

AppleDirections

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APPLE NEWS

Steve Jobs Named Interim CEO

At its first regularly scheduled meeting in early September, Apple's new Board of Directors formalized the role of Steve Jobs by naming him interim Chief Executive Officer of Apple Computer until a new CEO is named.

At this meeting, the Board of Directors also met with its executive recruiter, John Thompson of Heidrick & Struggles, to review the status of its search for a CEO. The board expects a new CEO to be named before the end of the year.

Jobs, Apple's cofounder and newly appointed member of the board, has been serving as an advisor to Apple's board and executive management team for several months.

Guerrino De Luca Resigns

On September 17, Apple announced that Guerrino De Luca, Apple's executive vice president of Marketing, was resigning from the company. De Luca had held that position since February 1997.

"This is a personal decision which does not reflect my assessment of the company's prospects," said De Luca. "We are seeing a lot of changes at Apple, and I'm confident that Apple will shine again."

STRATEGY MOSAIC

Apple Recommits to the Mac OS

Rhapsody to Provide Additional Opportunities

By Gregg Williams, Apple Directions staff

Since Apple announced the new operating system code-named *Rhapsody* last January, it has publicly stated that its OS strategy includes both Mac OS and Rhapsody. However, there is definitely a perception within the computer industry that Rhapsody is going to replace the Mac OS. This perception is not true, and Apple wants to set the record straight.

Here is a brief, no-nonsense statement of Apple's OS strategy: *Apple's future includes both the Mac OS and Rhapsody, but it is the Mac OS that is at the center of both Apple's and your success. Rhapsody is an important part of Apple's business; it will give you new and exciting development opportunities, but it will not replace the Mac OS.* The rest of this article will attempt to explain and enlarge upon this statement, but if you don't remember anything else from this article, remember what you've just read.

Mac OS and Rhapsody: Perception vs. Reality

One problem that Apple's currently facing is what I call the Myth of the Next Big Thing, which states that a new, similar product is automatically seen as a replacement for an existing product. When Apple announced Rhapsody last January, it was almost impossible for either Apple or the computer industry *not* to perceive Rhapsody as the Next Big

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STRATEGY MOSAIC

Apple Recommits

continued from page 1

Thing that would eventually replace the Mac OS.

In the following months, Apple began to realize two things: first, that Rhapsody is a longer-term opportunity than it originally thought; and second, that Apple could continue to deliver a tremendous amount of customer value through the Mac OS by increasing the company's investment in it. Unfortunately, the perception of Rhapsody as the replacement for the Mac OS continued, even in the face of actions and public statements that pointed to a stronger, not a weaker, Mac OS:

- In January, Apple shipped the interim Mac OS 7.6 release, which improved the operating system's performance and stability. The public liked it, and sales were considerably higher than expected.

- At the Apple Worldwide Developers Conference last May, Apple announced its "dual OS" strategy and proclaimed its continued commitment to the Mac OS. For example, Avie Tevanian, Apple senior vice president of software engineering, said, "The Mac OS is so important to moving our business forward. We have no plans for Rhapsody to replace the Mac OS any time soon." In addition, Apple's then-CEO Gilbert Amelio announced major Mac OS releases through mid-2000 and said, "The Mac OS will continue for years to come, and customers can migrate to Rhapsody at their own speed."

- My "Understanding Apple's Dual OS Strategy" article appeared on page 1 of the June issue of *Apple Directions*. At the beginning of that article, I wrote, "Let me state Apple's position as clearly as possible: *Rhapsody is not a replacement for the Mac OS; rather, both operating systems are part of a dual OS strategy.*" My July page 1 Strategy Mosaic reiterated the dual OS strategy and included the above two quotes by Tevanian and Amelio.

- In July 1997, Apple shipped the major Mac OS 8 release, which added major new features and generated record sales.

- Of course, Apple could not have created such a release as Mac OS 8 without a significant engineering staff to do the work. In my "Understanding Apple's Dual OS Strategy" article, I called attention to this fact, saying that "the number of Mac OS engineers is now six times greater than the number of Mac OS 7 engineers two years ago."

- At MACWORLD Expo/Boston in August, Steve Jobs called the Mac OS "an incredibly core asset" and added, "Apple is *about* the Mac OS. We're going to be doing other things, because we're creative people. But at the core, Apple is about the Mac OS, and all of the fears that I've heard from people that we're abandoning it are absolutely not true."

Mac OS and Rhapsody: How They Compare

The truth, stated simply, is this: The Mac OS is Apple's most important asset. It is both a brand and a product that its customers know and love. It meets the needs of millions of users every day. It has a tremendous installed base of users, products, services, and infrastructure. It is an asset that Apple is continuing to evangelize, improve, and keep healthy. It is the center of Apple's—and your—success.

Rhapsody, on the other hand, is an exciting new platform, but it isn't at the center of Apple's success. Industry history shows us that it takes more than a few years for developers and customers to adopt new technologies—developers must work them into existing product cycles and business plans, and the majority of customers wait for the verdicts of early adopters before buying into new technologies.

Developers and customers will adopt Rhapsody when it makes sense for them. Apple plans to listen to developer and customer feedback and improve Rhapsody in *whatever direction will maximize its success*. Having said that, it's also important to emphasize that Rhapsody includes exciting new features and technologies that will enable you to create compelling new solutions. Apple believes that Rhapsody solutions will drive the success of the Rhapsody operating system, not the other way around.

December Apple Directions Online

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

Right now, Apple intends to do what makes sense for Apple and its customers, and that means doing two things: standing solidly behind the Mac OS as its number-one operating system, and continuing to work on and promote the Rhapsody operating system.

Apple's Mac OS Strategy

You may not realize it, but Apple began revitalizing the Mac OS last year, long before it even decided to acquire NeXT—after all, Apple shipped Mac OS 7.6 in January 1997, and system updates don't happen overnight. In July, Apple continued this process with the wildly successful Mac OS 8 release, which had initial sales that exceeded Apple's expectations by a factor of 4 (1.2 million copies in its first two weeks).

The success of Mac OS 7.6 and 8 results from a fundamental and deliberate change, begun in 1996, in the philosophy that drives how Apple decides to improve the Mac OS. Apple decided to shift from delivering technology for technology's sake and, instead, to focus on delivering features that customers want—features that would add value immediately without requiring developer intervention. (Examples of such technologies are contextual menus and the Apple Data Detectors; expect to see more of these in Allegro, scheduled for the second half of 1998.)

Apple's current philosophy has focused on and will continue to focus on the following items:

- Increased performance
- Increased stability
- Enhanced user experience
- Tighter integration of the Internet into the Mac OS
- Addition of improvements to the Mac OS that enable it to meet customers' and developers' evolving needs

Does this philosophy work? Mac OS 8 customer satisfaction and record sales indicate that it does—and that Apple's recommitment to the Mac OS is the right move.

Mac OS 8.1 and Allegro

Apple is definitely on the right track with its Mac OS strategy, so expect future Mac OS releases to continue with that same strategy. Mac OS 8.1 (scheduled to ship before the end of 1997) is an interim release that will continue to improve the operating system as described above. The most visible improvements will keep the Mac OS current with

customers' and developers' needs; they include support for the HFS Plus volume format (to enable better usage of large hard disks), DVD and Universal Disk Format support (to support DVD hardware), and improvements to Macintosh PC Exchange (to support large and removable hard disks and to add read-only support for Windows 95 long filenames).

Allegro, the next major release of the Mac OS, is too far in the future to speak of specific technologies, but expect to see another jump in the evolution of the Mac OS comparable to that of the transition between Mac OS 7.6 and Mac OS 8.

Going Forward With Rhapsody

Rhapsody, which combines time-proven NeXT and Apple technologies with Apple's superior ease of use, promises to be an exciting new operating system. Apple encourages you to evaluate it, start developing software for it, and—if it makes sense for you—begin developing Rhapsody products. For the right developer with the right product, Rhapsody will immediately be profitable, but other product ideas will have to wait for the Rhapsody market to develop.

Rhapsody is a platform for developing and delivering server-based, workflow, and high-end desktop solutions for Apple's core markets (creative content and education). As it matures, Rhapsody will be attractive as a server operating system to customers in most Apple markets.

Rhapsody will also offer you development opportunities in such high-end desktop markets as publishing, pre-press, design, multimedia, web authoring, and higher education. The cross-platform capabilities of the Yellow Box APIs, together with leading Apple technologies—including QuickTime, the Enterprise Objects Framework (EOF), and WebObjects—

will make it possible for you to develop Power Macintosh- and Windows-compatible applications in enterprise, vertical markets, and other markets.

If you have an idea for a Rhapsody product that will be attractive to early Rhapsody users or that will offer a compelling reason for users to adopt Rhapsody, Apple strongly encourages you to pursue it. The Rhapsody group within Apple Developer Relations is committed to helping make developers with Rhapsody products successful. Initially, many Rhapsody products will have lower unit sales than Mac OS products—but even then, you can boost your sales by using Yellow Box for Windows to deliver your Rhapsody solution to Windows 95 and Windows NT customers.

Looking Back (From the Future)

Apple has undergone a year of tremendous upheaval, and it's survived—better yet, it has a much tighter focus than it had a year ago, as well as strong mid-course indications that its current strategy is working. Changes that began last year have only come to light with Mac OS 8, and changes that began earlier this year will appear soon—some by the end of the year, then on into 1998.

By 1999, you may be able look back at Apple's progress since 1995 and see a downward trend that bottomed in late 1996 and began reversing itself starting in the last half of 1997. Significant changes are still ahead, but I believe that they will build upon a solid foundation that is being established now.

Apple is working fiercely to reinvent itself, transforming its historical strengths in the context of today's reality. It is my hope that this effort will be successful, resulting in a stable Apple, vibrant OS platforms that will present many opportunities for developing exciting new products, and a much better business proposition for you. ♣

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Time to Test! Next Mac OS 8 Release Goes Beta!

The next release of Mac OS 8, version 8.1 (code-named "Bride of Buster"), has just gone beta and is due to be released before the end of 1997. It is extremely important that you test your products for compatibility with Bride of Buster, especially if they might be affected by any of the following technologies:

- Support for HFS Plus (which enables better usage of large hard disks)
- DVD and Universal Disk Format support (needed for DVD hardware)
- Improvements to Macintosh PC Exchange (which enables support for large and removable hard disks and adds read-only support for Windows 95 long filenames)

If you're not a member of an Apple Developer Program, you can become one by visiting <http://devworld.apple.com/worldwide/wwwprograms.html> or calling the Developer Support Center in the United States at 408-974-4897.

To receive this and other seedings, you must be registered for the Apple Technology Seeding Program. This is a free service to Apple Developer Program members—all you have to do is print out, sign, and mail an "Apple Seeding Projects Prototype License and Confidentiality Agreement (NDA)" form. For complete instructions and the NDA form, go to http://devworld.apple.com/seeding/software_seeding_FAQ.html.

Don't put this off—start testing your products with the beta version of Mac OS 8, version 8.1.



Apple Acquires Power Computing Assets

Apple announced in early September that it is acquiring Power Computing Corporation's core assets in a deal valued at \$100 million in Apple common stock. Included in the key assets Apple will acquire are the right to retain key employees with expertise in direct marketing, distribution, and engineering; Power Computing's customer database; and the license to distribute the Mac OS.

"Power Computing has pioneered direct marketing and sales in the Macintosh market, successfully building a \$400 million business," said Steve Jobs. "We look forward to learning from their experience and welcoming their customers back into the Apple family."

"Power Computing is grateful for the tremendous support and encouragement we have received from the entire Macintosh community," said Stephen Kahng, Power Computing founder and CEO. "We believe that in our small way, we have helped to make the Macintosh stronger, and that the spirit of Power will live on."

Power Computing will retain the Power Computing name and has stated it will sell Mac OS-based computers through December 31, 1997. Apple will provide ongoing Mac OS support to Power Computing customers, and Power Computing will continue to provide hardware and warranty service to its customers.



UMAX License to Include Mac OS 8

Apple has reached an agreement with UMAX Computer Corporation to bundle Mac OS 8 on UMAX computers under the general terms of UMAX's current licensing agreement with Apple. This license to UMAX for Mac OS 8 does not include the right to use Mac OS 8 on systems based on the Common Hardware Reference Platform, and is valid through July 1998.



Mac OS Upgrades for Power Computing and UMAX Customers

Through the Mac OS Up-To-Date program, Apple, Power Computing, and UMAX customers who buy qualifying Mac OS-based computers on or after June 22, 1997, may upgrade to Mac OS 8 for US \$9.95, plus applicable sales tax.

For program details, see the complete Apple press release at <http://product.info.apple.com/pr/press.releases/1997/q4/970915.pr.rel.macos.html>.



Apple Makes Mac OS Tools Available

Apple recently announced that it would begin distributing many of its Mac OS development tools, collectively known as the Apple Mac OS Development Toolkit, to members of Apple's developer programs worldwide as a benefit of membership. Among the tools to be included are the Macintosh Programmer's Workshop (MPW) development environment, the MacApp development framework, the MrPlus performance analysis tool for PowerPC processor-based applications, the Power Macintosh Debugger, and the SourceBug debugger for 680x0-based Mac OS applications. Many of these tools will be available on the Internet to ensure that anyone interested in developing for the Mac OS will have the necessary tools for doing so.

As a result of these changes, beginning October 31, 1997, the Apple Developer Catalog and the Apple Developer Catalog Online will no longer sell development tools. Third-party tools will continue to be available from a wide variety of sources: directly from tool vendors listed on the Mac OS Software & Hardware Guide (<http://www.macsoftware.apple.com>)

or through a number of resellers located around the world.

In addition to bundling its Mac OS tools as part of the Developer CD, Apple will also be licensing them to Mac OS tool vendors. Apple's first licensee of these tools is Metrowerks, which will be making them available to Apple developers worldwide as part of its CodeWarrior and Discovery Programming products.

If you are not currently a member of any of Apple's developer programs but would like to become one, visit the Developer World web site at <http://devworld.apple.com/worldwide/wwwprograms.html>.



Apple Decides Newton Will Stay

Citing the "tremendous potential" for the eMate 300, Apple confirmed in early September that it will not proceed with the spinoff of its Newton subsidiary. The eMate 300 has already achieved great success in education—one of Apple's key markets—and Apple believes that committing its resources to the eMate will strengthen the product's current appeal in the education market and enable the company to reach out to a broader audience. In addition to the eMate, the Newton group develops mobile computing products and licensable technologies.



Rhapsody Technical FAQ

Developers interested in keeping current with the technical details of the upcoming Apple operating system code-named *Rhapsody* should read the Rhapsody Technical FAQ document, which is posted on the web at <http://devworld.apple.com/rhapttechfaq.html>. Apple updates this set of web pages as new material becomes available.



Apple Introduces Internet Address Detectors

Apple recently announced the availability of Apple Internet Address Detectors (AIAD), a technology that makes it easier for Mac OS 8 users to manage and immediately perform actions on Internet addresses within documents. With AIAD, a user can select an Internet address within a document and use a contextual menu to perform a series of actions with that address—for example, launching a web browser and connecting to the selected web site. (Contextual menus constitute one of the new productivity features included with Mac OS 8.0.) You can download AIAD, free of charge, from <http://www.macos.apple.com/macos8/iad/>.



Mac OS Garners Praise as Best Java Development Platform

In late 1996, Apple stated its goals for its Java strategy, one of which was (and still is) to ensure that the Mac OS is the best platform for developing Java products. The comments of one Java developer, Dave Makower (coauthor of *Java Programming Basics*), imply that Apple has achieved that goal.

In the September 1997 issue of JavaWorld (an online magazine published by International Data Group), Makower wrote, "Roaster and CodeWarrior in particular are true high-quality IDEs [integrated development environments]. Nothing available on the PC or UNIX® platforms compares to either of these in terms of ease of use." Later, he talked about showing Java on the Mac OS to his coworkers (who use Linux, Windows 95, Windows NT, and Solaris): "The other day, we did a code walk-through, and they were amazed at how far the Mac user interface goes toward speeding the process of navigating through code."

These quotes come from the article "Four Mac-based IDEs Compared: Which Should You Choose?", which analyzes "the pros (great UI, ease of use) and cons (no JDK 1.1) of the Mac as a Java™ development platform." The issue also contains three informative articles on Java Beans, the Java component-software technology, so the issue is well worth checking out at <http://www.javaworld.com/javaworld/jw-09-1997/index.html>.



New Software and Documentation Releases

Here are some recent Apple releases that you may find of interest:

- *Mac OS Runtime for Java 1.5 SDK and MRJ 1.5 JIT Compiler for 680x0*. The web site <http://applejava.apple.com/> contains a link to a web page that allows you to download the newly released MRJ 1.5 Software Development Kit. If you click the image marked "Software," you can also get the 680x0 version of the MRJ 1.5 JIT (just-in-time) compiler, which was not included with the initial release of the MRJ 1.5 software.

- *Mac OS Extended Format (HFS Plus)*. The new Mac OS Extended Format (HFS Plus), is available through the seed release of "Bride of Buster," the code name for an upcoming version of Mac OS. The delivery of Mac OS Extended Format does not render the Mac OS Standard Format (HFS) obsolete—it's still required for floppy disks, small volumes, and CD-ROM discs. If you're an Apple Developer Program member, you can download this release after you've registered for the Apple Technology Seeding Program at http://devworld.apple.com/seeding/software_seeding_FAQ.html.

- *AppleShare Client 3.7.2, Seed 3*. This seed release, available at ftp://ftp-apple.net.apple.com/pub/appleshare/client_3.7.2f3c1.hqx, fixes a date problem with volumes mounted via aliases, and it includes fully localized clients. It also handles volumes greater than 4 GB on System 7.6 and later.

• *Language Kit Updater for Mac OS 8.* This kit, which you can download from ftp://ftp.info.apple.com/Apple.Support.Area/Apple.Software.Updates/US/Macintosh/System/Language_Kits/, updates the Arabic, Chinese, Cyrillic, Hebrew, Indian, Japanese, and Korean Language Kits to provide multilingual users with Mac OS 8 compatibility.



Power Macintosh 6500 Enhancements Include Mac OS 8

Apple's Power Macintosh 6500 systems will now include faster internal modems and CD-ROM drives, larger capacity hard drives, and Mac OS 8 system software. Targeted for the family and small office/home office (SOHO) markets, the new Power Macintosh 6500/300 Home Edition, 6500/275 Home Edition, and

6500/275 Small Business Edition feature a larger 6 GB internal hard drive, a faster built-in 24x-speed (maximum) CD-ROM drive, a 56-Kbps modem, and an internal 100 MB Zip drive. The Power Macintosh 6500/250 Home Edition features a 4 GB internal hard drive and no Zip drive. For pricing and configuration details, see the press release at <http://product.info.apple.com/pr/press.releases/1997/q4/970915.pr.rel.pm6500.html>.



Marketing Opportunity for MacDirectory Advertisers

MacDirectory Online, a global directory of Macintosh resources, wants to remind its advertisers that they can now update and submit information to be included in MacDirectory's online product and service databases at

any time. (Available on the web and in print, MacDirectory is accessed by over 300,000 potential customers each year.) You can register at these web sites:

- To register a service or a VAR: <http://www.macdirectory.com/pages/submitServ.html>
- To register a software product: <http://www.macdirectory.com/pages/submitSoft.html>
- To register a hardware product: <http://www.macdirectory.com/pages/SubmitHard.html>

In addition, MacDirectory, in collaboration with several leading employment agencies, has just established an extensive Macintosh job database available to employers looking for people with specific Macintosh-related skills. All job postings are available free of charge at this web site: <http://www.macdirectory.com/pages/jobs.html>. ♣

Technology

CD Highlights Tool Chest/Mac OS 8 Edition, November, 1997

Technology Feature Get Ready for Rhapsody!

Feature Debugging Tools and Techniques

CD HIGHLIGHTS

Tool Chest/Mac OS 8 Edition, November 1997

This month, we had so much material that we had to put it on two CDs. The Mac OS 8 CD contains all the localized versions of Mac OS 8.0 that were available this month. The Tool Chest CD contains a few nice tools (most notably, the Apple Information Access Toolkit, which makes large bodies of documents searchable), new Open Transport sample code, and the Apple Mac OS Development Toolkit (a collection of Apple-labeled development software).

Tool Chest CD, November 1997

Development tools, SDKs, documentation, interfaces, and sample code—what more could you want? Here are highlights of the Tool Chest CD.

Apple Mac OS Development Toolkit

As announced on page 4 of this issue, Apple is providing its premier Mac OS development tools to you on the Developer CD as a benefit of belonging to an Apple Developer Program. The Apple Mac OS Development Toolkit folder contains this month's tools, which include the Macintosh Programmer's Workshop (MPW) development environment, the MacApp development framework, the MrPlus performance analysis tool for PowerPC processor-based applications, the Power Macintosh Debugger, and the SourceBug debugger for 680x0-based Mac OS applications.

Apple Information Access Toolkit 1.0.1

The Apple Information Access Toolkit (AIAT) is an object-oriented information access engine that provides required capabilities for indexing, searching, and analyzing large volumes of documents. The AIAT, formerly known by its code name *V-Twin*, is a collection of tools that you can use separately or together to perform a variety of information access tasks. This code requires

Metrowerks CodeWarrior version 11 or Metrowerks CodeWarrior Professional version 1.

File Synchronization 1.1

The File Synchronization control panel allows you to set up and manage multiple copies of files in different folders. For example, if you maintain files on a mobile computer and copy those files to a desktop computer, you may find this control panel useful. It will automatically copy more recent files based on modification date, can display what will copy without actually copying it, and can run automatically or under user control.

Note: This tool is for developer use only and is not meant for the general public; do not distribute it to others. It works only on computers running Mac OS 8.

Virtual Reality Programming With QuickTime VR 2.0

This Adobe™ Acrobat™ file is the reference document for QuickTime VR 2.0. It includes both reference and tutorial material on the QuickTime VR Manager, Movie Controller, and File Format.

Interfaces&Libraries

This folder contains the latest versions of interfaces and libraries for 680x0 and PowerPC processor-based Macintosh development. This is the same set of files that was on the October SDK Developer CD but is included this month as a component of the Apple Mac OS Development Toolkit.

OpenTransport Sample Code

All of the following samples are featured in the latest release (version 1.2) of the book *Inside Macintosh: Open Transport*.

- GetSetOptions demonstrates a variety of uses of Open Transport's option management routines.

- ListMania demonstrates a variety of techniques for using Open Transport's list utility routines. Specifically, it shows how to use Open Transport LIFO lists in a simple producer/consumer application.

- NoCopyReceives demonstrates the use of no-copy receive operations under Open Transport.

- OTEndpointInfo demonstrates how to query an endpoint for its "vital statistic" using OTGetEndpointInfo. For your reference, it also prints that information for the most commonly used Open Transport endpoint types.

- OTLookupNameTest demonstrates the use of an NBP mapper to look up NBP entities on an AppleTalk network using Open Transport.

- OTSimpleDownloadHTTP demonstrates the easiest way to use Open Transport to download an HTTP site address (URL) from a web server.

- TransferProvider demonstrates how to use OTTransferProviderOwnership to transfer the ownership of an Open Transport provider (that is, an endpoint) between Open Transport clients. In this example, an endpoint is transferred between a shared library and an application that calls that shared library.

Mac OS 8 CD, November 1997

This CD contains localized versions of Mac OS 8.0 for Chinese (both traditional and simplified), Dutch, English (British), French (four versions: "plain," Belgian, Canadian, and Universal), German, Hangul/Korean, Italian, Kanji, Portuguese (Brazilian), Spanish, and Swedish.

—The Developer CD Team

Get Ready for Rhapsody!

First Widespread Delivery of Rhapsody to Developers

By Gregg Williams
Apple Directions *staff*

As I am writing this in late September, Apple engineers are a few days away from “freezing” the Developer Release of the Apple operating system code-named *Rhapsody*, and they expect it to be in developers’ hands by mid-October.

Since this is the first general release of Rhapsody to developers, it’s important for the developer community to understand what the Rhapsody Developer Release is and isn’t and how Apple will be supporting it. If you’re already scheduled to get the Rhapsody Developer Release or are considering getting it, read on.

Who Gets the Rhapsody Developer Release?

First, I want to make sure you understand how Apple is distributing the Rhapsody Developer Release. For you to receive the Rhapsody Developer Release, you must be a member of the Macintosh Developer Program or the Apple Media Program, *and* you must take the extra step of signing up for the Apple Technology Seeding Program. For details on joining an Apple Developer Program, go to <http://devworld.apple.com/worldwide/wwprograms.html>. For details on joining the seeding program, go to http://devworld.apple.com/seeding/software_seeding_FAQ.html; the form you need to sign is called the “Apple Seeding Projects Prototype License and Confidentiality Agreement (NDA).” For details on either program, you can also call the Apple Developer Support Center in the United States at 408-974-4897.

If you want the Rhapsody Developer Release and are not currently eligible to receive it, Apple will be making it available on an ongoing basis. So if you didn’t sign up in time for the initial distribution of the Rhapsody Developer Release, don’t panic—you’ll still be able to get it.

Rhapsody Developer Release

The Rhapsody Developer Release will be delivered in two packages. The first, scheduled for mid-October, will include the following components:

- Rhapsody (for PowerPC)
- The Rhapsody development tools
- Related documentation
- Some commercial-quality third-party Rhapsody applications

The second package, to be delivered in the first half of November, will include these components:

- Rhapsody for PC Compatibles (formerly known as *Rhapsody for Intel*)
- Yellow Box for Windows (both Windows 95 and Windows NT)
- Related documentation

The purpose of the Developer Release is twofold. First, it will give you your first opportunity to learn about the Rhapsody operating system and the Yellow Box architecture. You should use this release to start exploring possibilities for commercial Rhapsody applications; you will use the Premier Release and later releases to produce useful applications. Second, Apple hopes to get extensive feedback from you about what you like and don’t like about this preliminary implementation of Rhapsody and what you would like to see it include; Apple intends to use this feedback to improve Rhapsody, with changes showing up starting in the Rhapsody Unified Release.

To make the best use of the Rhapsody Developer Release and give Apple the most useful feedback, you need to understand what the release is and isn’t. That’s what the next two sections are about.

What It Is

The good news is that in the Rhapsody Developer Release, Apple is delivering a lot more than it expected to when the release was announced last January. Apple’s stated goal was to get the functionality of OPENSTEP 4.2

for Mach ported to the PowerPC processor and into developers’ hands as soon as possible. In parallel with this porting effort, other Apple engineers were able to add a number of things that add to the value of the Rhapsody Developer Release:

- The Mac OS 8 “platinum” human interface (which is only a starting point for the first full implementation of the Rhapsody human interface)
- The ability to write Rhapsody applications using the Java programming language (implemented using early versions of the Java Virtual Machine plus and the Java APIs for the Yellow Box)
- Lots of good sample code
- Some new Application Kit classes written for Rhapsody
- Impressive third-party Rhapsody applications (mentioned earlier)

What It Is Not

To make the best use of the Rhapsody Developer Release, you also need to know what’s been left out—that way you don’t waste your time giving Apple feedback that’s not useful.

First, the Rhapsody Developer Release is not meant for exercising traditional Mac OS APIs. It does not include many of the key Apple technologies that are scheduled to appear eventually in Rhapsody—in particular, QuickTime, QuickTime VR, QuickDraw 3D, ColorSync, AppleScript, QuickDraw GX typography, the Apple Information Access Toolkit (text search engine), and the HFS Plus volume format.

Second, it is not ready for daily use by customers. This means you should use it for learning and experimentation for software development purposes but not for critiquing the user experience.

Third, this release is not performance-tuned. Apple engineers will continue improving Rhapsody’s performance in future releases.

Fourth, this release is not intended for device-driver developers. The Rhapsody

device driver model is scheduled to appear in the Rhapsody Unified Release.

Supported Configurations

The Rhapsody Developer Release will not work on all PowerPC processor-based computers. The reasons for this are technical, but they boil down to the fact that different computers use different versions of the PowerPC processor (with slightly different instruction sets) and different interface chips. These differences require additional coding and testing, both of which take engineers' time. To deliver this release sooner to the development community, Apple had to limit the number of models it supports. Later Rhapsody releases will support more models.

Originally, the Rhapsody Developer Release was to support only the Power Macintosh 8500 and 8600 systems. Last May, after listening to developers' feedback at the Apple Worldwide Developers Conference, Apple announced that the Rhapsody Developer Release would also support the Power Macintosh 9500 and 9600 models that used an Apple-supplied video card. Here are the systems that existed at that time, and that are therefore officially supported:

- Power Macintosh 8500/120, 8500/132, 8500/150, 8500/180
- Power Macintosh 8600/200
- Power Macintosh 9500/120, 9500/132, 9500/150, 9500/180, 9500/180MP, 9500/200
- Power Macintosh 9600/200, 9600/200MP, 9600/233

(The multiprocessor models listed above will support the Rhapsody Developer Release but will make use of only one processor.)

In August, at MACWORLD Expo/Boston, Apple introduced a new series of Power Macintosh 8600 and 9600 systems. These systems are not officially supported by the Rhapsody Developer Release. However, Apple Developer Relations has been working closely with the Rhapsody team on this issue and it now appears likely that there can be full support for these new systems with no delays to the schedule. If Apple determines at any point that this is not possible, Apple Developer Relations will let you know so you can factor that into your new purchase decisions.

A computer running the Rhapsody Devel-

oper Release should have a minimum of 32 MB of memory (64 MB strongly recommended) and a hard drive at least 1 GB (gigabyte) in size (2 GB recommended). Apple recommends that you use the entire hard drive for Rhapsody, which means you will need an external 1 GB (or larger) hard drive if you wish to run both the Mac OS and Rhapsody on the same computer. (It is possible, but not recommended, to run both the Mac OS and Rhapsody on a sufficiently large drive that is partitioned.) The Rhapsody Developer Release will support removable media drives (including Iomega Jaz and Syquest), but they will act as nonremovable hard disks. Be sure to read the detailed installation and configuration notes that come with the Rhapsody Developer Release before installing it.

Developer Support

With the Rhapsody Developer Release, Apple wants you to get serious about learning how to develop Rhapsody applications. To help you accomplish this, Apple has recruited a team of Developer Technical Service (DTS) engineers whose sole focus is to provide support to Rhapsody developers. In addition, Apple will be offering two kinds of Rhapsody support to ensure that you have as productive an experience as possible: up-and-running support and code-level support.

Up-and-running support is something new for Apple because, normally, Apple-branded computers don't need it! (Eventually, Rhapsody for PowerPC won't, either—but this is, after all, a development release, and the Mach kernel underneath is still, shall we say, untamed. Apple expects the installation experience to be much better for the Premier and later releases.) Up-and-running support will be available for developers who might find they need help while installing or configuring the different Rhapsody versions included in the Rhapsody Developer Release: Rhapsody (for PowerPC), Rhapsody for PC Compatibles, and Yellow Box for Windows.

In addition, Apple will provide its usual e-mail developer support for code-level technical Rhapsody questions. This support will be available under the same terms that you're used to as a member of an Apple Developer Program. (In the United States and Canada,

for example, Macintosh Partners get questions answered for free. Macintosh Associates pay \$50 per question, while Macintosh Associates Plus members get ten free questions per year, then pay \$50 per additional question.)

Finally, Apple will also distribute Rhapsody support materials through the Developer World web site (<http://devworld.apple.com/>).

Online Documentation

The Rhapsody Developer Release includes both online and Adobe Acrobat versions of all the Rhapsody documentation (including the two excellent books *Discovering OpenStep: A Developer Tutorial* and *Object-Oriented Programming and the Objective-C Language*, which should be the first Rhapsody books you read). But when you start writing your first Rhapsody program, you won't want to switch to the Adobe Acrobat Reader program every time you want to look something up.

Fortunately, the Rhapsody Developer Release contains searchable online documentation that you can reference while you're in Project Builder (the application in which you write your code). You can entirely search both your application's code and the full Rhapsody documentation for any class name, method name, or arbitrary string. (For more details, see "Using the Rhapsody Documentation" on page 10 of the October 1997 issue of *Apple Directions*.)

Apple engineers are now working on further improvements that will appear in future versions of Rhapsody online documentation. In the Rhapsody Premier Release and later releases, Apple plans to replace the Developer Release documentation with a searchable HTML documentation system that can easily be localized or extended by anyone.

Beyond the Rhapsody Developer Release

As previously announced, Apple will ship the Rhapsody Premier Release in early 1998 and the Rhapsody Unified Release in mid-1998. The Rhapsody Unified Release will be the first full release of Rhapsody suitable for end users, but that will be just the beginning: Apple plans to continue improving Rhapsody after the Rhapsody Unified Release.

The Rhapsody Premier Release deserves some discussion. It will still meet its objectives

(as described in a January 1997 Apple press release): “[This release] is intended for early adopters of new technology. . . Plans include an evolution of the Mac OS appearance. . . [It will] enable new software applications to run in a fully preemptive and protected environment and will have limited compatibility with Mac OS applications.” The Rhapsody Premier Release is expected to include the Rhapsody “Blue Box,” which will enable users to run most Mac OS software that does not directly manipulate the underlying hardware.

Apple has aggressively moved to a system of schedule-driven releases. This means that Apple includes only those technologies and features that it can while still meeting the schedule as originally announced; technologies and features that are not ready in time for a given release become candidates for the next release. The successful, on-time releases of Mac OS 7.6, 7.6.1, and 8.0 prove that the schedule-driven approach is the correct one: Customers, developers, and Apple itself benefit from Apple delivering its software on a known, credible schedule.

As a result of this change in Apple’s software-delivery philosophy, it has become obvious that the Rhapsody Premier Release as delivered will be somewhat different from Apple’s original conception of it. Apple now

expects that the Rhapsody Premier Release will be very similar in features and appearance to the Rhapsody Developer Release, but with sufficient quality for an end-user release. The new volume format (known as HFS Plus or *Sequoia*) is now planned for the Rhapsody Unified Release, and additional technologies will be added as soon as they can be integrated into Rhapsody.

What You Can Do Now

If you’re interested in developing Rhapsody applications, you should install the Rhapsody Developer Release and write your first Rhapsody applications. After you do that, you should send Apple your feedback. (General feedback on the Rhapsody Developer Release—what you like and don’t like, what Rhapsody must include for you to be interested in using it—should go to rhapsody-dev-feedback@apple.com.) Also, be sure to read “Using the Rhapsody Documentation,” on page 10 of the October 1997 issue, for tips on how best to get started learning Rhapsody.

When you are explaining the Rhapsody operating system to coworkers or management, show them the third-party applications that are included with the Rhapsody Developer Release. These applications concretely demonstrate—in a way that no amount of talk

can do—that you can use Rhapsody to create powerful, real-world applications. Be sure to add that the object-oriented design of the Yellow Box toolbox makes development faster and easier, and that suitably designed applications can be deployed on multiple platforms, including Windows 95/NT. You can also use the Process Manager to “kill” one of several running applications, thus demonstrating Rhapsody’s full preemptive multitasking.

You may want to join the `rhapsody-dev` mailing list, which is intended “as a forum for those interested in developing software for Rhapsody to make progress toward that goal.” To join this mailing list, send e-mail to listproc@omnigroup.com. In the body of the message, type “subscribe rhapsody-dev <your full name>”. (You can find more details about this mailing list at <http://www.omnigroup.com/MailArchive/rhapsody-dev/>.)

Finally, you can keep current with late-breaking Rhapsody news by visiting the Developer World Rhapsody News page, at <http://devworld.apple.com/rhapsody.html>, and by reading Apple Developer News. (To subscribe, send e-mail to requests@thing1.info.apple.com, with the message “subscribe adirections” in the body of the message.) ♣

FEATURE

Debugging Tools and Techniques

By *Brian Bechtel*
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Editor’s note: As you can imagine, Brian gets a lot of questions about how to debug software—and he’s found that a lot of developers aren’t aware of all of the tools and resources that are available to help them do their jobs. The following article is adapted from a list of debugging tools and techniques that Brian often sends out to beginning programmers. Even if you’re an experienced programmer, there may be something here you don’t know about.

A good place to start in your debugging efforts is to look for problems with uninitialized pointers and handles. You should consider

installing the various debugging tools on the Tool Chest Developer CD. Two of the debugging INITs on the Tool Chest Developer CD are `EvenBetterBusError` (which checks for writes to location 0) and `DisposeResource` (which checks for double disposing of a handle or pointer). `MineField`, available from <http://www.spies.com/greg/tools.html>, checks for uninitialized pointers and handles. See the accompanying documentation for each of these INITs for details on how to use them.

Apple does not officially recommend third-party products, but you may want to investigate some of the development tools listed below. (The quoted description of each tool comes from the owning company’s description of the product.) In addition, Seapine Software maintains a list of Mac OS testing and quality control tools as a service to the devel-

oper community. You can find this list at <http://www.seapine.com/qclinks.html>.

- *QC by Onyx Technology.* “QC is a control panel/extension that adds the ability to stress test applications for runtime, memory related errors. QC can be used during development, during testing by in-house and beta testers, and after the product ships (although a little late if errors are detected) by end users to evaluate the stability of a software package.” For further details, see the web page at <http://www.onyx-tech.com>.

- *Spotlight by Onyx Technology.* “Spotlight is a stand-alone debugging aid that performs memory protection (arrays, heap accesses, outside your heap, low mem, etc), discipline checking on toolbox calls, and leak detection.” See the web page at <http://www.onyx-tech.com>.

- *Memory Mine by Adianta*. “The Memory Mine is a stand-alone tool for monitoring heaps and stress-testing applications (Purge, Compact, and Zap, as well as on-the-fly Memory Allocation). Heap corruption is flagged when it happens; memory leaks can be seen as they occur.” See the web page at <http://www.adianta.com>.

- *The Debugger by Jasik Designs*. This powerful debugger has an arcane interface, but it contains many features not found in competing debuggers. “Soft MMU for PowerPC applications enforces Bounds checking to ensure that they do not reference memory outside of ‘their’ heap zone. [The Debugger includes] sophisticated error check algorithms such as Trap Discipline (argument checking), Handle Zapping, Heap Scramble and Heap Check—to detect program errors before they become disasters.” See the web page at <http://www.jasik.com>.

- SmartHeap by MicroQuill. “SmartHeap is a runtime malloc/new replacement library that is faster than compiler-supplied mallocs. . . In addition to providing better performance, SmartHeap includes a debugging version of its malloc/new library. Because SmartHeap implements and manages this self-validating heap, it can detect bugs other tools miss, including leakage, overwrites, underwrites, double-frees, wild pointers, invalid parameters, out of memory conditions, references to previously freed memory, and so on. All interaction with the debugging library is via APIs—there is no user interface.” See the web page at <http://www.smartheap.com>.

- *HeapManager and HeapBoss by Biit, Inc.* “HeapManager is a memory allocator library and heap debugging tool for Macintosh C and C++ applications developed with Metrowerks CodeWarrior. The memory allocator is from 12 to 150 times faster (PPC version)

than those supplied by Metrowerks. It also works smoothly with large numbers of allocations (100,000 or more). The debugging library provides a heap checking and validation API, which can help find many kinds of pesky bugs that would otherwise go unfound.” See the web page at <http://www.biit.com>.

Finally, here is a list of Technotes, magazine articles, and books that contain valuable tutorial and reference information related to debugging Mac OS software:

- Q&A PT 19, “Using MacsBug to Diagnose Field Problems,” Dev.CD Sep 97 RL:Technical Documentation:Macintosh Technical Q&As:qa:plat:plat19.html. This document is also available at <http://devworld.apple.com/dev/qa/plat/plat19.html>.

- Technote TN1011, “Understanding No FPU and Type 11 Errors on Power Macintosh Computers,” available on the Reference Library edition of the Developer CD. On the September 1997 Reference Library CD, the file is at Dev.CD Sep 97 RL/Technical Documentation/Macintosh Technical Notes/technotes/tn/tn1011.html. This document is also available at <http://devworld.apple.com/dev/technotes/tn/tn1011.html>.

- *How to Write Macintosh Software*, 3rd edition, by Scott Knaster (Addison-Wesley, 1992), ISBN 0-201-60805-7.

- *Debugging Macintosh Software with MacsBug*, by Konstantin Othmer and Jim Straus (Addison-Wesley, 1991), ISBN 0-201-57049-1.

- *MacsBug Reference and Debugging Guide*, Apple Computer (Addison-Wesley, 1991), ISBN 0-201-56767-9.

- “Tips and Tricks for MacsBug,” by Michael Crawford, at <http://www.scruznet.com/~crawford/Computers/macsBug.html>.

- “Getting Results With MacsBug,” by Jeff Turnbull in *MacTech* magazine. This is a two-part article, starting in the September 1991 issue (Vol. 7, No. 9). It is also available at the following locations: <http://www.mactech.com/Articles/Vol.07/07.09/MacsBug-results/text.html> and [http://www.mactech.com/Articles/Vol.07/07.09/MacsBug-results-2/text.html#MacsBug-results-\(Part-2\)](http://www.mactech.com/Articles/Vol.07/07.09/MacsBug-results-2/text.html#MacsBug-results-(Part-2)).

- *develop* Issue 8, “Macintosh Debugging: A Weird Journey into the Belly of the Beast,” by Bob Johnson and Fred Huxham; also available at <http://devworld.apple.com/dev/techsupport/develop/issue08toc.shtml>.

- *develop* Issue 13, “Macintosh Debugging: The Belly of the Beast Revisited,” by Fred Huxham and Greg Marriott; also available at <http://devworld.apple.com/dev/techsupport/develop/issue13toc.shtml>.

- *develop* Issue 22, “Balance of Power: MacsBug for PowerPC,” by Dave Evans and Jim Murphy; also available at <http://devworld.apple.com/dev/techsupport/develop/issue22/balance.html>.

- *develop* Issue 26, “Sleuthing Through Your Code,” by Dave Evans; also available at <http://devworld.apple.com/dev/techsupport/develop/issue26/balance.html>.

- *develop* Issue 27, “Balance of Power: Stalking the Wild Defect,” by Dave Evans; also available at <http://devworld.apple.com/dev/techsupport/develop/issue27/balance.html>.

- A listing of the MacsBug 6.5.2 commands, formatted by Thomas R. Kimpton, is at <http://www.ambrosiasw.com/~dnebing/macsBug.html>. (This is the same information as you would get if you entered the “help” command in MacsBug. You can find the latest version of MacsBug at the following FTP site: ftp://ftp.apple.com/devworld/Tool_Chest/Testing_-_Debugging/Debuggers_-_dcmds/.)♣

Internet Resources

News

- Information on joining Apple's developer programs—<http://devworld.apple.com/worldwide/wwprograms.html>
- Registration for the Apple Technology Seeding Program—http://devworld.apple.com/seeding/software_seeding_FAQ.html
- Press release on Mac OS Up-to-Date program—<http://product.info.apple.com/pr/press.releases/1997/q4/970915.pr.rel.macos.html>
- Mac OS Software & Hardware Guide—<http://www.macsoftware.apple.com>
- Rhapsody Technical FAQ—<http://devworld.apple.com/rhaptechfaq.html>
- Internet Address Detectors—<http://www.macos.apple.com/macos8/iad/>
- September 1997 issue of JavaWorld—<http://www.javaworld.com/javaworld/jw-09-1997/index.html>
- MRJ 1.5 SDK download link—<http://applejava.apple.com/>
- AppleShare Client 3.7.2, Seed 3—ftp://ftp-apple.net.apple.com/pub/appleshare/client_3.7.2f3c1.hqx
- Language Kit Updater for Mac OS 8—ftp://ftp.info.apple.com/Apple.Support.Area/Apple.Software.Updates/US/Macintosh/System/Language_Kits/
- Press release on Power Macintosh 6500 systems—<http://product.info.apple.com/pr/press.releases/1997/q4/970915.pr.rel.pm6500.html>
- Service, software, and hardware registration for MacDirectory Online—<http://www.macdirectory.com/pages/submitsoft.html>, <http://www.macdirectory.com/pages/submitHard.html>
- MacDirectory job postings—<http://www.macdirectory.com/pages/jobs.html>
- Apple Developer News subscriptions—<http://survey.info.apple.com/subscribe/subscribe.html>

Technology

- Apple Technology Seeding Program—http://devworld.apple.com/seeding/software_seeding_FAQ.html
- Developer World—<http://devworld.apple.com/>
- Rhapsody Developers mailing list—<http://www.omnigroup.com/MailArchive/rhapsody-dev/>
- Developer World Rhapsody News page—<http://devworld.apple.com/rhapsody.html>
- See also the Internet links related to debugging in "Debugging Tools and Techniques," on page 10.