

AppleDirections

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APPLE NEWS

Apple Takes NeXT Step

On December 20, 1996, Apple Computer announced its intention to purchase NeXT Software, in a friendly acquisition for \$400 million. Pending regulatory approvals, all NeXT products, services, and technology research will become part of Apple. As part of the agreement, Steve Jobs, chairman and CEO of NeXT, will return to Apple—the company he cofounded in 1976—reporting to Dr. Gilbert F. Amelio, Apple's chairman and CEO.

The acquisition brings together Apple's and NeXT's innovative and complementary technology portfolios and significantly strengthens Apple's position as a company advancing industry standards. While Apple offers leadership in ease of use and multimedia solutions, NeXT offers strength in development software and operating environments for both the enterprise and Internet markets. NeXT's object-oriented software development products can contribute to Apple's goal of creating a differentiated and profitable software business, with a wide range of products for enterprise, business, education, and home markets.

Using NeXT technology to embrace open industry standards, Apple expects to further develop industry alliances as the Internet/intranet market evolves. Apple anticipates that NeXT's expertise in next-generation operating system design will allow elements of the NEXTSTEP operating system to become integral features of the Mac OS—providing developers a compelling OS foundation on which to build next-generation software solutions.

For details on the implications of this acquisition, see the Apple press release located at <http://live.apple.com/next/961220.pr.rel.next.html>.

Metrowerks will add to its CodeWarrior development environment to support the NeXT technology that Apple will include in

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STRATEGY MOSAIC

AppleShare IP 5.0

By Gregg Williams, Apple Directions staff

New Version Adds Web and Mail Servers, Internet Access

AppleShare has long been Apple's product for allowing networked groups of Mac OS and Windows users to access files and manage printing across the network. At MACWORLD Expo San Francisco last month, Apple announced a major revision to AppleShare, called *AppleShare IP 5.0* (code-named *FutureShare*). This version adds three new functions that most customers will find useful:

- A web-server program (which allows users to access information through a web-browser program)
- A mail-server program (which gives users the ability to send and receive e-mail)
- FTP, or File Transfer Protocol (which gives users access to files located on FTP sites across the Internet)

In addition, AppleShare IP 5.0 adds an extremely important feature that greatly enhances the product: the ability for AppleShare functions to occur using TCP (Transmission Control Protocol) as the underlying transport mechanism. In less technical terms, this means that AppleShare servers can reside anywhere on the Internet, expanding the reach of AppleShare across the entire world while still retaining AppleShare's ease of use and human interface.

AppleShare IP 5.0 also includes a new AppleShare Registry API (application programming interface) that allows any network service, including the ones you create, to access, manipulate, and extend a database of users, groups, and services. You can use this API and its underlying database to access functions that you would otherwise have to write, allowing you to bring your product to market faster.

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Editor

Patty Bing-You (bingyou@apple.com)

Technical Editor

Gregg Williams (greggw@apple.com)

Business Editor

Kris Newby (newby2@aol.com)

Associate Editor

Anne Szabla (szabla@applelink.apple.com)

Production Editor/Graphic Designer

Lisa Ferdinandsen (ferdinan@apple.com)

Contributors

Meredith Best, Peter Bickford, Alexander Brody, Brian McMahon

Production Manager

Diane Wilcox

Prep and Print

Consolidated Publications, Inc., Sunnyvale, CA

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AppleShare IP 5.0

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Finally, AppleShare IP 5.0 contains an interesting surprise: It's the first major commercial product from Apple that uses OpenDoc as a plug-in architecture framework for a modular network administration program (AppleShare IP 5.0 Admin, code-named *OpenAdmin*). For Apple, this use of OpenDoc decreased the time needed to bring AppleShare IP 5.0 to market. For you, it means that you can develop the administration portion of your network-service application faster and have it automatically blend into the AppleShare IP 5.0 Admin human interface.

The purpose of this article is twofold. First, it aims to describe AppleShare IP 5.0 and let you know what Apple's plans for it are, so that you can adjust your business plans if necessary; you may find that AppleShare IP 5.0 gives you new business opportunities. Second, the last section of this article alerts you to some opportunities that may be of interest to you.

A First Look at AppleShare IP 5.0

The following sections examine various aspects of AppleShare IP 5.0.

Improvements Over AppleShare 4.x

AppleShare IP 5.0 is an improvement over AppleShare 4.x because it provides the following:

- Full-featured network services—print services, remote file access through FTP (File Transfer Protocol) and AFP (AppleTalk Filing Protocol), and web and mail servers—that are integrated to work well together
- More features than AppleShare 4.x (which includes only file and print servers)
- Access to servers over both AppleTalk and (new to this release) the faster TCP (Transmission Control Protocol)
- The use of OpenDoc in the administration program to make it easier for you to add new network services and have them

seamlessly integrate into the AppleShare IP 5.0 Admin program

- Improved performance (including a more functional print server and higher data throughput when files are accessed through TCP)
- A single API for all network services that gives access to and provides security for users, groups, and services
- Greater ease of use

System Requirements and Availability

For greater speed, AppleShare IP 5.0 is “native”—that is, it is written in PowerPC processor code. It works on Apple Workgroup Servers and any Mac OS-compatible computer with a PowerPC 601, 604, or 604e processor; support for computers containing a PowerPC 603 processor is expected to come in a future release. AppleShare IP 5.0 runs only under the new Mac OS 7.6. A beta version of the AppleShare IP 5.0 software is now available at the AppleShare IP 5.0 web site, at <http://appleshareip.apple.com>.

The Market for AppleShare IP 5.0

As with previous versions of AppleShare, AppleShare IP 5.0 is of interest in any environment where a workgroup of users can benefit from being able to communicate with each other. This includes various educational situations (classroom, laboratories, and administration) and small- to medium-sized businesses. Because of some of its new features, AppleShare IP 5.0 is even more relevant to sites with both Mac OS-compatible and Windows computers than AppleShare 4.x is.

AppleShare 4.x provided both file and print services (though the print services were often not used because of a limitation in the implementation of print queues). With the addition of web and mail servers, AppleShare IP 5.0 will also be of interest to workgroups who want to set up their own intranets and e-mail systems.

March Apple Directions Online

The March issue of *Apple Directions* will be available by February 15 on the web at <http://www.devworld.apple.com>.

AppleTalk Filing Protocol (AFP) 2.2

This new version of the AppleTalk Filing Protocol (the previous one was version 2.1) adds something called *AFP over TCP*. A new interface called the *Data Stream Interface* (or *DSI*) allows AFP data packets to be transmitted using a variety of data stream protocols.

Apple engineers have used the Data Stream Interface to allow AFP packets to be converted to a form that can be transmitted over TCP/IP (Transmission Control Protocol/Internet Protocol) networks.

AFP over TCP means that AppleShare servers and volumes can be located anywhere on the Internet and that, if users have the required passwords, they can access those AppleShare servers and volumes as they always have under AppleShare. (For example, a remote volume somewhere on the Internet will still appear as a volume icon on a user's desktop, and it will behave just like the user's local hard-disk icon.)

AFP over TCP also means that if the TCP/IP connection is implemented using a high-speed network (for example, Fast Ethernet), AppleShare data transfers will occur at the much higher speed that the wiring allows.

The AppleShare Registry API

The new AppleShare Registry API replaces the Users and Groups API of AppleShare 4.x. It accesses an underlying Registry database (currently implemented through the AppleShare 4.x Users & Groups Data File to ensure compatibility with pre-AppleShare IP 5.0 network services). This Registry database contains information on the users, groups, and services associated with an AppleShare IP 5.0 server.

The AppleShare Registry API includes routines that allow you to query the AppleShare Registry database, change its contents, and be notified when an object inside the database is changed. The database contains objects for each user, group, and service, and any object can have any number of data fields, called *attributes*, associated with it.

Each type of object has certain attributes already associated with it, but you can add additional attributes. This allows you to use the AppleShare Registry instead of having to write your own code to manage your service's users and groups. For example, let's assume that you're writing a network backup program. You can supply additional data (for example, backup schedules or the names of the

volumes to be backed up) to existing user objects by giving each user object new attributes. This method also simplifies customers' (that is, network administrators') lives by preventing them from having to reenter the same set of user names for each new network service they install.

AppleShare IP 5.0 uses the AppleShare Registry database to provide password protection to AppleShare itself, as well as to file-sharing, web, and mail servers. The AppleShare Registry also supports extensible authentication, so developers can add new authentication methods to AppleShare IP 5.0 and their services using the AppleShare Registry.

The Components of AppleShare IP 5.0

AppleShare IP 5.0 contains five separate components. The following sections describe each of these components.

AppleShare IP 5.0 File Server

The AppleShare IP 5.0 File Server promotes collaboration among workgroup members by allowing them to share files and to limit access to files and servers through the user/group/password mechanism. The AppleShare IP 5.0 File Server implements two different methods of file access. Using AFP over TCP, remote Mac OS users can access files using the Mac OS desktop metaphor. Using FTP, remote users on any OS platform can retrieve files using an FTP file-access program.

The most important improvement in the AppleShare IP 5.0 File Server is its support for the TCP transmission protocol. The AppleShare client software, which is implemented as the AppleShare extension on the user's computer, can access volumes using either AppleTalk (for volumes on AppleShare 4.x servers or personal file sharing) or TCP (for volumes on AppleShare IP 5.0 servers).

AppleShare IP 5.0 improves the speed of volume access in the following way: If the volume's server supports TCP/IP, the AppleShare client software connects using the faster TCP protocol; if not, the client connects using AppleTalk.

So that alias files continue to work, AppleShare IP 5.0 ensures that any aliases created contain both AppleTalk path information and the TCP/IP address for the server. That way, if users have a TCP/IP connection to the server, the AppleShare IP 5.0 File Server will automati-

cally connect to the remote server using the faster TCP protocol.

An incompatibility between the System 7.5.3 Finder and AppleShare 4.x caused the AppleShare 4.2 client cache to break, decreasing AppleShare performance. AppleShare IP 5.0 is written to fix this problem, thus reclaiming a 20 percent speed increase that had been lost when AppleShare 4.x was running on System 7.5.3.

Finally, AppleShare IP 5.0 will deliver a significant overall speed increase over AppleShare 4.x. Although AppleShare IP 5.0 is still being tuned for performance, Apple found that an alpha version of AppleShare IP 5.0, when accessing data over TCP/IP, performs about 60 percent faster than AppleShare 4.2.1 does over AppleTalk. Apple is expecting some improvement over that figure by the time AppleShare IP 5.0 is commercially released.

AppleShare IP 5.0 Web Server

This new web-server program allows a server computer to deliver web pages (stored as HTML files) to users running web-browser programs. Apple expects the AppleShare IP 5.0 Web Server to meet the needs of a majority of AppleShare IP 5.0 purchasers. The AppleShare IP 5.0 Web Server includes all the standard features of web servers, including the ability to have new functions added to it through the use of CGIs (Common Gateway Interfaces). Like all the other services offered by AppleShare IP 5.0, the AppleShare IP 5.0 Web Server uses the AppleShare Registry database to keep track of users' names and passwords.

AppleShare IP 5.0 Mail Server

The AppleShare IP 5.0 Mail Server enables the members of a workgroup to send and receive e-mail across either AppleTalk or TCP. This mail server supports today's Internet mail standards, POP (Post Office Protocol) and SMTP (Simple Mail Transfer Protocol), and Apple plans to support the emerging protocol IMAP (Internet Messaging Access Protocol) in a future version of AppleShare IP. Because the AppleShare IP 5.0 Mail Server supports both POP and SMTP, it works with all major mail-client programs that run on the Mac OS and Windows (for example, Eudora, Cyberdog, Netscape Navigator™, and Claris EMailer).

Here are some important miscellaneous features of the AppleShare IP 5.0 Mail Server:

- To improve performance, the server stores all e-mail in a single database.
- The server uses group objects within the AppleShare Registry database to implement group e-mail addresses.
- The server allows the user to work with Mac OS user names (which can be in a non-Roman language—Japanese, for example) and

have them transparently converted to the users' Internet addresses when the mail is sent.

- The server supports APOP authentication (encrypted passwords), auto-forwarding of mail, and server logging (which logs mail events to a log file).

Finally, Apple is working to ensure that customer sites that are using PowerShare can make a successful transition to AppleShare IP 5.0. PowerShare customers will be able to convert to AppleShare IP 5.0 and preserve their existing e-mail, and Apple will provide a tool that will help a PowerShare site move its Catalog data to AppleShare IP 5.0. If you have any questions regarding the transition from PowerShare, contact John Hanay at hanay1@apple.com. Also, a white paper covering the PowerShare transition is available at the AppleShare IP web server, located at <http://appleshareip.apple.com>.

AppleShare IP 5.0 Print Server

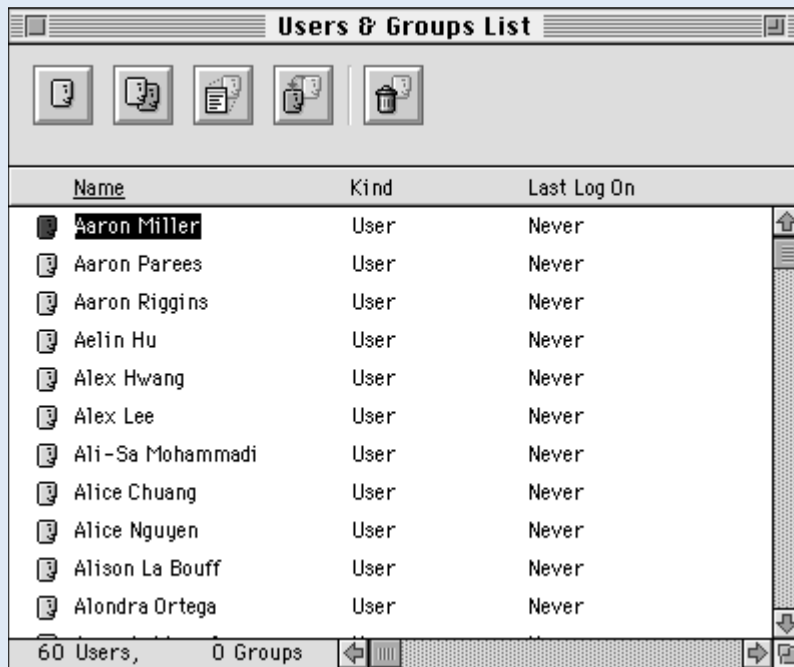
In previous versions of AppleShare, some design flaws limited the usefulness of the print server. The AppleShare IP 5.0 Print Server has numerous improvements that make it a robust, high-performance print server:

- The new LaserWriter 8.x drivers and PostScript™ Level II are supported.
- Performance has been improved (the AppleShare IP 5.0 Print Server is a fully-threaded application).
- The print server supports up to 10 print queues, 30 printers total, and 32 simultaneous print jobs. A print queue is a grouping of up to 10 printers; when a print job goes to a print queue, the printing is performed by the first idle printer in the print queue, thus minimizing the time needed to print.
- The print server uses server-side PPDs (PostScript Printer Description files) to let an application that is printing to a print queue get data about the printer that was chosen to do the printing.

AppleShare IP 5.0 Admin

The AppleShare IP 5.0 Admin program (informally known as *OpenAdmin*) is a complete rewrite of the AppleShare 4.x Admin program. It is a single program that the system administrator uses to manage users, groups, and services, and to provide password security, through calls to the AppleShare Registry API (an evolution of the Users and Groups API used in previous versions of AppleShare). Apple plans for a future version of AppleShare IP to replace the AppleShare Registry API with LDAP (Lightweight Directory Access Protocol), an industry-standard method for providing directory services.

AppleShare IP 5.0 Admin is also the first major product from Apple to use OpenDoc, and it does so to deliver a modular administration



Two AppleShare IP 5.0 Admin Windows. The Users & Groups List window is one of the windows that you can call up from the AppleShare IP 5.0 Admin program. When you double-click a user, the program displays a window that represents that user (in this case, the “User: Aaron Miller” window). Not only are both of these windows OpenDoc parts, but any information that appears after you select an item from the pop-up menu in the user window is also an OpenDoc part.

program that you can extend by adding new OpenDoc parts. The main AppleShare IP 5.0 Admin “application” is an OpenDoc document controlled by a part editor, as is any other window opened by it. (For examples of this, see the figure on page 4.)

If you are writing a network service that lives “on top of” AppleShare IP 5.0, you can write the administration portion of that service as one or more OpenDoc parts, and the parts will automatically appear to be part of the AppleShare IP 5.0 Admin program. (Several AppleShare IP 5.0 Admin windows—the window that represents a given user, for example—include a pop-up menu. Each pop-up menu item displays a different kind of information—for example, the user’s password—and is implemented as an OpenDoc part. To administer a network backup program, you might add a pop-up menu item called *Backup Volume and Schedule* and create an OpenDoc part that would display and change the relevant information.)

For details on why Apple chose to use OpenDoc and what advantages that brings to you, see the box on this page .

Developer Opportunities

Admittedly, AppleShare IP 5.0 won’t cause most developers to change their plans. However, some of you may be interested in the following items:

- There is a new version of the AppleTalk Filing Protocol—version 2.2. This new version supports AFP over TCP (which is what allows AppleTalk servers and volumes to be accessed across the Internet). AFP 2.2 includes two new calls that allow you to get additional information on an AppleTalk server or volume.

If your product currently uses AFP 2.1, you should examine the new features in AFP 2.2 and determine whether you need to change your product. To get the document *AppleTalk Filing Protocol 2.2 & AFP over TCP/IP Specification*, go to the AppleShare IP web site (<http://appleshareip.apple.com>).

- If you are thinking about creating a new product that works with AppleShare IP 5.0 (or revising an existing one), you should consider using the AppleShare Registry database to store information about your service, users, and groups. Doing so will decrease the amount of work you have to do to keep track of your users and groups. To get the document *AppleShare Registry API Reference*, go

to the AppleShare IP web site (at the address given above).

Conclusions

AppleShare IP 5.0 is a big step forward for AppleShare because

- It expands the reach of a technology that was formerly Apple-proprietary and extends it outward across the Internet.
- Its modular architecture and use of OpenDoc make it easier for both you and Apple to add new network services with less effort than before.
- It provides new services (most notably, web and mail functions) that customers have been asking for.

- It is on a path that will embrace relevant industry standards (in particular, the IMAP e-mail standard and the LDAP directory-services standard).

As always, Apple needs you to build on AppleShare IP 5.0 to maximize its success in the Mac OS marketplace. Products that work with AppleShare IP 5.0 will be more powerful and easier to use (plus easier for you to develop)—and that’s a win for you, Apple, customers, and the Mac OS platform. ♣

Why OpenDoc?

“If OpenDoc is such a great technology, why isn’t Apple using it?”

This question, asked by several developers, is one that needs answering. Apple’s answer is twofold: First, Apple will use OpenDoc only when it is appropriate; second, Apple has been using OpenDoc, but it’s only now that a project that uses OpenDoc has come into public view. AppleShare IP 5.0 is the first Apple product that meets both these conditions.

As you know from reading the main text of this article, Apple uses OpenDoc to help implement the AppleShare IP 5.0 Admin program. Here are some of the reasons Apple decided to use OpenDoc:

- OpenDoc makes software extensible. Because of this, either you or Apple can easily extend AppleShare IP 5.0 to encompass more functions. In addition, OpenDoc makes it easier for anyone to replace existing network services with new, improved versions.
- OpenDoc helps you write the administration human-interface portion of your network service faster because it allows you to focus on designing and writing only the code that is unique to your service. You will find that the effort required to write this administration OpenDoc part is much less than that of writing an application. Apple engineers report that the amount of work you’ll have to do is close to that of adding a new window to an existing application.
- OpenDoc eases the process of debugging and upgrading your software. Instead of writing one large, monolithic application, with OpenDoc you are writing smaller part editors, each of which is easier to debug because of its smaller size. In addition, since each part editor is a stand-alone component, it is easier to debug because it shares no dependencies with any other part editor. Also, when you want to enhance or fix a bug in an OpenDoc part editor, you don’t need to ship a new version of your entire product, just the individual part editors that you have changed.
- Good software frameworks now exist to make the creation of OpenDoc parts as easy as possible. The two best-known frameworks are the OpenDoc Development Framework (ODF), available at no charge from Apple’s ODF web site at <http://www.devtools.apple.com/odf/>, and PowerPart, an OpenDoc framework that is part of Metrowerks’ CodeWarrior development environment (release 10 and later).
- Apple needed a plug-in extension architecture to incorporate into AppleShare IP 5.0 Admin, and OpenDoc can be used to implement that. Rather than build yet another proprietary plug-in extension architecture, it made far more sense to use one that not only exists but is also an open architecture endorsed by many vendors.
- OpenDoc is a technology largely built by Apple, and Apple employs some of the most knowledgeable OpenDoc engineers in the industry. Apple drew upon this in-house expertise to make the use of OpenDoc within AppleShare IP 5.0 Admin as powerful, stable, and robust as possible.

The NeXT Step

continued from page 1

future versions of the Mac OS. For details on the Metrowerks announcement, see the press release located on the web at <http://www2.apple.com/home/news/metrowerks.html>.

■ ■ ■

Letter From Ellen Hancock

Ellen Hancock, executive vice president of research and development and chief technology officer at Apple, released the following letter just after the December 20 announcement of the Apple agreement with NeXT.

Dear Apple Developers:

Today Apple announced it has entered into an agreement to purchase NeXT in a friendly acquisition. NeXT employees, products, services and technology research will become part of the Apple organization. Although this is not a full disclosure of the detailed Mac OS strategy, I felt it was important for me to share my thoughts on what this acquisition means to you, our developers. As we have previously stated, we plan to announce the comprehensive Mac OS strategy at Macworld in San Francisco on January 7, 1997.

The acquisition of NeXT demonstrates that Apple is embracing outside technology and cross-platform standards. It's clear the "not invented here" syndrome is dead. NeXT's development environments allow developers to write once and deploy across a range of platforms. One of NeXT's greatest strengths is its rich collection of tools, which allows for rapid assembly, integration, and deployment of multiplatform solutions.

NeXT's dynamic object-oriented development environments also allow enterprise customers to develop software solutions quickly and deploy reusable applications on either traditional client/server or Internet/intranet-based networks. These same tools enable new applications to access legacy data and applications that protect customer investments in information technology.

The acquisition of NeXT is expected to

solidify Apple's inherent strengths in the Internet/intranet space. Current Apple Internet products and technologies, when combined with NeXT's object-oriented Java-enabled open development platform, should give us a competitive advantage and the opportunity to become a preeminent development and deployment platform for Java™ technology.

I believe that NeXT's profitable development environments for enterprise and Internet markets allow Apple to supplement its growing list of software products with a ready-made portfolio of powerful customer-focused software solutions. This acquisition is expected to be a significant milestone in building a differentiated, sustainable and profitable software business.

Finally, NeXT's operating system is mature and robust and can serve as a strong foundation for the future of Apple's software business. NeXT's operating system provides many of the features you have been demanding in a future operating system, such as fully preemptive multitasking, protected memory, and robust information linking and networking capabilities. It also contains a powerful object-oriented architecture that provides a greater scalability from laptops to server-level products. I am also confident that compatibility with existing applications will be strong in Mac OS as it evolves.

I believe that the acquisition of NeXT will be good for Apple developers. I believe it will enhance your development environment and strengthen your position in several of Apple's key markets, namely enterprise and the Internet/intranet space. The integration of NeXT-STEP OS technology into future versions of the Mac OS should result in a robust, modern operating system that provides customers and developers with a media-rich and Internet-savvy platform.

It really is my pleasure to share what I feel is great news and I look forward to your continued support. I believe this acquisition represents the passage of a major milestone in Apple's transformation and renaissance. We enter a new year with even greater relevance in the industry and a much stronger position as a mainstream, open player.

Ellen Hancock
Executive Vice President of Research and
Development and Chief Technology Officer
Apple Computer, Inc.

New Mac OS Strategy Due in Next Issue

Even though the news of Apple's proposed acquisition of NeXT is exciting, it doesn't directly deal with the evolution of the Mac OS. Apple is scheduled to announce its strategy for the Mac OS at MACWORLD Expo San Francisco (January 7–10). Since this issue went to press before that announcement was made, *Apple Directions* will cover it next month. The staff of *Apple Directions* apologizes for this situation, but such delays are an unavoidable part of paper publishing.

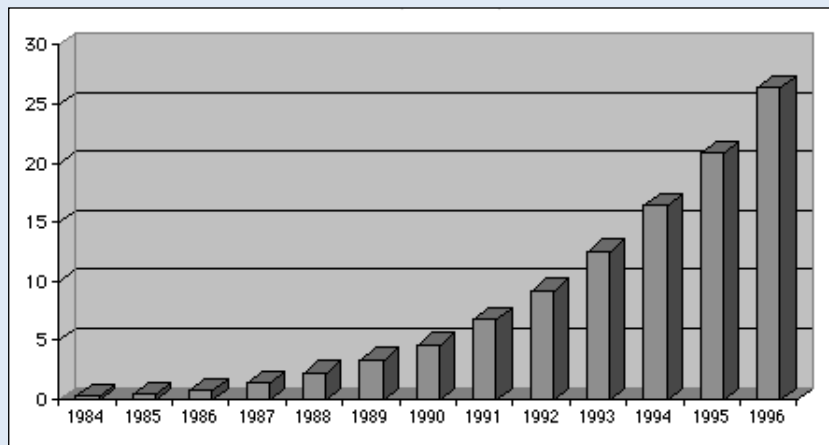
Electronic publication, however, has no such limitations. If you want to get up-to-date information from Apple electronically, you can do so in two ways. First, you can subscribe free of charge to Apple Developer News, which delivers news to your e-mail address weekly. To do so, send an e-mail message to adirections@thing1.info.apple.com; in the *subject* field (not the message body), type the string "subscribe <your real name>". Second, you can make a weekly visit to the Apple Developer World web page, at <http://www.devworld.apple.com>.

■ ■ ■

26 Million and Counting!

In November 1996, Apple shipped its 26 millionth Macintosh computer, increasing its installed base by 1 million computers since last August. While this milestone is much quieter than the "25 Million Strong" bash at Boston Macworld in August, it still signifies the large, growing army of Macintosh users. Since Macintosh computers are shared by multiple users, it is estimated that there are over 60 million Macintosh users in the world today. These numbers show a healthy demand for Apple Macintosh computers—and for the software that runs on them.

In other industry-related news that points to the strength of Apple's presence, readers of *PC World* voted Apple Macintosh computers number one in reliability for the fourth time in a row. (*PC World* conducts this survey twice a year, so that means Apple has received this award for two years in a row.) In addition,



Apple Macintosh cumulative units (in millions) shipped from 1984 through 1996.

readers also credited Apple phone support as having the lowest hold time of any personal computer vendor. (*PC World* is an industrywide personal computer magazine that covers computers from all vendors, including Apple and vendors of IBM PC-compatible computers.)

Apple was also rated number one in reliability in a user survey just completed by *HomePC* magazine. Apple customers who responded said they ran into far fewer problems that required a call to technical support; if they did have to call, Apple phone support resolved the problem more quickly than any other vendor did.



Apple Executives Score Three Major Media Hits

Apple scored three executive profile hits in major media in December 1996:

- Dr. Gil Amelio made the cover of the December issue of *Forbes* magazine. Sitting atop a column of Macintosh cartoons and under the headline “Gilbert Amelio’s Grand Scheme to Rescue Apple,” Dr. Amelio discusses Apple’s turnaround efforts and future plans. The first comprehensive look at Apple’s comeback efforts, the article focuses on how a new operating system strategy could put Apple back in the industry race. You can read the entire article online at <http://www.forbes.com>.

- There’s an upbeat portrait of Marco Landi in a late 1996 issue of *PC Week Inside* titled “Renaissance Man.” The article explores Landi’s leadership role in Apple’s resurgence, with special emphasis on his customer commitment and energetic management style.

- Heidi Roizen was the subject of an in-depth interview titled “Roizen Expectations” in the December 8th edition of the *San Jose Mercury News’ West* magazine. In the six-page article, author Tia O’Brien asks the question “Should we buy a Macintosh for our daughter?” and manages to deliver warm, personal, and often funny insights into the life of Apple Developer Relations’ top executive. Does Heidi ever answer O’Brien’s question? Based on Heidi’s prediction “that it will take a year to get a realistic view of Apple’s future,” O’Brien decides she can hold off another year.



Live Object Containers Hold Their Own

The first Live Object containers have begun shipping, and enthusiasm is running high for “hold everything” OpenDoc software. (“Containers,” for those not familiar with OpenDoc jargon, are pieces of software—either Live Objects or conventional applications—that have been designed so that users can add new functionality simply by dragging and dropping Live Objects or other compatible

software components into the software.)

Developer Todd Cash (tcash@incom.net) recently talked about his impressions of Live Objects and OpenDoc after attending Apple’s Los Angeles Developer Roadshow: “I think [OpenDoc] has to be one of the coolest things to hit the Mac since QuickTime. The demo of WAV [a word processor implemented as a Live Object] knocked my socks off—it worked great with a spreadsheet part and a 3D graph part embedded in it. I’m definitely going to look into the parts market.”

Nisus Software recently released Nisus Writer 5.0, the first commercially available word processing application that is also a Live Object container. Product Manager Joe Kissell talked about the advantages that it offers users: “If users want enhanced table capabilities, they just drag and drop another company’s table object into a document. The Nisus Writer CD includes several of the hottest Live Objects available.” For an overview of Nisus Writer’s features, see the web page at http://www.nisus-soft.com/5.0_features.html.



Apple Open Transport/PPP 1.0 Supports Industry-Standard PPP Network Protocol

Apple recently announced Open Transport/PPP 1.0, an extension to Open Transport that adds support for Point-to-Point Protocol (PPP), an industry standard that provides access to multiprotocol networks. Open Transport is Apple’s standards-based networking and communications system for Macintosh and Mac OS-compatible computers. Open Transport/PPP 1.0 is the first PPP implementation for the Mac OS to take full advantage of the Open Transport architecture; it’s also the first PPP implementation to offer the performance and stability of native code on PowerPC processor-based Mac OS systems.

With the release of Open Transport/PPP 1.0, Apple has moved its evolution of Apple Remote Access (ARA) to phase II of what Apple calls its

“ARA Road Map”—Apple’s plan to evolve its AppleTalk networking products to embrace industry standards and Internet protocols.

Developed entirely at Apple, Open Transport/PPP reemphasizes Apple’s commitment to the Internet and to providing high-quality network software for all Internet users. Open Transport/PPP 1.0 provides clients, who use a modem or ISDN terminal adapter to connect to a remote TCP/IP network or the Internet, with access to TCP/IP network services.

Here are some of the features of Open Transport/PPP 1.0:

- Open Transport—style modem and PPP control panels
- Transmission and reception of status monitors for modems without visual indicators
- Support for modems and ISDN terminal adapters
- Support for multiple saved settings
- Detailed logging feature to assist in connection troubleshooting
- Use of shared library technology for effective memory management
- Compatibility with virtual memory
- Support for connection reminders and idle timeout
- Compatibility with Internet access using PPP, as well as SLiRP and TIA (the Internet Adapter)
- Support for AppleScript
- Use of ARA CCL scripting language for both modem and connection scripts
- Compatibility with ARA 2.x modem CCL scripts
- Forty-two CCL scripts for modems and ISDN terminal adapters
- Extensive online help via Apple Guide
- Support for automatic connections when a network application is activated

For more details about the new features of Open Transport/PPP 1.0, and for news of Apple’s progress in the ARA Road Map, see the press release at <http://product.info.apple.com/pr/press.releases/1997/q1/961126.pr.rel.opentrans.html>.



New Mac Buyers Hungry for Software; Mac OS Logo Improves Sales

A third-quarter (Q3) Recent Buyer Study conducted by Apple’s Primary Research Group reveals that new Macintosh buyers are hungry to buy additional Mac OS software. The study also found that many customers look for the Mac OS logo to identify possible software for purchase. According to the study, 62 percent of Q3 Macintosh buyers purchased additional software for their Macintosh computers within the first five months of their hardware purchase. Power Macintosh and Performa buyers were the heaviest purchasers of new software (62 to 65 percent), but a majority of new Macintosh LC owners (56 percent) and PowerBook owners (54 percent) also purchased additional software.

Virtually all of these software buyers chose stand-alone programs, while some also bought all-in-one packages. Of those buying stand-alone programs, the most frequently purchased applications were graphics (23 percent), games (22 percent), utilities (21 percent), desktop publishing (19 percent), education/reference (19 percent), and word processing (16 percent).

Among the product families, Power Macintosh buyers most often purchased graphics, utilities, and desktop publishing programs; Performa owners purchased games; Macintosh LC buyers selected educational/reference programs; and PowerBook owners chose utilities, communications, and word processing programs.

The study also looked at the retail software purchasing habits of new Macintosh buyers. In purchasing additional software for their new computer, more than one-third of consumers buy their software at computer stores. Others use various types of retail outlets, including consumer electronics stores, office supply stores, member warehouse stores, and college and university bookstores.

The retail software environment, with its endless rows of titles, can often be intimidating. According to Apple’s Q3 survey of recent U.S. Macintosh buyers, the practice of affixing “Mac OS” logo stickers to boxes of software is helpful and should be continued or expanded.

Nearly 40 percent of the Macintosh buyers who bought software say they actively look for the Mac OS logo on the box. But promoting the Mac OS logo alone isn’t enough. Efforts must also be directed at letting consumers know that Macintosh titles can be found not only in the Macintosh aisle but also in the DOS and Windows section of the store. Almost half (45 percent) of all Macintosh buyers still don’t know they can find Macintosh software in the Windows sections of stores.

To counteract this perception of Macintosh platform erosion, Apple has launched an aggressive new communications campaign called “Software Storm.” Software Storm is designed to raise the visibility of third-party software for the Mac OS by making it easier for customers to identify, locate, and purchase Mac OS software products through various distribution channels. The campaign features in-store merchandising sporting the Mac OS logo and tag line “All great software wears this face.”



SIMBA Reports Apple Gains in Education Markets

A recent study by SIMBA Information of Stamford, Connecticut, reported a strong gain in the number of educational software developers for the Macintosh platform. According to SIMBA’s survey, “Macintosh as a platform choice showed healthy improvement in 1996, jumping to 86 percent from 73 percent in 1995.”

SIMBA’s *Electronic Media for the School Market* report also says that Microsoft’s Windows School Connection program now has 114 educational software publishers as members. In comparison, Apple’s Education Solution Provider (ESP) program currently has nearly twice as many members (about 200) who publish educational products for the Macintosh platform.

Also included in SIMBA’s report are survey results by Education Market Research (EMR) of Rockaway Park, New York. In a survey of 60 school technology dealers in the United States, EMR reported that sales (in dollars) of Macintosh systems were up in 1996 by 11 percent from 1994 to 1995, while sales of DOS and Windows systems showed no appreciable growth. According to EMR, total hardware

dollar sales to the K–12 market increased by 14.8 percent in 1995–1996. EMR defined hardware as computer systems, file servers/networking software, modems, CD-ROM drives, and videocassette/videodisc players.

(Editor's note: Thanks to George Wagner, who originally posted this material in the MACWAY newsgroup.)



How to “Cash In” on Apple’s ATM Network Software

Apple just announced the availability of Apple ATM Network Software for general license by network interface card and application developers. Apple believes the licensing of ATM Network Software will promote the emergence of a new class of third-party applications and peripherals that take advantage of the unique features of Asynchronous Transmission Mode (ATM) networks—speed, quality-of-service guarantees, and scalability—on the current Mac OS without sacrificing connectivity to the Internet and existing networks. Apple ATM Network Software consists of modular software that is card-independent and provides the functionality to operate on a standard ATM network.

This software presents an opportunity to hardware developers working on high-performance ATM network cards and to software developers who want to write native ATM applications for the Mac OS platform using the XTI ATM API. Carlos Montalvo, vice president of Apple’s Interactive Media Group, commented on this technology’s significance: “Building on Apple’s strengths in multimedia as demonstrated by the strong adoption of the QuickTime Media Layer, we believe that licensing the ATM Network Software will allow developers to bring ATM-enhanced multimedia products to market more quickly. Many of Apple’s key customers—including Viacom, Disney, BBC, and Industrial Light and Magic—require the network capabilities provided by ATM’s traffic-management architecture.”



Apple’s VideoPhone Kit Ships

The Apple VideoPhone Kit began shipping in limited quantities in December 1996. This product replaces QuickTime Conferencing and includes a high-resolution color camera, Apple VideoPhone videoconferencing and collaboration software, Farallon’s Timbuktu Pro document-sharing software, and Macintosh System 7.5.5. The estimated retail price is U.S. \$279. The Apple VideoPhone Kit, announced formally at MACWORLD Expo San Francisco in January, is positioned for use in consumer, small office, and K–12 education markets.

The Apple VideoPhone Kit (part number M5673LL/A) works with most Performa and Power Macintosh computers and includes the following features:

- Videoconferencing capabilities
- Interoperability with Windows and UNIX® through Netscape’s CoolTalk conferencing products
- A multiuse color digital camera that enables you to conduct videoconferences, capture raw video footage, take still photos, and even make movies
- Color videoconferencing and document sharing for users connecting through an ISDN modem, the Internet, or an Ethernet connection to a network
- Audioconferencing and collaboration for users with a 28.8-Kbps modem connection to the Internet
- File transfer, shared white board, and “chat tool” capabilities

For more extensive product information, see the QuickTime Conferencing web site at <http://qtc.quicktime.apple.com/>.



PIX 3D Accelerator Supports QuickDraw 3D

S-MOS Systems and Apple recently announced that the S-MOS PIX3D Rendering Engine now supports Apple’s QuickDraw 3D RAVE API for Macintosh, and it will soon support RAVE for Microsoft Windows platforms.

RAVE (Rendering Acceleration Virtual Engine) is the foundation technology used in QuickDraw 3D, Apple’s award-winning, comprehensive 3D graphics architecture for the Mac OS, Windows 95, and Windows NT. Through PIX-based acceleration, RAVE-based games and applications on either platform will now benefit from speed increases of more than 100 percent over nonaccelerated rendering. Both companies are working aggressively with game developers to include RAVE support for their 3D titles that run on the Mac OS and Windows.

PIX is a very low-cost, high-performance (66 million pixels per second) 3D rendering chip for PCI-based Macintosh and PC graphics boards. PIX offers improvements in polygon setup and rasterization, perspective correction, visibility determination, and texture-map address calculation.

Game developers using Apple’s API will be pleased to note that PIX’s support for RAVE greatly simplifies the migration of games from one platform to the other, as relatively little porting is necessary. What’s more, both RAVE and PIX were designed to effortlessly accommodate large, detailed textures, allowing game developers to allocate up to 16 MB of texture in a game.

For more information on RAVE, see the Apple web site at http://devworld.apple.com/dev/games/detail_q3d.html.



Apple’s Cocoa Is Like Java for Kids

Cocoa, developed by the AppleNet Internet Multimedia team and Apple Research Labs, is a prototype Internet authoring tool for kids. With this software, children can build interactive worlds with animated characters, design video games and play them right on a web page, draw a living picture book that never reads the same way twice, and more. Because Cocoa is based on what Apple calls object-oriented “programming by demonstration,” children can add content with custom interactivity and multimedia to any web page without learning scripting or HTML.

Cocoa is the product of many years of research conducted by Apple’s Advanced Technology Group. Over 75 schools and institutions in North America and Europe were involved in extensive user testing with hun-

dreds of children. Most of the testers learned to use the basic features of Cocoa in less than 20 minutes. Cocoa is offered as a visual alternative to other user programming tools.

Because Cocoa can be used by teachers, parents, and kids, it's ideal for teaching problem solving and introductory programming. It can also be used by teachers as a customizable teaching aid, as well as by curriculum developers looking to provide interactive CDs as an adjunct learning tool to traditional textbooks.

To try out this experimental software, go to the web site at <http://cocoa.apple.com>. Final product versions are planned for late 1997; pricing has not yet been determined for these upcoming products.



New Personal Web Server Goes Beta

Expanding its easy-to-use product line of Internet publishing technologies, Apple recently announced the release of a beta version of Personal Web Sharing, a web sharing technology licensed from Maxum development. The new product will allow users to publish both simple and multimedia content across the Internet or an intranet using World Wide Web protocols.

Just as today's Macintosh customers use personal file sharing for sharing files between individuals within workgroups, the personal web server will allow document sharing with any user who has a web browser, including users of Windows, UNIX, and OS/2. Web server security is assured with the proven existing personal file-sharing features in the Mac OS.

The Maxum personal web server software offers extremely high performance. "We estimate that the Mac OS web server solution will offer customers performance improvements more than five times greater than the Web-ForOne product that Microsoft recently acquired, and it will have less effect on the performance of other applications that the customer is using," said Andy Lauta, director of Product Marketing, AppleNet.

In addition, the personal web server offers scalability to Apple's broad range of industrial-strength dedicated web server products, Apple Internet Server Solution (AISS). The personal web server is easy to install and manage, and offers complete integration with the Mac OS.

The personal web server is designed for

small businesses and schools as well as corporate departments. For example, workers often need to quickly make available drafts of product proposals, weekly sales reports, or copies of a presentation. In many of these environments, information must be shared, but a dedicated server is not needed. A personal web server is a quick and easy way for an individual to share information across an intranet.

A beta version of the personal web server software is available on the AppleNet web site at <http://applenet.apple.com>.



Newton Press for Windows 1.0 Ships

Apple's Newton Press for Windows 1.0 is now available in local retail stores. Newton Press is useful PC-based software that provides fast connectivity to move documents easily between a PC and a Newton OS-based product.

Newton Press is compatible with all major formats, popular operating systems, and the Newton OS-based product line. Newton Press for Windows is compatible with Windows 3.1, Windows NT 3.5x, and Windows 95, as well as Newton OS-based product lines like the MessagePad 130, MessagePad 120, and earlier series. Anyone with a Newton handheld computer can view, annotate, fax, or print the documents created with Newton Press.

Newton Press for Macintosh is also available and sold separately.

For more information about Newton Press for Windows, see the Newton Press home page at <http://www.newton.apple.com/newton/solutions/press/press.html>.



Developing for the Mac OS

In 1995, developers shipped more than 1,440 products for the Mac OS and, according to data from the Software Publishers Association (SPA) and PCData, the Mac OS software market is more profitable than the competition, with average revenues per unit higher overall for Mac OS-based software than for

applications that run on Windows.

Here are a few of the new software products recently released for the Mac OS:

- ASi, a leader in compression solutions, recently released PKZIP DCL for the Power Macintosh. The PKZIP DCL provides a library of routines for the compression and decompression of data on a Macintosh or Power Macintosh. With PKZIP DCL, programmers can compress and decompress data using their own file-handling routines to read and write their data.

For more information on PKZIP DCL, visit the ASi web site at <http://www.asizip.com>.

- Bare Bones Software recently announced the release of BBEdit Lite for OpenDoc. This product brings the text-editing and text-transformation capabilities of BBEdit to the OpenDoc environment. With BBEdit Lite, OpenDoc users can take advantage of BBEdit's ability to edit and process large quantities of text with great speed.

You can download BBEdit Lite free of charge from the Bare Bones Software web site located at <http://www.barebones.com>.

- PointCast recently announced the availability of PointCast Network for the Macintosh. The first public beta version of PointCast's Macintosh client allows you to receive up-to-the-minute broadcast news, stock quotes, weather, and more, directly on your computer screen.

PointCast is very proud of its Macintosh version, and the PointCast web site reflects that pride. According to Chris Hassett, president and CEO of PointCast, "We've had phenomenal response from the Mac community for this product—more than 100,000 Mac users have e-mailed us in anticipation of the beta. We're committed to the Macintosh platform, and the strength of this beta version is evidence of that."

To download the beta .9 version of the PointCast Network software for the Power Macintosh, visit the PointCast web site at <http://www.pointcast.com/download/dwnmac.html>.

- Totally Hip Software's WebPainter 1.0 for the Macintosh recently made its debut to a "sizzling" review in the December 9 issue of *MacWEEK*. In the very upbeat article, *MacWEEK* reviewer Jeff Glasse awarded WebPainter four out of five diamonds and said that the Macintosh version is easy to learn, is clear, and "does exactly what it promises to do."

WebPainter for OpenDoc is expected to be available for commercial release in January

1997. To download a beta version of WebPainter 1.0 for the Macintosh, visit Totally Hip's web site at <http://www.totallyhip.com>.

- Broderbund's Family Tree Maker for Windows has been the top-selling program for preserving family histories for more than seven years. In response to "the overwhelming customer demand from family history enthusiasts," Broderbund just announced that it will ship a Macintosh version of Family Tree Maker. This Macintosh version has the same major features as the Windows version and can access the collection of family archive CDs that are also available from Broderbund. This is a win for Apple, because it shows how a developer of a Windows-only product can see a lucrative business opportunity on the Macintosh platform.



QuickDraw 3D for Macintosh and Windows Receives Best of COMDEX Award

At COMDEX/Fall '96 in Las Vegas, Apple announced that QuickDraw 3D, its outstanding 3D architecture for workstation-quality graphics on personal computers, has received the prestigious COMDEX/Fall '96 Best of Show Award in the multimedia software category. QuickDraw 3D 1.5 is a significant update that brings QuickDraw 3D to the Mac OS and 32-bit Windows 95 and Windows NT platforms to enable multiplatform development of 3D authoring tools, games, and other applications. QuickDraw 3D has been available for the Mac OS since August 1995, and version 1.5 is a simultaneous update for both Mac OS and Windows 95/NT computers.

QuickDraw 3D 1.5 installers for the Mac OS and 32-bit Windows are now available for downloading from the web at <http://quickdraw3d.apple.com>.

QuickDraw 3D can be installed on users' computers to provide excellent 3D performance, and a separate SDK (software development kit) allows developers to incorporate QuickDraw 3D for Macintosh or Windows into their products. (For more information on the SDK, visit the QuickDraw 3D web site given above.)

In support of this new cross-platform initiative, over 25 hardware and software vendors have endorsed—and plan to incorporate and support—QuickDraw 3D for Windows in their upcoming products. Major software vendors that intend to use QuickDraw 3D 1.5 for Windows include Specular, Strata, and NewTek. Macromedia is also supporting QuickDraw 3D as an Xtra extension for Director 5.0, which can be downloaded by all registered users. A number of leading hardware vendors, including 3Dfx, 3Dlabs, ATI, S3, S-MOS, and Cirrus Logic, also support QuickDraw 3D with their 3D hardware boards and chips. A testimony to the true portability of QuickDraw 3D is that 99.9 percent of the function calls are identical between the Macintosh and Windows versions; only six calls differ between the two.

Since its introduction on the Macintosh in 1995, QuickDraw 3D has won a number of industry awards, including the following:

- COMDEX/Fall '96 Best of Show Award for Multimedia Software
- *Discover* Magazine 1996 Technology Awards Finalist
- *Publish* 1996 IMPACT Award
- *BYTE* Magazine 1995 Editors' Choice Awards: Award of Distinction
- *MacUser* 1995 Editors' Choice (Eddy) Award: Breakthrough Technology of the Year
- *Macworld* World Class Awards 1995: Best New Technology



Apple Enhances MAE for Sun and HP Workstations

Apple recently introduced an enhanced version of Macintosh Application Environment (MAE). This innovative software product brings the functionality and ease of use of the Mac OS to SPARC stations from Sun Microsystems and workstations from Hewlett-Packard that run popular versions of the UNIX operating system.

Like its predecessor, MAE 3.0 enables users of these UNIX-based workstations to run off-the-shelf Macintosh applications, but the new version is even faster, easier, and more flexible to use. Specific enhancements include the following:

- Emulator performance that's up to 20 percent faster
- Optimized remote X graphics performance
- Additional ease-of-use features such as AppleScript, Apple Guide, Macintosh Drag and Drop, and Macintosh PC Exchange
- Multiple Independent Volumes (MIVs), which let users represent any UNIX directory or file system as a hard disk volume on the Macintosh desktop
- Floating license management that uses the popular FLEXlm floating license manager to let system administrators manage and monitor MAE licenses more flexibly
- File-sharing security improvements
- Improved control over AppleSingle/AppleDouble Format handling for better UNIX file integration
- MS-DOS floppy disk and CD, Photo CD, and ISO9660 CD compatibility

MAE 3.0 is available for the retail price of U.S. \$459 through the *Apple Developer Catalog* or directly from Claris at 800-293-6617 ext. 1399 in the United States or 800-361-6075 ext. 1221 in Canada.

To obtain a free 30-day evaluation copy, e-mail support, or more product details, see the MAE web site at <http://www.mae.apple.com>.



Apple Introduces a High-Capacity LaserWriter Printer

To address the needs of corporate and education customers who have extensive paper-handling requirements, Apple recently announced the LaserWriter 12/640 PS Plus, a high-capacity, cross-platform laser-printing solution. This printer solution bundles the LaserWriter 12/640 PS with 12 MB of installed memory, the LaserWriter 12/640 PS 500-Sheet Cassette and Feeder, and the LaserWriter 12/640 Duplex Printing Unit into a single box. This solution is priced much lower than if the individual components were purchased separately, but the printer and its options will continue to be made available individually for those users whose requirements are less demanding.

The LaserWriter 12/640 PS Plus is available through Apple-authorized resellers in the United States and certain international regions. The LaserWriter 12/640 PS Plus and options are expected to sell in the United States at the following prices:

- LaserWriter 12/640 PS Plus—\$2,195
- LaserWriter 12/640 PS Envelope Cassette—\$149
- LaserWriter 12/640 PS Face-Up Output Tray—\$49
- LaserWriter 12/640 PS Toner Cartridge—\$120



Claris Opens Ranks of CSA

Claris Corporation recently announced the expansion of the Claris Solutions Alliance (CSA), a consortium of software professionals, publishers, authors, and trainers who use and recommend Claris software products. Spurred by the fast growth of the CSA, which has risen to nearly 1,500 members worldwide, Claris is adding two new tiers to the organization.

- Claris Partners, a new CSA membership, is for highly experienced software development professionals who will work closely with

both Claris product development and sales teams to better address the needs of Claris software customers.

- CSA Enterprise, another new category of CSA membership, is designed for professionals responsible for in-house database development and administration of FileMaker Pro databases, and for help-desk personnel supporting FileMaker Pro users.

- CSA Associate membership, formerly the single CSA membership, has been expanded to include a wide scope of users, including software consultants, publishers, trainers, and the novice developer and consultant.

For more information on CSA or for a membership application, visit the Claris Partners section on Claris's home page at <http://www.claris.com>. ♣

Technology

CD Highlights: Tool Chest Edition, February 1997

Human Interface: The Bad Alert of the Month Contest

Feature: Making QuickDraw GX More Usable: GX Graphics should increase developer and customer acceptance of QuickDraw GX itself. Read this article to see if GX Graphics presents new business opportunities to you.

Technology: QuickTime 2.5 to Be Cross-Platform

CD HIGHLIGHTS

Tool Chest Edition, February 1997

Any new project brings with it a set of new, exciting challenges, and the Developer CD hasn't proven any different. Challenge number one is space—it's at a premium on this edition of the Developer CD Series. With the plethora of content I received for the February 1997 Tool Chest CD—such as OpenDoc Development Framework release 3, four new QuickView databases, and the Multiprocessing SDK—I had to move a couple of things to free up some space. But not to worry; although I did have to temporarily pull the Development Tools & Languages folder and the Language Kits folder from this edition, those folders will return on the May 1997 Tool Chest edition. In the meantime, check out the February 1997 Tool Chest CD, which, in addition to sample code and Developer Notes updates, includes the following new and revised packages.

MoreFiles 1.4.4

MoreFiles is a collection of high-level routines written over the last couple of years to answer File Manager questions from developers.

The routines in MoreFiles have been tested (but not stress-tested), documented, and code-reviewed by Apple.

MoreFiles provides

- High-level and FSSpec-style routines for parameter-block-only File Manager calls and for Desktop Manager calls
- Useful utility routines that perform many common File Manager–related operations
- A robust file-copy routine
- A recursive directory-copy routine
- Catalog searching routines
- Routines for dealing with pathnames

See the file !MoreFiles Read Me for a description of fixes and improvements in version 1.4.4.

Multiprocessing SDK

DayStar Digital and Apple have designed a multiprocessing, multitasking application programming interface, the Multiprocessing API (MP API), for use in a new generation of PowerPC processor–based Mac OS multiprocessing systems. (Multiprocessing is the simultaneous use of more than one processor.) These systems are standard Macintosh computers with one major exception: They contain more than one CPU. The MP API defines a set of services that allow developers to create and communicate with multiple elements of execution called *tasks*. When tasks are run on a multiprocessor system, they are scheduled and run simultaneously on all available processors.

This SDK has been prepared by DayStar Digital to help you get started using the MP API. The MP API document provided with this SDK describes these services in detail.

MPHelloWorld (Pascal)

This is a Pascal version of the MP sample code included in the Multiprocessing SDK.

OpenDoc Development Framework

The OpenDoc Development Framework, or ODF, is an object-oriented framework developed in C++ for building cross-platform OpenDoc component editors. Like MacApp, Apple's framework for building stand-alone Macintosh applications, ODF makes the process of building an OpenDoc component editor easier by implementing much of a component editor's default behavior.

OpenDoc Development Framework (ODF) release 3 is a maintenance release. ODF 3 is not cross-platform; it is still Macintosh-only. When Apple shipped ODF 2 in September, it scheduled ODF 3 for a January/February time frame. But the number of patches and the improvements made in recent months made Apple decide to release an earlier version

without waiting for the cross-platform support. Apple thinks it is important to provide you with a reference release containing all the changes you have seen posted on the ODF-Interest list and the web. The release is called ODF 3 (instead of ODF 2.5 or ODF 2 Update 1) because it is less confusing that way.

This release supports the following development environments for PowerPC:

- Metrowerks CodeWarrior 10
- MrC for MPW

This release supports the following build environments for 680x0:

- Symantec C++ for MPW
- CodeWarrior 10 for 68K

Please refer to the Getting Started folder for specific instructions on configuring your compiler for use with ODF.

OT Server Sample

The Virtual Server is an attempt to provide a piece of sample code that uses the native Open Transport API and is complex enough to demonstrate real issues that an application developer will need to deal with. It also demonstrates the speed of Open Transport when used properly.

This version of the Virtual Server simply opens a listening endpoint and as many accepting endpoints as you want using TCP. It waits for an inbound connection request, accepts the connection, and hands it off to an accepting endpoint. The accepting endpoint waits for a 128-byte "request" packet, then returns a predefined amount of data from memory to the client. It then does an orderly release and puts the endpoint back into its idle queue.

It's fast! Running on Open Transport 1.1.1, a Power Macintosh 7100/80 computer on a 10-Mbit Ethernet connection using 8K downloads

please turn to page 20

The Bad Alert of the Month Contest

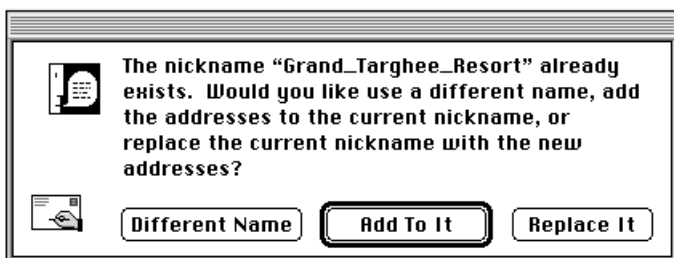
By Peter Bickford

There's an unfortunate stereotype of people in my profession as being "the interface police"—mean-spirited individuals whose only joy in life comes from pointing out that you've used the wrong font in your dialog boxes, or that your button placement is two pixels off the Official Human Interface Guidelines.

When I started this column, I decided I wanted to change that perception by maintaining a positive, upbeat attitude that was sympathetic to the plight of the developer—instead of just taking the easy way out and slamming every interface atrocity I came across. But let's face it: For curmudgeonly old interface cops like myself, this "Officer Friendly, your user-friendly pal" stuff can be a real strain. Sometimes you just have to cut loose and give people the heck they deserve.

The Contest

Lately, I've been collecting alert boxes and posting them on my office door in an unofficial "Bad Alert of the Month" contest. One of the early winners was sent to me by Maui Software's Bill Modesitt, who encountered it in the mail program he was using:



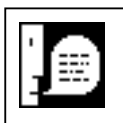
Bill's comment was short and to the point: "But I wanted to cancel!"

This one went up on my office door in September, replacing the previous winner—a rather Zen-like alert from an internal build tool that simply stated, "An unknown token can't go before this."

The Bad Alert of the Month contest started out as a joke, but given some of the applications I've seen lately, I'm beginning to suspect that programmers are actively competing for the top honors. I'd like to devote this column to honoring their achievements in creative user communication—and give everyone else a few tips on how to make sure your dialog box never winds up on my office door.

Get the Icon Right

Let's start with the basics. On the Macintosh, alerts come in three different flavors, each with its own icon.



Note Alerts

Use a note alert when you need to give the user information, generally after the fact. For instance, you might display a note dialog box to tell the user that "the backup you started last night at 2:30 A.M. has just completed." Note alerts have only one button labeled, *OK*, which is used to dismiss the alert.



Caution Alerts

Caution alerts tell the user that something important or dangerous is happening and give them choices for proceeding. The classic example is the Empty Trash confirmation: "The Trash contains 23 items, which use 965K of disk space. Are you sure you want to permanently remove these items?" The dialog box contains buttons for all the possible choices, including the all-important *Cancel* button for letting users exit safely without doing anything.



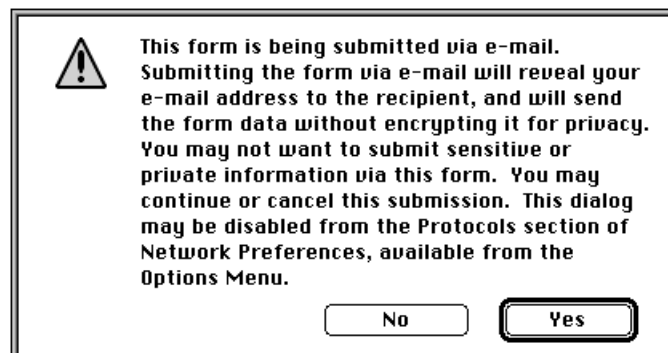
Stop Alerts

Stop alerts tell the user that an error occurred, or that for some reason the program couldn't complete the user's request. Like note alerts, this type of alert has only one button, *OK*, by which the user meekly accepts the reality of the situation and dismisses the alert. In drastic circumstances where the error will force the program to quit, the button might be labeled *Quit* instead. Try to avoid being cute and calling the button *Drat!*, *Blast*, or *Blah!*

Right away, the mail program alert Bill found fails on at least three different counts. First, it's really a caution alert, so it shouldn't have a note alert icon. Second, there's no *Cancel* button to let the user escape without getting into trouble. Having done all that, its developers decided to give it a little "extra pizzazz" by gratuitously inserting their application icon into the alert. Unfortunately, users often mistake any such extra graphics for buttons. The developers would have been better off leaving it out.

Brevity Is the Soul of Wit

Just as many applications suffer from code bloat, a lot of alert boxes are becoming too verbose for their own good. The September Bad Alert of the Month was a prime example of this:



So which button would you click?

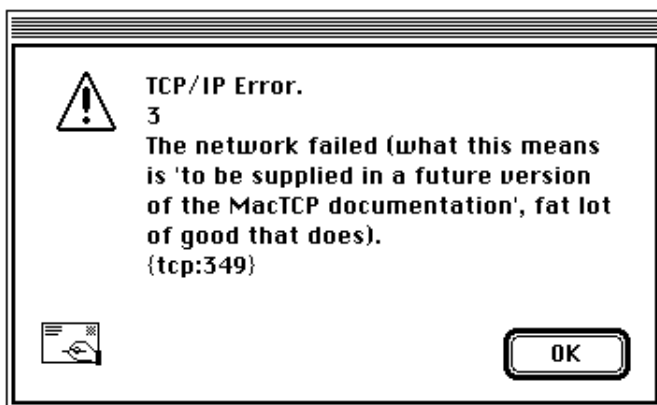
In some ways, this alert is not a total loss. It tells the user what the problem is, why it happened, and what to do about it. Unfortunately, it uses so many words doing this that by the time you reach the end of the alert you can't remember what the question was.

Compare this alert to highway construction signs and billboards. You'll write better alerts if you assume that your users are mentally zooming around at 70 miles per hour, and only half paying attention to the program they're driving. As soon as the alert appears, 95 percent of your users are looking for only one thing—what they need to do to make it go away. If you keep your message short and to the point, you've at least got a chance to make an impression before they move on with the program.

It's also a good idea to label your buttons as if they'll be clicked by people who haven't bothered to read the message above them. If you've ever watched user tests, you'll be scared to death by how often this happens. For instance, instead of the *Yes* and *No* buttons the above alert might have used buttons labeled *Send* and *Cancel*. This little change alone would probably have been enough to let users get on their way, instead of coming to a screeching halt while they puzzled things out.

Say What You Mean

When your program's users have wandered into rough territory and you need to display an alert, it's not the right time to start babbling in technospeak or giving them cryptic codes to figure out. Of course, the all-time champion bad code alert is the "Error of type ID=02 has occurred" system bomb. A funnier take on the same theme was found by Apple DTS's own Brian Bechtel in a by-now-familiar mail program:



The practice of using coded error numbers in messages meant for end users is really an anachronism. It dates back to the old days of mainframes with severely limited memory, when deciding to include actual error messages might mean adding another 64K of core memory to the machine at fabulous expense.

One of the funniest jobs I ever had was working at an insurance company that used such a system. All day long, users would get "ABEND" (abnormal end) job codes telling them why their reports weren't running. The users would write these codes down on pieces of paper, then walk over to a wall of locked-down system manuals and look up their meanings in a multivolume ABEND code reference. The users were forced to use the write-and-walk system, which was instituted after some nefarious character made off with two of the ABEND volumes, effectively bringing the department to its knees until a new set could be ordered. After that, the IS department decided that the ABEND books weren't leaving with the users anymore—the users would have to come to the books.

If you've got something to say to users, say it in their language. If you feel you must pass on specialized technical information about the cause of the problem, try to make it as understandable as possible to the user. If you need to report on a low-level error, try first to report it using a string lookup table. After all, it's a lot more effective to tell users that a disk-full error has occurred than to tell them that they are victims of File System Error #-34. Finally, if you're caught dealing with a situation like the one Brian encountered, consider whether it might be better for the alert to say "An unknown error has occurred" and move on.

All This and More

Compared to most of the other things that give your program a good human interface, designing good alert messages is child's play. I think the reason I'm seeing so many bad examples from day to day is that alerts are usually the human interface to parts of our applications that we hope users never encounter. The trouble is that these are also the places where our users need our help the most. Bad alert messages mean frustrated, confused users . . . and really bad alert messages mean I get something new to hang on my door for people to laugh at.

*Till next time,
Doc*

Peter Bickford is a human interface senior scientist in Apple's Developer Consulting Group. Send him your interface suggestions, gripes, or Bad Alert of the Month entries at bickford@apple.com.

For more information on alert design, check out Paige K. Parson's excellent article "Guidelines for Effective Alerts" in develop Issue 24. My thanks to Bill Modesitt, Brian Bechtel, Bob Edmiston, and everyone else who contributed bad alerts from their favorite programs.

Making QuickDraw GX More Usable

By Gregg Williams, Apple Directions Staff

GX Graphics, for Specialized Solutions, Has Lower Overhead

QuickDraw GX, Apple's integrated architecture for graphics, type, and printing, has been around since 1994. It's received critical acclaim through several programs that have made full use of it: for example, LightningDraw (drawing), ReadySetGo (desktop publishing), and UniQorn (page layout and Internet publishing).

Despite the enthusiastic response by users and the industry press for these first products, developers have not adopted the technology for several reasons. First, QuickDraw GX suffers from a chicken-and-egg dilemma: Developers won't create QuickDraw GX-based software until they see a considerable number of successful QuickDraw GX-based applications in the market, but customers can't show their interest in QuickDraw GX-based software until developers create such software for sale. Second, the memory overhead for QuickDraw GX even being present (on PowerPC processor-based Mac OS computers, roughly 1.2 MB with virtual memory turned on, 2.0 MB with it turned off) has been a barrier to both developer and user acceptance.

Given customers' positive response to existing QuickDraw GX-based software, Apple believes that the way to encourage greater adoption of QuickDraw GX is to find a way to get more QuickDraw GX software into the market. The availability of more QuickDraw GX-based software will result in greater sales of such software, which in turn will influence developers to create more QuickDraw GX-based software.

Apple's solution is to implement a subset of QuickDraw GX, currently known as *GX Graphics*, that adds only 200 to 400K to the size of system software when GX Graphics is not in use. This much smaller memory overhead (when compared to the full implementation of QuickDraw GX) makes it much more likely that you will create a GX Graphics-based application that your customers can run without adding more memory to their computers.

How did Apple achieve this reduced memory footprint? It did so by implementing a

subset of QuickDraw GX: GX Graphics implements the graphics and typography portions of QuickDraw GX; the original QuickDraw GX software still implements Apple's next-generation graphics, typography, and printing technologies. By giving you GX Graphics, Apple has given both you and your customers access to the powerful QuickDraw GX graphics and typography technologies either *with* or *without* printing.

"What?" you ask. "How can I write a useful application if I can't print out what I've drawn?" As you'll see later in this article, there are several categories of software that don't need to be able to print (multimedia CD-ROM titles, for example). If you decide to create an application using GX Graphics, you will have access to the powerful graphics and typography of QuickDraw GX, and you will be able to deliver an application that will run on most existing Mac OS-compatible computers without forcing owners to add additional memory to their computers.

A Quick Review of QuickDraw GX

Before I can talk meaningfully about GX Graphics, I first need to review the main features of QuickDraw GX: graphics, typography, printing, portable digital documents (PDDs), and color matching. By including these features, QuickDraw GX implements what Apple calls the *Mac OS Graphics Architecture*.

QuickDraw GX Graphics

The graphics portion of QuickDraw GX is vastly superior to that of today's QuickDraw because the former is more versatile, allowing you to do things that would be difficult or impossible to do using QuickDraw. Each of these features can be used to create sophisticated graphics that have a smaller file size than an equivalent graphic created with QuickDraw.

- QuickDraw GX includes a much richer set of drawing primitives than QuickDraw. QuickDraw GX supports multiple types of graphic images called *shapes*, which includes curves, multiple-curve paths, simple text, text with multiple styles, sophisticated line layout shapes, color bitmaps, and hierarchical pictures.

- QuickDraw GX graphics are resolution-independent—that is, you define QuickDraw GX shapes using measurements that are

independent of the resolution of any imaging device. Because of this, shapes are always drawn at the highest resolution possible for the device.

- QuickDraw GX allows you to perform various transformations on any graphic shape, include scaling, rotating, skewing, and perspective. This adds even more ways to manipulate shapes directly from QuickDraw GX itself.

- QuickDraw GX includes transfer modes for color mixing. This allows the intersecting areas of overlapping shapes to change color based on the properties assigned to each shape drawn. This allows, for example, two shapes to act as light sources (the overlapping area is brighter) or as pigments (the overlapping area is darker).

- Similarly, two QuickDraw GX shapes can interact to create a third, more complex shape—for example, the union, intersection, or exclusive-or of the original shapes.

QuickDraw GX Typography

As with graphics, the typography features of QuickDraw GX allow you to do more with less work. QuickDraw GX includes the following type-related features:

- QuickDraw GX provides a more sophisticated type of line layout that allows you to perform kerning, tracking, shifting, ligature formation, contextual glyph substitution, multiple language text handling, and line breaking.

- QuickDraw GX text can be drawn left-to-right (for languages such as English, Spanish, and Russian), right-to-left (for languages such as Hebrew), or top-to-bottom (for languages such as Chinese).

- QuickDraw GX supports more precise control over character-to-character spacing.

- A QuickDraw GX font can have multiple parameters (for example, type weight or width). The user can vary such a font to create multiple font styles from a single font.

QuickDraw GX Printing and PDDs

The QuickDraw GX printing architecture includes *printing extensions* that allow you to modify the printing process (for example, to add a watermark to each page or to keep records of printer usage for billing purposes) without having to write a custom driver. In addition, it gives users a better interface for

printing and more options while printing.

An outgrowth of the QuickDraw GX printing architecture is PDDs (portable digital documents). Users create PDDs by printing to a PDD driver instead of a printer. This produces a file instead of a printed document; other QuickDraw GX users can view and print any PDD, even if they don't have the application or fonts that were used to create it.

Color Matching

Apple currently provides the ColorSync technology to supply functions that help ensure that colors are accurately represented during input (scanning), display (on the monitor), and printing (to some output device). QuickDraw GX includes color matching through its support of ColorSync 1.0. QuickDraw GX 1.2 (due in July 1997) will extend QuickDraw GX's color-matching capabilities by supporting ColorSync 2.x.

GX Graphics

As I stated in the introduction to this article, the GX Graphics software implements the graphics and typography portions of QuickDraw GX, doing so with a significantly reduced memory overhead compared to that of QuickDraw

GX itself. GX Graphics is currently implemented as a system extension (specifically, an INIT with the name *GXGraphics*).

By July 1997, Apple expects to offer an improved version of GX Graphics that is implemented as a shared library. (For details, see the box on page 18.) The shared-library implementation of GX Graphics will be an improvement over the INIT implementation in that shared libraries are faster and more stable. In addition, shared libraries offer memory savings to users. A shared library is in memory only when an application that requires it is running, and multiple applications can simultaneously access a single copy of a shared library (which produces significant memory savings in itself). When no such applications are running, the shared library is removed from memory, and its presence in system software incurs no memory overhead at all.

Markets for GX Graphics

Here are some of the areas in which you can use GX Graphics:

- More sophisticated graphics on the Internet
- Page layout for web pages
- Multimedia authoring tools (for creating Internet-based or CD-based multimedia)

- Digital video editing

This is only what Apple has been able to think of. We expect you to find more exciting, innovative uses for it as well.

The sections that follow will describe how some companies are already using GX Graphics to create exciting new products.

Lari Software's Apple Electrifier

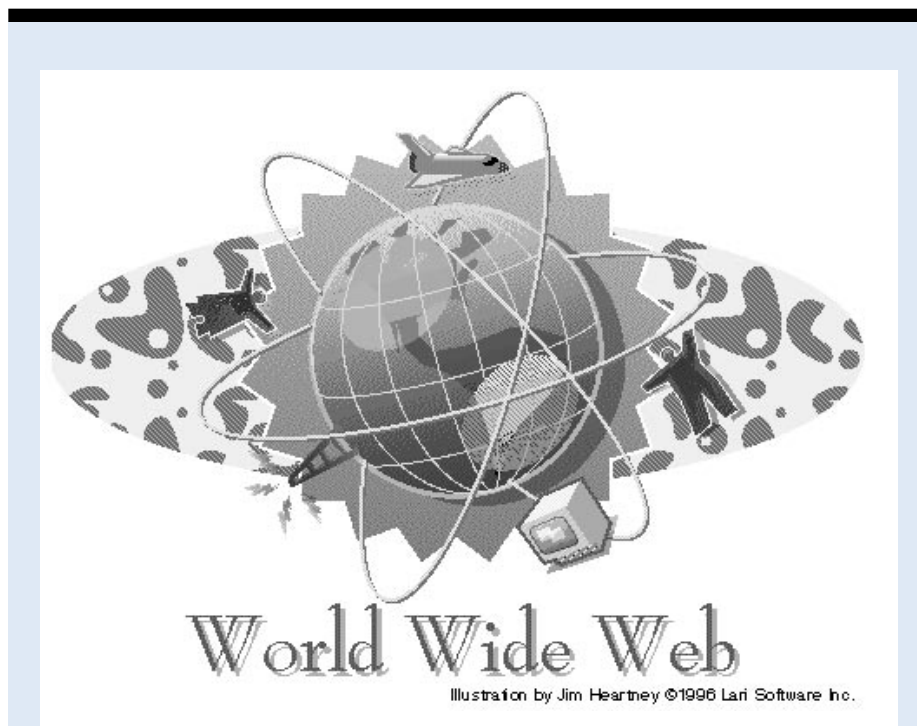
Don't you just hate web pages that keep pushing small graphics images—whether you want them to or not—to animate their pages? And don't you also hate web pages that include large bitmaps that take *forever* to load? Lari Software hopes to make both of these annoyances a thing of the past with its free Apple Electrifier web-browser plug-in (which resulted from a partnership between Apple and Lari Software).

Stated simply, the Apple Electrifier plug-in is playback software that displays QuickDraw GX graphics files within a web page. The Apple Electrifier plug-in is currently available for Mac OS-compatible computers using a PowerPC processor; a Windows version was previewed at last November's COMDEX. This means that—at least on web pages—QuickDraw GX will soon be a cross-platform technology!

Using Lari Software's inexpensive LightningDraw Lite software (available free for a limited time from Lari Software's web site), web-page designers can create static graphic images, save them as Electrifier files, and insert them into their web pages. (To get an idea of the quality of graphics that can be created using LightningDraw Lite and QuickDraw GX graphics, see the figure on this page.)

Such Electrifier images display automatically on any web browser that supports Netscape Navigator plug-ins. (The LightningDraw Lite software is available on the World Wide Web at <http://www.larisoftware.com/>. The Apple Electrifier plug-in is available at <http://www.electrifier.com/>; if QuickDraw GX is not installed, the Apple Electrifier installer program will also install the GXGraphics INIT.) Users who want to print the graphics they've created can also buy Lari Software's LightningDraw GX software.

The Apple Electrifier plug-in also makes it possible for you to add animation to your web site—without continuously pushing multiple graphics images to the user's web browser. The HTML code that places an Electrifier image within a web page also gives you animation options. You can set values for variables



A LightningDraw Lite Image. Note the use of color gradations, a QuickDraw GX feature, in the globe and the starburst behind it. Using QuickDraw GX also saves space: This image occupies 50K as a QuickDraw GX image, but 99K as a PICT file.

called *scale*, *stretch*, *rotate*, *spin*, *loop*, and *time* to produce different animation effects. The Apple Electrifier plug-in does the actual drawing and redrawing of the image, giving your web page animation with no bandwidth overhead on the Internet.

How much of an improvement are Apple Electrifier graphics over conventional graphics (in the context of displaying graphics and animation over the Internet)? Here's one example: A graphic of the Mac OS logo takes 2.8K as a QuickDraw GX graphic, while the same image in GIF format takes 675K. That same 2.8K image is also the basis for a spiraling animation of the Mac OS logo on a web page. The only other way to do the same animation on a web page is to have the page download a 909K QuickTime movie.

Because QuickDraw GX contains so many sophisticated drawing primitives, web-page artists can create large, colorful graphics and animations in significantly less space that would be used by a conventional graphic (a PICT or GIF file, for example). This means that web-page designers can use graphics and animation on their pages and still keep them viewable by users connecting to the Internet through 28.8 Kbps modems.

In the future, Lari Software will be revising the Apple Electrifier technology to a 4.0 version. According to the company, the Apple Electrifier 4.0 format will be "a highly efficient time-based authoring format conceptually based on the QuickTime format." Lari Software's upcoming Ignite content-creation software will use the Apple Electrifier format to include such features as streaming, interactivity, multiple element animations, and dynamic content that can be altered on the fly. An experimental version of Ignite incorporates compression that typically reduces large file sizes by 50 percent.

PaceWorks' ObjectDancer

PaceWorks' ObjectDancer (formerly code-named *Dancer*) is an object-oriented animation tool that leverages off QuickTime and QuickDraw GX to combine and synchronize animations of type, graphics, video, sound, and music with great accuracy. Thanks to QuickDraw GX's superior control over advanced typography, ObjectDancer makes it possible for customers to create sophisticated animation effects with a wide range of fonts and types.

The Evolution of the Mac OS Graphics Architecture

October 1996

- QuickDraw GX 1.1.3 (implemented as an INIT)
- GXGraphics 1.1.3 (no printing features; implemented as an INIT)
- ColorSync 2.1.1 (for color matching)

January 1997 (Mac OS 7.6)

- QuickDraw GX 1.1.5 (includes bug fixes; implemented as an INIT)

July 1997 (the "Tempo" Release of Macintosh System Software)

- QuickDraw GX 1.2 (includes improved PostScript printing and improved support for ColorSync 2.x; implemented as an INIT)
- GXGraphics 1.2 (no printing features; implemented as a shared library for reduced memory footprint, increased performance and stability)

Further Out

- Apple plans a single version of QuickDraw GX, implemented as a shared library, that eliminates the need for GX Graphics and fully implements the Mac OS Graphics Architecture.

Animations created by ObjectDancer can be played on any platform with basically no prerequisites, since two of its output formats—GIF89 animation files and Java applets—are basically platform-independent. ObjectDancer can also create QuickTime movies; because support exists for playing QuickTime on Windows platforms, you can use ObjectDancer animations in your web pages, knowing that they can be viewed from both Mac OS and Windows-based computers.

Because ObjectDancer is used primarily for creating animations, it does not need to be able to print. This means that both developers and customers can use the GX Graphics software with ObjectDancer, thus reducing the memory footprint needed to develop or run animations.

For more information on ObjectDancer, visit PaceWorks' web site at <http://www.paceworks.com/>, or contact the company at info@paceworks.com.

Video Editing: Movie Clips and Radius Edit

Apple is working with two other companies, Digerati and Radius, that are both creating video-editing solutions. Digerati is working on Movie Clips, a mass-market video-editing solution, while Radius's product, Radius Edit, is a high-end solution. Both products use GX Graphics to produce good-looking

antialiased text and to provide various transformation on any text that is added to the video being edited.

Conclusions

GX Graphics gives you access to the power of QuickDraw GX *today* and allows you to sell QuickDraw GX-based products to today's Mac OS-compatible computers. You can use the powerful graphics and typography features of QuickDraw GX to create sophisticated, cutting-edge products with much less effort than you could using QuickDraw.

As time passes, QuickDraw GX will become more commonplace in Mac OS applications. If you start using GX Graphics now, you'll have considerable GX programming experience under your belt when the other developers are just learning it. So now's the time to ask yourself the question: How can I use QuickDraw GX's superior graphics and typography (in the form of the GX Graphics software) to make an innovative product today?

All this means that GX Graphics gives you a chance to create profitable new products now and gain a competitive advantage in the future that you can maintain as the years go on. Doesn't that sound like a good deal to you? ♣

QuickTime 2.5 to Be Cross-Platform

Industry Leaders to Help Develop and Support Windows Version

Apple recently announced that Adobe, Broderbund, Cinebase, Intergraph, and Equilibrium have joined the third-party codevelopment team of QuickTime 2.5 for Windows. Macro-media, Media 100, and Truevision are also continuing their close relationship with Apple in accelerating the development of QuickTime 2.5 for Windows. (QuickTime 2.5 is currently available on the Mac OS platform.)

Engineers from all eight companies will be collaborating with Apple to build key elements of the QuickTime 2.5 for Windows product, including video-frame grabbing, Windows NT multiprocessor support, memory management, media compression and decompression, and the high-performance playback necessary to ensure broadcast and professional adoption. In addition to the eight codevelopers listed, a total of 47 leading hardware and software developers have endorsed QuickTime as a multimedia deployment and content-creation architecture on Windows 95 and Windows NT. This wide-ranging industry support also follows a recent *PC Graphics Report* (written by Omid Rahmat, vice president of Jon Peddie Associates in Tiburon, California), which noted that "QuickTime 2.5 has all the makings of a media architecture for sound and video without equal in the PC world."

QuickTime 2.5 for Windows includes a number of key advantages for multimedia development:

- Full multiplatform support (Mac OS, Windows 3.1, 95, and NT, OS/2, and UNIX®)
- Long-term industry usage (QuickTime playback has been available on Windows for more than four years) and associated code stability
- Seamless integration with other Apple multimedia technologies for Windows, including the following:
 - QuickDraw 3D for workstation-quality 3D graphics.
 - QuickTime VR for creating panoramic computer-generated or photo-realistic environments.
 - QuickTime Conferencing for collaboration and videoconferencing capability.

—Apple's upcoming QuickTime Media Layer (QTML) for multimedia authoring on Mac OS and Windows, which enables a single "bridgework" API (application programming interface) on Mac OS and Windows to give integrated support for 3D, audio, video, conferencing/collaboration, speech, virtual reality, and more. QTML will serve as Apple's open-platform alternative for a single, unified standard in multiplatform rich content deployment.

QuickTime 2.5 for Windows will be the first multiplatform, high-performance open architecture for manipulating and distributing high-quality digital video on Windows 95 and Windows NT personal computers. However, in addition to QuickTime's excellent audio and video quality, QuickTime 2.5 for Windows also includes other data types that can be transparently accessed within the API, including sprites, MIDI (Musical Interface Digital Interface) music, text, virtual reality (through its integration with QuickTime VR), 3D (through integration with QuickDraw 3D), and collaboration and videoconferencing (through QuickTime Conferencing integration).

QuickTime 2.5 Benefits

The sections that follow describe the major benefits of QuickTime 2.5.

Interchangeable M-JPEG File Format Motion

JPEG (also known as *M-JPEG*) is a compression standard for video professionals that was implemented differently by each video-capture product. Files created in one system typically could not be played back or edited by another due to proprietary "hints" that were hard-coded into vendor hardware or software.

Through Apple's QuickTime Developer Working Group and the QuickTime Open Forum, Apple and leading digital video solution vendors have agreed to a fully interchangeable M-JPEG file format. Apple has implemented this new format in QuickTime 2.5 for Mac OS and will duplicate this functionality in QuickTime 2.5 for Windows. This will allow video professionals and editors to work with M-JPEG files without being confined to the hardware solution originally used to capture the M-JPEG video. QuickTime 2.5 for Windows will also include a software M-JPEG

codec (compressor/decompressor), allowing editors and others involved in the creative process to view M-JPEG compressed files on any computer with no additional hardware.

QuickTime Music Architecture

Significant enhancements to the QuickTime Music Architecture (QTMA) now enable title developers to easily enhance their content with full-bodied, low-overhead MIDI music. With the introduction of the QTMA, Apple has made it simple for computer users to work with MIDI by providing a software synthesizer and a library of Sound Canvas instruments licensed from Roland. This is very important for Windows users and computer manufacturers, since it eliminates the need for a sound card in the host system and it provides a standard set of musical instruments whose presence the developer can count on.

The enhancements in QuickTime 2.5 build on the QTMA by allowing music and synthesizer developers to deliver their own custom software synthesizers, instruments, and libraries of musical instruments through QuickTime. Title developers can use these components to embellish their content with music and create a distinctive aural experience.

The enhancements to the QTMA will also benefit professional musicians and music enthusiasts who use the Macintosh to create music. In addition to playing through the computer's built-in speaker, QuickTime 2.5 can route musical information to external MIDI devices and effects processors working directly with music industry standards such as Opcode's Open Music System (OMS).

QuickTime to Support 3D, VR, and Conferencing Objects

Apple has enhanced QuickTime to use the QuickDraw 3D engine for rendering 3D objects in real time within a QuickTime movie. Video professionals can synchronize, composite, and animate workstation-quality 3D rendered objects with other media types such as video, audio, and music. Seamless integration with QuickTime VR and QuickTime Conferencing is also included in QuickTime 2.5 for Windows, and QuickTime movies are also supported as dynamic textures on 3D objects and polygons.

Graphic Importer Component

QuickTime 2.5 includes a new graphic importer component that allows applications to import a variety of file formats. With this feature, a developer can import file formats such as GIF, MacPaint, AVI, FlashPIX, Chips Graphics Inc., and Photoshop directly into their QuickTime-aware applications.

Support for Closed-Caption APIs

Traditional closed-captioning simply displays accompanying text as an overlay graphic to the video (and thus the captured movie). The closed-captioned text embedded in the video is lost for any useful purpose other than viewing. Along with video, sound, and music channels, closed-captioned text can be captured

and embedded into a QuickTime movie's text track, which allows for fast searching and cataloging of stored media.

Enhanced Primary Data Handler

QuickTime's primary data handler has been updated to allow for higher performance playback. The data handler has been modified to maximize throughput resulting in noticeable performance improvements. The data handler acts as "magic glue" that permits the streaming of media over high-speed ATM (Asynchronous Transfer Mode) and DV/DVC networks.

Asynchronous JPEG and Raw Codecs

The JPEG and Raw codecs are now asynchronous, allowing QuickTime to continue

processing data while the codecs simultaneously compress or decompress video.

New Clock Component

A new clock component now guarantees enhanced synchronization of video and sound and simplifies the problem of synchronizing these data types across the diverse array of sound and video hardware configurations supported by QuickTime.

For More Information

For more information on QuickTime and the latest QuickTime releases, visit the QuickTime web site at <http://quicktime.apple.com>. ♣

CD HIGHLIGHTS*Tool Chest Edition*

continued from page 13

almost reaches the connection's capacity. If a 200-MHz Power Macintosh is used on the same network with 1K downloads, the server sustains more than 300 connections per second.

PeopleSoft/Apple White Paper

Apple and PeopleSoft have launched a partnership that will deliver PeopleSoft applications that run on the Mac OS. This document is a technical white paper that describes the partnership, the product, and the direction in which PeopleSoft is heading.

Snapshot Sample 1.0b3

Snapshot Sample is a tiny application that shows how to grab the icon positions for all the files on the desktop and later restore those icon positions. This is useful for programs, such as games, that switch resolutions on the fly, thereby causing problems with the user's desktop icons.

Standard File Samples

StandardGetFolder, one of three samples involving Standard File dialog boxes, has been updated. It demonstrates a CustomGetFile call, with additions to the dialog box to allow selection of a folder or volume. This sample is loosely based on the previous CustomGetFolder sample. The update fixes numerous bugs and, because it uses Script Manager calls to handle strings, it is substantially better for localization.

QuickView Databases

This update to the Macintosh Programmer's Toolbox Assistant contains the following QuickView databases.

- *Advanced Color Imaging on the Mac OS.* These three QuickView databases provide conceptual information for working with color in your application. They include sample code and a reference to the Palette Manager, Color Picker Manager, ColorSync Manager, and Color Manager. Advanced Color Imaging Assistant has been revised for version 2.1 of the ColorSync Manager and includes hypertext links to new and revised material.
- *Apple Game Sprockets.* Game Sprockets is the set of new APIs that simplifies game

programming for the Macintosh. The four sprockets documented in this QuickView database are SoundSprocket, DrawSprocket, InputSprocket, and NetSprocket. Some of the APIs for these sprockets offer new capabilities, and others make already-existing Mac OS APIs more accessible.

- *Speech Recognition Manager.* This QuickView database provides documentation on speech recognition services for Macintosh computers.
- *Inside Macintosh: Telephony.* This is a QuickView database of the *Inside Macintosh* volume that describes the Telephone Manager, the part of Macintosh system software that provides telephony capabilities, which allow you to manage telephones—in particular, to establish or control connections between telephones on a telephone network. You can use the Telephone Manager to develop a wide range of applications, including screen-based telephone dialers, computer-based answering machines, call forwarders, and so forth.

*Meredith Best
Developer CD Leader and
Online Content Librarian*

Business

Marketing Feature: Branding Essentials: What Developers Can Learn From Soda and Soap Makers
Developer Spotlight: Using Apple Media Tool as a Teaching Tool: The Exploratorium, a hands-on science museum in San Francisco, uses Apple Media Tool to introduce teachers and students to multi-media authoring.

Branding Essentials: What Developers Can Learn From Soda and Soap Makers

By Alexander Brody and
 Brian McMabon, com.com

Perhaps one of the most frustrating conundrums that Apple faces today is the mousetrap riddle: If Apple and its developers have truly “built a better mousetrap” (Mac OS hardware and software), why is the world still beating a path to Windows?

This article attempts to shed a little light on this mystery. It helps to explain why, against all logic, an inferior product can win in a market-share war. And it also explains how you can use a powerful marketing strategy, called *branding*, to capture the “mind share” of consumers, as well as their dollars.

For decades, the biggest product companies in the world have used branding to win their marketing battles. Many of these giants had parity products and faced an army of “me too” competitors. The only advantages they used to dominate their markets were “virtual”—these advantages were created in consumers’ minds. At our consultancy, com.com, we’ve taken our decades of expertise in branding and applied it to the high-technology business realm. In this article, we talk about how Apple developers can use these principles to win in their own markets.

Why Things Go Better With Coke

Chemically, Coca-Cola, Pepsi-Cola, and the “plain wrap” colas are nearly identical. Yet Coke dominates Pepsi around the world, and both outsell private-label colas despite being twice as expensive. Why?

Because, in people’s minds, Coca-Cola is not merely “carbonated sugar water”; it’s the elixir of the American Dream. The brand is synonymous with the vim and vigor used to conquer the Wild West and the Moon. It’s the flag and singing on mountaintops.

Pepsi is taste, not magic. And the other guys? The other guys are just cheap.

Kodak film and competitive films produce pictures, but which do consumers choose for a special occasion? a wedding? a first-born child clutching a diploma?

Do consumers choose Kodak because it’s more likely to produce a picture? Or because they believe Kodak captures “memories” better than anyone else? Kodak, the brand, sells memories. The others just sell pictures. And that difference is worth billions of dollars each year.

That’s the power of branding.

Now imagine what branding could do in a marketplace where there are clear superiorities and advantages. It’s been fascinating for our agency to watch the evolution of the Mac OS platform. We consider the platform clearly superior—not because we’re technical experts, but because we’re not. So its battles for market share and mind share leave us bamboozled. In a business based entirely on logic and measurement, we can’t imagine an industry where being “better” should be a more obvious differentiator.

So, is branding dead in the technical world, or has it just been applied incorrectly in the information age? We think it’s the latter. With that in mind, here are some things to think about as you develop a marketing plan for your next “killer app.”

What a Brand Is Not

Because there are so many inaccurate definitions of branding, we feel compelled to tell you what branding *isn’t* before we identify it correctly.

Most people who have a product for sale or a distinctive box with a nifty logo think they have a brand. In truth, most have nothing more than an investment in clutter. Studies have suggested that every man, woman, and

child in America is exposed to 2,500 marketing messages a day through ads, product boxes, signs, and so on. Of the 2,500 messages you saw yesterday, how many do you remember? Two? Three? Ten? All the others are little more than marketing clutter.

People who run an ad with their box prominently displayed and their product name in the headline think they’re building their brand. Most, however, are just adding to the clutter that buries potential brands.

People who emphasize a product’s amazing features are convinced they’re differentiating their brand. This is the most common mistake of all.

Hardware branding is anything but new; back in the 1950s hardware often meant *tools*, and there were lots of tool manufacturers. For the most part, ads and branding materials for tools were interchangeable. The typical electric drill ad of the day featured a pretty model in neatly pressed coveralls and perfect makeup. As she brandished the drill uncomfortably, the pleasant call-outs lavished praise on the Chuck Size, the RPM potential, the comfortable Pistol Grip, and the miracle of Double Insulation. Such ads were 100 percent accurate and highly factual, but they all missed the point.

Then someone at Stanley Tools saw the branding light. This company realized no one in the world wanted a drill—a shocking revelation for a drill manufacturer and a bit illogical, at first glance, since so many people own drills. But the people at Stanley were correct, and they changed the history of advertising in a single line:

“At Stanley, we don’t sell drills. We sell holes.”

It was so simple, yet it marked a total departure from “features” selling and a total devotion to brand. Stanley clarified the benefit in the consumer’s mind. For the first time, a

hardware manufacturer said, “You have a problem, we have a solution,” as opposed to “We have neat features, you figure them out.”

The analogy with computer systems is exquisite. Certainly the people at a software company such as Oracle, for example, believe consumers like the benefits that computers provide, rather than the box itself. But for most companies, the advance of high technology has been so fast that branding, in too many cases, lags behind. In fact, for all of the millions of marvels produced by Silicon Valley, there are shockingly few brands.

Even the most successful software company, Microsoft, is only now beginning to develop a brand. Does that sound absurd? Surely Bill Gates is an unparalleled marketing genius—isn't he?

Ask anyone to name the most popular computer standard. Don't be surprised if—even in 1997—the answer is most often “IBM compatible.” Not “Microsoft.” Not “the PC.” Not “Wintel.” Not even “Windows” (although we suspect this will eventually change).

The answer is still “IBM.” Ironically, IBM hasn't been a force on the desktop since 1984, when IBM compatibles proliferated. That was 13 years and billions of dollars in Microsoft and Intel revenues ago. So what does IBM have that the other technology leaders don't? A brand.

What a Brand Is

A brand is why people care. A brand is trust. A brand is not a product—it's the feeling a product evokes. A brand is why people will pay more for your product. A brand is something made to appear unique. (Kodak is memories; the other guys are just film.)

All the proof you need is in the history of the personal computer. With all due respects to Altair, Apple invented the personal computer as we know it—the Apple II. It was really cool and, combined with VisiCalc, it was even useful. But of the million or so people who bought one, almost none of them spent their days in skyscrapers.

The people in skyscrapers knew real computer experts. They lived in the ice-cold, false-floored basements of skyscrapers and spoke COBOL and Fortran. They were IBM users, and to them the Apple II was a toy. This was an opinion they were happy to share.

Meanwhile, IBM came out with its own version of the Apple II, unremarkable in every way—except for the brand.

Because the people in skyscrapers cared about IBM, trusted IBM, and were never fired

for buying IBM, they rethought the whole “PC = toy” stance. After all, the IBM PC came from people wearing white shirts and dark ties, and the Apple II didn't. The IBM PC was compliance. Apple was independence.

PCs flew off the shelves. Cloners like Compaq, Dell, and Gateway were inspired to comply with—not to improve upon—IBM, because “IBM compatible” was just as good as “IBM.” People weren't buying Compaq computers, they were buying *IBM-approved* products.

Meanwhile, Apple was focused on being better. It built the Macintosh computer, which *was* better, and Apple expected the world to beat a path to its door. Innovators, visionaries, and wild-eyed idealists (including students) bought these computers, but those who didn't understand the benefit of being innovative stuck with being compatible.

For many cloners, their success was also their failure. While “IBM compatible” lives to this day, many of the clones have fallen by the wayside. They won no loyalty. There was no “Eagle” or “Osborne” computer brand. The IBM-compatible world could go on without them. That's why you don't see cars on the freeway with Packard-Bell or Microsoft stickers in their windows.

This brings up an important point for Apple and its developers. *The Windows world's lack of brand is its Achilles heel. Come up with a brand that sells the advantage of innovation over mindless compliance, and the Macintosh may start to make major inroads.*

The Mac OS and Apple have loyalty—fanatical loyalty. The question is “How do you build your brand to take advantage of that loyalty?” Or in your case, “How do you build a related brand that takes advantage of Apple's loyalty?”

The “BrandSpirit” Exercise

The “hole” we're selling in this article is this: an understanding of the essence of your brand. The “drill” that will help you understand this concept is the trademarked term that our company calls *BrandSpirit*.

BrandSpirit is an exercise that allows almost anyone to isolate the essence of a brand. We based its development on our work with \$100,000,000 clients such as American Express, AT&T, Nestle, IBM, Procter & Gamble, Kleenex, Kodak, Avis, 3M, and hundreds of others. (The company com.com was founded by veterans of Young & Rubicam and Ogilvy & Mather, two of the largest ad agencies in the world.)

More specifically, BrandSpirit is a one-line summation of a product's or service's reason

for being, stated from your customers' point of view.

However, it is not as simple as it appears. It's not a headline from an advertisement or a positioning statement. It's not a product personality (for example, “If Apple were a teenager, would it be a skier or a snowboarder?”). It's the answer to the question “Why do I, the customer, care about this product?”

A BrandSpirit should border on the poetic, because it's describing an emotional attachment.

Here are some examples that should clarify the concept and assist you with creating your own BrandSpirit. We've picked a wide range of products and services to demonstrate the flexibility of BrandSpirits and patterns in their construction. These examples also demonstrate that you don't have to be as big and well known as IBM or Coca-Cola to have a brand.

PCC BrandSpirit

The first example is an amusement park and living museum located on the north coast of the Hawaiian island of Oahu. It's called the *Polynesian Cultural Center (PCC)*, and it was set up to give visitors a picture of Polynesian life throughout the Pacific, from Samoa to Hawaii. It allows people, in little more than an afternoon, to gain an appreciation of Polynesian culture.

BrandSpirit:
The Polynesian Cultural Center Is, In a Single Day, All Your Hopes and Dreams of Paradise, Fulfilled.

More than just a historical sidebar, we found the PCC to be one of few reminders of why Hawaii was originally considered a paradise. Many tourists are surprised by the difference between their idyllic vision of Hawaii and the reality of Waikiki, which is a very modern, high-rise district of Honolulu. The PCC allows people to explore the Hawaii that they'd hoped to find. It's not a realistic view of Polynesia's past, but then, that's not what most travelers are looking for.

The PCC's BrandSpirit has romance and passion. There's a promise and a reason to “use” (buy, consume, experience) the product again. And it's stated in an intriguing fashion from the user's perspective.

Why do I care about the PCC? Because it fulfills my fantasy of what Hawaii was like

before commercialism, war, or Western intervention.

Hawaiian Airlines BrandSpirit

Another example is the BrandSpirit for Hawaiian Airlines. Hawaiian Airlines (HAL) provides a service: It flies people from the U.S. mainland to Hawaii, between the Hawaiian islands, and to Samoa and Tahiti. It flies McDonnell-Douglas planes laid out to American Airlines' specifications. No single aspect of HAL's business appears to be unique.

Still, when we studied its business, we discovered that HAL was the choice of people who have ties to Hawaii. Those without ties often fly to Hawaii using frequent-flier awards from a mainland business airline: United, Delta, Northwest, and so on. Because of this common denominator between HAL's customers, we decided that it made sense for the airline to cater to Hawaiian style, touching on everything from decor to entertainment to cuisine.

Next, we observed that HAL flew to all points significant to Hawaii's history. It connected Hawaii to Samoa and Tahiti, the home of Hawaiian ancestors. And it connected Hawaii to the United States, the origin of many of its newer residents.

We realized that HAL was the only airline to link all of these areas, past and present. So, for a touch more emotional impact, we compared a HAL route map (points on a map connected with arching lines) to a flower lei, perhaps the most powerful symbol in Hawaiian culture.

*BrandSpirit:
Hawaiian Airlines
Is the String
in the Lei
Connecting All the People
of Hawaii.*

For the brand, we envisioned every destination as a flower. Turning individual flowers into a lei requires a string, and Hawaiian Airlines is the only "string" connecting them all.

Finally, we used the term "people of Hawaii" rather than "Hawaiian people" because the latter suggested only people who were ethnically Hawaiian. We felt that people who grew up in Hawaii, or who simply loved the culture, were no less connected by the same lei. Again, there is passion, romance, and a reason to remain loyal—key elements of a BrandSpirit.

No doubt you're wondering if BrandSpirits work for products located outside the islands or, more important, for products you've never heard of.

South County Motorcycle BrandSpirit

South County Motorcycle builds custom bikes based on Harley Davidson designs. The company, based in Gilroy, California, produces about 1,000 motorcycles per year. It builds "dream bikes." If you want a Harley Bad Boy

"The Windows world's lack of brand is its Achilles heel. Come up with a brand that sells the advantage of innovation over mindless compliance, and the Macintosh may start to make major inroads."

with stretched forks, twice the fuel capacity, a baby-blue-on-chrome engine, belt-drive instead of chain-drive, and an extra-fat rear wheel, South County is the place to go.

But it will cost you. That's why South County's clientele generally consists of professional athletes and business people over 35 years of age.

We considered that apparent contradiction as we defined the brand. Why would very successful people, who pay their taxes and go to work everyday, and who are responsible citizens with families, want such a loud symbol of counterculture—even when they can afford luxury?

We think it's because they desire a little forbidden fruit. They don't want to give up all they've worked for, but they don't want to lose the "bad boy" fantasies they had when they were young. Now they can afford to live the image they wished they'd had 20 years earlier—exactly as they'd imagined it.

So although South County Motorcycle builds custom-made Harleys, what it sells is a

form of rebelliousness. That's what we wanted to capture in their brand.

*BrandSpirit:
A South County Motorcycle
Is the Only Vehicle
on the Road Between
Where You Are
and Where You Were.*

Each element of this BrandSpirit evokes a specific connotation in the mind of a consumer:

- A South County motorcycle is "the only vehicle" because it's completely custom made. You could buy a stock Yamaha and customize it to the point where it achieves fantasy proportions, but then it's no longer a Yamaha-brand bike. It's a brandless hybrid.
- "Where you are" refers to your current position in life: successful, responsible, and a person of some means.
- "Where you were" appeals to your nostalgia for the past. You may have been a rebel, young and idealistic. Today, you may long for the freedom of the road and the freedom from responsibility.
- That "road between" is the road that you alone have traveled since your youth.

A High-Tech Example: Hewlett-Packard BrandSpirit

When we were asked to create a BrandSpirit for Hewlett-Packard (HP), we read a lot about the company and its history. It was a history marked by surprising innovation, as opposed to high-profile success: the first oscillator, the first test and measurement systems, radar, the first LED (light-emitting diode), the first atomic clock, the first RISC processor, and the first affordable line of laser printers.

But this string of "firsts" was not what impressed us. It was HP's foray into what must have seemed like science fiction.

In the 1930s, the world was a dramatically different place. Automobiles still had spoke wheels like stagecoaches. Planes were made of wood. There were officially only eight planets, no freeways, and no televisions. And Adolf Hitler was a *Time* magazine "Man of the Year."

Then, like an episode of *Star Trek* with an inconvenient breach in the space/time continuum, two guys—John Hewlett and David Packard—fashioned an oscillator out of copper wire, glass, and other crude components available in a farming town.

What a quantum step.

From that point on, just as *Star Trek's* "Prime Directive" warns, the entire future of the planet was altered. Just 60 short years later, there was a computer, of some kind, in almost every home in the industrialized world.

*BrandSpirit:
Hewlett-Packard
Is the Company
That Invented the Future
of Mankind.*

HP did not accept this BrandSpirit in 1995. Either the company didn't believe its own history, or the people running things didn't understand their own brand. Within weeks, the grandfather of technical innovation introduced its own IBM-compatible computer—11 years behind the trend, 20 years after the personal computer, and without a single innovative whisper. Which tends to support the second reason.

Strategies for Building Your Own Brand

Hopefully the elements of your own BrandSpirit are already coalescing in your mind. But what will you do with it when it is complete?

Put it to use in every aspect of your business. Or call someone who can help you do it.

A BrandSpirit should be shocking in its insight, as selling holes instead of drills was for Stanley Tools. It should not just illuminate your product in a whole new light; it should light up your whole company.

You should frame your BrandSpirit. Set one frame on your desk and hang another over your reception desk—not just for prospects, but for your coworkers to see every morning.

Imagine the impact that the HP BrandSpirit could've had on new employees: "This is the company that started it all, and now the mantle of inspiration is passed to me."

Would HP employees reading that BrandSpirit suggest taking a 20-year step backward, advocating yet another DOS box? Or would they instead suggest merging HP's networking or workstation expertise with a Mac OS license, giving HP a unique platform with thousands of power applications, while also giving a superior platform new-found credibility? The result would have been a product Microsoft couldn't control and Packard-Bell couldn't undercut.

But even though the brand history was there, the BrandSpirit wasn't. So a company with \$80 billion in overhead is trying to fight a commodity price war.

The framed, vitally alive BrandSpirit should influence everything you do and produce.

If you were the "string in the lei connecting all the people of Hawaii," your next promotion wouldn't be a raffle: it would be a tie-in with a long-distance phone company or a web page with native Polynesian text.

If you produced the only vehicle on the road "between where you are and where you were," you wouldn't run ads in the Yellow Pages or in score cards at stock car races. An accurate BrandSpirit takes the mystery and hesitation out of marketing and advertising decisions. It helps you define your products and prospects. It's a defense against all diversions—even against good sales people selling inappropriate media.

More important, it's direction for all your creative people, from those who design new products to those who create sales materials. You should hold new ideas up to your BrandSpirit and say, "Is this product (or ad) true to our brand? Would a company that stands for [your BrandSpirit here] offer this product (or run this ad)?"

In the past, you may have liked or disliked an idea for reasons you couldn't resolve, but you may have passed it off as instinct or a gut reaction. It was more likely a subconscious BrandSpirit. You instinctively knew why people did or didn't care. The BrandSpirit allows you to translate your instincts and share them with people.

The more you adhere to the BrandSpirit in everything you present to the public, the more the public will believe in your products. And when someone comes along with a cheaper, back-engineered knock-off, your brand loyalty will protect you. You may lose the fringe, but not the bulk of your business.

Even if you make a mistake, you'll get a second chance. (Remember New Coke?) If you offer a discount, people will jump at it. (That's why budget clothes retailers, such as Ross and Marshalls, put Ralph Lauren shirts right near the entrance.)

Best of all, your BrandSpirit can touch every aspect of your business. It should dictate new product development. It should dictate marketing and advertising programs. It

should influence the paint scheme in your lobby. It's 100 percent applicable to any other opportunity. And nobody else, ever, can claim it.

Your web site should reflect your BrandSpirit. It's not in conflict with the paperless world. If someone visits your site for ten seconds, they should leave with a casual understanding of your brand. And that, after all the GIF animations, RealAudio™ clips, and QuickTime VR movies, is the real reason they'll be back. They'll buy, and they'll remain loyal.

That'll Be \$25 Million, Please

If you had millions of marketing dollars to spend through the world's best ad agency, you wouldn't get another penny's worth of branding over and above what you've read here. (Now, if you ever amass a Nike-sized marketing budget, you can spend it all on execution, because your brand is set.) But after internalizing the concepts presented in this article, you can probably tell 99 percent of the big clients and agencies in the world a thing or two about branding: It's why people care. And why people will pay more.

The BrandSpirit exercise is a vital necessity now more than ever. The understanding of brand has been the foundation of companies such as Procter & Gamble for decades. But today there are more products changing more quickly, confronted by more new channels and challenges, than ever before. If you don't have a brand, you may not have a chance. But if you can nail down the reason that your customers care about your products and your company, you may become one of the brands that dominates the next century. ♣

Alexander Brody (bmcbrody@partnerscom.com) and Brian McMabon (brian@partnerscom.com) are the cofounders of com.com, a consultancy with expertise in brand and advertising. Before com.com, Brody spent 40 years in advertising. He was president of both Ogilvy & Mather Worldwide and Young & Rubicam International, as well as the founder and first president of Dentsu Y&R. McMabon was a creative director at Ogilvy & Mather with emphasis in branding and high-technology accounts. The com.com web site is located at <http://www.partnerscom.com>.

Using Apple Media Tool as a Teaching Tool

By Kris Dalebout Newby,
Apple Directions Staff

Jim Spadaccini is a famous multimedia developer, but you probably won't ever see his face on the cover of *Wired* magazine. And you won't find his software applications on any "top ten titles" lists—though many of his fans, who are mostly under the age of 18, might nominate him for having one of the most disgusting applications. Why? Because Spadaccini's most famous work is *The Cow Eye Dissection*, an Internet-based tutorial that teaches eye anatomy through an audiovisual dissection of a cow's eye.

Other Spadaccini projects include a commercial CD-ROM title produced by high school students, a class that helps teachers incorporate multimedia into classrooms, and an experimental Internet home page for teachers and science enthusiasts. What makes all of these projects unique is their innovative use of interactive media as a teaching tool. Using Apple Media Tool, Spadaccini is defining new ways to make the complex process of multimedia authoring accessible to teachers and students. This work is not only important to schools, but to the software industry as well: Through these projects, he's firing up the imaginations of a new generation of multimedia developers.

Keeping His Eye on the Job

Spadaccini's "day job" is at the Exploratorium, a hands-on science museum located in San Francisco. As the museum's learning studio facilitator, he creates interactive learning exhibits for the Exploratorium and its web site.

His best-known interactive exhibit, "The Cow Eye Dissection," has been used by thousands of school children around the world. This online exhibit contains an audiovisual tutorial that takes teachers, students, and other visitors through the steps of an eye dissection. And there's a downloadable quiz-like application that challenges students to match technical terms with the correct eye parts on a cross-sectional diagram. A built-in QuickTime audio track helps students learn the correct pronunciation of the eye's anatomical parts. Spadaccini created this quiz using Apple Media Tool. The quiz runs

on the Mac OS and Windows, and it takes up less than a megabyte of memory when compressed.

This project illustrates the impact that the Internet will eventually have on education. By sharing teaching tools like this eye dissection on the World Wide Web, teachers from around the world will be able to provide their students with a richer educational experience.

"I love looking through the feedback area of our web site," says Spadaccini. "There's a primary school in New Zealand that went through my primer, then posted their own dissection pictures. And I received lots of nice letters from all over the world from students who've used the dissection primer."

A Title Published by Teens

Before coming to the Exploratorium, Spadaccini directed educational programs for teens. Over the course of a year, he helped 100 high school students from the San Francisco Bay Area author and publish their own commercial CD-ROM title.

This title, *Visionary Stampede—Dreams and Challenges of the Nineties*, was a compilation of student-authored multimedia content that answered two questions: "What are your dreams?" and "What are the problems of the nineties?" This CD, which included everything from slide-show presentations to fully interactive games, was created entirely with Apple Media Tool—and only one student on the team had programming experience. This title went on to win a silver Invision award, as well as a National Educational Film and Video award. (To learn more about *Visionary Stampede*, visit the web site <http://www.vstamp.com/>.)

"One thing this project illustrated was how multimedia can become an effective teaching tool when thoughtfully implemented in a classroom setting," says Spadaccini. "It can allow students to expand their creativity, build self-esteem, and learn about subjects on their own terms. Multimedia works best in the classroom when students are the creators, not the receivers of information. Multimedia can also teach students team-building and management skills—things that are important in the real world."

Exploratorium San Francisco, California

Jim Spadaccini develops multimedia content for the Exploratorium, a museum of science, art, and human perception. He also teaches a number of multimedia classes at San Francisco State University.

Contact information:
Phone: 415-353-0459
Fax: 415-332-2403
E-mail: jims@exploratorium.edu

Media samples:

- http://www.exploratorium.edu/learning_studio/index.html
- http://www.exploratorium.edu/learning_studio/cow_eye/step1a.html
- <http://devworld.apple.com/dev/du/amt/index.html>

Apple Media Tool Benefits

- *Ease of use.* In just a few hours, computer novices can assemble simple interactive multimedia programs.
- *Compatibility with QuickTime technologies.* Users are able to simply drag and drop QuickTime-based media—such as movies, audio tracks, and virtual reality panoramas—into an easy-to-use, visual media framework.
- *Reliable cross-platform porting.* Moving a Macintosh-based project to the Windows platform is fast and reliable.

The Learning Studio
@THE EXPLORATORIUM

What's New!

EXPLORATORIUM Cool Ten Sites

The coolest for the month of January! Also, check out the categories with reviews of the best sites for science, art, and education.

Still Cool!

SCIENCE INFORMATION INFRASTRUCTURE

New! Auroras resource now with RealAudio interviews. Also, check out LandSat images, and more.

What's New in the World

A look at planets outside our solar system. Check out the Science Explorer and visitor responses to our genetics questions.

The Learning Studio Web Site. By sharing multimedia science resources on the World Wide Web, the Exploratorium museum is helping teachers around the world provide their students with a richer educational experience.

The Educator's Challenge: Multimedia on a Shoestring

Spadaccini also teaches Apple Media Tool and Internet classes through San Francisco State University's Multimedia Studies Program. One popular class helps educators integrate multimedia into school curricula.

"We teach educators in a variety of different ways," says Spadaccini. "We offer hands-on instruction. We have other educators drop in to share their own multimedia experiences. And we have teachers work on their own projects.

"We find that a common problem teachers face is a lack of hardware and software

resources," says Spadaccini. "Because of this, we focus on helping the educators make the most of the equipment that they have at their disposal. We also teach them to integrate multimedia into their curricula in very small steps: A lot of teachers think they'll be able to create a full-blown CD title right off the bat, and that's just not realistic. First we teach them how to post information on the web. Then we show them how to use Apple Media Tool to integrate different media types."

Spadaccini's favorite teaching story is that of an art teacher from Philadelphia who joined his multimedia class with virtually no computer experience. In just two weeks, the teacher was able to use Apple Media Tool to produce a fine-arts title that she could use with her students. This virtual gallery tour included seven screens with integrated images, music, and a QuickTime movie—and she was able to quickly compile it for both Mac OS and Windows platforms at the end of the project.

"It was a very powerful experience to see a teacher with no computer experience create a multimedia title that easily," says Spadaccini.

A Toy Box for Science Teachers

Whether he's testing visitors' memories with the online exhibit "Common Cents" or just keeping students and teachers updated with his web page "What's New in the World," Spadaccini's contribution to the Exploratorium web site is a great example of how multimedia can make science more interesting and understandable. (This fun site is located at http://www.exploratorium.edu/learning_studio/index.html.)

Spadaccini sums up why he uses Apple Media Tool for his projects and classes: "I use Apple Media Tool because of its ease of use. In a typical class, there may only be one or two people who know programming or scripting. Apple Media Tool is the first tool that opens up multimedia authoring to everyone—and it's really the only tool we've come across that's powerful enough to do that.

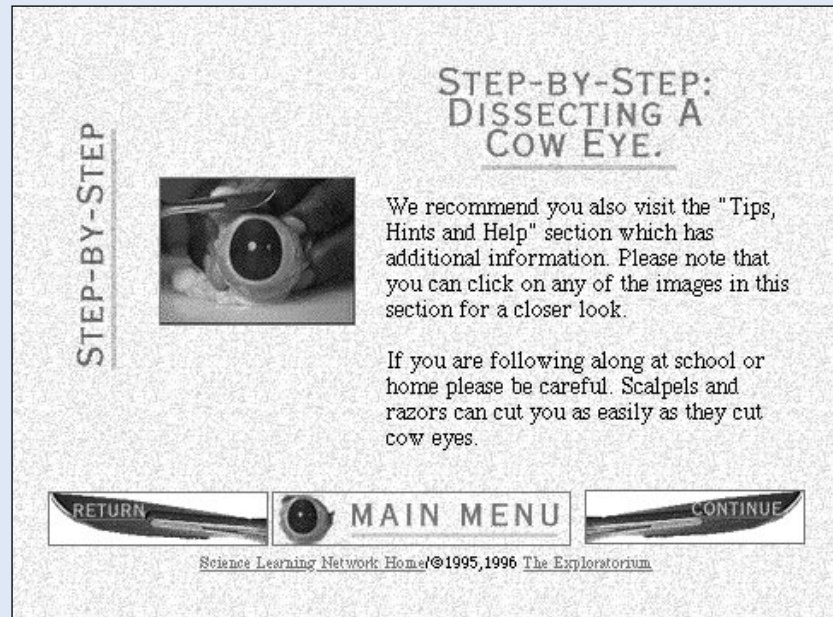
"One of the best features of Apple Media Tool is the one that allows users to drag and drop in media elements. The fact that you can simply drop a QuickTime or QuickTime VR movie into an Apple Media Tool media map and have it work perfectly the first time is tremendous.

"Another nice thing about Apple Media Tool is that you can build a title once, then quickly compile it for both the Mac OS and Windows platforms. Cross-platform compatibility is

Apple Media Tool at a Glance

- **Apple Media Tool (AMT) from Apple Computer.** Winner of *MacUser* magazine's 1993 "Best New Multimedia Product" Eddy Award, this product is an object-based, cross-platform multimedia development tool that uses a screen-map storyboard metaphor. It allows users to quickly and easily drop QuickTime VR, QuickTime movie, PICT, text (RTF), and sound files into a storyboard, then add interactivity using a visual, no-scripting interface. Version 2.1, which was announced in September (<http://product.info.apple.com/pr/press.releases/1996/q4/960917.pr.rel.mediatool.html>), features extended support for QuickTime VR, expanded user interface control, and the ability to launch applications and web sites from within an Apple Media Tool run-time environment. AMT features and projects can be customized with Apple Media Tool Programming Environment. Titles created with these products can be distributed royalty-free.

- **Apple Media Tool Programming Environment (AMTPE) from Apple Computer.** This object-oriented language and application framework allows programmers to customize features of the Apple Media Tool authoring environment and add functionality to interactive projects created with Apple Media Tool. All code written with this product compiles for both Macintosh and Windows platforms.



The Cow Eye Dissection Primer. Jim Spadaccini posts many of the Exploratorium's interactive science exhibits, such as this QuickTime-based primer, to the Internet.

essential for educators, who often work in multiplatform environments."

In October, Spadaccini published an Apple Developer University interactive tutorial called *Multimedia Authoring With Apple Media Tool*. This is a great resource for educators, students, and others who want to try their hand

at multimedia content development. (A demo version of this tutorial at posted on the web at <http://devworld.apple.com/dev/du/amt/index.html>. Or it can be ordered through the *Apple Developer Catalog* at <http://www.devcatalog.apple.com>.)

The importance of Spadaccini's tutorial, as

Toolbox

Hardware

- Power Macintosh 8500 computer with 48 MB of memory
- Radius 110 computer with 48 MB of memory

Software

- Adobe™ Photoshop
- Adobe Premiere
- Apple Media Tool
- Apple QuickTime technologies
- Gryphon's Morph

well as his work with educators, is that it's opening the worlds of multimedia and science to a new generation of multimedia developers. By posting his works to the Internet, he's reaching young people all over the world who might never get a chance to visit his innovative museum. And this—to put it in terms that someone from a San Francisco science museum could comprehend—earns Jim Spadaccini a “10” on the Richter scale of industry influence. ♣

Kris Dalebout Newby (newby2@aol.com) is business editor of Apple Directions and a freelance writer based in Palo Alto, California.

Internet Resources for This Issue

News

- Press release on acquisition of NeXT—<http://live.apple.com/next/961220.pr.rel.next.html>
- Press release on Metrowerks CodeWarrior—<http://www2.apple.com/home/news/metrowerks.html>
- Apple Developer World—<http://www.devworld.apple.com>
- Forbes article on Dr. Gil Amelio—<http://www.forbes.com>
- Nisus Writer 5.0—http://www.nisus-soft.com/5.0_features.html
- Press release on Open Transport/PPP 1.0 and

ARA Road Map—<http://product.info.apple.com/pr/press.releases/1997/q1/961126.pr.rel.open-trans.html>

- QuickTime Conferencing—<http://gtc.quicktime.apple.com/>
- RAVE—http://devworld.apple.com/dev/games/detail_q3d.html
- Cocoa Internet authoring tool—<http://cocoa.apple.com>
- Personal Web Sharing—<http://applenet.apple.com>
- Newton Press—<http://www.newton.apple.com/newton/solutions/press/press.html>
- ASI's PKZIP DCL—<http://www.asizip.com>
- BBEEdit Lite—<http://www.barebones.com>
- PointCast Network—<http://www.pointcast.com/download/dwnmac.html>

- Totally Hip's WebPainter 1.0—<http://www.totallyhip.com>
- QuickDraw 3D 1.5 installers—<http://quickdraw3d.apple.com>
- Macintosh Application Environment (MAE)—<http://www.mae.apple.com>
- Claris—<http://www.claris.com>
- AppleShare IP 5.0—<http://appleshareip.apple.com>

Technology

- LightningDraw Lite—<http://www.larissoftware.com/>
- Apple Electrifier plug-in—<http://www.electrifier.com/>
- PaceWorks ObjectDancer—<http://www.paceworks.com/>
- QuickTime—<http://quicktime.apple.com>

Business

- com.com—<http://www.partnerscom.com>
- *Visionary Stampede*—<http://www.vstamp.com/>
- *Multimedia Authoring With Apple Media Tool* tutorial—<http://devworld.apple.com/dev/du/amt/index.html> (demo version) or [.devcatalog.apple.com \(*Apple Developer Catalog*\)](http://www</div><div data-bbox=)

- Exploratorium media samples—http://www.exploratorium.edu/learning_studio/index.html
- http://www.exploratorium.edu/learning_studio/cow_eye/step1a.html

<http://devworld.apple.com/dev/du/amt/index.html>

- Press release on Apple Media Tool 2.1—http://product.info.apple.com/pr/press_releases/1996/q4/960917.pr.rel.mediatool.html ♣

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. Or, send e-mail to APDA@applelink.apple.com. The *Apple Developer Catalog* is also available online on the web (<http://www.devcatalog.apple.com/>).