contacts.

**Apple and the Internet**

<http://product.info.apple.com/productinfo/tech/wp/internetwp.html>

Information about Apple's Internet strategy and products.

**Newton**

<http://dev.info.apple.com/newton>

Includes information about Newton 2.0 and Newton Toolkit 1.6.

**OpenDoc**

<http://www.opendoc.apple.com/mainpage.html>

The place to go for the OpenDoc 1.0 SDK and OpenDoc sample parts.

**Third-Party Products**

<http://dev.info.apple.com/thirdparty/>

Fill out the form located at this site to add your products to this list.

**Apple Multimedia Program**

<http://www.amp.apple.com>

Includes information about Apple's multimedia technologies as well as a searchable database of multimedia developers.

**The Macintosh Advantage**

<http://www.apple.com/whymac/>

The source for official Apple ammunition to fight the war against Windows 95.

**Macintosh PowerBook and Mobile Computing**

<http://www.info.apple.com/gomobile/>

Complete information about PowerBook computers.

**PowerTalk**

<http://dev.info.apple.com/evangelism/powertalk/>

Resources for PowerTalk programmers, including the StarNine gateways recently licensed by Apple. As of this writing, the site doesn't yet contain further information about Apple's replacing PowerTalk with the Internet and OpenDoc as the core of its communications architecture.

**QuickDraw 3D**

<http://www.info.apple.com/qd3d/>

Everything you need to know about QuickDraw 3D, Apple's new 3D graphics architecture.

**Power Macintosh**

<http://www.info.apple.com/powermac/powermac.html>

<http://www.info.apple.com/ppc/ppchome.html>

Two useful sites for information about Power Macintosh computers.

**QuickTime**

<http://quicktime.apple.com>

News and technical and marketing information about QuickTime.

**QuickTime VR**

<http://qtvr.quicktime.apple.com>

You can find samples of QuickTime VR products here, as well as information on how Apple's virtual reality technology works and how you can incorporate it into your multimedia products.

**QuickDraw GX**

<http://www.info.apple.com/gx/gx.html>

Look here for information on QuickDraw GX as well as links to other non-Apple sites.

**Apple Education**

<http://www.info.apple.com/education>

Use online forms located at this site to request product specifications, information about the Apple Education Series (bundled products), and technical support from Apple engineers.

**Macintosh Application Environment**

<http://www.mae.apple.com>

Contains a sample of the Macintosh Application Environment (MAE), software that lets UNIX workstations run Macintosh applications.

**Pippin**

<http://support.info.apple.com/pippin/>

Contains technical information about designing products that will work with Apple's PowerPC processor-based, low-cost CD playback device.

**eWorld on the Web**

<http://www.eworld.com/>

Go to this location to find content and services from eWorld, Apple's online service.

**QuickTime Live!!**

<http://live.apple.com>

Apple's site for showing multimedia broadcasts of live entertainment, including images, videos, sound, and QuickTime VR.

**Apple Internet Servers**

<http://www.apple.com/documents/otherappleservers.html>

Includes lists of other Apple Web sites as well as Gopher and FTP sites.

**Non-Apple Sites**

We can't guarantee the information the following sites contain, since they're not created by Apple, but we think you'll find them useful and interesting.

**Internet Search**

<http://home.mcom.com/home/internet-search.html>

Provides access to InfoSeek, Lycos, WebCrawler, and other Web search engines.

**Macintosh Vendor Directory**

<http://rever.nmsu.edu/elharo/faq/vendor.html>

A directory of companies with products for the Macintosh computer.

## New This Month/From Our Readers

This list contains Internet "stuff" (for lack of a more descriptive term) we've just become aware of, thanks to *Apple Directions* readers inside and outside Apple. Know of a particularly useful site? Whether it's a Web page, a list server, an FTP site, or a newsgroup, let us know about it and we'll consider adding it to this feature next month. Send your suggestions to [a.directions@applelink.apple.com](mailto:a.directions@applelink.apple.com).

**Apple Software Licensing**

<http://dev.info.apple.com/swl/swl.html>

If you use all or part of any Apple software in a program that will be distributed to other people, you need to license the use of that software from Apple Computer, Inc. Here's the site to visit for official information on whether you need a license from Apple and, if so, how to obtain it.

**It Shipped!**

<http://dev.info.apple.com/itshipped.html>

This Apple site describes the It Shipped! program and provides a link to a form you can use for electronic submission of your products to the It Shipped! database. Once you fill out the form and send it back to Apple, your product will be listed in the next issue of *Apple Directions!* (See page 33 for the current It Shipped! listing.)

**Gradient—DCE for the Macintosh**

<http://www.gradient.com/>

The Open Software Foundation's DCE, which stands for *Distributed Computing Environment*, is a set of distributed services for development, deployment, and maintenance of distributed applications. Gradient's Mac-DCE product, codeveloped with the University of Michigan, is an implementation of OSF DCE Secure Core functionality for Macintosh clients. The Gradient Web site provides more information.

**MacSciTech**

<http://www.macscitech.org/>

This is *the* page for those interested in the Macintosh computer as a scientific platform. MacSciTech is an association for scientific/engineering/technical Macintosh users. This page includes technical information, meeting announcements, product announcements, and access to software libraries that specialize in scientific applications.

**Top 100 Computer Magazines**

<http://www.internetvalley.com/top100mag.html>

The owners of this site have selected their list of the 100 top online computer magazines—including our sister publication *develop*, the Apple Technical Journal—and listed them here, along with links to each magazine's Web site. This site is part of the View From Internet Valley Web site, which includes a history of the Web and a variety of information about the Internet.

**DayStar Digital**

<http://www.daystar.com/DayStarHome2.html>

Go here for information about DayStar's PowerPC upgrade cards for 680x0 Macintosh systems and their newly released Genesis MP media-publishing workstation, a Mac OS-compatible computer driven by four PowerPC 604 processors.

**Mac vs. UNIX Web Server Performance**

<http://www.netdreams.com/net.dreams/papers/theTest.html>

This site contains a server performance comparison between a Power Macintosh 7100/66 computer running the Mac OS and MacHTTP and a Sun SPARC IPX running SUN OS (UNIX) 4.1.3 and NCSA httpd version 1.3. The conclusion: "In terms of performance-per-dollar, the Power Macintosh wins by a large margin in this test."

**Brad's WebSTAR/MacHTTP**

<http://www.ape.com/webstar/>

A database of all the Macintosh computer-based Web sites that the owner of this site can find—so far nearly 1,000 entries strong.

**Macintosh Programming Tools**

<http://www.astro.nwu.edu/lentz/mac/programming/tools.html>

A terrific source for Apple and non-Apple Macintosh programming tools.

**OpenDoc Part Ideas**

[http://www.eng.uci.edu/~sroussey/NetVision/software/od\\_parts/](http://www.eng.uci.edu/~sroussey/NetVision/software/od_parts/)

A repository of OpenDoc software, as well as ideas for software that could be implemented as OpenDoc components.

**CI Labs**

<http://www.cilabs.org/>

Provides a great deal of OpenDoc content.

**MacTech Magazine**

<http://www.class.com/MacTech/URLs.html>

Contains *MacTech Magazine's* list of Internet locations for Mac OS developers.

**Nathan's Everything Macintosh Page**

<http://www.cs.brandeis.edu/~xray/mac.html>

A virtual treasure trove of Macintosh information, as its name implies.

**Digitool (Macintosh Common Lisp)**

<http://www.digitool.com/>

Contains information on the Macintosh Common Lisp (MCL) product line.

**The Ultimate Macintosh Page**

[http://www.freepress.com/myee/ultimate\\_mac.html](http://www.freepress.com/myee/ultimate_mac.html)

Contains more Mac OS information and software than you could possibly imagine exists.

**guideWorks**

<http://www.guideworks.com/>

The Apple Guide home-away-from-home page.

**Abacus Concepts, Inc.**

<http://www.abacus.com>

Check out this page to see how one of your colleagues has made good use of Apple Guide.

**The QuickDraw GX Fan Club**

<http://www.ixmedia.com/quickgx/quickgx.html>

<http://www.ixmedia.com/quickgx/subscribe.html>

The first site includes information about QuickDraw GX designed to

encourage its use and development; the second lists addresses of two e-mail lists for receiving updates about QuickDraw GX.

**PC Fairy Tales**

<http://www.icsi.net/~crfrank/newpcTales2.toc.html>

Information to help debunk common Macintosh myths.

**Kaidan Digital Imaging Solutions**

<http://www.kaidan.com>

Contains information about add-on lenses and QuickTime VR camera mounts for QuickTake cameras.

**Metrowerks**

<http://www.metrowerks.com/>

Go here to find out about Metrowerks' CodeWarrior PowerPC development environment.

**Pictorius**

<http://www.pictorius.com>

Contains information about Pictorius Prograph CPX and Peregrine, its visual application client/server database programming environment.

**User Group Connection**

<http://www.ugconnection.org/vendors/vendors.html>

Resources and services for marketing your products to Apple's most influential and enthusiastic users: user groups.

**The Complete Conflict Compendium**

<http://www.islandnet.com/~quill/c3data.html>

A listing of all Macintosh computer software conflicts and cures known to the site's owners.

**MacHack**

<http://www.machack.com/>

Go here to find out about the annual MacHack hackers conference.

**Macintosh Help Wanted**

<http://www.memphisweb.com/mathew/default.html>

<http://www.memphisweb.com/nammac/default.html>

Need to find programmers and others to work on developing Macintosh products? Go to these locations for help.

**Cult of Macintosh**

<http://www.utu.fi/~jsirkia/mac/>

This is the site of another "everything Macintosh" compendium of information for Macintosh lovers.

**Why Should I Buy a Macintosh?**

[http://www.dsu.edu/~bitzm/why\\_buy\\_mac/index.html](http://www.dsu.edu/~bitzm/why_buy_mac/index.html)

This site's name says it all.

### Quinn's Human Interface Subtleties

<http://redback.cs.uwa.edu.au/Quinn/WWW/HumanInterfaceSubtleties.html>

Lists the many human interface subtleties that continue to make the Macintosh user experience richer and easier.

### SALON Online Magazine

<http://www.salon1999.com>

A literary/arts/cultural "e-zine" sponsored by Apple Computer, Adobe Ventures L.P., and retail bookstore experts Borders, Inc.

### Mac\*Chat Newsletter

<http://www.cts.com/browse/xxltony>

An online newsletter directed primarily at Macintosh customers to help them make the best use of their Macintosh systems. To subscribe, send e-mail with the string "SUBSCRIBE MACCHAT" in the body of the message to [listserv@vm.temple.edu](mailto:listserv@vm.temple.edu).

### BroadCast Software Distribution

<http://www.broadcastsoft.com>

Contains a free evaluation copy of software that lets you distribute software products electronically.

### Douglas Adams

<http://www.umd.umich.edu/~nhughes/dna/stories/adamson95.html>

Douglas Adams's highly subjective thoughts on Windows 95.

### Pages That Employ QuickTime VR

<http://www.bmwusa.com/ultimate/roadster/z3downloads.html>

Take the new BMW Z3 roadster (as seen in the new Bond movie, *Goldeneye*) for a test drive, courtesy of Quicktime VR.

<http://pathfinder.com/time/special/baseball>

Shows the 1995 World Series in QuickTime VR.

<http://sfasian.apple.com>

View a QuickTime VR version of an exhibit of Mongolian art.

<http://www.crowneplaza.com>

Holiday Inn uses this site to show QuickTime VR tours of two of its hotels.

<http://www.honda.com/cars/odyssey/>

See QuickTime VR interiors of Honda Motor Company's new car models.

<http://www.gildamarx.com/>

Shows Gilda Marx Fashion Design's line of athletic body suits.

<http://www.interart.net/>

Real estate tours of actual, for-sale properties.

### Nisus Software

<http://www.nisus-soft.com/~nisus/>

Click on the Trash icon at this site and see where you end up! ♣

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**Apple Developer Catalog Ordering Information** To place an Apple Developer Catalog order from within the United States, contact Apple Developer Catalog at 800-282-2732; in Canada, call 800-637-0029. For those who need to call the U.S. office from abroad, the number is 716-871-6555. You can also reach us by AppleLink at APDA or by e-mail at [APDA@applelink.apple.com](mailto:APDA@applelink.apple.com). More detailed Apple Developer Catalog ordering information is available at the following locations:

- Internet: <http://www.info.apple.com/dev/apda.html>
- AppleLink: Developer Support:Developer Services:APDA
- eWorld: in the Developer Corner of the Computer Center