Apple**Directions**

APPLE NEWS

Jobs's Keynote Sets Stage for Apple's Future

In his keynote address at the recent MAC-WORLD Expo in Boston, Apple advisor and cofounder Steve Jobs set the stage for the future strategic direction of Apple by announcing sweeping changes to Apple's Board of Directors—including the news that he was joining the board—and a new partnership with Microsoft Corporation.

While the changes to Apple's Board of Directors were enthusiastically received by the crowd of Macintosh users, they were all but eclipsed by the unexpected news of the partnership between Apple and Microsoft. Telling the momentarily stunned audience at the Boston Park Plaza hotel that "the era of competition between Microsoft and Apple is over," Jobs outlined a broad product and technology development agreement between the two companies that included the following deal points:

• Microsoft and Apple agreed to a broad patent cross-licensing agreement that paves the way for the two companies to work more closely on leading-edge technologies for the Mac OS platform.

• Microsoft will develop and ship future versions of its popular Microsoft Office productivity suite, Internet Explorer, and other Microsoft tools for the Mac OS platform.

• Apple will bundle the Microsoft Internet Explorer browser with the Mac OS, making it the default browser in future operating system releases.

• Apple and Microsoft plan to collaborate on technology to ensure compatibility between their respective Virtual Machines for Java™ and other programming languages.

• To further support its relationship with Apple, Microsoft will invest $150 million in nonvoting Apple stock.

Strategy Mosaic will return next month.

"In 1984, Steve Jobs and I stood together when Microsoft announced Microsoft Excel, an application that is widely credited with helping to define the potential of the Mac as a great applications platform," said Gates. "Today's announcements underscore our continued belief in the Mac as a platform for applications and leading-edge Internet technologies. Microsoft has millions of customers who rely on Macintosh technology, and they can be assured that Microsoft products for the Mac will continue to be available."

"We are thrilled at the prospect of working more closely with Microsoft on applications and Internet software," said Jobs. "We are confident that this is the beginning of a much closer relationship between the two companies, which will greatly benefit our common customers."

The Microsoft deal—while certainly the center of attention—was only one of several announcements that Jobs made during his keynote address. He also announced significant changes to Apple's Board of Directors, which is replacing all but two former directors with four new hands-on industry executives, including Bill Campbell, president and CEO of Intuit Corporation; Larry Ellison, chairman and CEO of Oracle; Steve Jobs, chairman and CEO of Pixar Animation Studios; and Jerry York, former CFO of IBM and Chrysler Corporation, and vice chairman of Tracinda. The four new members join remaining board members Edgar Woolard, chairman of the board of E. I. DuPont de Nemours and Company, and Gareth Chang, senior vice president of Hughes Electronics and president of Hughes International.

The new board has decided not to name a chairman until the new Chief Executive Officer has been selected. Resigning from the Apple board are Mike Markkula, Apple's board

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Jobs's Keynote

member of longest standing; Katherine Hudson, president and CEO of W.H. Brady; and Bernard Goldstein, managing director of Broadview Associates, L.P. Their departure follows the recent resignations of Delano Lewis, president and CEO of National Public Radio, and Gilbert Amelio, Apple's former chairman and CEO.

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Mac OS 8 Sales Exceed Forecast by 400 Percent

Mac OS 8—the latest operating system release for the Macintosh—was barely out the door when Apple cofounder Steve Jobs confirmed during his keynote address at MACWORLD Boston that sales of the upgrade had already reached 1.2 million copies in the first two weeks of release.

"Concerning our latest release, Mac OS 8, I've got some really good news for you," said Jobs. "We released this thing two weeks ago, and we have already sold 1.2 million copies. That's four times greater than what our forecast was. So we're scrambling to ship everything. If it takes a little time to get yours, I apologize. We are scrambling. And this 1.2 million number is going up. It shows no sign of abating. Things are going very well with Mac OS 8."

Mac OS 8 is the most significant upgrade of the Mac OS since 1984. Several major retailers, distributors, and catalog sales companies have sold out of their Mac OS 8 stock during the first two weeks of availability—resulting in the most successful sales performance ever for an Apple software product. Sales continue to surpass Apple's projections with the sales channel reporting strong demand and ordering substantial additional units. Apple hardware sales have also benefited from Mac OS 8's availability: Dealers in certain locations have reported an increase of more than 30 percent over the introductory weekend.

Mac OS 8 includes a multitude of new features and technologies that offer an improved user experience with increased productivity and efficiency, greatly simplified Internet access, leading-edge tools, state-of-the-art multimedia capabilities, and enhanced performance and stability.

Improved User Experience;
Greater Productivity and Efficiency
Mac OS 8 delivers a more advanced user experience, increasing your overall productivity and efficiency through improved system responsiveness, access, and control, as well as scalable functionality for all user levels. For optimized system responsiveness, Mac OS 8 features a multithreaded, PowerPC processor–native Finder, which enables faster operations and multitasking—for example, you can copy files while simultaneously performing other operations. To give you more direct system access and control, Mac OS 8 offers unique spring-loaded folders, which open when you drag a file on top of them; pop-up windows, which allow you to move folders, hard disk icons, or network volume icons to the bottom of the screen in the form of a reduced title bar that you can then open with a single click; and contextual menus, which provide a list of actions that apply to an item (such as an icon) that you have selected while holding down the Control key. Features in Mac OS 8 are scalable, so if you're a novice user, you can select the View as Button and Short Menus options for simplified access to applications and documents.

Supplementary help is available from the Mac OS Info Center, a hypertext information source. Through HTML-based content on your hard disk, the Mac OS Info Center uses a web browser to provide detailed information and answers to questions such as "What's new in Mac OS 8?" and "What can I do with this

particular feature/technology?". The Mac OS Info Center also provides live links to late-breaking Mac OS news and more detailed information on the web about Apple technologies.

Harness the Power of the Internet

With Mac OS 8, you can access the Internet more quickly and easily than ever before by using its rich set of browsing, communication, and information services. Mac OS 8 also allows you to publish and share information over the Internet. With Mac OS 8, you can access the Internet by using a single configuration process that covers all Internet elements including TCP/IP, PPP, and mail and web services. An Internet setup assistant helps you configure your system through simple questions and answers and, if you're a first-time Internet user, it helps you select an Internet Service Provider (ISP) by giving you an up-to-date list of ISPs for your area and then automatically configuring your system (United States, Canada, and Japan only) based on your selection. Single-click Internet access is provided through web browser and e-mail desktop icons as well as from all applications with the Connect To menu item.

Best Browsing and Communication Tools

Mac OS 8 offers some of the industry's best browsing and communication tools, including Netscape Navigator™ 3.01 and Microsoft Internet Explorer 3.01. Mac OS 8 also includes Claris Emailer Lite for mail services and

America Online 3.0. With Mac OS Runtime for Java, you can run Java cross-platform programs just like any other desktop application.

Easy Web Publishing Across Platforms

Mac OS 8 makes it easy to publish Internet content and share files within intranets and across the Internet by using two key features—Personal Web Sharing and Personal Net Finder. Personal Web Sharing instantly turns any Mac OS computer into a web server by enabling HTML and other web-formatted content to be accessed by web browsers on any platform. Personal Net Finder provides a Finder-like listing of shared files and folders on a Mac OS computer to anyone connecting to it. This extends the capabilities of Mac OS file sharing over Internet-standard protocols to anyone, on any platform, with a browser.

Leading-Edge Information Services and "Push" Technologies

Complementing Mac OS 8's strong Internet integration are leading-edge information services that bring customized news, information, and support directly to your desktop. The latest "push" technologies are provided, including PointCast Network and Marimba's Castanet Tuner.

PointCast Network is the first news and information service to broadcast up-to-the-minute content directly to your computer screen. PointCast Network in Mac OS 8 also includes an Apple channel, which brings you Apple-related news stories, software updates, new product announcements, customer support news, and other special information.

Marimba's Castanet technology automatically distributes and maintains Java-based software and content within a company or across the Internet. The inclusion of Castanet with Mac OS 8 allows you to view any type of "channel"—internal corporate applications, multimedia consumer channels, and more.

Collaboration With Excite for Easy Internet Navigation

As a starting point for Internet exploration, Apple has collaborated with Excite to provide information delivery and Internet navigation services in Mac OS 8. As part of this collaboration, Excite has created special versions of its leading navigation services—My Excite Channel, Excite Search, and Excite Guide—for

Apple to feature as part of the dynamic home page services in Mac OS 8:

• My Excite Channel (http://livepage.apple.com) delivers timely news and information based on your personal interests.

• Excite Search (http://livepage.apple.com/search) is a comprehensive search service that provides you with a way to locate and sort relevant online information quickly and efficiently.

• Excite Guide (http://livepage.apple.com/guide) provides reviews of leading web sites by category.

These services are easily accessible, since they represent default settings of the web browsers included with Mac OS 8.

Premier Cross-Platform Multimedia Authoring and Playback

Apple's multiplatform QuickTime Media Layer (QTML) technologies are showcased in Mac OS 8 to let you take advantage of QTML's premier multimedia authoring and playback capabilities.

Integrated with Mac OS 8 is QuickTime 2.5, the widely adopted software architecture used by tool vendors and content creators to develop and deliver synchronized graphics, sound, video, text, and music; QuickTime VR 2.0, Apple's award-winning cross-platform software for creating and viewing photorealistic environments (panoramas) and real-world objects; QuickDraw 3D 1.5, a system software technology and API (application programming interface) that enables the creation and rendering of real-time, workstation-class 3D graphics; and QuickDraw GX, the architecture for 2D graphics, animation, and type. QuickTime in Mac OS 8 also supports MPEG software decompression for full-screen, full-motion video playback without additional hardware on PowerPC processor–based Mac OS computers.

Enhanced Performance and Stability

Mac OS 8 brings a new level of performance and stability to the Mac OS. The various components optimized for the PowerPC processor, such as the Finder, significantly increase Mac OS 8's overall system performance and stability. As with Mac OS 7.6.1, type 11 errors are greatly reduced and most application errors do not affect the system or other applications. To help prevent problems before they start, system diagnosis is performed during

installation, including checks for disk problems and driver updating.

System Requirements

Mac OS 8 works with most existing applications, extensions, and drivers, and provides excellent backward compatibility. Mac OS 8 supports all 68040- and PowerPC processor–based Mac OS–compatible systems. 68030-based systems, including those with PowerPC upgrade cards, are not supported. The operating system requires least 12 MB of physical memory; with less than 20 MB of physical memory, virtual memory must be turned on and set to at least 20 MB.

For Mac OS 8 product information, demos, and reviews, visit the Mac OS 8 web site at **http://www.macos.apple.com/macos8/**.

Information on pricing and availability is available at **http://www.macos.apple.com/macos/releases/fulfillment.html**.

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Mac OS Runtime for Java 1.5 Software and SDK Now Available

Apple recently announced the availability of Mac OS Runtime for Java 1.5 (MRJ 1.5), an implementation of Sun Microsystems' Java Virtual Machine and run-time environment for Macintosh and Mac OS–based computers. MRJ 1.5, which features a set of shared libraries and other system software files, follows on the success of Apple's MRJ 1.0 and offers improved functionality. Apple has also released the MRJ 1.5 Software Development Kit (SDK).

With the addition of a PowerPC "just-in-time" (JIT) compiler and numerous performance enhancements to the graphics subsystem, MRJ 1.5 offers a tenfold improvement in performance over previous versions of MRJ, as measured by the industry-standard Caffeine Marks benchmark. (The actual improvement will vary with the type of Java code running.) MRJ 1.5 includes the new MRJ Toolkit, which allows developers to add Mac OS–specific features to Java applications. MRJ Toolkit stubs are written in 100% Pure Java to allow applications taking advantage of the MRJ Toolkit to automatically run on non–Mac OS platforms

without modification. By using the MRJ Toolkit, you can easily extend your applications to provide excellent support for unique Mac OS advantages without sacrificing 100% Pure Java compatibility.

Mac OS Runtime for Java and the corresponding SDK are available at no charge from **http://applejava.apple.com/**.

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Microsoft Alliance to Enhance Apple Java Strategy

Last August at MACWORLD Expo in Boston, Apple announced a partnership with Microsoft that included a commitment "to collaborate on technology to ensure compatibility between their respective Virtual Machines for Java." Since that announcement was made, there has been much speculation on how this agreement would affect Apple's Java strategy. According to Will Iverson, Java product manager at Apple, the agreement enlarges Apple's Java strategy but does not change its direction. Here is the text of a brief interview with Iverson:

Q: Will Apple continue to develop MRJ?
A: Apple still intends to develop MRJ, now and into the future. We expect to incorporate Microsoft technology as appropriate to ensure compatibility with the Microsoft Java Virtual Machine for Windows as a superset of Java.

Q: Will Apple continue to support 100% Pure Java?
A: Yes. We intend to support all 100% Pure Java initiatives.

Q: Will Apple support other Microsoft extensions to Java?
A: It is too early to make specific statements now. We will be announcing more details in the future.

Q: Will Apple ship the Microsoft/ Metrowerks Java Virtual Machine instead of MRJ?
A: We have no plans to do so. Apple intends to continue to develop MRJ as a key portion of the Mac OS platform. MRJ was bundled with

Mac OS 8, and we plan to continue to enhance and integrate MRJ with the Mac OS.

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CodeWarrior to Support Mac OS 8 Application Development

Metrowerks recently announced additions to CodeWarrior Professional that will enable your applications to take advantage of new features in Mac OS 8. CodeWarrior will soon support the Mac OS 8 Appearance Manager through new classes in PowerPlant that will allow you to use new interface controls such as sliders, progress bars, group boxes, pop-up menu buttons, bevel buttons, and image wells. Metrowerks is modifying existing PowerPlant gray-scale classes so that they will allow you to implement these same controls in System 7.5. This way, your PowerPlant applications can have the same look and feel in System 7.5 as in Mac OS 8.

In addition to modifications to CodeWarrior, Metrowerks also made the following announcements:

• Full Java Development Kit (JDK) 1.1.3 support for Mac OS 8 will soon be available in Metrowerks' tools.

• Release 5 of Metrowerks Visual Source Safe for Macintosh, the latest version of Metrowerks' cross-platform revision control system, recently began shipping. This product replaces the CodeManager brand name and significantly extends the feature set of earlier versions of the product.

• Release 3 of CodeWarrior for PalmPilot, an integrated suite of tools for both the Mac OS and Windows 95/Windows NT, is now available. With CodeWarrior's new features and updates, you'll find it easier than ever to develop applications for PalmPilot products. This release includes complete and separate PalmPilot SDKs (software development kits) for Mac OS and Windows, each with a comprehensive tutorial, numerous examples, and all the interface and library files needed to create Palm OS applications.

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Two New Apple Products Break World Speed Records

On the eve of the annual MACWORLD Expo in Boston, Apple unveiled the world's fastest personal computer and the world's fastest Mac OS server—the 350-MHz Apple Power Macintosh 9600/350 and the Apple Workgroup Server 9650/350.

The World's Fastest Personal Computer

The 350-MHz Apple Power Macintosh 9600/350—part of a new line of powerful desktop computers from Apple used by professionals in fields such as publishing, multimedia/Internet authoring, science, and engineering—is nearly twice as fast as Apple's highest-performance offering of one year ago and faster than the fastest Pentium II system available.

"The Power Macintosh 9600/350 is my dream machine," said Harry Marks, noted designer of content for broadcast media. "This computer is so fast that it dramatically changes the entire user experience compared to my year-old high-performance Power Mac."

The new Power Macintosh 9600/350 computer is part of a new line that includes the Power Macintosh 9600/350, 9600/300, and 8600/300. An additional model, the 8600/250, is available in many countries outside the United States.

The new Power Macintosh 9600 and 8600 computers feature several design improvements that contribute to outstanding system performance. Most notable is the new Apple Inline Cache, which resides on the processor card and creates a wider path with faster communication between the processor and the 1 MB level-2 cache, dramatically increasing performance. In addition, the Apple Inline Cache doubles the rate (to 100 MHz) at which the cache is accessed.

The Power Macintosh 9600/350, 9600/300, and 8600/300 models are available immediately worldwide. For estimated U.S. pricing, see the full Apple press release at http://product .info.apple.com/pr/press.releases/1997/q4/ 970805.pr.rel.pm9600.html.

The World's Fastest Mac OS Server

The Apple Workgroup Server 9650/350—based on an accelerated next-generation PowerPC 604e processor running at 350 MHz—features several design improvements that contribute to its outstanding system performance. Apple's new Inline Cache, a 1 MB level-2 cache, facilitates higher processor-to-cache communication, thus increasing the PowerPC processor's performance. A 100-MHz bus located between the Apple Inline Cache and the system's processor facilitates the rapid transfer of information.

The enhanced Workgroup Server 9650/350 is expected to be available starting in early September 1997. For U.S. estimated pricing and configurations, see the press release at http://product.info.apple.com/pr/press .releases/1997/q4/970805.pr.rel.macosserver .html.

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WebObjects Now Enables Java- and CORBA-based Solutions

Apple's WebObjects application development software is now able to help enterprises deliver new solutions based on Java and CORBA (Common Object Request Broker Architecture), as well as HTML and HTTP. Through IIOP (Internet Inter-ORB Protocol) capability bundled with Netscape Communicator, you can use WebObjects and the Netscape browser to create interactive and open network applications quickly and easily.

WebObjects includes an application server, prebuilt application components, and rapid application assembly tools that allow you to bring enterprise solutions online quickly. By providing an open middle-tier application server that supports multiple standards, WebObjects delivers more interactivity to end users and more flexibility to developers.

According to Apple's senior product line manager for WebObjects, David Kay, the new support for Java and CORBA illustrates the flexibility of the WebObjects product, as Netscape Communicator and its IIOP plug-in from Visigenics were not part of the web landscape when WebObjects was designed.

"The standards-based, open-systems approach taken by Apple and the former NeXT Software team in developing WebObjects enables customers to adopt new technology in 'Web Time,'" said Kay. "This is just one of the ways that we are making it easier for developers to create dynamic web applications with WebObjects."

You can read the complete press release at http://product.info.apple.com/pr/press .releases/1997/q4/970723.pr.rel.webobjects .html.

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Apple and Advis Announce WebObjects Support for SAP R/3

Apple and Advis, a Boston-based Apple Enterprise Alliance Solution Provider, recently introduced the Mantle for SAP R/3 product for Apple's WebObjects application server. Advis's Mantle provides you with transparent access to SAP Business Objects through the Business Application Program Interface (BAPI) and Remote Function Call (RFC) interface published and supported by SAP.

With Mantle, the data and functionality of SAP R/3 systems can be integrated with the dynamic web capabilities of WebObjects for rapid development and deployment of robust, highly scalable corporate intranet and Internet business applications.

SAP is the leading global provider of client/server business application solutions. According to International Data Corporation, SAP is the number-one vendor of standard business application software and the fourth largest independent software supplier in the world. R/3 is SAP's enterprise-wide application system implemented by large organizations seeking to integrate their business information.

For details, read the Apple press release at http://product.info.apple.com/pr/press .releases/1997/q4/970723.pr.rel.advis.html.

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Apple Announces QuickTime Plug-in 2.0 for the Internet

Apple recently announced version 2.0 of the QuickTime Plug-in for Microsoft Internet Explorer and Netscape Navigator and Communicator. Slated for release by October 1997, the plug-in will bring the advanced digital media capabilities of QuickTime 3.0 to the Internet, including QuickTime VR 2.0 support, "hot spots," the ability to play alternate movie tracks, and URL (web site address) linking.

Apple plans for the QuickTime Plug-in to support most popular file formats, so you can interact easily with digital media content on Internet web sites. QuickTime Plug-in 2.0 will run on Windows 95, Windows NT, and Mac OS, and Apple expects it to be available by October for downloading at http://quicktime .apple.com.

For more details, see the Apple press release at http://product.info.apple.com/pr/ press.releases/1997/q4/970723.pr.rel .quicktime.html.

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QuickTime VR Authoring Studio Simplifies 3D Scene Creation

Apple's QuickTime VR Authoring Studio, which was introduced at MACWORLD Expo in Boston, is a new solution that allows web designers and multimedia authors to create QuickTime VR (virtual reality) panoramas and objects quickly and easily. With the new QuickTime VR Authoring Studio, Apple believes that QuickTime VR adoption will increase on both the Internet and CD-ROM.

QuickTime VR Authoring Studio is intended to radically simplify the creation of QuickTime VR scenes including panoramas and objects. The product has an easy-to-navigate user interface and features Panorama Stitcher, Panorama Maker, Object Maker, Scene Maker, and Project Manager (for keeping track of media assets).

More details are available in the press release at http://product.info.apple.com/pr/ press.releases/1997/q4/970805.pr.rel .quicktime.html.

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Mac OS and QuickTime Lead in Video and Multimedia Production

The market research firm Griffin Dix Research Associates has confirmed that Mac OS and QuickTime are the technology platforms of choice in the digital video and multimedia production markets. The firm's research shows that 48 percent of respondents use the Mac OS as their platform of choice for video and multimedia production and that 41 percent of video production sites use QuickTime.

According to Griffin Dix, the "sample for the *Professional Digital Video Research Study* included equal numbers of buyers of Mac OS and digital PC video products, as well as platform-independent lists of video production sites. The results indicate that the Mac OS is the primary operating environment for video and multimedia production at sites using digital video products. The study also shows that QuickTime has become an important standard in the various video production market segments, including corporate in-house video production departments, video services companies, and TV broadcast sites."

At the same time, QuickTime was recognized as one of *Videography* magazine's Editors' Choices at the 1997 National Association of Broadcasters (NAB) trade show. Earlier this year, QuickTime received *Television Broadcast Magazine*'s "Editors' Pick of Show" award for the advancement of the art and science of television broadcast at the NAB show.

For more details on this Griffin Dix study, see the Apple press release at http://product .info.apple.com/pr/press.releases/1997/q4/ 970805.pr.rel.griffindix.html.

For details on purchasing the complete *Professional Digital Video Research Study* and the *Consumer and Prosumer Video Research Study,* visit the Griffin Dix web site at http:// www.dixresearch.com/DV97.html.

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Apple Sales in Europe and Japan Show Healthy Growth

If you "read between the lines" of Apple's third-quarter earnings report, you might notice two bright spots in Apple's sales outlook—both European and Japanese product sales showed strong growth. According to Diego Piacentini, Apple Europe's vice president of sales and general manager, "Apple Europe has trimmed back most of its excess fat. None of the staff cuts have come from sales, however. In fact, Apple has increased its European sales force by 5 to 6 percent."

Joanne Taaffe of the IDG News Service's Paris Bureau reported that Apple's third-quarter unit sales grew by 5 percent in the United Kingdom, 10 percent in Switzerland, 20 percent in Spain, and 25 percent in Italy.

Apple Recon, a third-party site that presents Apple news related to stock trading, wrote that Apple's third-quarter sales grew by 70 percent in Japan, due mostly to strong PowerBook 2400 and 3400 sales.

For more on this promising trend, see these two articles:

• "Europe: Bright Spot for Apple," by Joanne Taaffe, IDG News Service, Paris Bureau, on the Macworld Online web site (July 18, 1997) at http://stage.macworld.com/ daily/daily.1460.html.

• "RFI Update: Apple's Better Than Expected Q3 Earnings" (July 16, 1997) on the Apple Recon web site at http://www.geocities.com/ WallStreet/7744/aapl_q3_report.html.

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Cakewalk Moves to the Mac OS Platform

Cakewalk Music Software, a provider of Windows-based software for creating music and sound, announced an aggressive strategy for developing Mac OS software. As part of a cross-platform initiative, Cakewalk will acquire and further develop additional music software products for the Mac OS.

Cakewalk's initial technology acquisition is Metro, a professional-level MIDI sequencer

from JS Technologies. Cakewalk plans to further develop Metro for the Mac OS platform and will incorporate some or all of the technology in its Windows product offerings as well.

To help execute this strategy, Cakewalk has hired Jeremy Sagan, software developer of Metro. The company has also committed to providing full customer support and future upgrades for current users.

For more details, see the full press release at http://cakewalk.com/html/mac.html.

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Genealogy Software Developer Drops Its Windows Family

Leister Productions of Mechanicsburg, Pennsylvania, announced that it's selling the Windows version of its highly acclaimed genealogy application, Reunion, to Sierra Software so that Leister can once again become a Macintosh-only software developer.

According to Leister, the decision to abandon Windows was based on the belief that the company could bring newer technologies to the genealogy software market faster by concentrating exclusively on Mac OS development. The company added that the Macintosh portion of its business has been more fun and profitable.

To read more about this transition, visit Leister's web site at http://www.LeisterPro.com.

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Apple Announces Apple Internet Server Solution 3.0

Apple recently announced that it's shipping version 3.0 of its Apple Internet Server Solution (AISS) software with Workgroup Servers 7350/180 and 9650/233. AISS 3.0 is a "web server in a box"—an all-in-one solution for anyone who does content authoring, site management, and publishing—that consists of a Workgroup Server and a CD-ROM containing

all of the software required to establish a presence on the web. Here's some of the other software included in the Apple Internet Server Solution CD:

- CyberStudio by GoLive (new)
- Rumpus FTP Server by Maxum Development (new)
- FireSite Speed Booster and Virtual Domain Manager by Clearway (new)
- Butler SQL by EveryWare (new)
- MacTCP Watcher by Peter Lewis (new)
- WebSTAR/SSL by Quarterdeck/StarNine
- Tango Enterprise by EveryWare
- NetCloak and PageSentry by Maxum Development
- BBEdit by Bare Bones Software
- Claris Home Page
- Apple RAID and MacDNS
- Acrobat™ Reader by Adobe™
- LogDoor by Open Door Networks
- Netscape Navigator

More details are available in the press release at http://product.info.apple.com/pr/press.releases/1997/q4/970723.pr.rel.aiss.html.

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MacApp Application Framework Release 13 Available

Apple recently announced the availability of MacApp release 13, a new version of its advanced object-oriented application framework that facilitates the rapid development of Mac OS applications.

According to MacApp product manager Gary Little, the new features of MacApp will help make Mac OS programmers much more productive, particularly in developing Internet-savvy applications. "MacApp's Network Support Classes make it very easy to establish and manage TCP/IP connections, often with only a few lines of your own code. One of our example programs, for instance, is a rudimentary web server that has only eight lines of Internet-specific code."

The latest version of MacApp is a significant upgrade that provides the following new features:

- *The ability to use advanced C++ capabilities.* MacApp uses "modern" C++

language features such as native exceptions, casting operators, templates, constructors and destructors, and the standard C++ libraries.

- *Tighter control of framework usage.* MacApp release 13's modular form gives you more control over which MacApp components are included in your applications. Certain core modules have been moved to a separate library called the *Apple Class Suites,* where they can be used independently of the rest of MacApp.

- *The ability to easily add Internet capabilities to applications.* This feature is provided by the Network Support Classes subsystem, a provider-independent, asynchronous event and networking subsystem, complete with timers, transaction queues, state machines, and parsing.

- *The ability to easily create multithreaded applications.* The new version of MacApp provides support for cooperative and multiprocessor threading through a set of straightforward and consistent classes, as well as an efficient, intuitive synchronization abstraction based on the monitors and conditions model.

- *Extended support for application development.* MacApp release 13 provides many additional features, including support for Mac OS 8's platinum appearance, QuickDraw 3D, and multi-level undo capability; new debugging aids; improved run-time performance; and smaller disk and memory footprints for applications.

- *MacApp views.* These views (the visible elements of an application) are built visually with the Ad Lib™ layout editor, which Apple recently acquired from its original developer. A new version of Ad Lib (2.6.4) is part of the MacApp release.

MacApp is available for downloading, free of charge, at http://devtools.apple.com/macapp/.

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Apple Updates Two Utilities for Mac OS 8

If you want your application to be compatible with Mac OS 8, you need the latest versions of these two utilities from Apple: MacsBug 6.5.4a3c1 (Apple's debugger) and System Picker 1.1a3 (a utility that lets you choose a System Folder on a volume for startup).

You can download MacsBug from the web at http://devworld.apple.com/dev/tools.shtml,

and you can download System Picker at ftp://ftp.apple.com/devworld/Utilities/.

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AppleShare IP 5.0.2 to Support Mac OS 8 and WebSTAR API

Apple recently announced that the latest version of its server software, AppleShare IP 5.0.2, will work with the newly introduced Mac OS 8, as well as StarNine's WebSTAR API. By supporting the WebSTAR API (application programming interface), Apple is strengthening its support of the Internet and promoting broad adoption of the API to its developer community.

The first Internet beta version (5.0.2 seed 1) contains performance and reliability enhancements, including an updated version of the AppleShare Client—version 3.7.2. The

second Internet beta version (5.0.2 seed 2) adds support for Mac OS 8 and includes the WebSTAR API.

The seed 2 version is now available for downloading from the AppleShare IP web site at http://appleshareip.apple.com.

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Apple Hits the Road to Promote New Products

Macintosh computer users across the United States are getting a chance to experience the latest in personal computing as Apple kicks off its national road show. Announced at MAC-WORLD Expo/Boston, the road show features hands-on demonstrations of Apple's new Power Macintosh and PowerBook systems in more than 30 cities across the United States between August and November.

"Taking our newest Macintosh computers and Mac OS 8 operating system on the road is

precisely the kind of grass-roots effort that I think is essential to give our users the good reasons and confidence to buy a Macintosh," said Apple executive vice president of Marketing Guerrino DeLuca.

The road show is part of Apple's campaign to demonstrate the Mac OS platform's enhanced user experience, Internet communications, multimedia capabilities, and compatibility with computers that run Windows, all made possible by recently introduced hardware and the Mac OS 8 operating system. In addition to Apple products, the road show is also displaying the latest products from Adobe Systems, Berkeley Systems, Broderbund, Claris, Davidson, Living Books, and Netscape Communications—all running on Mac OS 8.

Cities for the 17-week itinerary were selected for their high concentrations of Macintosh users, and each stop along the way will be complemented with special user group and community programs, as well as merchandising promotions. You can obtain a detailed road show schedule on the web at http://www.apple.com/roadshow. ♣

CD HIGHLIGHTS

SDK Edition, October 1997

Once again, it's SDK (software development kit) time. In plenty of time for Halloween, it was as if an occult hand had dropped new software into our in-basket—revised Rhapsody documentation, a new release of Mac OS universal interfaces, an improved implementation of QuickDraw 3D, and more! The paragraphs below give you the details.

Universal Interfaces and Libraries 3.0.1

This folder contains version 3.0.1 of the Universal Interfaces, which integrate all the latest Mac OS headers into one release. This revision adds interfaces and libraries for QuickTime VR, the Mac OS 8 Appearance Manager, and PPCard 3.0. It also includes the Mac OS 8 FoldersLib stub library and "classic" 680x0 libraries, as well as updates to the Location Manager, QuickDraw 3D, and Unicode Converter interfaces and libraries.

Note: If you are using SDKs that include their own interface and library files, be sure to use the appropriate files from this folder instead of the older ones that were included with the SDK.

ColorSync Photoshop Plug-ins 2.1

The ColorSync Plug-In Modules provide an easy way for you to obtain high-quality reproduction of color images. Together with the ColorSync System Extension and the installed device profiles, the ColorSync Plug-In Modules ensure that your color images will be reproduced most accurately on any device. Three modules (Import, Export, and Filter) are available to fit into any type of workflow and to provide color-matching capabilities to both novice and advanced users.

Here's what these plug-ins allow you to do:
• Accurately print the image viewed on your monitor
• Accurately print or view the image you have scanned
• Embed a profile in your image to be specified as the image's source
• Make four-color or HiFi-color separations for any press printing condition

• Use your in-house device to preview what your image will look like on the printing press
• Execute any custom color matching needed

Mac OS Run-Time Architectures

This document describes the Mac OS run-time architecture, which is based on the Code Fragment Manager (CFM) and on the original classic 680x0 run-time architecture.

Mac OS 8 Human Interface Guidelines

This new supplement to *Macintosh Human Interface Guidelines* will help developers take advantage of Mac OS 8 and future versions of the operating system. This document includes information on the Appearance Manager, new and upgraded controls, dialog box layout, and more.

QuickDraw 3D 1.5.3 SDK

This is a new version of Apple's cross-platform API (application programming interface) for creating and rendering workstation-class 3D graphics in real time. This version includes the following improvements:
• Corrections of various bugs related to picking, rendering, the QuickDraw 3D Viewer, and the window system interface
• Enhanced support for plug-in renderers and the applications that use them
• Several performance enhancements
• Improved reliability under low-memory conditions
• An improved error-message system for MacsBug
• Enhancements that enable hardware accelerator boards to deal with occluding objects (for example, windows and menus) correctly

Rhapsody Documentation

This folder contains revised versions of three documents: *Discovering OpenStep: A Developer Tutorial; Foundation Reference;* and *Application Kit Reference.* The new version of *Discovering OpenStep* has been updated for the Rhapsody

Developer Release and includes corrections and new material. *Foundation Reference* is the complete reference for the foundation classes—such as NSArray, NSString, and NSThread—that are part of most Rhapsody applications. *Application Kit Reference* documents the classes that provide everything the user sees and touches—for example, windows, buttons, and formatted text. On the web, you can get the latest versions of these documents at **http://devworld.apple.com/dev/SWTechPubs/index.html**.

StreamNOP 1.0b1

StreamNOP is a sample STREAMS module that was designed for you to use as a template when creating STREAMS modules for Open Transport. StreamNOP requires Open Transport 1.1.1 or later.

This template demonstrates the following features:
• An empty STREAMS module that does nothing to messages that pass through it
• Setup for using OTDebug.h
• Setup for instrumentation using the Instrumentation SDK
• A standard technique for getting per-stream data

Apple Workgroup Server 9650/350 Developer Note

This document describes the specific hardware features of the Workgroup Server 9650/350 that differ from its predecessor, the Workgroup Server 9650/233. It also defines the disk-drive and PCI-card configuration installed in the server and provides guidelines for adding additional storage devices on the internal SCSI bus. It is intended to provide experienced Macintosh hardware and software developers with general information about the product.

—The Developer CD Team

Using the Rhapsody Documentation

By Gregg Williams
Apple Directions *staff*

With the Rhapsody Developer Release approaching soon, it's time to start thinking about how you're going to learn how to program for Rhapsody. I've spent some time both studying the existing Rhapsody documentation and doing some programming on a PC compatible running Prelude to Rhapsody. Here are some notes that I believe will help get you started.

Getting Started With the "Book-Format" Documentation

It's safe to say that people have different learning styles, and trying to learn Rhapsody by reading about it may not be for you. Or it may be that you don't have the time to study Rhapsody right now. If either of these is the case, don't worry—you won't be at a significant disadvantage if you wait until the Developer Release to start learning Rhapsody. However, if you're inclined, you can download some excellent Rhapsody documentation from the web (at **http://devworld.apple.com/ dev/SWTechPubs/Documents/Download/index .html**) and start learning now. (All the documents mentioned in this article are on the web site mentioned above and the October 1997 Developer CD; they will also be included as part of the Rhapsody Developer Release.)

I highly recommend two "book-format" electronic documents: *Discovering OpenStep: A Developer Tutorial* and *Object-Oriented Programming and the Objective-C Language.* (By the way, do yourself a favor: Print these documents out on prepunched paper and put them in a binder—it's worth it.)

I read the Objective-C document first and found that it helped me understand the code samples in *Discovering OpenStep.* However, you may decide to dive into *Discovering OpenStep,* which presents three Rhapsody programs you can create on your computer. If you do, I suggest that you first read Appendix A, "Object-Oriented Programming," which should give you enough knowledge of the basic Objective-C syntax to understand the document's code samples.

Even if you're not planning to learn Rhapsody, I highly recommend that you download

Discovering OpenStep and read the first chapter, "Welcome to Rhapsody." This is an extremely good introduction to Apple's Yellow Box strategy that explains how OpenStep, Rhapsody, and the Yellow Box are related to each other. (For a brief glossary of terms, see "Learning the Lingo" in the July 1997 issue of *Apple Directions.* You may also benefit from reading two other articles from the July 1997 *Apple Directions,* "Apple's Yellow Box Strategy" and "Strategy Mosaic: WWDC Notes and Reflections." All three articles are available on the web at **http://devworld.apple.com/mkt/ informed/appledirections/july97toc.html**.)

Discovering OpenStep

Discovering OpenStep walks you through the construction of three example applications— the most complicated one being a simplified database of travel information, complete with a forms-based user interface. By following these examples, you'll learn many important things, including the following:

• The overall flow of the Rhapsody development process, including how to use the two main development tools, Interface Builder and Project Builder

• An overview of how Rhapsody approaches object-oriented programming

• The basic syntax of Objective-C, the programming language that many programmers will use to access the Yellow Box classes

• Many key OpenStep concepts, including targets and outlets, palettes, delegation, notification, inspectors, and memory management

• The basics of debugging and referencing online documentation

• How to structure and implement "multidocument applications"—that is, applications that can save and restore documents

Object-Oriented Programming and Objective-C

Objective-C is the language many programmers will use—along with either C++ or C— to create Yellow Box programs. (You will also be able to use Java for the same purpose—and Apple expects a lot of people to do so. But even if you plan to program Yellow Box applications in Java, you still need a working knowledge of Objective-C, since virtually all existing sample code is written in it.)

Objective-C is abstractly defined as a set of extensions to the C programming language. However, the compiler included in the Rhapsody development environment can compile C, Objective-C, and C++ code, and you can mix code from all three languages on the same line. This means that you can write most of your application in C or C++, and you can still use much of your existing C and C++ code in your Rhapsody applications. However, unless you are programming in Java, you *must* use Objective-C code to create and manipulate the Rhapsody user interface.

Object-Oriented Programming and the Objective-C Language gives you a good overview of the Objective-C language. Not only does it explain the language itself, but it also discusses some very important interactions between the Objective-C language and the OpenStep environment—in particular, how Objective-C code interacts with the OpenStep run-time environment. Be aware, however, that Chapters 3 and 4, "Objective-C Extensions" and "The Run-Time System," cover both fundamental concepts (for example, the peculiar way in which objects must initialize themselves) and material that you probably don't need to know immediately (for example, distributed objects); because of this, it may be best to read these chapters once and come back to them as needed.

Studying Further

One important thing you need to realize about Rhapsody is that despite the important role that the development tools and the Objective-C language have, much of the programming power and increased productivity that Rhapsody offers come from its associated frameworks—primarily the Foundation Kit and Application Kit (AppKit) frameworks. As with other object-oriented environments (which invariably have their own frameworks), your productivity with Rhapsody will be proportional to your familiarity with its frameworks, and you can't know what's easy or hard in Rhapsody until you become familiar with them.

The Rhapsody Developer Release also includes documents that gather all the online reference material relating to the Foundation and Application Kit frameworks into two book-format Adobe Acrobat documents. The
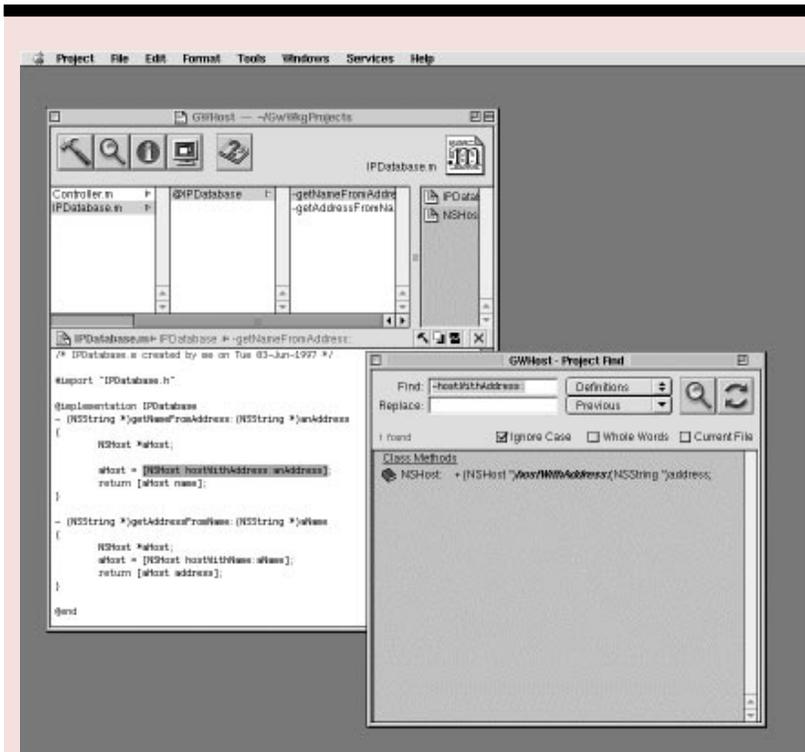
Finding What You Need. From the Project Builder browser window (left), you can use the Project Find window (right) to call up documentation or program code related to a given Objective-C class, method, or variable name. See the main text for details.

Foundation Reference and *Application Kit Reference* documents are so big that you probably won't want to print them out in their entirety, but you may still want to become familiar with them. Each class description in these two documents includes both overview information and a brief description of each method in the class. Ignore any "white plus sign inside a black 3D box" symbols you might see at the beginning of method descriptions—they mark methods that are included in the Solaris implementation of the frameworks and therefore have no relevance here. (More important, remember that this symbol has nothing to do with the "+" symbol that distinguishes Objective-C class methods from instance methods.)

So what do you study first? Is NSTextAttachmentCell important? What about NSTextField? According to some people who know more about Rhapsody than I ever will, you should start by studying the following Foundation Kit classes:
- NSObject—the root object; describes the behavior that all objects have
- NSString—the string object

- NSArray—an indexed collection of any type of object
- NSDictionary and NSMutableDictionary—allow you to store and retrieve information with an associated key value
- NSNotificationCenter and NSNotification—handle broadcast notifications of changes

You should also study the following Application Kit classes:
- NSResponder—defines abstract event-handling behavior
- NSApplication—the center of an application; handles events and manages windows
- NSWindow—the user's focus: handles events and manages views
- NSView—defines abstract drawing and event handling
- NSControl—defines abstract user-interface objects
- NSButton—the canonical user-interface object
- NSTextField—a control that handles text input
- NSTextView—an extremely rich text-

handling object (and the basis of Apple's famous word-processor-in-five-minutes Rhapsody demo)

The Limitations of Studying Documentation
As I suggested at the beginning of this article, nothing takes the place of hands-on experience. However, *Discovering OpenStep* and *Object-Oriented Programming and the Objective-C Language* cover a lot of basic concepts that you will need to know before you can do significant Rhapsody programming.

Don't expect to understand everything in these documents the first time through. Unless you've had previous exposure to OpenStep programming, your study of Rhapsody will expose you to a lot of new concepts. (I don't know about you, but it usually takes me a while to assimilate new programming paradigms. I'm currently in my second reading of *Discovering OpenStep*.) Keep in mind that you are trying to learn a lot of new material and that you will probably need to cover some subjects several times before you begin to understand them.

Online Documentation
Adobe Acrobat documentation is good enough when you want to read documentation (especially if you print it out first), but it's not what you want when you're trying to program. "How do I print out an NSString?" "What's the definition for the method being called in this line of code?" When you have questions like that on your mind, you just want to get an answer without taking your mind off the programming at hand. Fortunately, in the Rhapsody Developer Release, answers are just a few mouse clicks away.

The Project Find Button
Your entry to online documentation is the Project Find button, which is represented by a magnifying glass in the upper-left corner of the project window. Clicking this button displays the Project Find window. (See the screen shot on this page.) By typing in the name of a Rhapsody symbol in your project and clicking the Find button (which also uses a magnifying-glass icon), you can find information on that symbol's definition.

For any entry in the Project Find window, you can click the text part of the entry (in the example screen shot, the line containing the text "NSHost: + (NSHost *)*hostWithAddress:* (NSString *)address;") to cause the main

browser pane to show the line of code within your project where the symbol in bold (in this case, *hostWithAddress*) is defined.

Here's an important piece of information you might not discover on your own: If a Project Find entry begins with a book icon (as the one in the screen shot does), clicking the icon (not the text) causes the main browser pane to display the online documentation for the symbol in bold. This is the same documentation as is in the *Foundation Reference* and *Application Kit Reference* Adobe Acrobat documents.

You can also use the Project Find button to get other kinds of information. You can use the double-arrowed pop-up menu in the top middle region of the Project Find window (labeled *Definitions* in the screen shot) to select menu items named *References* and *Textually.* Depending on which of these items you select before you click the Find button, the Project Find window returns a different set of entries:

• A "definitions" search returns entries that point to the code that defines the symbol in bold.

• A "references" search returns entries that point to places in the code where the symbol in bold is used.

• A "textually" search returns entries that point to usages of the symbol in bold—*treated as text*—anywhere in the project's source files (in comments, for example).

In addition, you can use the Ignore Case, Whole Words, and Current File checkboxes to further filter the search results.

The Click-to-Find Button

The project window's Click-to-Find button shows a question mark superimposed on an open book. If you want to do a "definitions" search operation, you can use this button to do it more easily.

Here's how it works: When you click the Click-to-Find button, the cursor changes to a question mark. If you then click another button in the browser window, you get a "help box" (similar to a Mac OS help balloon, but with more information). If, instead, you move the question-mark cursor over the code in the main browser pane, you will find that Project Builder automatically highlights a unit of code. (In the example on page 11, the code highlighted—"[NSHost hostWithName:anAddress]"—is an Objective-C message.) Clicking while the question-mark cursor is on the highlighted code causes Project Builder to do a "definitions" search on the relevant symbol (in the example, the method hostWithAddress) and display the results in the Project Find window. Control-double-clicking a symbol is a shortcut for using the Click-to-Find button on the same symbol.

The Frameworks Directory

A tremendous amount of documentation is viewable through the Project Builder browser window. To get to it, move the scrollable horizontal thumb (in the middle of the window) all the way to the left and select the Frameworks subdirectory. (You may need to scroll the leftmost browser pane to make this entry visible.)

Click in the middle and right browser panes to go down the directory of files. When you click on an individual file, Project Builder will display its contents in the main browser pane.

You can use this method to access both the header files and documentation for the Foundation and Application Kit frameworks. If you'd prefer to browse the documentation rather than perform searches to find what you want, you can access it directly by going to the framework's documentation directory. Spend some time exploring this directory. One of the most useful subdirectories I have found is the one that contains the files that document a framework's classes and methods. You can locate these files by taking the path Frameworks/*.framework/Documentation/Reference/ObjC_classic/Classes/, where * is either the string "AppKit" or "Foundation".

Conclusions

I hope you will find the information in this article useful. As you start learning Rhapsody and come across any insights, shortcuts, or tricks that you think will help other developers, please send them to me at greggw@apple.com, and I'll try to distribute them back to the Rhapsody development community. ♣

Author's note: About a third of this article previously appeared in an article called "Learn Rhapsody NOW!", which I distributed electronically. To those of you who saw that article, my apologies for the repetition.—GW

Internet Resources

News
• My Excite Channel—http://livepage.apple.com
• Excite Search—http://livepage.apple.com/ search
• Excite Guide—http://livepage.apple.com/guide
• Mac OS 8 site—http://www.macos.apple.com/macos8/
• Mac OS pricing and availability—http://www.macos.apple.com/macos/releases/fulfillment.html
• Mac OS Runtime for Java and SDK—http://applejava.apple.com/
• Power Macintosh pricing—http://product.info.apple.com/pr/press.releases/1997/q4/970805.pr.rel.pm9600.html
• Workgroup Server pricing—http://product.info.apple.com/pr/press.releases/1997/q4/970805.pr.rel.macosserver.html
• WebObjects press release—http://product.info.apple.com/pr/press.releases/1997/q4/970723.pr.rel.webobjects.html

• WebObjects with Advis Mantle for SAP R/3—http://product.info.apple.com/pr/press.releases/1997/q4/970723.pr.rel.advis.html
• QuickTime Plug-in 2.0 download site—http://quicktime.apple.com
• QuickTime Plug-in 2.0 press release—http://product.info.apple.com/pr/press.releases/1997/q4/970723.pr.rel.quicktime.html
• QuickTime VR Authoring Studio—http://product.info.apple.com/pr/press.releases/1997/q4/970805.pr.rel.quicktime.html
• Press release on Griffin Dix study—http://product.info.apple.com/pr/press.releases/1997/q4/970805.pr.rel.griffindix.html
• Griffin Dix site—http://www.dixresearch.com/DV97.html
• "Europe: Bright Spot for Apple"—http://stage.macworld.com/daily/daily.1460.html
• "RFI Update: Apple's Better Than Expected Q3 Earnings"—http://www.geocities.com/WallStreet/7744/aapl_q3_report.html

• Cakewalk Music Software—http://cakewalk.com/html/mac.html
• Leister Productions—http://www.LeisterPro.com
• Internet Server Solution 3.0—http://product.info.apple.com/pr/press.releases/1997/q4/970723.pr.rel.aiss.html
• MacApp 13 download site—http://devtools.apple.com/macapp/
• MacsBug download site—http://devworld.apple.com/dev/tools.shtml
• System Picker download site—ftp://ftp.apple.com/devworld/Utilities/
• AppleShare IP—http://appleshareip.apple.com
• New Mac Road Show—http://www.apple.com/roadshow

Technology
• Rhapsody documentation—http://devworld.apple.com/dev/SWTechPubs/Documents/Download/index.html
• Gregg Williams's July 1997 articles on Yellow Box—http://devworld.apple.com/mkt/informed/appledirections/july97toc.html