*The Developer Business Report* *June 1994*

# AppleDirections

## Inside This Issue



## Apple News

# Apple Adds PowerPC to Workgroup Servers

On April 25, Apple Computer, Inc., announced another step in its transition to a full PowerPC product line with the introduction of the new Workgroup Server 6150, 8150, and 9150 computers. These new servers—all based on the PowerPC 601 microprocessor—offer customers high performance, excellent compatibility with existing Motorola 680x0-based applications, and the promise of increasing performance as more applications are converted to run in PowerPC native mode.

These new Workgroup Servers were designed to meet the rigorous demands of server environments, including features such as second-level caching (to boost performance), a responsive service and support program, large data-storage capacities, and protection of stored data through RAID (Redundant Array of Independent Disks) and backup software. In addition, many new customers will find these servers more attractive for use in mixed workgroups that include Apple Macintosh, DOS, and Windows-based PCs.

When running new versions of application and server software optimized for PowerPC, the new Workgroup Servers offer two to four

*please turn to page 8*

## Strategy Mosaic

# Active Assistance in the Macintosh Interface

### Scriptable Applications and Apple Guide Are Essential

*By Gregg Williams,* Apple Directions *staff*

There are moments—both good and bad—that crystallize everything, *everything* you and your company have done in the past few years. The best is when a customer says, "I *love* your program! I can't tell you how much work it saves me." And even if she describes your program's virtues for ten minutes longer than you really want to listen, even that is a compliment—and, deep in your bones, you realize that your decisions were good ones and your hard work was justified.

And then there are those other moments. Your customers are flooding your support staff with needless questions. They aren't using your product's best features. Worse yet, you see someone in a store put your product back on the shelf and walk away with your competitor's.

All these moments answer the same question: *Did you give your customers what they need to be successful at their work?*

*please turn to page 5*

AppleDirections

**Volume 2, Number 6**

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

**Editor**
Paul Dreyfus (AppleLink: DREYFUS.P)

**Technical Editor**
Gregg Williams (GREGGW)

**Business & Marketing Editor**
Dee Kiamy (KIAMY)

**Designer**
Robert Stone

**Production Editor**
Lisa Ferdinandsen (LISAFERD)

**Contributors**
Juan Bettaglio, Pete Bickford, Pat Calderhead, Alex Dosher, Kris Newby, Caroline Rose, Anne Szabla, Jessa Vartanian

**Manager, Developer Press**
Dennis Matthews

**Manager, Developer Support Information**
Greg Joswiak

**Production Manager**
Diane Wilcox

**PrePress/Film**
Aptos Post

**Printer**
Wolfer Printing Co., Inc., Los Angeles, CA

© 1994 Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408-996-1010. All rights reserved.

Apple, the Apple logo, APDA, AppleLink, AppleShare, AppleTalk, A/UX, HyperCard, MacApp, Macintosh, Macintosh Quadra, MacTCP, MPW, Newton, and PowerBook are trademarks of Apple Computer, Inc., registered in the U.S. and other countries. Apple Guide, AppleMail, Apple Restore, AppleScript, AppleSearch, Code Warrior, ColorSync, develop, DocViewer, Dylan, Finder, OpenDoc, Performa, PlainTalk, PowerBook Duo, PowerShare, PowerTalk, QuickDraw, QuickTime, SNA•ps, TrueType, and WorldScript are trademarks of Apple Computer, Inc. Adobe, Photoshop, Type Manager, and PostScript are trademarks of Adobe Systems Incorporated, which may be registered in certain jurisdictions. Classic is a registered trademark licensed to Apple Computer, Inc. PowerPC is a trademark of International Business Machines Corporation, used under license therefrom. Windows is a trademark of Microsoft Corporation and SoftWindows is a trademark used under license therefrom. UNIX is a registered trademark of UNIX System Laboratories, Inc. All other trademarks are the property of their respective owners.

Mention of products in this publication is for informational purposes only and constitutes neither an endorsement nor a recommendation. All product specifications and descriptions were supplied by the respective vendor or supplier. Apple assumes no responsibility with regard to the selection, performance, or use of the products listed in this publication. All understandings, agreements, or warranties take place directly between the vendors and prospective users. Limitation of liability: Apple makes no warranties with respect to the contents of products listed in this publication or of the completeness or accuracy of this publication. Apple specifically disclaims all warranties, express or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

**Special Report**

# Apple Directions for 1994

It's direction-setting time at Apple. As I write this in late April, folks are scurrying around and working late, getting ready for this year's Worldwide Developers Conference (WWDC). You see, *Apple Directions* and the WWDC are a lot alike: We share the purpose of communicating Apple's strategic, technical, and business directions so that you can set yours accordingly.

A big part of WWDC planning takes place at the highest levels of Apple Computer, Inc., as the company's leaders determine key messages for the coming year to be communicated at the conference. It's their once-a-year opportunity to speak directly to the 3,000 or so of you who attend the conference, to get you excited for another year of developing Macintosh and, now, Newton products.

To find out what those messages are, we polled a variety of Apple executives and top managers. Their statements, which follow, fill the space normally occupied by my Editor's Note and IndustryWatch. For those of you who couldn't attend, you can look at these statements as a "mini-keynote address" that sums up many of the ideas and messages communicated at the conference. For those of you who came to San Jose for the conference this year, this is a take-away to share with the folks at home. (In fact, some of you are probably reading this during a break from the WWDC sessions, since we're handing this month's issue out at the conference. If you are, we hope you're enjoying it!)

Whether you attended the conference or not, the statements that follow contain many of Apple's key messages to you for the coming year. As usual, *Apple Directions* will continue to flesh out these messages, so that you know not just what they mean to you and how they can benefit your business, but also what you can do about them.

*Paul Dreyfus*
*Editor*

### Ike Nassi, Vice President and Director of Development Products Group: Tools That Make You More Productive

Writing software is hard work. Making money or satisfying users with software is even harder. Apple's job is to increase the opportunities for you to be successful in developing software through a comprehensive and innovative set of tools. These tools must address a range of needs, from those of developers writing components and applications to those of consultants creating unique software solutions. You also need a range of tools choices from both Apple and third parties.

At the same time that we're trying to meet these immediate needs, we're also looking ahead to create tools that create breakthroughs in programmer productivity. We're also committed to easing the task of creating cross-platform applications. To meet these needs, Apple provides tools in three focus areas: core tools, application architectures and frameworks, and solution tools.

In the area of core tools, Apple will continue to improve the Macintosh Programmer's Workshop (MPW), and we are also working with key tools vendors, including Symantec, Metrowerks, Absoft, Language Systems, ACI US, and others, to create a greater choice of compilers and programming tools. By developing fundamental tools technologies, such as compilers, linkers and debuggers, and making them available to our partners, we're encouraging greater third-party tool development. This effort will enable you to choose the tools that fit your needs and style of working.

In addition to our strong continued commitment to C and C++, we're also working on Dylan, a new object-oriented dynamic programming language that provides a dramatic increase in programmer productivity while at the same time allowing for the delivery of small, fast applications. Apple is developing a leading-edge, breakthrough development environment to support this language featuring incremental

development and advanced customizable browsing. Dylan also has the ability to interact with existing C and C++ code and APIs, allowing you to move to Dylan at your own pace. You will be hearing more about Dylan in the coming months.

For the many of you who have based your products on the MacApp application framework, we have released MacApp 3.1 so that you can take your existing source-code investment into the future with Power Macintosh. And MacApp 3.5, currently under development, will give existing products entry into the component software world of OpenDoc (via OpenDoc container support) and add support for other key technologies, such as AppleScript and AOCE.

Today there is widespread recognition that software applications need to become simpler. Users now need to cut and paste between various applications to create a single document—a cumbersome and error-prone process. Too often, people must focus on the applications they're using rather than the task they're trying to accomplish.

At the same time, developers continue to add more features to software, making it increasingly complex. It's difficult for developers to bring products to market quickly, maintain the product, and innovate.

OpenDoc offers an alternative to the status quo. This technology will enable software developers to create software that is made up of component "parts." Component software will provide users with true software integration, which will allow them to create custom software that focuses on what they're working on. For developers, component software will open the software industry to innovation by making it easier and less expensive to bring new products to market.

Added to this will be the OpenDoc Parts Framework, or OPF. With it, you'll be able to create OpenDoc parts faster and more easily. It's a cross-platform parts framework, producing parts for both Macintosh and Windows component software.

We're also providing useful tools for those of you who provide solutions directly to end-users. HyperCard 2.2 and AppleScript are complementary tools that provide unprecedented productivity for consultants, educators, in-house developers, and power users. We expect the next version of HyperCard to run in native mode on Power Macintosh computers; the next release of the AppleScript Scripter's Kit, available now, includes a scriptable version of the Finder.

At this year's Worldwide Developers Conference, Apple will be highlighting these and other key tools and technologies. In the months that follow, we'll keep you informed about opportunities for you to take advantage of the tools and technologies to make your development tasks easier and make you more productive.

• • •

**Ian Diery, Vice President and General Manager, Personal Computer Division: The Power Macintosh Opportunity**

When Apple introduced the Power Macintosh computer on March 14, we pointed out that powerful technology is only useful to the extent that it helps people solve real problems and take advantage of real opportunities. We also said that the advent of RISC-based computing was about much more than feeds and speeds—that Power Macintosh would be the enabler to entirely new classes of applications that would, in turn, translate into tangible solutions for customers.

Understandably, the key element determining the success or failure of the Power Macintosh is the volume and nature of developer support for the platform. And that while running existing applications in emulation is crucial, the more important area is the realm of optimized applications.

Thanks to the joint efforts of Apple Computer and the developer community, we're well on our way to creating a wide array of solutions for Power Macintosh customers. In fact, as of late April, over 70 optimized—or *native*—applications for the Power Macintosh computer were shipping, including industry leaders like Adobe™ Photoshop, Fractal's Design Painter, Insignia's SoftWindows™, and WordPerfect. *[Editor's note: See page 11 for a complete list of shipping native Power Macintosh applications.]*

On top of that, I've recently learned that several previous Windows- or UNIX®-only developers from financial and engineering environments are joining the Macintosh community of developers and are actively porting their programs to the Power Macintosh platform.

But there is even greater cause for optimism regarding Power Macintosh developer opportunities. First, the power of the new RISC-based platform offers you the opportunity to upgrade your current base of users to more powerful—optimized—versions of your software applications. And, second, given the impressive ability of the Power Macintosh computer to run DOS/Windows applications (using Insignia's SoftWindows), you now have the means to reach an entirely new population of users.

Apple looks forward to the continued support from the entire developer community for the Power Macintosh computer, and to how we can, together, help more individuals and institutions get more out of their investments in information technology than ever before.

• • •

**Don Norman, Apple Fellow and AppleSoft User Experience Architect: Revolutionizing the User's Experience**

Apple is starting to make rapid, exciting advances in the user experience of our products. System 7.5 is the beginning. *[Editor's note: See this month's story on System 7.5 in the Technology section, beginning on page 13.]* The next system release is a major step forward. And the one after that will be even more revolutionary. Moreover, we intend to do this with full protection of our established base and with full consideration of our developer community: evolutionary revolution, we call it.

The current Macintosh user interface, the world standard for GUI (graphical user interface) and direct manipulation, is ten years old. It doesn't scale well for many of the exciting new directions in personal computing. Think of the current systems as being reactive: You have to do everything yourself, and the systems react in appropriate ways.

The next step is toward active user interfaces: No longer need the user do every step. Just ask, and the actions get done. *[Editor's note: If you haven't already done so, see this month's Strategy Mosaic on page 1.]* After that, we move toward even better, smarter, more accommodating interfaces: We have very exciting plans. As we add more power, as we move toward an even stronger user-centered approach, we will not discard what

has gone before. Our GUI is still the world's best for many operations, and so this mode of working will always be available. However, as we make our most major advances, we will be counting on the powerful computing environment made possible with the Power Macintosh computer, whose RISC architecture and power enables a whole new class of user experience.

What basic technologies should you, our developers, work with? These are the three critical ones:

• *OpenDoc.* This will be fundamental to all our advances. OpenDoc focuses on tasks, not applications. The massive, overwhelming menu structure and pallets of today's large applications will no longer exist. Now we can have task-specific tools, documents, and stationery. This will let users stop focusing upon their applications and, instead, focus on their tasks and on being creative and productive and having fun.

Because OpenDoc is modular and object-oriented, you can start to build a lot of task-specific intelligence into your documents and parts. Spelling checkers and paintbrushes are obvious OpenDoc parts. But think big: Think of calendar parts, appointment-making parts, bill-paying parts, and so on. Think of your customers' everyday tasks, and make intelligent documents and parts that fit their work patterns.

• *AppleScript.* A task that might require many individual steps in today's GUI, direct-manipulation environment could be done in one step through scripting—but only if your applications and OpenDoc documents and parts are fully scriptable. Make it so. *[Editor's note: See both Strategy Mosaic and the System 7.5 article for more on AppleScript.]*

• *Apple Guide.* This is a lot more than a help system. It can also be a stand-alone application, helping your customers with their task-specific problems. This is a real developer opportunity. Moreover, Apple Guide can be the home for all those special-purpose scripts you are developing: They can be launched through Apple Guide. Think big. Your creative imagination can lead you to some very exciting possibilities.

These three technologies—OpenDoc, AppleScript, and Apple Guide—are key to all our future operating-system releases. These are not isolated technologies: They form a cohesive important package.

• • •

**John Floisand, President, Apple Pacific: New Pacific Markets**

We're very fortunate to have so many talented developers working on the Macintosh platform. The next year looks to be an exciting one for Apple and especially for my division, Apple Pacific.

The Pacific region encompasses Australia, Japan, Canada, the Far East, and Latin America. Many of you are among the 1500 developers with products in Japan, where this year Apple became the number two vendor in the PC market. We expect our growth in Japan to continue, as we plan to aggressively go after the education market—an untapped opportunity.

In the past year, we opened offices in Beijing, China, and New Delhi, India. Both markets represent new opportunities for Apple and for you—the application developer. We all know well that in order for customers to get the most out of their Apple products, they need localized software running on the Macintosh platform. Hence, we need you and your terrific applications!

Apple Pacific is the fastest growing geography at Apple, and we welcome your interest in developing and localizing products for our markets. For more information on developer opportunities in the Pacific, please contact Linda Shiozaki at AppleLink address SHIOZAKI.

• • •

**Doug McLean, Director of Marketing, LAN Systems, Apple Business Systems: Opportunity for Cross-Platform, Client-Server Solutions**

Apple entered the branded server business one year ago. The Workgroup Server family has been enthusiastically embraced by Apple customers. They've met with particular success in the education, professional publishing, and small-business markets. We recently announced three new PowerPC processor–based Workgroup Servers that exhibit the same compatibility and performance advantage as the Power Macintosh systems. Apple's success in meeting the server needs of the Macintosh-dominated local area network (LAN) market has set the stage for us to address the client-server computing requirements of the broader mixed client market—networks made up of computers that run a variety of operating systems—in 1994–95.

Apple will pursue a two-pronged strategy to make our client-server technology available and relevant to Windows and DOS users. First, we will make Windows/DOS clients available for AppleShare, AppleSearch, Apple Remote Access, and the PowerShare Collaboration Servers. This will allow DOS and Windows users to reap the same benefits of Apple's highly functional, easy-to-use network services.

Second, Apple has entered into a partnership with Novell to make NetWare 4 available for PowerPC processor–based Workgroup Servers. This combination of the leading network operating system and PowerPC technology will be a price/performance leader in the client-server market when it ships late in 1994.

Apple's entry into the mixed-client LAN market and the compatibility and performance benefits available from PowerPC processor–based servers offer new and unique opportunities for Macintosh developers to apply their expertise at creating the best, easiest-to-use distributed solutions. The growth of mixed-client LANs will cause more than 60 percent of all LANs to contain both Macintosh and Windows systems within three years. The demand for leading-edge client-server solutions is growing at double-digit rates, according to most market analysts. Many customers, large and small are now planning how they will implement these mixed networks and subsequently attach them to the information highway. Apple is convinced that developers who recognize these trends and leverage them will reap rich rewards as we head into the millenium.

• • •

**Sergio Nanni, Regional General Manager, Apple Europe: Growth Opportunities in Local Markets**

Developers and their distributors could benefit by looking at many more local markets and languages than they do today. So-called small markets can provide growth and profit opportunities. Being in charge of a territory where 15 Apple localized languages are spoken, I have experienced both the early resistance of some developers to take a truly "global" approach and the great success of those who adopt such an approach. Localization is in most cases a very profitable investment, complementary to Apple's "full-localization" strategy involving 40 languages worldwide.

• • •

**Peter Dewald, AppleSoft Manager, DACH Region (D=Germany, A=Austria, CH=Switzerland): European Developer Community Rallies Behind Power Macintosh Release**

The key DACH message for developers is the following: Apple is serious about becoming a major player as a system platform provider. We thus recognize the importance of a strong and well-populated developer community, and we're going to give them the necessary attention and support they need to thrive.

In addition to that, from the European perspective, I think these are the important issues for developers:

• The key opportunity is the Power Macintosh platform, which is promising to allow Apple to increase its market share and thus widen the market potential for developers, as well. On top, it brings back old strongholds of Macintosh applications like CAD, for which the 680x0 Macintosh system was no longer adequate. The introduction process for Power Macintosh computers for the first time involved a significant number of European developers, more than ever before, showing the significance of the European developer community. (By the way, applications from European developers are a significant part of currently shipping native PowerPC products.)

• Developers can help us by providing native applications for Power Macintosh computers and making it easy for customers to migrate by offering low-cost upgrades, since customers have paid for their applications once already.

• Within DACH, we are continuing to expand developer activities (we have always kept up the developer program), focusing primarily on providing business information and on recruiting new developers from other platforms. ♣

**Strategy Mosaic**

# *Active Assistance*

*continued from page 1*

"But what else can I do?" you say. "I've spent all I can on documentation, and I only have so much money for customer support. If I stop improving my product, people will stop buying it—but *I* can't help it if my customers don't use the features I've documented. What am I supposed to do?"

Granted, there may not be much more that you can do today. But that's about to change, and therein lies both opportunity and obligation: an opportunity to give your customers what they need to be successful, and an obligation to do so—because your customers will soon expect it, and your competitors are sure to oblige them.

## Welcome to the Next Level

Welcome to *active assistance,* the next level of human interface. Stated simply, active assistance means changing the computer from being a passive tool to being an active assistant that helps you get your work done. Active assistance will make your software better. It will ultimately increase the audience for your software because it will encourage non-computer users to make a Macintosh their first computer. And it may even save you money in the form of reduced cost of goods and customer support.

Apple has planned an architecture for making active assistance happen on the Macintosh—in fact, I've been keeping you informed about the foundations of this architecture for several years. You already have access to AppleScript and the Open Scripting Architecture (OSA). This month, Apple is delivering to you preliminary versions of two key pieces of technology—Apple Guide and the scriptable Finder—that I believe will bring the topic of active assistance to critical mass. These technologies (and others—see the coverage of System 7.5 elsewhere in this issue) will be made available to the public in the second half of this year, but Apple is handing them to you now so you can start integrating them into your products.

Though the lower levels of active assistance will be available on 680x0 Macintosh models, some of our future technologies will perform best on the new Power Macintsh computers. Active assistance will be one area that will show how the PowerPC processor will deliver not just more speed, but an entirely new computing experience.

In this article, I will give you Apple's long-range plans regarding active assistance. You need to make some decisions about how you are going to react to this technology. What you decide now will affect your company's position in the market three to five years from now, and if you get behind, it will be either expensive or impossible to recover.

## Three Levels of Active Assistance

The first level of active assistance is *automation.* It's already here, in the form of Apple event–aware applications and AppleScript—and, unfortunately, some of you are already behind. Briefly, Apple events make it possible for other applications to request services from your application. AppleScript allows both you and your customers to automate tasks and create custom solutions using off-the-shelf products. (For more information on the various technologies discussed in this article, see the text box on page 17.)

The second step toward active assistance is *on-line help,* which I'll define for this article as any modeless, screen-based assistance, reference, or tutorial content. Apple Guide, Apple's "engine" for on-line help, will be part of System 7.5 (due in the second half of 1994). But now is the time to start using it because Apple is making a usable, feature-frozen beta version of Apple Guide available to over 20,000 developers worldwide. (Apple Worldwide Developers Conference attendees received a beta copy of System 7.5 at the conference. By the end of May, Apple will mail a copy to everyone—including Apple Associates and Partners—who receives the monthly technical mailing.)

The last step, still in the future, will implement *active delegation.* This will involve the computer actively helping customers do their work, even anticipating their needs and making suggestions on how they might work more efficiently. You're already familiar with one form of active delegation—software "agents" that carry out a task without your intervention.

Active delegation—and other future Macintosh technologies—will depend on your application being fully scriptable and using Apple Guide. So not only are

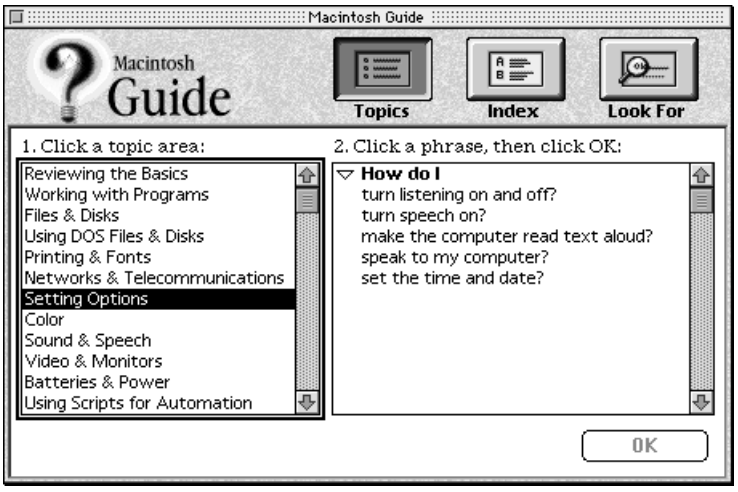
scriptability and Apple Guide technologies that will benefit you immediately, they will also be in use within two years and commonplace within four. (Four years may sound like a long time, but that translates into two or, at best, three major product revisions.)

### Scriptability and Recordability

Let's talk about where we are today. The idea of scriptable applications was born with Apple events, a feature of System 7. (A good introductory article, "Scripting Your Success," by Laura Hamersley, appeared way back in the September 1991 issue of *Apple Direct.*) Along the way, products such as Microsoft Excel, Claris FileMaker Pro, QuarkXPress, WordPerfect, HyperCard, Dynodex, and dozens of other products became scriptable. Because of Apple's Open Scripting Architecture, you can create scripts for automating tasks using Apple's AppleScript, CE Software's QuicKeys, or Userland Software's Frontier.

Your application needs to be scriptable today; if it's not, you're already behind. Factoring your application to make it scriptable may require considerable work, but future Macintosh technologies—and potential customers—will require it. The next step is to make your application *recordable.* For more information on AppleScript, see the article on System 7.5, starting on page 13. Also, be sure to check out *Inside Macintosh: Interapplication Communication,* which is the definitive reference on implementing Apple events and AppleScript.

But you don't have to look to the far future to see the need for adding scriptability and recordability to your application. System 7.5 will include both AppleScript and (finally) the scriptable Finder. With these two items shipping on all new Macintosh models and available on every Macintosh upgraded to System 7.5, I believe that a lot more people will start using scripting. Once that happens, they'll suddenly be a lot more conscious of applications that are "blind" to scripting. (And, hey, recordability will be important, too. Who'll want to write scripts when they can record them instead?)




**Apple Guide Full Access window. In addition to choosing topics by area, users can browse topics based on a list of indices, or they can type a word or phrase in and get a list of related topics.**

### What Is Apple Guide?

Apple Guide is a system-wide help service that provides a consistent interface for non-modal on-line help. It can be used to provide tutorial information, sreference material, shortcuts, or tep-by-step guidance in performing tasks.

When invoked from a help keystroke or Help menu command, Apple Guide allows the user to pick a help topic—for example, "How do I turn speech on?"—in several ways, then provides step-by-step instructions in a sequence of panels of information that appears in an Apple Guide *presentation window.* (See the figures "Apple Guide Full Access window" and "Apple Guide presentation window" on pages 6 and 7).

Apple Guide can sense the state of the computer and omit certain steps if they're not needed, so as not to confuse the user. Apple Guide can also send Apple events to other programs (including the scriptable Finder) to make the assistance it offers even more active. For example, you can add a "Do This For Me" button that performs the actions being described by the current Apple Guide topic—a shortcut that users will love!

In addition, an Apple Guide panel can cause a seemingly hand-drawn circle, underline, or arrow—called a *coachmark*—to appear anywhere on the screen. You can use coachmarks to draw the user's attention to whatever part of the human interface the current panel refers to.

Here are some important things to note about Apple Guide:

- Any help database (called a *guide file,* or *guide*) that is in the same folder as the current application appears in the Help menu. This means that you can add Apple Guide help to existing programs without recompiling them. The next time you revise your program, however, you should change it to make direct use of Apple Guide; this will allow you to provide even more powerful forms of on-line help.
- Most of the work of creating a guide file can be done by instructional designers who might not be comfortable with complex development tools. Designers can create content source files with any major word or text processor. They use a tool called Guide Maker to convert the source files into a guide file, and then test, debug, and localize it.
- As mentioned earlier, Apple Guide sequences can execute scripts. These scripts can be triggered by the user clicking on a button, a word, a radio button, a checkbox, or a specified area of the screen.
- You can use PICT graphics and QuickTime movies in your guide. These allow you to add still and moving images to your conent.
- You can call an Apple Guide sequence from your program. One very interesting way to improve your customers' perception of your application is to call an Apple Guide sequence instead of a dialog box when you need to tell them something. For example, today, an application that doesn't have enough memory to complete an operation can do little more than open a dialog box that says, "There is not enough memory to do that." With Apple Guide, your application might instead display an explanatory message that would show them various ways to increase available memory and even offer to do it for them. There's *no way* that customers won't flock to an application that does things like that for them.
- Do you already have help files for the Microsoft Windows

version of your application? If so, you can convert existing Microsoft Help files automatically to Apple Guide format (though you'll later want to enhance your guide file to use Apple Guide features not available in Microsoft Help).

### Why Use Apple Guide?

Once System 7.5 ships in the second half of this year, every new Macintosh model will come with Apple Guide and four guides—Macintosh Guide (general information and how-to help), Macintosh Tutorial (for new Macintosh users), AppleMail, and PowerTalk guide. Apple documentation will be promoting the use of these guides and Apple Guide on-line help in general. One reason for using Apple Guide—a "stick" incentive, I admit—is because users, not distinguishing between system software and *your* software, will be expecting on-line help (that is, Apple Guide–based help) to be available all the time.

But there are several positive, "carrot" incentives for implementing Apple Guide. First, you can use it to reduce your cost of goods. In the years to come, Apple plans to reduce the printed documentation it ships with its products and replace it with on-line help based on Apple Guide. By doing the same, you may be able to greatly reduce the expenses associated with printed documentation.

Granted, at first, you will need printed documentation for your non–System 7.5 customers. But eventually you may be able to eliminate comprehensive printed documentation entirely. In any case, the cost of an extra floppy or two (or no extra cost, if you can put your guide files in otherwise unused space on a CD-ROM product) is less than that of large printed manuals. (FYI, a beta version of the Macintosh Guide file—which contains over 250 topics—is about 1.5 MB, but it compresses to under 500K. So you should be able to distribute all the help you want on one extra 1.4 MB floppy disk.)

Another positive reason for using Apple Guide is that it will probably reduce your support costs, especially the support of elementary questions. Your customers will be far more likely to use Apple Guide than printed documentation, so the more you document with Apple Guide, the more support-cost savings you'll see. I would also guess that the more "Do This For Me" buttons you put in your guides, the more your guides will get used. People like the idea of getting things done for them, no matter how small—the considerable success of QuicKeys and other keyboard-macro utilities attests to this.

One reason for using Apple Guide is less tangible than the ones I've mentioned so far but is ultimately the most important one possible: that doing so helps your customers be more successful and, not coincidentally, leaves them with a more positive recollection of your product. Let's face it, no matter how powerful and easy-to-use a given feature is, if customers don't know about it or don't make the effort to use it, it's worse than useless. Not only does it not make a difference, but it also takes up disk space, increases development costs, and perhaps even makes your application run slower. But you can use Apple Guide for more than just on-line help; for example, you can also use it to educate your customers about your application's main features and make it easy for them to try them out.

Here are, briefly, a few more reasons for using Apple Guide:

- It gives you an engine for on-line help and active assistance that you do not have to develop, code, maintain, or enhance—it essentially comes free to you.
- In many cases, you can reduce development expenses by using Apple Guide instead of other, commercially available authoring systems.
- Guide files are easier and less expensive to update than printed manuals.
- In addition, Apple Guide supports *mix-in guides,* which can be dropped into the same folder as a guide to add additional topics to it. You can use a mix-in guide to improve an existing guide quickly and inexpensively. For example, after your application has been out for a few months, your customer support staff tells you that people are having trouble using one feature or don't understand what a second feature is used for. You can quickly create additional topics to explain these features and create a mix-in guide. You can then add the mix-in guide to your shipping product and distribute it electronically to your customer base.

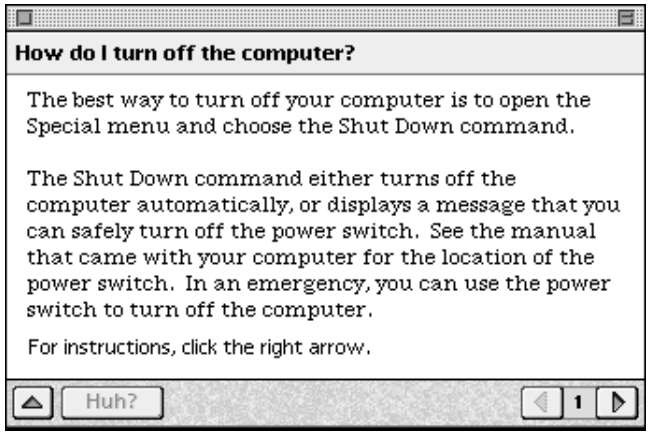
### Your Next Move

Developers, industry pundits, and other Apple watchers periodically complain that Apple doesn't advise the outside world on its future directions. Well, that's what I'm doing here, and I can't be any plainer than this. If you are a Macintosh developer, here's what you should do:

- Make your application scriptable *now.* This means implementing the Open Scripting Architecture, the Required and Core suites of Apple events, other defined suites that make sense for your application, and any custom Apple events that give other programs access to the most useful features of your application.
- Move existing on-line help to Apple Guide, and use it for future documentation and tutorials.
- Begin planning for the transition to OpenDoc, which is a cornerstone of future Macintosh computing in several ways. (By the way, making your current application scriptable is a good first step in your transition to OpenDoc.)

If you want to stay competitive in the Macintosh market, you must do these three things. Future Macintosh technologies depend on your application supporting all of them.

But don't take just my word for it. Listen to Don Norman, Apple Fellow and Chief Architect of the Apple User Experience Group. "The AppleSoft strategy for operating systems represents a consistent evolution of Apple's user experience strategy. In other words," he said, half-joking, *"we know what we're*




**Apple Guide presentation window. Apple Guide displays successive panels of instruction or information in windows like this.**

*doing.* We're releasing System 7.5 to you now, and we already know where the next three versions of the OS are going. The next release will be a major step forward—and we have even more exciting things planned after that. These three technologies—Apple Guide, AppleScript, and OpenDoc—are essential to our operating-system strategy."

**Winning the Next Level**

According to Don Norman, the user interface must advance for computers to become more useful. The first generation of computers (in terms of usability) was that of command-drivern computers; they weren't very easy to use and, consequently, few people used them. Next came today's crop of "responsive" computers, popularized by the Macintosh platform. They are easy to use but passive—that is, you have to direct them explicitly in each step of the task at hand. Apple Guide will bring about a generation of "active" computers that will help users complete selected tasks. And future Apple technologies will bring about "proactive" computers, which will watch the way you work and offer to assist when they see something they can help with.

With apologies to Woody Allen, a computer platform is like a shark—if it doesn't move forward constantly, it dies. Sure, you can make do with today's interface, but tomorrow you'll be a dead shark. Not that the situation is all negative. Easier-to-use computers will draw in new first-time users, and companies with easier-to-use products will make more money.

And then there's the faithful customer who bends your ear about how he just couldn't live without your product—and, deep in your bones, you realize that your decisions were good ones and your hard work was justified. ♣

**Apple News**

## *Workgroup Servers*

*continued from page 1*

times the performance of today's Motorola 680x0-based systems. The systems are ideal for professional publishing, education, small- to medium-size organizations, and Macintosh-dominated workgroups within larger enterprises.

Apple will offer PowerPC processor logic-board upgrades for existing Workgroup Server 60 and Workgroup Server 80 customers as well as Macintosh Quadra 900 and 950 customers who want to upgrade to a Workgroup Server 9150. Workgroup Server 95 customers will also be provided a migration path to PowerOpen and PowerPC processor–based servers from Apple in the future.

**Suited to Needs of Mixed Workgroups**

To increase the appeal of the Apple Workgroup Servers to a larger audience, Apple has announced its intention to provide DOS and Windows users with access to Apple's local area network (LAN) application services, such as AppleShare, PowerShare Collaboration Servers, AppleSearch, and Apple Remote Access. Apple plans to offer an implementation of AppleTalk specifically designed for Windows (versions 3.1 and higher) as the basis for these services. This will allow users in mixed workgroups—those using a combination of Apple Macintosh, DOS, and Windows-based PCs—to more easily share information and work together with the same ease of use that has always been available for Macintosh networks.

In a related story (see "Novell Commits to Apple Technologies"), Apple and Novell have announced plans to bring Novell's industry-standard NetWare 4 to PowerPC processor–based Workgroup Servers, further increasing the audience for the PowerPC processor–based Apple Workgroup Servers.

**Compatibility of Apple Software Services**

To ensure that its software services are compatible with the new Workgroup Servers, Apple will provide updates for its server software products, including the PowerShare Collaboration Server software, AppleShare, AppleSearch, and Apple Remote Access. The client software for these services is already compatible with Power Macintosh computers and requires no update. These compatibility updates will allow Apple's server software products to work on the new Workgroup Servers at 68040 processor speeds. New versions of these products, optimized to take advantage of native PowerPC performance, are expected in conjunction with future releases of the Macintosh operating system.

**Data Integrity Features**

The Workgroup Server 6150, 8150, and 9150 computers come with several features designed to ensure data integrity. Data stored on these Workgroup Servers can be protected with features such as RAID software, which provides increased data security in case of a disk failure; alternately, it provides improved disk performance by storing file data across multiple hard drives. The Apple RAID software will be available this summer and will require two hard drives. The Workgroup Server 6150 and 8150 come standard with an internal hard disk drive (see "Workgroup Server Features and Apple Price" below for configuration details); to use the Apple RAID software, these servers will require a second hard disk drive at least as large as the internal drive. The Workgroup Server 9150 is shipped with two internal hard disk drives and is able to use the Apple RAID software without adding additional hardware.

High capacity DDS-2 Digital Audio Tape (DAT) drives, which are capable of backing up 10 to 14 gigabytes (GB) of information, are also available with many configurations. Additionally, Dantz Development's Retrospect Remote backup software, which comes bundled with the Workgroup Server 8150 and the Workgroup Server 9150, can automatically back up both server system data and client systems on a network.

**Service and Support**

Apple's entire Workgroup Server product family comes with service and support programs. The server support program provides telephone support seven days a week, 24 hours a day, to provide help to customers in setting up and using their server products. Apple also provides a "within-two-business-days" on-site service plan; optional premium service plans are available in selected areas to provide service by the next business day or within four business hours. Service and support may vary outside the United States.

**Workgroup Server Features and Apple Price**

Each new Workgroup Server comes with the System 7 operating system installed; Apple RAID software will be made available this summer. Selected configurations also come with AppleShare 4.0.2 file-and-print server software installed, while other

configurations allow customers to choose the third-party server software that best fits their needs.

All prices listed are U.S. Apple Prices. Product availability, pricing, and configurations may vary outside the United States.

***Workgroup Server 6150.*** The Workgroup Server 6150 is the most affordable member of the PowerPC processor–based Workgroup Server product family from Apple. It is designed to provide file-and-print server services to small workgroups in business and education markets. It includes a 60 MHz PowerPC 601 processor, 256K second-level cache, Ethernet, an internal 500 MB hard disk drive, an internal double-speed CD-ROM drive, a floppy disk drive, a SCSI bus to support up to seven devices, and eight ports to support a wide range of peripherals. Use of RAID software requires the addition of an external disk drive. The keyboard, display, and appropriate Ethernet transceiver are sold separately.

- Workgroup Server 6150, with 8 MB memory, 500 MB hard disk, double-speed CD-ROM drive, and AppleShare 4.0.2 preinstalled—U.S. Apple Price: $4,219 (#M3358LL/A)

***Workgroup Server 8150.*** The Workgroup Server 8150 is the mid range member of the PowerPC processor–based Workgroup Server family. It is designed to meet the needs of medium-sized workgroups in education, business, and publishing. It includes an 80 MHz PowerPC 601 processor, 256K second-level cache, Ethernet, a 1 GB hard disk drive, an internal DDS-2 DAT drive, Retrospect Remote backup software, a floppy disk drive, support for internal and external SCSI devices, and nine ports to support a wide range of peripherals. Use of RAID software requires the addition of an external disk drive. The keyboard, display, and appropriate Ethernet transceiver are sold separately.

- Workgroup Server 8150, with 16 MB memory, 1 GB hard disk, DAT drive, and CD-ROM drive—U.S. Apple Price: $7,459 (#M3300LL/A)
- Workgroup Server 8150 with 16 MB memory, 1 GB hard disk, DAT drive and CD-ROM drives, and AppleShare 4.0.2 preinstalled—U.S. Apple Price: $8,499 (#M3359LL/A)

***Workgroup Server 9150.*** The Workgroup Server 9150 is the most expandable and powerful member of the PowerPC processor–based Workgroup Server family, designed to meet the needs of growing workgroups in education, business, and publishing. It features an 80 MHz PowerPC 601 processor, 512K second-level cache, two internal 1 GB hard disk drives, space for up to a total of five internal 3.5-inch half-height hard disk drives, an internal DDS-2 DAT drive, an internal double-speed CD-ROM drive, Retrospect Remote backup software, two SCSI DMA buses to support up to 14 devices, and nine ports to support a wide range of peripherals. The keyboard, display, and appropriate Ethernet transceiver are sold separately.

- Workgroup Server 9150, with 16 MB memory, two 1 GB hard disks, DAT drive, and CD-ROM drive—U.S. Apple Price: $9,229 (#M3272LL/A)
- Workgroup Server 9150, with 16 MB memory, two 1 GB hard disks, DAT drive, CD-ROM drive, and AppleShare 4.0.2 preinstalled—U.S. Apple Price: $10,269 (#M3357LL/A)

**PowerPC Logic Board Upgrades and Apple Price**

These products require installation by an authorized Apple Service Provider; installation service charges may vary. Overall system performance may vary depending on server application.

- Workgroup Server 6150 Logic Board Upgrade, with 8 MB memory, 256K second-level cache, RAID software, and AppleShare 4 update kit—U.S. Apple Price: $1,259 (#M2913LL/A)
- Workgroup Server 8150 Logic Board Upgrade, with 8 MB memory, 256K second-level cache, RAID software, AppleShare 4 update kit, and Retrospect Remote 2.1 update kit—U.S. Apple Price: $1,899 (#M2915LL/A)
- Workgroup Server 9150 Logic Board Upgrade with 8 MB memory, 512K second-level cache, and RAID software—U.S. Apple Price: $2,499 (#M3262LL/A). Note: The upgraded Workgroup Server 9150 requires Power Macintosh DRAM (#M1507LL/A or #M1508LL/A).

# Networking-Related Developer Opportunities

Apple's PowerPC processor–based Workgroup Server and Novell announcements mean new developer opportunities and a larger potential audience for network-aware software. Novell's NetWare 4, which will run on the new Workgroup Servers, will handle a mixed network of Macintosh, DOS, Windows, Windows NT, and OS/2 client machines. This means new opportunities for cross-platform client-server and server-based applications enabled by Apple RISC technology and Novell NetWare.

Another factor that will increase the installed base of Workgroup Servers in mixed environments is Apple's announcement that it will produce products that will allow DOS and Windows users to interact with Apple's AppleShare, AppleSearch, Apple Remote Access, and PowerShare Collaboration Servers software. Again, this means more people in mixed environments will consider buying Workgroup Servers, but it will specifically mean a larger audience for products that use any of the above four Apple technologies. APDA sells developer tools to help you integrate these technologies into your software.

In addition, here are some developer opportunities that Apple thinks will prove promising in 1994 and 1995:

- Education solutions for Macintosh and Windows clients attached to Apple servers running NetWare
- Cross-platform information search and retrieval with AppleSearch
- Server-based solutions that benefit from the RISC processing throughput of PowerPC technology
- Scalable, network-based professional publishing solutions
- General-purpose workgroup productivity solutions that benefit from the highly scalable Apple File Protocol (AFP) embedded in Apple System 7 file sharing, AppleShare, and NetWare.

For more information:

- Look for a White Paper at Novell's booth at the WWDC. If you are not going to attend the WWDC, contact Apple Developer Hotline at (408) 974-4897 or at AppleLink address DEVSUPPORT, and we'll send it to you.
- Check for more details in future issues of *Apple Directions.*

### Apple's Server Family Grows

The new PowerPC processor–based Workgroup Server 6150, 8150, and 9150 systems extend Apple's current family of Workgroup Servers, which use Motorola's 68040 microprocessors: the Workgroup Server 60 and Workgroup Server 80, which run the Macintosh System 7 operating system, and the Workgroup Server 95, which runs A/UX, Apple's UNIX implementation. The Workgroup Server 95 is the highest-performance AppleShare server.

The 68040-based systems offer the best price/performance for running basic office productivity services, such as file/print sharing and electronic mail services. According to Jim Groff, vice president and general manager of the Apple Business Systems (ABS) Division, "We believe demand for our 68040-based Workgroup Servers will remain strong, based on their excellent price/performance and the very attractive upgrade path to PowerPC."

## Novell Commits to Apple Technologies

On the same day that Apple Computer, Inc., announced its new Workgroup Servers (see "Apple Adds PowerPC to Workgroup Servers"), Novell, Inc., and Apple announced plans to implement NetWare 4, Novell's industry-standard distributed network software, native on Apple PowerPC processor–based servers.The agreement between the two industry leaders is part of a plan designed to provide customers with the scalability and extensive feature set of NetWare 4 and the leading price/performance characteristics of PowerPC processor–based systems. With NetWare 4 on the PowerPC processor– based servers, Apple and Novell intend to provide an ideal solution for larger, more diverse distributed network environments.

NetWare 4, Novell's distributed network software, is expected to be available on PowerPC processor–based Workgroup Servers from Apple in late 1994. Details of the product plans will be made available at that time.

According to Michael Spindler, Apple Computer president and chief executive officer: "This announcement builds on our strategy to make Apple technologies more open and accessible to a broader range of customers across computing platforms and operating systems, and is further evidence of industry support for Apple's new PowerPC processor–based Workgroup Servers. By embracing industry standards like NetWare 4, we are broadening Apple's networking solutions and providing our customers with a wider range of product offerings."

Robert J. Frankenberg, Novell's president and chief executive officer, explained the reasons behind his company's announcement. "PowerPC will clearly be a major force in the industry and NetWare on PowerPC will position Apple as a strong player in increasingly heterogeneous corporate networking environments. Novell is working with Apple as a key industry partner in providing NetWare services to our mutual customers."

### NetWare to Extend Networking Range on Macintosh

NetWare on Workgroup Servers from Apple will complement and extend Apple's family of local–area network (LAN) services, which include AppleShare file and print services, the PowerShare Collaboration Server software, AppleSearch, and Apple Remote Access. Apple's NetWare implementation will provide integrated support for both NetWare and AppleTalk protocols. Customers can smoothly grow from small, peer-to-peer networks of PCs and Macintosh computers to plug-and-play client/server solutions based on Apple LAN services, and finally to larger, more diverse distributed network environments with NetWare 4. Apple and Novell are working together to ensure a smooth growth path between Apple LAN services and the NetWare environment.

Developers will gain a rich environment in which to build new NetWare Loadable Modules, network software applications, and services that take advantage of the NetWare for PowerPC platform.

### Novell Support for Other Apple Technologies

In addition to supporting NetWare 4 running on PowerPC processor–based servers from Apple, the two companies plan to continue cooperating in other areas to enhance compatibility between each company's products. To that end, Novell stated its support for Apple's Open Transport Communications Architecture as a framework in the Macintosh environment for implementing multiple protocols. Novell will continue its commitment to support AppleTalk as a key networking protocol within NetWare.

The NetWare Core Protocol (NCP) will be implemented on Macintosh personal computers using the Open Transport Communications Architecture. The NCP client will be supported over Novell's IPX/SPX networking protocol or TCP/IP. This capability will offer Macintosh users two alternatives for NetWare connection. Using AppleTalk-based protocols, Macintosh users obtain the plug-and-play benefits of AppleTalk and transparent access to NetWare and AppleShare servers. Using NCP protocols, Macintosh computers can be managed and administered as an integral part of an all-NetWare network.

Apple and Novell also stated their intention to further integrate Novell's NetWare Directory Services (NDS), Message Handling Service (MHS), and Apple's Open Collaboration Environment (AOCE), including PowerTalk client products.

Both companies will also cooperate to ensure compatibility between Novell's AppWare Development Environment and OpenDoc. Apple and Novell plan to continue their work with Component Integration Labs to deliver OpenDoc simultaneously on Macintosh, OS/2, UNIX, and Windows systems.

## OpenDoc Progress Report

If you attended this year's Apple Worldwide Developers Conference (WWDC), you would have no doubt as to the importance of the OpenDoc cross-platform, compound-document architecture—12 sessions were devoted specifically to OpenDoc, and it was mentioned in many others. (For an overview of OpenDoc, see "Why 1994 *Will* Be Like 1984: OpenDoc Will Change the Macintosh . . . and More," in the August 1993 issue of *Apple Directions*.)

Here are some details about recent OpenDoc events and our future plans for getting you the resources you need to start working with OpenDoc:

- In early May, Apple Computer, Inc., seeded approximately 1,000 developers worldwide with an initial alpha release of OpenDoc.

• At the WWDC, approximately 5,000 attendees were given a later alpha version (a6) of OpenDoc and preliminary documentation.

• By the end of May, Apple will ship to all Apple Associates and Partners and others receiving the Apple Developer Mailing a WWDC technology CD containing a beta version of System 7.5 and extensive OpenDoc documentation, including *OpenDoc Technical Summary* (which you should read first), *OpenDoc Human Interface Specification, OpenDoc Human Interface Guidelines,* and *OpenDoc Class Reference.* These documents will allow you to start learning OpenDoc and thinking about how you will integrate it into your products.

• Apple is currently writing the *Inside Macintosh* documentation for OpenDoc and replacing the Apple Shared Library Manager (which has been used as a interim dynamic linked libarary mechanism for early OpenDoc implementations) with the System Object Model (SOM). SOM is an IBM-originated technology that will help make OpenDoc available on multiple platforms. Once these things are finished and OpenDoc goes beta—sometime this summer—Apple will deliver a beta version of OpenDoc to developers worldwide. (Apple traditionally gives widespread developer distribution of new technologies at the beta stage.)

• The first shipping version of OpenDoc for the Macintosh platform is scheduled for this fall, and Apple expects its OpenDoc partners to ship OpenDoc for Microsoft Windows in the same time frame.

*Apple Directions* will keep you posted on OpenDoc news as it becomes available. ♣

# 60-Plus Native Power Macintosh Applications Ship

As of April 29, 1994, more than 60 native Power Macintosh applications were shipping throughout the world. Native applications have been recompiled to take advantage of the Power Macintosh computers' two- to six-times performance boost over previous 68040-based Macintosh models. The following is a list of native applications shipping as of April 29; additional applications continue to be released each day.

| Company | Product |
|---|---|
| ACI | Object Master Universal |
| Adobe | Photoshop |
| Aetis | Protections Logicielles Copy Protection |
| Aldus | Freehand |
| ALSOFT | Atlas 1.0.4 |
| | GeoConcept |
| Artwork Systems N.V. | ArtPro 1.2 |
| Atlas Software B.V. | Drill 1.2 |
| | Key Software 1.1 |
| | Optipoint 1.1 |
| Autodessys, Inc. | 3D Form Synthesizer |
| Baltic Business Systems | MacHansa Accounting II 2.0 |
| B.E.M.E. | ALIX (colors for printers) |
| Bungie Software | Pathways into Darkness |
| Canto Software GmbH | Cumulus |
| Central Point Software | MacTools 3.0 |
| Charles River Analytics | Open Sesame! |
| Claris Corporation | ClarisWorks |
| DELTAPOINT | DeltaGraph Pro 3 |
| Diehl Graphsoft | MiniCAD+ |
| Domark | Flying Nightmares |
| Dunaway Systems B.V. | Signalize 2.6 |
| | Spooler 1.2 |
| | PostScript Interpreter |
| | Scanning & Vektorizing 2.3 |
| | Remote Font & Clip Art |
| FIT Software | Full Contact |
| Fractal Design | Dabbler 1.0 |
| | Painter 2.0 |
| Frame | FrameMaker |
| GRAFTEK | Ultimage/Pro (Optilab/Pro) |
| Gryphon Software | Morph |
| Hi Resolution Limited | Mac=Bac 1.1 |
| | MacPrefect Remote 1.0.1 |
| | MacVisa 1.1 |
| Insignia | SoftWindows |
| Interstudio | flex•plan 1.0 |
| | Nonio C 5.0 |
| | Domus CAD 71 |
| ITEDO Software GmbH | IsoDraw 2.6 |
| Jasik Designs | MacNosy |
| Language Engineering | LogoVista E to J |
| MedImage | MedView |
| Metrowerks | CodeWarrior |
| MicroMacro, Ltd. | MicroGuard ADB Copy Protect |
| Orange Micro Inc. | OrangePC |
| ORKIS | ImageBasePro 2.5 |
| Pole Position Software GmbH | Mac DCF77 |
| Route 66 Geo Info Systems | AtomicTime, ROUTE 66 1.2.0 |
| Segue Software | QA Partner |
| SOFT Technologies | Simulateur de conduite 1.2 |
| SofTeam Hardware & Software Dist. | MacSign 4.0 |
| | Punto 1.6 |
| Something Good | AI-Shogi |
| Specular | Infini-D |
| Trio Systems Europe | C-Index Pro 1.0 |
| TrueD Software | Live on RISC |
| VAMP | MacCAD Trailblazer |
| Vicom Technology Ltd. | VICOM MultiTerm |
| | VICOM Pro 5.0 |
| | VICOM RunTime |
| VideoFusion | Recorder |
| | VideoFusion |
| Wilkensen SCOOP (formerly Yellow Shark S/W) | SCOOP Archive 1.1 |
| WordPerfect | WordPerfect |

# Technology

## Inside This Section



## *develop* Issue 18: Apple Guide, Power Macintosh, and More

Before telling you about what's in this month's issue of *develop,* Apple's technical journal, we'd like to brag a bit about our latest awards. We've again won in both the local and the international Technical Publications Competition of the Society for Technical Communication—the highest award in our category in both competitions. We hope you'll agree with this judgment when you check out the articles in Issue 18, which cover the new Apple Guide help system and the Power Macintosh computer, among other scintillating topics.

• "Giving Users Help With Apple Guide" tells how to integrate this powerful new help system into your application, to provide users with context-sensitive help and interactively guide them through common tasks.

• "Programming for Flexibility: The Open Scripting Architecture" describes how to attach and run scripts as a way of customizing applications.

• "Exploiting Graphics Speed on the Power Macintosh" gives a strategy for ensuring that users benefit from the improved performance of QuickDraw on the PowerPC platform, and the first installment of our new "Balance of Power" column provides coding

*please turn to page 16*

**CD Highlights**

## Reference Library Edition, June 1994

This month's cover features artwork created by Jon C. Lund, the new artist for the Reference Library Developer CD series. Also, in response to your feedback that material shouldn't be buried too deeply, the Reference Library folder has vanished, and its contents now appear at the top level of the CD.

Here is some of the new and revised material included on this month's CD.

*Reference Library Edition*

### ABS Technical Notes

ABS Technical Notes contain the latest bugs, as well as tips and tricks for developers of software for A/UX, AppleSearch, AppleShare, AppleTalk Remote Access, Apple Workgroup Servers, DAL, and SNA•ps.

### APDA—Tools for Developers

APDA is Apple's worldwide source for hundreds of development tools, technical resources, training products, and information for anyone interested in developing applications for Apple computer platforms. Customers receive the APDA Tools Catalog, which features all current versions of Apple development tools and the most popular third-party development tools. APDA offers convenient payment and shipping options, including site licensing.

### ColorSync 1.0.5

ColorSync, Apple's color-matching architecture for the Macintosh computer, is a system extension that enables consistent color across the system. The key components of ColorSync are the ColorSync extension, ColorSync System Profile control panel, and ColorSync Profiles for Apple's color monitors.

ColorSync 1.0.5 provides these new features:

• separation of ColorSync functions into extension and control panel files

• support for both 68K and PowerPC processor–based computers

• ColorSync Profiles for the PowerBook 270c computer, the Apple Multiple Scan 20 Display, and the Apple Multiple Scan 17 Display

### Convert•Projects 1.0b3

Convert•Projects is a utility that reads a THINK C or THINK Pascal project and produces an equivalent (or nearly equivalent) Code Warrior project. This utility is particularly useful for large projects, in which manually adding and segmenting the project would be tiresome or impractical.

Convert•Projects 1.0b3 corrects a problem when dealing with Symantec C++ 7.0 projects, and assigns the correct file creator to PowerPC/Pascal projects.

*please turn to page 21*

# System 7.5: Apple's Unified Operating System for 680x0 and Power Macintosh Computers

*By Paul Dreyfus,*
Apple Directions *staff*

This month, Apple Computer, Inc., seeded you and about 20,000 of your closest developer friends with the beta release of System 7.5, the next reference release of the Macintosh operating system. The release, which runs on both 680x0 and PowerPC processor– based Macintosh computers, incorporates more than 50 new features—technology designed to make our mutual customers' computing lives easier and more efficient.

"Holy Smoley, Batman! 50 new features!!?!!" you might be thinking. "And Apple's expecting me to incorporate all of them into my software?"

The answer to both of those questions is a resounding "Yes!" But you'll want to dig a little into the beta release and read the rest of this article, as well as the documentation on the seed CD. After doing so, I think you'll agree with us that, with perhaps a couple of exceptions (which I'll mention in a minute), this new release will also make your lives and businesses easier.

Since it's been awhile since we talked about some of these technologies, the text boxes that accompany this article briefly describe three of the major technologies being added to System 7—PowerTalk, AppleScript, and QuickDraw GX. For more about the fourth, Apple Guide, you'll want to read this month's Strategy Mosaic, starting on page 1, if you haven't already done so. Our intention is to refresh your memories and provide an overview of developer opportunities opened by each extension; for more comprehensive information on all the System 7.5 technologies, see the text box on page 17.

### For Customers: Out-of-the-Box Advantages

You need to know right up front that the vast majority of the enhancements don't require any work from you. Apple is throwing in useful customer features like the ability to open files in DOS, Windows, OS/2, and ProDos (a must in many schools), a hierarchical Apple menu, support for larger hard disks (up to 4 gigabytes from 2 gigabytes), a replacement for TeachText called Simple Text that provides styled text options, and advanced search capabilities because that's just the kind of folks they are. (You can find a chart detailing the new System 7.5 features in the document called "A Guide to Macintosh System 7.5" on the System 7.5 beta CD.)

The new reference release is intended to improve the user's experience with an operating system that, out of the box, lets the user do more than ever before. Apple will promote these new capabilities in the marketplace, furthering the Macintosh platform's advantages

## PowerTalk Technologies: Catalogs and the Mailer

PowerTalk provides a set of collaborative services that allows users to send electronic mail, share files, and digitally "sign" and forward documents from within an application. Apple began shipping PowerTalk, the first implementation of the Apple Open Collaboration Environment (AOCE) with System 7 Pro last fall. When Apple released PowerTalk, one analyst said that the new technology gave the Macintosh platform a 12- to 18-month competitive advantage in the marketplace.

With the release of System 7.5, that collaborative technology will be available to mainstream Macintosh customers, making it more important than ever that you adopt its features, including the following ones.

### Catalogs and Information Cards

Catalogs store information about users and other objects required to facilitate effective communication. Catalogs can store this data in the form of information cards and provide quick access to the information needed to collaborate with others.

Information cards keep individual or group profiles containing electronic addresses, phone and fax numbers, personal notes, and more. Because PowerTalk supports drag-and-drop delivery, files and folders can be sent to others by simply dragging them onto information cards.

By defining new catalog templates, you can provide your customers with extended functionality to give them access to any type of information. The implementation of catalog storage ranges from personal catalogs (collections of information cards stored on a user's hard disk) to sophisticated hierarchical, distributed, and replicated repositories of information such as those implemented by Apple's PowerShare Catalog server. Your customers can also use your application for access to virtually any type of database through the catalog mechanism.

### The PowerTalk Mailer

PowerTalk provides a built-in letter application, AppleMail, which provides entry-level mail capabilities that include support for messages that contain stylized text, images, and video. Unlike many electronic-mail applications, AppleMail does not require a server.

In addition to providing mail capabilities with AppleMail, PowerTalk also extends mail functionality to every application by providing a "mailer," which provides a standard user interface for a mailing label that can be attached to documents. Apple has been asking you to make your application "mail-capable" by building the mailer into it, a fairly straightforward task. Once your application is mail-capable, your customers can send documents to other users on the network without quitting the application.

Again, for sources that provide details about how you can take advantage of AOCE and PowerTalk, see the text box on page 17.

# QuickDraw GX: The First Customer Release

With System 7.5, Macintosh customers will finally get their first look at QuickDraw GX, which greatly extends the graphics capabilities of the Macintosh. QuickDraw GX has been enhanced to take advantage of increased performance on PowerPC processor–based Macintosh computers; it also works on 68020, 68030, or 68040 Macintosh systems.

Many of its features require little or no work from you and are available to users immediately. These features include improved printing, which requires that your application support a new print dialog box, and portable document technology. Your existing Macintosh applications and fonts will work, unaltered, alongside QuickDraw GX and be able to take advantage of many of its printing enhancements. Other features, such as advanced color, type, and graphics, will require a significant effort from those of you who develop for the desktop publishing and design markets.

### Out-of-the-Box Benefits

The following are the new features QuickDraw GX offers System 7.5 customers immediately, with little or no work from you:

• *Simplified, more powerful printing.* QuickDraw GX allows users to display and control selected printers through printer icons on the Macintosh desktop. To print a document, users drag the file to the desired printer icon. Because multiple printer icons can appear on the desktop, users can choose to send a document to any of a number of printers. An improved print dialog box, which requires minimal support from you, also lets the user select among multiple desktop printers without having to access the Chooser.

• *Viewing and printing documents without the original applications or fonts.* QuickDraw GX supports a new type of document file format, known as a portable digital document (PDD) or "print and view" document, that facilitates the exchange of documents in electronic form. With this technology, users can create a file that can be opened, viewed, and printed from any other Macintosh computer with QuickDraw GX installed.

Even if the other Macintosh computer doesn't have the same application or fonts that were used to create the document, the file retains all of the graphics and typographic information of the original document. Your software doesn't have to be altered one bit to create such portable documents.

### QuickDraw GX Features Requiring Developer Adoption

As we mentioned, there is a host of QuickDraw GX features that will require work from you if your product is to use them—and if they are to see widespread use by Macintosh customers. The good news for you is that, once you've done the work, your application will provide unprecedented desktop publishing and graphics functionality that will greatly distinguish your product in the marketplace. These features include the following:

• *More sophisticated typography.* Macintosh computers gave many users their first opportunity to work with high-quality type. This helped make their written work more readable and effective. Many Macintosh users are now demanding even better typography from their applications, and they want it to be even easier to work with. Applications that support QuickDraw GX satisfy both these demands.

By adopting QuickDraw GX, you can significantly improve type and document composition in your application. This is because QuickDraw GX automates much of the typographic process. Users who work extensively with type will no longer have to determine the proper kerning and justification for a particular block of type, or remember to select special characters (such as ligatures) when typing. These settings and capabilities are built into QuickDraw GX fonts and are handled automatically within applications that support QuickDraw GX.

Installation, screen display, and printing of fonts is simplified with QuickDraw GX, which includes support for Apple's TrueType standard as well as a new version of Adobe Type Manager, ATM GX. This allows users to select the typefaces they want, whether in TrueType or Type 1 format.

• *International support.* QuickDraw GX also provides extensive, system-level capabilities for the display and printing of any international text system, such as Arabic or Kanji. It doesn't matter whether the text reads right to left, left to right, vertically, or some combination of the three. QuickDraw GX can even display text that combines different reading directions within the same line.

In addition, QuickDraw GX and WorldScript, Apple's system technology for software internationalization and localization, give you a powerful set of tools for the creation and release of equivalent software versions worldwide. Specifically, QuickDraw GX provides support for the display and graphical manipulation of international fonts and text systems on Macintosh computers. QuickDraw GX fully supports worldwide character sets based on international standards.

• *Advanced color.* It's easy to create documents that contain color—most Macintosh computers have color displays and most Macintosh applications are color-capable. The difficulty has been in trying to get on-screen colors to match the colors produced on color output devices.

For example, a businessperson might have to redesign an entire presentation because the contrast between the text and the background color is not nearly as great on transparencies as it is on the screen. Or, a graphic designer might have to rework a corporate logo when the colors come out differently in print than they looked on the screen.

To create better color matching, QuickDraw GX incorporates Apple's ColorSync color-management technology, which enables color devices and applications to input, display, exchange, and output color information consistently and predictably. It matches colors between scanners, screens, printers, and even between Macintosh systems. If your application incorporates the ColorSync scheme, your customers will be able to send a color file from one Macintosh computer with QuickDraw GX installed to another, and the same color-matching processes will help maintain accurate color display and printout on the second machine.

• *Graphics capabilities, code size, printer drivers.* By providing a sophisticated set of system-level graphics routines, QuickDraw GX lets you incorporate graphics features such as rotation, stretching, skewing, and drawing into a broader range of applications. Also, QuickDraw GX applications can be smaller than previous applications, requiring considerably less RAM and hard-disk space.

Also, it used to be that developing printer drivers for the Macintosh computer was a somewhat mystical journey, requiring blood, sweat, and many tears. Now, because major print functions—including background printing, dialog boxes, and PostScript™ font management—are provided as standard objects under QuickDraw GX, you can far more easily build printer drivers for existing and new output devices. This provides a major opportunity for printer driver developers, who in turn will benefit the entire Macintosh user base by enabling them to print to a wide variety of output devices.

For references to information about building these QuickDraw GX features into your products, see the text box on page 17.

in compatibility, ease-of-use, efficiency, and greater customer productivity. In turn, this will enhance the value of the Macintosh platform—and your applications.

### For Developers: All Recent Technologies in One OS

In fact, in the long run we think System 7.5 will make developing and marketing cutting-edge Macintosh applications easier: With its release, you only have to support one version of System 7. System 7 Pro will go away; its advanced technologies, including PowerTalk and AppleScript, have been folded into System 7.5 in response to feedback from developers and customers, who said that a unified operating system was the way to go.

Also, the forthcoming new operating system includes virtually every separate system extension discussed in these pages for the past year or so. If you want to give your customers access to the functionality these extensions provide, you no longer have to go to the effort of licensing them separately from Apple and including them in your release. Also, the synergy provided by having all of them in one place is supposed to inspire you to imagine and develop truly unique software solutions, combining the capabilities of the various technologies.

The following system extensions are included, standard, in System 7.5:

- AppleScript, previously released only with System 7 Pro,
- for the first time, a scriptable Finder
- PowerTalk, also available before only as part of System 7 Pro
- QuickDraw GX, the first release of the complete version of Apple's new print and imaging software architecture, optimized to take advantage of native Power Macintosh performance
- Apple Guide, Apple's advanced new electronic assistance architecture
- A version of QuickTime that's been optimized for Power Macintosh systems
- the Drag Manager and Macintosh Drag and Drop, previously available separately
- the Telephone Manager and Macintosh Telephony Architecture
- Sound Manager 3.0, which provides state-of-the-art sound
- the Thread Manager, which provides concurrent processing for applications written to its application programming interface
- Macintosh Easy Open, which works with translation filters to open Macintosh documents without the application that created the document
- the MacTCP client, which gives users access to the increasingly popular Internet and other UNIX-based networks

### The Best Story Is an Old Story

The work for you, of course, comes in supporting these

## Support AppleScript NOW!

Because we feel that it's important for your application to support AppleScript, and because doing so takes more effort than supporting some of the other System 7.5 technologies, Gregg Williams (see Strategy Mosaic on page 1) and I are being pretty direct in urging you to adopt AppleScript. AppleScript has been available as part of System 7 Pro since fall 1993, but starting with the release of System 7.5, every Macintosh customer will have access to its technology as well as a scriptable version of the Finder.

Your application can support two levels of AppleScript functionality. The first level is "scriptability." If you make your applications scriptable, your customers can write scripts, using Apple events and the OSA Object Model, that automate its features and allow them to be shared by—and to share—other applications that support AppleScript. For example, a script can "ask" a speadsheet application to graph some data and then place it, fully formatted, in a word-processing document.

The next level is "recordability," which allows users to automatically build scripts by recording the actions they undertake while using your program.

You'll have to decide which levels are appropriate for your application, based on what your customers tell you and what you feel the greatest opportunities are in your market. We feel that supporting scriptability is a must, given that Macintosh customers will now have the System 7.5 scriptable Finder, meaning that users can now automate system tasks with their scripts. It will be especially important to support AppleScript if you sell to business settings, where your customers—including information systems managers and network administrators—will be most likely to want to automate tasks and combine applications' features into their own solutions.

### What AppleScript Can Do for Your Customers

If you haven't made your application scriptable yet, it will take some work, but it will open up a broad range of possibilities for your customers. Here's just one idea of how AppleScript can be used to combine the features of the Finder and different applications into a very useful, customer-designed solution: Using AppleScript to script the Finder along with scriptable applications, an individual could automate the process of updating a weekly report. The script could retrieve and open the report template from a departmental server and then go onto an administrator's hard disk and open the most recent budget spreadsheet, select this month's figures, and copy them directly into the report.

The script could then enter the date in the report, open the PowerTalk "mailer" attached to the report document, identify people on several different mail services to whom it should be sent, and send it. Once sent, the script can perform a Save As operation and name the report with the current date, saving it in an archive folder on the server.

Here are two more examples: Using AppleScript and the desktop functions of the Finder, a user could create a script that backs up a hard disk onto a server. Taking advantage of the scriptable Finder, a user could also create a script that sets up a file-sharing "drop" folder, automatically enabling file sharing, specifying privileges, and creating a folder that can be shared.

We'll leave it to you to determine the extent to which you support AppleScript, but, as with porting your applications to run in native Power Macintosh mode, we think it's crucial that you begin making your applications Apple event–savvy now, if you haven't already. For more information on how, see the text box on page 17.

extensions in your applications. Once new features and functionality become readily available, customers have a tendency to want to use them. Since all these extensions will now be part of the mainstream Macintosh operating system, you can bet that your competition will adopt them and that your customers will clamor for your products to incorporate them. Apple is giving you the beta version of System 7.5 several months in advance of shipping the new system to customers to give you a head start before all its technology hits the mainstream.

However, and this is a big however, with the exception of Apple Guide, you've been hearing about all of these extensions for some time now—in *Apple Directions, develop,* and *Inside Macintosh,* at previous Worldwide Developers Conferences, and from Apple evangelism. Most of you ought to know at least something about each of them by now, if you're not already in the middle of adding them to your software.

If you've chosen not to listen to us (and I hope that's the last time you do that!), we'll say it again: Adopting these technologies doesn't take a huge investment in coding, with only a couple of exceptions. Making your applications "drag-aware," building in the PowerTalk mailer, using QuickDraw GX print dialog boxes, and so on, are not Herculean labors.

### The Hard Parts

One exception for many of you will be AppleScript. As you know, AppleScript makes it possible for users to develop their own custom solutions and to automate tasks, combining the features of multiple applications. An attractive idea, but the catch is that for your applications to participate in AppleScript-based solutions, they have to be reworked so that they're driven by Apple events, which takes a fair amount of engineering.

Many of you haven't yet made your applications "Apple event–savvy"—that is, you haven't implemented the Apple event Required and Core suites and the Open Scripting Architecture (OSA) in your applications. Now that Apple is releasing the scriptable Finder, the floodgate of scripting is open: Users will build scripts to automate Finder functions, and they're going to expect to be able to do the same with your software. So the time is now to join the ranks of the makers of Excel 4.0, FileMaker Pro, WordPerfect, QuarkXpress, QuicKeys, and a growing number of other AppleScript-savvy applications.

Another exception is QuickDraw GX; while many QuickDraw GX features, especially its printing enhancements, are available to your applications and users with minimal support from you, its advanced color, graphics, and typography require significant new coding if they're to be incorporated in your products. More on that in the text box on page 14, "QuickDraw GX: The First Customer Release."

The bottom line on System 7.5 is that Apple is unifying its system software, integrating a plethora of recent technologies into one package to enable you to more easily adopt the new technologies and make our mutual customers more productive.

### System Availability, Requirements

Apple expects to release System 7.5 to customers in the second half of this calendar year (that is, 1994). It will be localized into more than 35 languages, including U.S. English, French, German, and Japanese.

As we've already said, System 7.5 will run on both 680x0 and PowerPC processor–based Macintosh systems, but memory requirements differ between the two types of systems. For 680x0-based Macintosh systems, System 7.5 without PowerTalk and QuickDraw GX requires a Macintosh Plus or later model with a minimum of 4 MB of RAM; if you're going to run PowerTalk and QuickDraw GX as well, you'll need a minimum of 8 MB of RAM and a 68020 processor.

On PowerPC processor–based Macintosh systems, System 7.5 requires a minimum of 8 MB of RAM; when adding PowerTalk and QuickDraw GX, a minimum of 16 MB is recommended.

### Act Now, Benefit Soon

I know that System 7.5 gives you a lot to digest. But Apple is giving you time to digest all these messages—and act on them—before the customer release later in the year. Once you've implemented these technologies in your products, they can help further the proven advantages in ease of use and productivity that the Macintosh platform already has over the competition. And it goes without saying that we all need to contribute to that advantage to build our mutual market share. ♣

## develop *Issue 18*

*continued from page 12*

tips for getting the most speed out of the PowerPC processor.

- "Displaying Hierarchical Lists" tells how to provide a user-controlled display mechanism for hierarchical data, much like the triangular buttons used for displaying files and folders in the Finder.
- "The Right Way to Implement Preferences Files" gives some thoughts on what makes a well-implemented preferences file and provides a library to help.

There are also columns on QuickTime movie playback and the debugging version of QuickDraw GX, a new Newton Q&A section (to which you can send in your own questions), and the exciting conclusion to our history of the dogcow.

You'll find all this along with the accompanying code on this month's edition of the Developer CD Series—and, if you subscribe to *develop,* you'll have the pleasure of reading it in print. We've made some changes to our look in this issue, and we'd really like your feedback on them along with any gripes or praise about the content. Your vote counts more than any other judge's! So please, let us know what you think at AppleLink DEVELOP.

Caroline Rose
Editor, *develop*

# System 7.5 and OpenDoc: For More Information

Here is a partial list of sources you can consult for more information on how to incorporate the technologies described in this issue into your products. All *Apple Directions* or *Apple Direct* articles can also be found on AppleLink (path—Developer Support:Developer Services:Periodicals) or on this month's (June) Reference Library Developer CD (in the Periodicals folder located on the top level of the CD). Articles from *develop* can also be found in the same folder on the June Developer CD. For APDA ordering information, see page 32.

### OpenDoc

- A technical summary of OpenDoc is available on the March 1994 Developer CD, path—Dev.CD Mar94:Reference Library:Technical Documentation:OpenDoc.
- "Component Integration Laboratories to Promote Open Document Standards," *Apple Directions,* November 1993.
- "Why 1994 *Will* Be Like 1984," *Apple Directions,* August 1993.
- "OpenDoc To Be Developed For Windows and OS/2," *Apple Directions,* August 1993.

### AppleScript

- "Programming for Flexibility: The Open Scripting Architecture," Issue 18 of *develop,* June 1994. This article is also on the June 1994 Developer CD.
- Various Apple event–related tools and documents are on the May 1994 Developer CD, pathname Dev.CD May 94:Tool Chest:OS/Toolbox:Apple Events.
- The AppleScript 1.1 software is available on the May 1994 Developer CD, path—Dev.CD May 94:New System Software Extensions:AppleScript 1.1.
- "AppleScript, an Elemental Technology," *Apple Directions,* July 1993.
- "Scripting Your Success," *Apple Direct,* September 1991.
- AppleScript Software Development Toolkit version 1.1, available from APDA (#R0175Z/B, $199.00 in U.S.).
- *Inside Macintosh: Interapplication Communication,* available from APDA (#T05943LL/A, $36.95 in U.S.), your local bookseller (this information is included in the AppleScript Software Development Toolkit version 1.1), or the September 1993 Developer CD (path—Dev.CD Sep 93: Reference Library:Technical Documentation:Inside Macintosh:IM—Interapplication Comm).
- Apple Event Registry: Standard Suites, available from APDA (#R013LL/A, $85.00 in U.S.).
- Apple Events/AppleScript Programming Tutorial, available from APDA (#R0224LL/A, $150.00 in U.S.).

### PowerTalk

- "Apple Turns Pro," *Apple Directions,* November 1993.
- "A Talk With Gursharan Sidhu, AOCE Architect," *Apple Directions,* November 1993.
- "How to Get Started With PowerTalk," *Apple Directions,* November 1993.
- "AOCE: Apple's Architecture for Collaborative Computing," *Apple Direct,* March 1993.
- Apple Open Collaboration Environment Software Developer's Kit, available from APDA (#R0525LL/A, $195.00 in U.S.).

### QuickDraw GX

- "Rethinking Your Applications for QuickDraw GX," *Apple Directions,* October 1993.
- "Getting Started With QuickDraw GX," Issue 15 of *develop,* September 1993.
- "Developing QuickDraw GX Printing Extensions," Issue 15 of *develop,* September 1993.
- "QuickDraw GX for PostScript Programmers," Issue 15 of *develop,* September 1993.
- *Inside Macintosh: QuickDraw GX Graphics,* available from APDA (#T1113LL/A, $31.95 in U.S.) or from your local bookseller.
- *Inside Macintosh: QuickDraw GX Printing Extensions and Drivers,* available from APDA (#T1114LL/A, $31.95 in U.S.) or from your local bookseller.

### Apple Guide

- "Giving Users Help With Apple Guide," Issue 18 of *develop,* June 1994.

### Macintosh Drag and Drop

- Macintosh Drag and Drop documentation on the November 1993 Developer CD (path—Dev.CD Nov 93:New System Software Extensions:Macintosh Drag and Drop).
- "Drag and Drop—Anywhere, Anything," *Apple Directions,* November 1993.
- Macintosh Drag and Drop Developer's Kit, available from APDA (#R0552LL/A, $75.00 in U.S.).
- "Drag and Drop From the Finder," Issue 16 of *develop,* December 1993.

### Macintosh Easy Open

- "Apple Releases Macintosh Easy Open," *Apple Direct,* February 1993.
- Macintosh Easy Open Developer's Kit, available from APDA (#R0442LL/C, $150.00 in U.S.).

### Macintosh Telephony Architecture

- "A Phone on Your Desktop," *Apple Directions,* March 1994.

### QuickTime

- QuickTime Developer's Kit version 1.6.1, available from APDA (#R0147LL/C, $195.00 in U.S.).

### Sound Manager

- "Sound: The Final Frontier," *Apple Directions,* January 1994.
- "What's New With the Sound Manager 3.0," Issue 16 of *develop,* December 1993.
- Sound Manager Developer's Kit version 3.0, available from APDA (#R0507LL/A, $50.00 in U.S.).

### Thread Manager

- "Concurrent Programming With the Thread Manager," Issue 17 of *develop,* March 1994.

### MacTCP

- TCP/IP Connection for Macintosh, available from APDA (#M8113Z/A, $59.00 in U.S.).

**Human Interface**

# Usability Testing

## In Which Doc Reveals the Benefits—and the True Cost—of Usability Testing

*By Pete Bickford*

It happens all the time. I'll be sitting through some demo when the programmer points to an object on screen and mouths those dreaded words: "This next part is kind of different, but it seemed like a neat idea, so we went with it."

The programmer then smiles gleefully and proceeds to show off his "innovation." In the past, these "kind of different" features have ranged from ghastly orange custom scroll bars to screens packed with every Hayes modem setting known to man. (Here, the programmer pointed to the hundreds of checkboxes and radio buttons while beaming, "See! You can set them all from one window!")

Now, Ma Bickford always said that if you can't say something nice, don't say anything at all (a restraint that is virtually absent from the human interface profession). Nevertheless, I do try to be tactful, and usually respond with a hearty "Gosh! That's really . . . *interesting.* What did your usability testing say about it?"

At which point the programmer tends to utter a complex stream of syllables that goes something like, "Uh . . . err . . . well . . . you know . . . we . . . uh . . . well . . ." ending in ". . . didn't actually get a chance to do much testing on it."

I'm sure you, gentle reader, can imagine how surprised I am to hear this.

### Testing Code Instead of Software

By now we've figured out as an industry that software ought to—oh . . . actually *work* if it's going to be sold to a customer. To ensure this, many shops hire software testers at a ratio of *at least* 1:1 to their programmers. The idea is that programmers aren't very good at testing their own code.

Strangely, the same shops often treat the actual *usability* of the software as a sort of luxury that can safely be squeezed into the workload of the programmers (whose lives tend to center around Toolbox traps and obscure data structures). And although most developers have by now at least heard the term *usability testing,* surprisingly little of their code will ever be exposed to it. In this way, it's much like the word *documentation*—some ten or fifteen years ago.

### Lab Coat Not Required

If we are even a little kind, we can safely assume that programmers really do care that the software they create is actually usable. When asked why they don't *check* to make sure, the answers you'll hear are generally something like these:

- "Usability testing is too specialized/difficult."
- "We don't have the time."
- "Usability testing costs a lot of money."

All of these, I assure you, are vicious lies spread by the makers of video cameras and lab coats in conjunction with the ever-powerful one-way mirror manufacturers' lobby. The truth is that some of the most effective usability testing is incredibly simple, takes only a few minutes, and costs only about $7 per subject. Moreover, there is documented proof that what you learn from doing usability testing pays itself back many times over by slashing your user support costs and helping you avoid design pitfalls.

### A Brief Lesson in Conducting a Usability Test

The following are some instructions for carrying out a basic usability test:

Step 1: Find a user. A real user (as in, "someone who will be using your system"). If you can't find one of these, find someone a lot like the people who will be using your system—someone who has the same kind of technical and occupational expertise.

*Caution:* If you're developing an in-house system, resist the temptation to use a manager as a test subject, unless the actual system will be used exclusively by managers. Too many designers give in to this temptation, since the real users are considered "too busy" or "not important enough" to participate in a usability test. So instead they send their managers, a system is designed around *them,* and the result is something unusable by the rank and file.

Step 2: Set the user down with a drawing or prototype of your system. The important thing about prototypes is to remember that they are not "real." They should be designed quickly and thrown away quickly. The prototype only needs to be good enough to get the basic ideas across.

Step 3: Explain to users that you're there to find the areas of the system that are confusing or difficult, and that any place they run into trouble is an opportunity for you to make the system better. "Mistakes" are not the user's fault—they just point out trouble spots in the system.

Step 4: Ask users to perform a set task using the system. Explain to them that you will not be offering any help, and that they should "think aloud" so you can tell what they're thinking as they try to work the system.

Step 5: Watch users quietly and note the areas where they do unexpectedly well or where they run into trouble. And here's the hardest part: You absolutely must resist the temptation to give "hints" or point out parts of the system that they "overlooked."

Step 6: At the end, ask them about the areas of the system that you noted, then thank them and give them a project T-shirt for their trouble.

Step 7: Use the results.

Total time for the test: usually under 30 minutes.

Total cash outlay: $7 per user (for the T-shirts).

If you're keen on spending money, you can hire consultants and do a lot of videotaping behind one-way glass; however, you'll get 90 percent of the benefit by just using the above techniques. The important thing is to get out there and "just do it." If you try an interface out on four people, you'll usually find three of them hitting the same problems. Any such problem will need to be fixed (or, if there's nothing that can be done, at least documented).

**Usability testing finds problems with your product that you never could have guessed were there… A few minutes fixing these things can make all the difference—but first you have to know that the problems are there.**

### Win Friends and Change Minds

Usability testing finds problems with your product that you never could have guessed were there. For instance, you'll sometimes discover that wording that is natural to you gives entirely the wrong impression to a regular user. Other times, you'll find that buttons and menus that seem obvious to you are ignored or overlooked by users who either don't notice them or don't interpret them as being important to solving the problem at hand. It's these little things that add up to a sense of anxiety and confusion on the part of the user. A few minutes spent fixing these things can make all the difference—but first you have to know that the problems are there.

Usability testing is also useful from a political level within an organization. For one, it's the evidence that matters when trying to settle an argument between different design approaches. Engineers of good conscience can have hellacious battles arguing which interface design is the best for solving a given problem. Although designs can take hundreds of hours to code, a few hours of usability testing can often settle the question.

Another thing to remember is that usability testing can be *wonderful* public relations for your project. By taking the time to go out and recruit target users to help in your usability testing and product design, you'll have gone a long way toward spreading goodwill and the sense that you really care about your customers' needs.

### The All-Important Paradox of Usability Testing

There is, however, one great paradox to usability testing: Although you can use it to find out from users what went wrong, it's usually unproductive to then ask them how to make the design right. Users, as much as we love them, are not designers—they seldom have knowledge of the technical possibilities for solving a problem in the optimal way.

So, given a really unusable system, they'll generally suggest a system exactly like it as a solution—with the one or two things that bugged them the most changed in some way. In the pre-Macintosh days, you often heard users ask for smaller type so that they could see more information on the screen at one time (remember 132-column screens?). Thankfully, the designers of the Macintosh looked beyond the immediate request (smaller characters) to the underlying need (to see more data) and created a system where you could view information using multiple windows. The lesson: While you need to notice what the user's problems are, you as a designer are responsible for looking beyond the surface to discover the underlying issues and offering a real solution.

### Keeping Us Honest

Well-organized development teams include marketers, engineers, graphic artists, documentation folks—and, yes, human-interface designers. Over the course of the project, it's almost guaranteed that arguments are going to arise over some aspect of the human interface. And, though the human-interface designer will often have the best solution (I naturally offer myself as a shining example of this), nobody on the team has a monopoly on the truth.

In the end, there is only one judge of how good the human interface is, and that person is the user. By doing usability testing on your product in the development stage, you stand a much better chance of passing muster when your product is "usability tested" in the marketplace.

*Till next time,*
*Doc*

*AppleLink: THE.DOKTOR*

---

*Pete Bickford is a member of the Apple Business Systems human interface team.*

# Programming Courses From Developer University

If your technical people need how-to instruction in all aspects of programming with technology from Apple Computer, Inc., then Developer University (DU) is the place for them. With course offerings on a broad range of subjects, from PowerPC and OpenDoc to Newton and MacApp, DU will give your engineers the information they need to build Macintosh and Newton software using the latest Apple technologies.

To help you find the courses that will help your programming efforts, each month *Apple Directions* will publish the latest schedule of Developer University classes offered at Apple's Cupertino R&D Campus. To receive more information, including a catalog and detailed schedule, or to register for a class, contact the Developer University Registrar by phone at (408) 974-4897 (select 2 when you reach the phone tree), or by fax at (408) 974-0544, or send an AppleLink message to DEVUNIV. A list of short descriptions and the Developer University schedule is also available on AppleLink (path—Developer Support:Developer Services:Apple Information Resources:Developer Training).

### New Courses for Spring and Summer 1994

Developer University will be offering the following courses for the first time this spring and summer:

- Programming OpenDoc
- Newton Technology Overview
- Newton Programming: Extended Topics
- Newton Programming: Communications
- Object-Oriented Fundamentals

In addition, DU offers its Technology Review Series for the first time. Offered monthly beginning in June, this series consists of one-day seminars for technical managers and software developers who are looking for an in-depth review of key Apple technologies. The sessions explore development issues posed by new technologies and provide an intensive look at the technologies. You may sign up for one or several sessions. Signing up for an entire series will entitle you to a 10 percent discount.

The accompanying text box lists the courses offered by Developer University between May and August 1994. ♣

## Developer University Schedule

**May**

23 Programming With QuickDraw GX
PowerPC Boot Camp
Newton Programming: Essentials
24 Programming OpenDoc

**June**

*Technology Review Series:*
6 Introduction to AppleScript
8 Introduction to PowerTalk
9 Introduction to QuickDraw GX
10 Introduction to OpenDoc

*Regular courses:*
1 Newton Technology Overview
6 Newton Programming: Essentials
7 Scripting With AppleScript
9 Newton Technology Overview
13 Programming OpenDoc
Programming With QuickDraw GX
13 PowerPC Boot Camp
Object-Oriented Fundamentals
27 Macintosh Programming Fundamentals
Advanced C++
Newton Programming: Extended Topics

**July**

*Technology Review Series:*
11 Introduction to AppleScript
12 Introduction to PowerTalk
13 Introduction to QuickDraw GX
14 Newton Technology Overview
15 Introduction to OpenDoc

*Regular courses:*
11 Intermediate Macintosh Application Programming
Programming With QuickDraw GX
12 Scripting With AppleScript
18 Object-Oriented Fundamentals
PowerPC Boot Camp
25 Programming MacApp 3.0
26 Programming OpenDoc
Newton Programming: Communications

**August**

1 Newton Programming: Essentials
8 Newton Programming: Extended Topics
Advanced C++
Macintosh Programming Fundamentals
15 Newton Programming: Communications
Debugging Strategies and Techniques
PowerPC Boot Camp
17 Writing and Using Device Drivers
22 Apple Events/AppleScript Programming
Object-Oriented Fundamentals
Programming With QuickDraw GX
29 Programming MacApp 3.0

## CD Highlights

*continued from page 12*

Convert • Projects is *not* a source-code converter. If your code uses nonportable constructs that aren't supported by the Code Warrior compilers, you'll need to change your code manually.

Note: This is *not an Apple product.* It is provided on an "as is" basis. Apple Computer, Inc., is not responsible for any problems you may encounter in its use.

### C.S.M.P. Digests

This digest is a collection of article threads from the Internet newsgroup comp.sys.mac.programmer. It is designed for people who read c.s.m.p. semiregularly and want an archive of the discussions.

Note: This is *not an Apple product.* It is provided on an "as is" basis. Apple is not responsible for any problems you may encounter in its use.

### Developer Notes

Included here, along with our regular archive, are developer notes for several new products, including the PowerBook 520 and 540 and PowerBook Duo 280 and 280c computers and the PowerBook Duo Dock II.

The PowerBook 520 and PowerBook 540 computers are all-in-one notebook computers featuring the powerful Motorola LC68040 microprocessor, color displays, and integrated communications architecture. The cases for these computers are contoured, with room inside for two rechargeable batteries and a high-speed modem. The user can install an expansion card in place of one of the batteries.

The PowerBook Duo 280 and PowerBook Duo 280c computers are PowerBook Duo docking computers using the Motorola MC68040 microprocessor. In addition to the features of the PowerBook Duo family, the PowerBook Duo 280 and 280c include new active-matrix displays—grayscale or color—and larger internal hard disks.

The PowerBook Duo Dock II is an enhanced version of the original Macintosh Duo Dock providing the docking capability that converts PowerBook Duo computers into fully functional desktop computers. It includes several features that improve the performance and expandability of the PowerBook Duo computer family.

### Mac Tech Notes (Text)

Technical notes are collections of short (and not-so-short) articles dealing with specific development topics. This month's new and updated technical notes include

- *DV 06: Finding Drivers in Unit*
- *DV 25: CD Remote DB Format*
- *QT 04: QuickTime 1.6.1*
- *TE 27: Inline Input and TextEdit*

### Macintosh CD-ROM Setup 5.0.1

This folder contains the network installation for Apple's CD-ROM driver.

### Macintosh Drag and Drop 1.1

Macintosh Drag and Drop is one of Apple's new technologies, which you should support. By using Macintosh Drag and Drop, you can easily implement intra-application and inter-application drag-and-drop capabilities in your products. Your applications will have an improved user interface, and your users will be able to manipulate and work with their data faster and more intuitively.

Macintosh Drag and Drop implements the new Drag Manager Toolbox, which provides the Drag Manager routines for drag-and-drop behavior in your application. To provide the standard drag-and-drop interface, you only need to add a few new calls and provide two callback routines that are utilized during drag operations.

The Drag Manager is integrated with the latest Finder (included in System 7 Pro and System 7.5), which allows users to drag and drop files from the Finder into any applications' windows and provides file information for those files. Applications can also determine where data was dropped in the Finder—for example, that it was dropped into the Trash.

Version 1.1 of Macintosh Drag and Drop adds support for native PowerPC applications and fixes a number of key bugs from version 1.0. To support native applications, we've included two new files—the DragLib library, which you use to link with your application, and the Drag.h file, a universal header file to include. We've also improved the Macintosh Drag and Drop extension to provide PowerPC glue code. If you start up your Macintosh with the Macintosh Drag and Drop version 1.1 file in your Extensions folder, you don't need to include the DragLib file with your application; the new extension will provide the DragLib code fragment that your application will link with at run time.

You may license Macintosh Drag and Drop 1.1 and include it with your products. Macintosh Drag and Drop 1.1 includes the Macintosh Drag and Drop file, the Clipping Extension file, and the Dragging Enabler file. You may not license any other files in the Developer's Kit. For more information, call Apple Software Licensing at (408) 974-4667.

### U.S. System Software—Performa 7.1P6

This disk set has all of the Apple software included with the Macintosh Performa computer. To install this software on your hard disk, boot your machine with the Utilities disk. Follow the instructions in the Apple Restore program included on that disk to restore all of your disk images. It is recommended that you do not install this software over other system software.

You can use this software to test for compatiblity between your application and Performa system software. If you do not have a Performa computer, you can run this software on a Macintosh Classic® II, LC II, LC III, IIvi, IIvx, or LC 520 computer.

### Coming Next Month

Next month's CD will include the long-promised boot-everything System Software folder, megabyte upon megabyte of localized System 7 Pro versions, and, possibly, the beta release of a new version of QuickTime.

*Alex Dosher*
*Developer CD Leader*

# Business & Marketing

**Market Research Monthly**

## Market Analyst Expects Faster Adoption of PowerPC

Our April 1994 Special Market Report on Power Macintosh computers used data prepared by Pieter Hartsook, the long-time independent personal computer market analyst and editor of *The Hartsook Letter.* Mr. Hartsook has just revised *upward* his long-range forecast for PowerPC processor–based Macintosh systems. We thought you'd want to know why, and get his latest figures for your own forecasting.

"Adoption of PowerPC will be smoother and faster than I originally expected," said Mr. Hartsook. "Internal Apple sources and independent software vendors indicate that compatibility and performance with existing Macintosh software is better than originally anticipated.

"Now that we've had a chance to see the new Power Macintosh computers in action and to witness their compatibility with existing software, I expect a speedy adoption of the new hardware," he added.

Mr. Hartsook now projects that Apple Macintosh shipments will reach 4.8 million units in 1995, up from his previous 4.4 million estimate. That year, total worldwide shipments for Apple 680x0 and PowerPC processor–based systems combined will be 200,000 units more than his earlier estimates.

In 1997, Apple Macintosh sales will reach 5.5 million units, all of them PowerPC processor–based systems, a 400,000-unit (8 percent) increase from his earlier forecast. Complete revised data appears below.

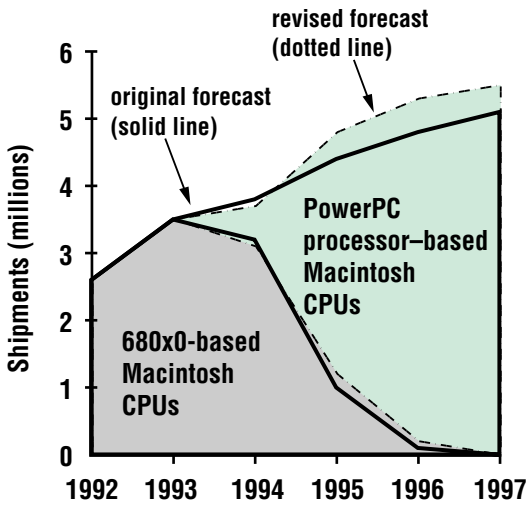
To obtain the most current *Hartsook Letter, Newsletters and Forecast Reports,* contact *The Hartsook Letter,* 3001 Marina Dr., Alameda, CA 94501; phone: (510) 521-4988; AppleLink: HARTSOOK.

*Important note: All data presented in this month's Market Research Monthly is used by permission of* The Hartsook Letter, *© 1994; further reprinting without written permission of* The Hartsook Letter *is forbidden. The data is reprinted for your information only; its use in* Apple Directions *does not constitute an endorsement of the data by Apple Computer, Inc.* ♣

**Inside This Section**



### Worldwide Apple Macintosh Shipments (in millions)




### Supporting Data

| Year-end totals | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|---|---|---|---|---|---|---|
| **Original forecast** | | | | | | |
| 680x0-based Macintosh CPU | 2.6 | 3.5 | 3.2 | 1.0 | 0.1 | 0.0 |
| PowerPC processor–based Macintosh CPUs | 0.0 | 0.0 | 0.6 | 3.4 | 4.7 | 5.1 |
| **Total** | 2.6 | 3.5 | 3.8 | 4.4 | 4.8 | 5.1 |
| **Revised forecast** | | | | | | |
| 680x0-based Macintosh CPU | 2.6 | 3.5 | 3.1 | 1.2 | 0.2 | 0.0 |
| PowerPC processor–based Macintosh CPUs | 0.0 | 0.0 | 0.6 | 3.6 | 5.1 | 5.5 |
| **Total*** | 2.6 | 3.5 | 3.7 | 4.8 | 5.3 | 5.5 |
| ***-percent increase from original forecast** | | | | 6% | 9% | 8% |

Marketing Feature

# The ABC's of the U.S. Preschool Software Market

## Why Teaching Little People Is Becoming a Big Business

*By Barbara Nelson, Apple Computer, Inc.*

The lifelong journey of learning begins at a very young age. Experts say that half of all we will learn is learned by age four. By this age, we've begun to understand the world around us and communicate through language. We've built a sense of self, and we're as curious about the world around us as we'll ever be.

Computers and quality software enhance the learning process of young children, allowing them to explore their world in new ways. The combination of affordable computers and rich multimedia tools has brought educational software within reach of the very young. And of course, it's in your hands to think small to create these exciting new "totware" products. *[Editor's note: To see how one developer is approaching this market, see this issue's Developer Outlook, "Strategies for Success in the Early Learning Market," on page 29.]* As Apple's national preschool sales/program manager, I've written this article to help you understand the trends and development opportunities in this emerging market.

The preschool software market—generally defined as the segment serving the needs of children three to five years old—is growing at a rapid rate. Apple Computer, Inc. is stoking the fire under this market by incorporating preschools into its education program and working with national preschool organizations to increase the adoption of computers. This active commitment, along with increasing demand for quality preschool products, is creating lucrative opportunities for developers interested in entering this market.

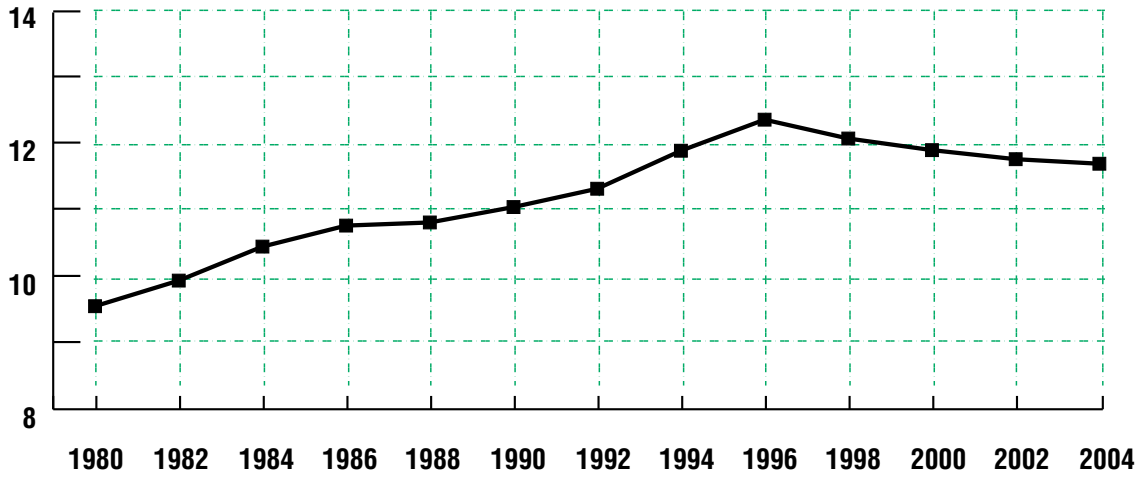
### Apple's Focus on the Preschool Market

In deciding on a platform for your preschool products, consider the Macintosh first. We're the strongest player in the overall U.S. education market in terms of installed base and annual units shipped. According to the August 1993 K–12 Report from the Software Publishers Association, Apple computers made up 68 percent of the U.S. education market installed base (Macintosh and Apple II models), making it the most purchased platform sold into this market.

And 57 percent of school shipments during the 1992–1993 school year were Apple units, according to Quality Education Data (QED).

Apple sponsors a variety of innovative programs for education. We have an established sales and marketing program focused specifically on the preschool market, a move that's intended to increase the demand for Macintosh-compatible third-party products. The main objectives of Apple's efforts are

- to increase the number of Macintosh computers in preschools through special education pricing, direct mail, and a focused sales effort
- to evangelize the creation of computer-based solutions




Sources: Reports and publications issued by the U.S. Bureau of the Census.

targeted at key preschool market needs
- to work with national early childhood organizations to increase the adoption of Macintosh computer technology in preschool institutions.

As part of its commitment to the growing preschool market segment, Apple introduced an attractively priced bundle of hardware, preschool software, and teacher support materials—the Apple Early Childhood Connections package—at the NAEYC (National Association for the Education of Young Children) conference in November 1993. Built around the Macintosh LC 575 computer system with built-in CD-ROM and multimedia capabilities, this package features a library of the leading early childhood developmental software and CD-ROM titles, as well as Apple-published teachers' guides and support materials. This bundle can be ordered directly from Apple by any state-licensed organization that provides educational and/or child-care services to children under age five.

According to Jeff Orloff, former manager of national programs marketing for Apple USA's education division, "The Early Childhood Connections package expands on Apple's leading K–12 Early Language Connections program. By offering a totally integrated solution—hardware, software, and teacher support materials—the Early Childhood Connections package will allow early childhood educators to easily integrate these powerful new learning tools into their existing preschool curriculum."

On the consumer side of the early learning market, the Macintosh Performa 550 and 575 are the models most frequently sold into homes. Beginning in the autumn of 1994, Apple expects about 75 percent of all Performa units to ship with built-in CD-ROM drives.

Apple offers the best technology to support the preschool market. All Apple computers are "multimedia-capable" right out of the box—an important market factor for preschool products that rely heavily on animation and music. And along with Apple's industry-acknowledged ease of use, our commitment to ergonomics and quality of monitors is very important to child safety and development. We meet ELF (Extremely Low Frequency) standards (the stringent Swedish MPR2 criteria for electric and magnetic emissions from monitors) and federal guidelines for handicapped access.

Another important future growth issue for preschool developers is the outlook for CD-ROM title sales. Apple is currently investing heavily to spread the adoption of this media. By the summer of 1994, all Macintosh computers sold into schools will offer a CD-ROM option. And to promote sales of CD-ROM titles in the consumer market, Apple is participating in a strategic pilot program with more than 50 Blockbuster stores in the San Francisco Bay Area. The program is called the "Interactive Experience" and allows customers to sample, rent, or purchase titles at their many retail outlets. Assuming that this pilot program is successful, this new channel should provide preschool product developers a lucrative new source of sales and product exposure.

### The Anatomy of the Preschool Market

According to census data, there are about 12 million children between three and five years old in the U.S. market. (See the graph "U.S. Population of Children Ages Three to Five" on page 23.) Total spending by preschool institutions amounts to about $20 billion annually, with $575 million going to learning aids such as software and computers, according to the February 1994 issue of *Six Months to Six Years.*

If you're developing products for these young children, there are two audiences you need to sell to—parents and preschool institutions. (For advice and ideas on selling to these two groups, see "Strategies for Success in the Early Learning Market" on page 29.) Since this is an emerging market, finding out exactly how many preschools and preschool families use computers is difficult. We do know from the Software Publishers Association that about 27 percent of American households have a computer at

Looking to reduce your in-box costs for manuals? Apple DocViewer is now available for licensing from Apple.

Create electronic manuals, complete with hypertext table of contents, index, and advanced searching features. DocViewer takes the investment you've made in your Microsoft Word or FrameMaker documentation and turns it into a non-editable, on-line reference for your customers.

Send an AppleLink message to ADV for more information.

home. On the institutional side, Mike Wilson of Wilson Marketing Group, a direct marketing consultant specializing in early education markets, estimates that there are almost 160,000 institutions or "buying entities" in this market. Roughly 4 million children are served by school-based programs (private or public traditional, pre-kindergarten, and kindergarten-through-sixth-grade institutions) and 5 million attend one of the 80,000 private-sector day-care centers, preschools, Head Start, or Montessori schools. (See the figure "U.S. Preschool Educational Institutions and Buying Units" on this page for numbers of each type of institution.)

For developers not familiar with the broad range of U.S. preschool institutions, the following descriptions provide details:

- *Kindergartens and pre-kindergartens.* Usually located in public and private elementary schools, these school-based institutions serve children ages three to six.
- *Day-care centers.* These centers provide care for children up to six years of age. This category includes centers for infant/toddler care, after-school care, and handicapped centers, as well as custodial child care.
- *Montessori schools.* Maria Montessori originally pioneered the well-defined educational methods used in these preschools. Today most of these schools freely purchase non-Montessori materials.
- *Preschools.* These institutions provide a school-readiness program for children ages two to five years old.
- *Head Start centers.* Head Start is a U.S.-wide, federally funded preschool program for low-income families. Some offer special programs for children of migrant and Native American families. Head Start centers are administered by regional area offices. Education coordinators control much of the purchasing.

## Trends Fueling Preschool Market Growth

So why is the preschool market predicted to take off in the next several years? The combination of computer price drops, wider acceptance of computers in preschools, and a stronger commitment to preschool education have primed the pump behind this untapped market.

Dropping computer prices have laid the foundation for growth. Right now a mere 15 percent of all preschool institutions have computers, and of these computers, many are used for administration purposes only, says the Wilson Marketing Group. The advent of affordable computers and more quality preschool software will begin luring parents and preschool educators into the world of computers.

Attitudes play an extremely important role in the preschool market. Until recently, many national preschool organizations —groups that influence teachers on curriculum issues—have discouraged the purchase of computers for young children. Several events have changed these attitudes. Recent studies affirm that when software is well designed and developmentally appropriate for this particular age group, computers can enhance a young child's learning. The easy access to sound and graphics on affordable computers such as the Macintosh LC 575 make computers both appropriate and easy to use for nonreaders. As educators and parents start thinking of computers as essential learning tools in the classroom, both Apple and preschool software developers will benefit from increased sales.

Another important attitudinal shift in the United States is what Ross Sackett, publisher of the preschool newsletter *Six Months to Six Years,* calls the "child-care habit"—the growing belief that preschool is essential preparation for a child's educational future. Today, nearly one in three preschool children attend some sort of center. This ratio will grow as even more women continue to enter the workforce. According to the Wilson Marketing Group, a stronger economy and increased acceptance of organized child care should result in a 20 to 30 percent increase in center enrollments (data excludes Head Start centers) over the next three years.

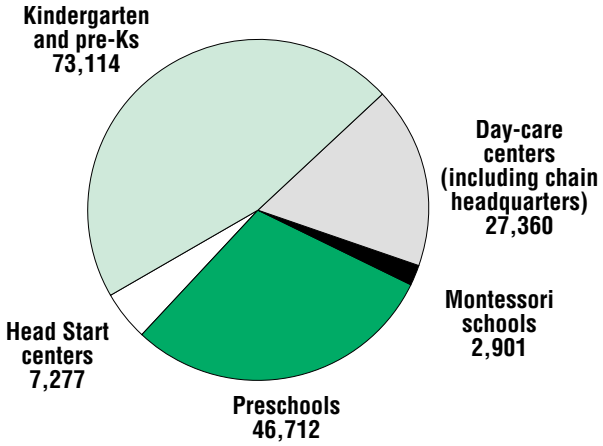
On the government side, the U.S.-wide commitment to preschool education is manifesting itself through increased federal funding. According to Ross Sackett, Head Start funding has grown from less than $1 billion five years ago to $3.3 billion. Two other federally sponsored programs that support preschool education include the Comprehensive Child Care Block Grant program, which has grown to almost $1 billion, and the Chapter 1 program, which recently received a $1 billion increase, raising it to almost $4 billion.

## Institutional Growth Areas

As a result of the trends mentioned above, combined with Apple's focused effort to sell Macintosh computers to preschools, demand for Macintosh software should increase most rapidly in these three types of preschool institutions:

- *Pre-kindergarten/Head Start programs.* Primarily because of federal funding increases, great growth is occurring in pre-kindergarten enrollments on the school-based side of the market. School programs receive 20 to 25 percent of the government's Head Start funding, plus 18 to 20 percent of Child Care and Development Block grant monies, says Mike Wilson of the Wilson Marketing Group. These organizations mainly serve four-year-olds, so the nonschool side of the market continues to serve the other parts of the market. Most of the growth should occur in additional children being enrolled in existing centers rather than more new centers opening up. Head Start seems likely to double its current enrollment level of about 700,000

## U.S. Preschool Educational Institutions and Buying Units




Source: Wilson Marketing Group, *Early Childhood and Special Needs Marketing Guide 1993/1994*

# Preschool Market Developer Opportunities

| Category | Solutions needed |
|---|---|
| Child growth and development | Interactive books |
| | Creativity and play |
| | Learning enhancement |
| Institutional aids | Teacher productivity |
| | Staff development |
| | Office management |
| | Parental communication |

children over the next four years.

• *College-based programs.* With regard to computer use, preschool programs run by colleges and universities are among the most progressive in the child-care market, and many of them use Macintosh computers. About one-third of these programs serve children with special needs. These programs often use computers for child-care development, teacher training, and parent education courses.

• *Day-care centers.* Because of the growth factors outlined in the previous section, there should be significant increases in preschool and day-care enrollment over the next several years. Another important statistic is that there are 265,000 registered family day-care centers in the United States. These private home situations, usually with fewer than ten children, frequently use computers for their personal and day-care needs.

## Development Opportunities

There will always be a strong demand for great software products that encourage the growth and development of preschool children. These products should be open ended and encourage exploration and growth. (See the table "Preschool Market Developer Opportunities" on this page.

These concepts are a far cry from the early drill-and-practice software that was sold under the banner of "educational." The newest generation of preschool software focuses on rewarding curiosity rather than penalizing wrong answers. (See "Preschool Software Design—More Art Than Science" on page 27 for more design guidelines.) Categories of growth and development products that preschools and parents are most interested in include the following:

• *Interactive books.* This rapidly growing market segment consists of interactive stories that teach children to read and allow them to explore characters and objects in the stories. The paradigm shift from passive text-based software to interactive stories has been well received by educators and parents. Many developers addressing this segment have found success in basing their products on much-loved children's book characters, such as Little Critter and Strega Nona. (Of course, licensing these characters is a must.)

• *Creativity and play programs.* These game- and tool-based activity programs teach children how to think, manipulate objects, and express themselves. There's a need for products that encourage children to build things such as paper airplanes or paper dolls. Some popular examples of creativity and play programs are Thinkin' Things from Edmark and EA Kids Art Center. (See "Strategies for Success in the Early Learning Market" on page 29 for Edmark's advice on developing and marketing these types of products.)

• *Learning enhancement.* This type of product lets children explore a specific topic, such as dinosaurs (science), how another culture lives (social studies), the alphabet (pre-reading skills), and so on. Preschool educators can use this type of product to enhance their curricula.

Another market opportunity is in software that helps teachers and administrators run preschool institutions. There's also the potential to develop entirely new categories of software that would have broader appeal to the school market at large. For example, one developer is working on Newton software that allows bus drivers to check students in and out of school. Here are some examples of other new software categories:

• *Teacher productivity.* This type of product helps teachers spend more time teaching students and less time performing administrative tasks. Ideas include software that quickly creates teaching materials such as paper puppets, sentence strips, or character necklaces, or software that helps teachers check students in and out of the classroom.

• *Staff development.* Because of the enormous turnover in child-care personnel, there's a tremendous need for easy-to-use, on-the-job teacher training materials. Organizations such as the NAEYC, Children's Defense Fund, and National Governor's Association see the lack of training and certified personnel as a crisis in the industry. The average day-care worker in the industry has less than a two-year degree and many have none. Having trained educators on staff is often seen as a competitive edge by institutions.

• *Office management.* As early as 1987, preschool and Head Start program management applications have been available. But these are predominantly DOS- and Windows-based applications, and there's a need for Macintosh-compatible applications. The recently introduced Power Macintosh line will be very important to this market. This line's ability to run IBM-compatible software will enable preschools with installed DOS-based machines to upgrade to attractive price/performance Power Macintosh computers, without sacrificing investments in existing DOS-compatible software.

• *Parental communication.* According to Faith Popcorn in *The Popcorn Report,* parents are more interested in their kids' schooling during the preschool years than during any other period. Developers can benefit from this parental interest by creating applications that help teachers provide parents with a chronicle of a child's daily activities, a home reading list, a report of what skills a child has learned, and so on.

• *Health awareness.* Many institutions such as Head Start are required to run parental training classes, as well as children's programs. These organizations take a "whole child" approach, focusing on matters such as health and parental literacy that affect a child's ability to learn. For example, one product on the market today enables teachers to print out a flyer on the symptoms of chicken pox and other diseases during school outbreaks. In the area of health awareness, there's a need for products that help institutions track illnesses of children, provide nutritional information, complete accident reports, and educate parents on health concerns.

## Consumer and Education Cross-Selling

Cross-selling your products between consumer and education channels is a good way to leverage a product development

investment, but be aware of some important differences in product content. Parents tend to purchase products more for entertainment value, and in education, entertainment alone is not enough. Sound educational software will sell in the consumer market, but the reverse is not necessarily true.

To ensure the success of selling across these channels, consider taking these steps to make your product educationally sound:

• *Create an education advisory panel.* This panel should include credentialed individuals in the field of early childhood education. Bring them into the development process early, and consult with them frequently. Include children in the development process as well. Your panel can also ensure that your product is positively accepted by their educator peers through conference speeches and press quotes.

• *Buy copies of top-selling educational applications and examine them carefully.* Compare them to your product. To research the market, gather reviews of existing products to see what types of features work and don't work in the eyes of reviewers and educators. A good place to start is *Children's Software Revue* (See "Resources for Early Childhood Software Development" on page 28 for ordering information.) This publication keeps a database of over 700 reviewed children's software products, and they provide a $15 title search service to developers interested about learning what products are available in a given category.

• *Create teacher materials.* Most teachers aren't familiar with the advantages of computers in the classroom. Explicitly show them how your product

# Preschool Software Design—More Art Than Science

"Constructing a good children's product is more of an art than a science," says Warren Buckleitner, the editor-in-chief of *Children's Software Revue,* a newsletter offering parents, educators, and software developers the latest information about early learning software and hardware. "Software for preschool children has to be much more sophisticated than software for adults. It has to artfully combine speech and high-quality graphics, and it must be tremendously easy to use."

For the last eight years, Buckleitner and the High/Scope Educational Foundation have produced the *High/Scope Buyer's Guide to Children's Software,* a comprehensive guide to software for children under the age of seven. (For information on submitting review copies, contact High/Scope at 600 N. River St., Ypsilanti, MI 48198.) The criteria that they use in evaluating early learning software products follows.

• *Easy to Use.* Preschool children are primarily nonreaders who have few or no typing skills. The software should be menu-driven with icons and utilize speech as often as possible. Digitized speech may be used for both instructional content and help facilities. Mouse skills are difficult for young children to master. Most have no trouble with point-and-click tasks, but when "dragging" is added, many three- and four-year-olds experience great difficulty.

• *Interactive.* The interactive quality of the computer is one of the most compelling reasons for children to use computers. The computer should require much more than pressing the Return key or mouse button to move to the next screen. As more programs move to features that allow animated activities to occur on screen, young children become accustomed to this feature and they become frustrated or bored when they don't find interaction possible.

• *Childproof.* Programs for the very young should anticipate children accidentally hitting the wrong keys, and developers should lock out unnecessary ones. The program should make the active window as large as possible. And developers should override System 7's function that returns users to the desktop when they click outside of the active window, because it frustrates children.

• *Designed with features for teachers and parents.* Teachers and parents like to manipulate the presentation of material for children. This control should extend to levels of difficulty and the amount of the material presented. For example, in a math program that presents activities using the numbers 1 through 10, a teacher may want to change the difficulty level so that only the numbers 1 to 5 are used.

• *Child controlled.* While content and levels of difficulty are tools that teachers and parents should be able to control, it's the child who should be able to direct the software activities. Children should choose which activities they want to use. In other words, if a program's objective is to teach children about the numbers 1 through 5, children should be able to achieve this goal in multiple ways. Children should also be able to "save" their work and move to other sections at will.

• *Designed to aid learning.* Two important questions that Buckleitner always considers when evaluating a product are "After a child uses this product, what does he or she leave with?" and "What does it do better than traditional materials?" There's a big difference between video games and educational software. Programs designed to help educate young children should clearly state in the documentation what educational objectives the software addresses.

It's generally accepted that young children have short attention spans. But recent studies have shown that young children remain at computers far longer than was originally thought. Holding children's attention and keeping their interest is critical to good software. Many programs may have overall excellent objectives for learning, but flaws in design can quickly ruin a program's quality. The age and development of children must be addressed in the design. Don't expect a young child to cut out items in computer printouts that contain small detailed lines. Or don't place difficult art activities in the middle of programs designed for beginning readers. It's very easy for good software to miss the match between learning objectives and design.

• *Worth the price.* Educators are always price conscious. They consider what the life of the program in the classroom will be. Is the program broad-based enough to hold children's interest and keep them returning to the software? The more learning objectives the software meets and the lower the price, the happier the teacher or parent will be. (High/Scope reports that the average software application in their guide sells for $44.27.)

Educators of young children have very definitive views of the types of learning experiences that best promote the growth and development of young children. To learn more about these guides, it's highly recommended that you order the document *Developmentally Appropriate Practice in Early Childhood Programs,* published by the NAEYC (National Association for the Education of Young Children). See "Resources for Early Childhood Software Development" on page 28 for ordering information.

can improve education for young children.

• *Don't mark up educational versions too much.* Preschool purchasers are willing to pay a little extra for teacher support materials, but don't add too much of a price premium because this market is fairly price sensitive. (*High/Scope Buyer's Guide to Children's Software* reports that the average software application in their guide sells for $44.27.) Volume education discounts are usually offered by second-tier distributors, not developers.

• *Upon completion of a product, submit it to organizations such as the* High/Scope Buyer's Guide to Children's Software *for review.* Good reviews are an inexpensive way to garner more sales for your product. Check out the resources section at the end of the article for a list of key publications that help you spread the word about your product. (See "Resources for Early Childhood Software Development" below for other good software reviewers.)

Following these proven cross-selling tactics should help ensure the success of your products in both the education and consumer channels.

### The Preschool Market: For Love and Money

Bottom line, now is the time to get in on the ground floor of the preschool software market. The fortuitous convergence of computer price drops, waning preschool computerphobia, and commitment to preschool education for all children has primed this market for growth. Developer opportunities exist for both teaching and administrative software applications. And as is the case with many emerging markets, the earlier you establish name recognition and customer loyalty, the harder and more expensive it will be for your competitors to dislodge you from your market position.

In designing software for young children, it's essential that you get advice from education experts and your most important reviewers—children. Get these experts involved early on, because sound educational software will sell in the consumer market, but the reverse is not often true.

And finally, while this business can be very profitable, take into account one of the rewards of developing software for young children that can't be measured in net profits or return-on-investment—the satisfaction of knowing that what you're doing is indisputably worthwhile. Working with children, you're often forced to shed all the baggage that comes with being an adult and reexperience something that you normally don't encounter during your day-to-day tasks—the wonder and excitement of learning something new. ♣

---

*Barbara Nelson is the national preschool sales/program manager at Apple Computer. As an authority on teaching, children, and technology, she's worked as a demonstration kindergarten teacher and served as a consultant in early childhood education and bringing technology to schools. At Apple since 1986, she's been instrumental in developing the preschool program and hardware solutions. She was most recently recognized for her efforts in* Who's Who in American Education, 1994 Edition.

## Resources for Early Childhood Software Development

• *Apple Education Resource CD.* This CD includes Apple product information, a software and hardware guide to educational products, and a collection of articles on integrating technology into education settings. For a fee, developers can include their information on this CD. To get information on participating in a future volume of this CD, call (408) 738-2769.

• *ATLIS Online Network.* ATLIS targets educators and educator associations, and it's the "official" network of the NAEYC. Services include news about early childhood, bulletin boards for individuals working with young children, and on-line consultants. Of interest to developers is their NAEYC Technology Panel that shares information about quality software products, and a bulletin board that provides developers a forum for announcing new products. For further information, contact America Tomorrow at (301) 229-1067.

• *Child Care Information Exchange.* This magazine reviews software and is an important source of information for child-care centers. Send product evaluation copies to *Child Care Information Exchange,* Attn: Bonnie Neugebauer, P.O. Box 2890, Redmond, WA 98073, (206) 883-9394.

• *Children's Software Newsletter.* This publication targets parents wanting information on the best software for young children. *Children's Software* is published as a joint project of Children's Software Press and the Department of Computing in Education at Teacher's College, Columbia University. This publication is available by subscription for $15 per year (four issues); individual copies are $4 each. Developers interested in having a product reviewed should send it to Children's Software Press, Attn: Diane Kendall, 720 Kuhlman Rd., Houston, TX 77024. Telephone inquiries can be made to (718) 622-4625.

• *Children's Software Revue.* This quarterly newsletter reviews software from preschool to upper elementary levels. They welcome unsolicited submissions of software for review. In addition, this organization offers a title search service to developers wanting to research available products in specific categories. For $15, they'll search through their database of over 700 titles. For more information contact Active Learning Associates, 520 North Adams St., Ypsilanti, MI 48197, (313) 480-0040.

• *KidSoft.* This is a CD-ROM–based publication targeted at children and their parents. It contains both a magazine and a CD-ROM with games, product demos, and encrypted software applications. Unsolicited product evaluations are not conducted. Further information about KidSoft may be obtained by calling them at (800) 354-1033.

• *National Association for the Education of Young Children.* The NAEYC is the most influential organization in the preschool market. This organization of 105,000 members provides curriculum, staff development, and accreditation practices for the market. Please do not send evaluation software products to this organization. To order their *Publication #224: Developmentally Appropriate Practice in Early Childhood Programs Serving Children From Birth Through Age 8,* send a $5 check or money order to NAEYC, 1509 16th St. NW, Washington, DC 20036-1426. Their phone number is (202) 232-8777.

• *Six Months to Six Years (6M6Y).* This newsletter is a good source of information and issues relevant to preschool education. To subscribe, contact Crescent Park Press, P.O. Box 448, Eureka Springs, AR 72632; (501) 253-8686.

Developer Outlook

# Strategies for Success in the Early Learning Market

*By Tina Ruppelt, Carolyn Bickford, and Donna Stanger, Edmark Corporation*

The wonderful thing about developing educational software for young children is that the benefits are so tangible: Providing children with positive early learning experiences clearly contributes to our society. And besides being able to go to work every day feeling like you've made a difference, this business is just plain fun.

In this article, we share some strategies that we hope will help other developers entering the early learning software market.

It's an exciting time for this emerging market. Parents and teachers are just beginning to understand the educational potential of interactive software. The more they get great results from great software, the higher the probability that we, as software developers, can achieve two mutual goals—to provide high-quality educational experiences for young children and to expand a profitable educational software segment.

Edmark Corporation's strong educational heritage guides all of our product development and marketing activities. We began developing educational materials for schools 24 years ago. In 1985 we created our first software product, then entered the retail channel in 1992 with a line of software for children from two to ten years old. Our current software offerings include KidDesk, Millie's Math House, Bailey's Book House, and Thinkin' Things. We feel our focus on educational principles has paid off, since these products won 29 educational technology awards during their first 18 months in the marketplace.

## The Secret of Success: Combining Learning With Fun

The best early learning products succeed on two fronts: They're educationally sound and engaging. Working closely with educators is the key to making a product that is educationally sound. We strive to take advantage of technology, not just for technology's sake, but to use it to enhance our products' ability to reach children. The formula for creating a captivating product is more elusive, but testing with children and educators can help keep you on the right track. The goal is to create a product that will make children want to use it again and again, learning more each time they return to it. Companies that succeed in combining both these qualities reap a double reward—healthy sales from both the home and education side of the market.

Here are some things that we've found essential to making this happen:

• *Create "developmentally appropriate" software.* One of the most important factors in Edmark's success has been its commitment to developing educationally sound, "developmentally appropriate" products—in other words, gearing our software activities and interfaces to the capabilities of three- to eight-year-olds. Appropriate products for young children should incorporate "explore and discover" activities. *(Editor's note: see "Preschool Software Design—More Art Than Science" on page 27 for details.)*

For example, our Thinkin' Things product includes six thought-provoking, multisensory activities that a child can switch among at will. In this product's "Oranga Banga" section, a drum-playing orangutan helps children build visual and auditory discrimination skills by asking them to progressively repeat more complex rhythm patterns. Or a child can make up his own drum solos and have the orangutan repeat them.

Open-ended, multisensory products provide children with a more interesting and natural way of learning. The result? They ultimately gain a better grasp of new knowledge and a positive self-image.

One way to ensure you're designing developmentally appropriate software is to work with preschool educators and to follow widely accepted development guidelines, such as those published by the NAEYC. (The NAEYC is the National Association for the Education of Young Children, the highly respected national organization that most preschool educators look to for guidance. See "Resources for Early Childhood Software Development" on page 28 for information on how to order their development guidelines.)

• *Hire your own education experts and listen to them.* Don't merely get education experts involved—hire them early on in the development process, when they can still influence your product design. Educators not only provide you with up-front input regarding educational philosophy and design; they incorporate subtle product improvements along the way. These experts also become instrumental in teaching your developers about what constitutes good educational materials and how learning objectives are executed in classrooms. And this information ultimately helps them craft better education solutions.

• *Test your products.* Thorough testing is essential to creating great early learning products. Developing an interface for kids is more of an art than a science. Adults can't make interfaces for kids without using kids or having some intuitive understanding of how kids think. At Edmark, formal and informal testing occurs from start to finish. We test ideas by talking informally with educators, hiring education experts during product development, testing beta versions of our software in actual classrooms, and most important, putting the product in front of a lot of kids.

## Cross-Channel Synergism

The educational software market is highly competitive and has seen many new entrants in the past year, including several large, well-capitalized companies. To be successful, you need not only great products, but also a well-developed marketing and sales strategy.

We chose to market our products in both the retail and school

markets for several reasons, not the least of which is the wonderful cross-channel synergism that's possible. When kids get excited about using computers in the schools, they want to share this experience with their parents at home. And this works both ways. Parents who see computers become an important part of their child's knowledge base at home push for more computers and software at schools. To make the most of your marketing efforts in both channels, we find that paying attention to the following details can boost sales:

• *Use retail hoopla to jumpstart long-term educational software sales.* The market cycles for selling to the school and retail channels are very different, but this can work to your advantage. By introducing a new product in time for the busy retail Christmas season, you can use the following months to build up word-of-mouth consumer referrals for the June/July school buying season. This spreads out your revenue stream and minimizes the need for seasonal workers.

In the retail channel, the Christmas quarter is by far the most active and competitive. During this fast-paced period, product launches are important and produce immediate results. The volume potential is much higher than in the school market, but the marketing/sales costs and risks are commensurably higher.

In the education channel, products take at least a year to ramp up to their steady-state sales potential. This is because it takes time to generate word-of-mouth referrals in schools, and schools do the bulk of computer and software purchasing during only two months of the year. School fiscal years generally start on July 1, and most school districts do their major purchasing for the year in July and August, based upon staff requests developed earlier in the spring.

**The best early learning products succeed on two fronts: They're educationally sound and engaging. Working closely with educators is the key to making a product that's educationally sound.**

There are two primary advantages to coping with the short cycles of the education channel: first, you can sell products at higher margins through lab pack and site licenses, and second, products have longer life cycles.

• *Customize marketing materials for each channel.* School purchasing and consumer decision-making processes are so different, that you shouldn't try to use the same marketing materials for each audience. Sell sheets and benefit lines should specifically target the primary needs of each type of purchaser. Schools need more details on educational benefits, since they're trying to match learning objectives to their curricula. Parents are looking for a product that is clearly educational and will engage their children for an extended length of time.

What's more, the shelf lives of these channel materials are very different. School catalogs need to last a year, while retail promotions often rely on short-term motivational offers to stimulate sales.

• *Add teacher-support materials to increase sales.* In the education channel, adding teacher-support materials to your products will


# *The High-Tech Marketing Companion*

## Proven techniques for solving your toughest marketing problems


In this book by Dee Kiamy and the editors of *Apple Directions,* industry experts and developers describe practical, proven techniques for solving the toughest marketing problems facing your business. You can read about

- how to avoid the ten most common product launch mistakes
- choosing and sticking with the best target market
- getting more and better product reviews
- developing packaging that helps your product stand out on the dealer's shelf

And much more!

To order, call Computer Outfitters at (800) 260-0009 (U.S. and Canada) or (406) 758-8000 (other countries). The book is also available at booksellers throughout the United States and Canada.

sell more units than will pretty boxes. Most school purchases are made through catalog presentation or demonstrations, so that the packaging—often not seen until after the purchase—may be less colorful and less expensive. For retail, the product box is important in closing a sale, and eye-catching graphics are important for catching a buyer's eye on crowded retail shelves.

### Choosing a Distribution Strategy

For both the education and retail market, you need to decide upon the best strategy for getting your products to customers. When we first entered the software market, we evaluated three alternatives: working with an established publisher, selling the product as an "affiliate" label, or publishing it ourselves. Your choice should be based on your capital reserves, your ability to raise capital, your areas of expertise, and the type of company you want to be five years from now. If you decide to look for a publisher or affiliate label relationship, we suggest researching a variety of companies so that you can select those that have strengths in the services you need the most.

- *Sell through an established publisher.* Publishers sell your product in return for a royalty, and most publishers want some input on elements of product design and content based on their market and image. They may give you an up-front advance on anticipated royalties. In this scenario, since the publisher carries the risk of losing promotion and marketing costs, you receive a smaller percentage of the profit from each sale. The advantage of this approach is that it lets you concentrate on the product development aspects of your business.
- *Sell under an "affiliate" label.* In this case, your product is published under your label, and you pay for and implement the packaging, marketing, positioning, and pull-through of the product. The company you affiliate yourself with gets you on the retail shelves, manages distribution and channel marketing, and, depending on your contract, may work with you on press relations or other aspects of the marketing and selling process.

Some companies use different affiliates for retail and education markets. Some publish themselves in one market and then have an affiliate label in another. If you choose this alternative, you need to have capital and resources for the packaging and marketing efforts.

- *Publish yourself.* This alternative gives you the most control over your product, but also means you take on most of the financial risk. You need a significant capital stake (we've raised several million dollars) and the understanding from your investors that it may take several years before they get a return on their investment.

### Get Advice From Experts

When we ventured into the software markets 18 months ago, one of the most effective strategies we used was to hire outside expert consultants. While it is expensive up front, we found that this strategy saved us money in the long run. It forced us to spend our own time where we could make the biggest difference—developing great products—and it helped us gain needed experience quickly. We benefited most from experts in the areas of public relations, package design, the education dealer channel, and the retail distribution channel.

**With efforts like Apple's discounted preschool hardware bundles, more Macintosh computers are going to make their way into early school environments, and the demand for Macintosh-compatible early learning products will continue to grow.**

### The Market Outlook

In spite of recently publicized school budget cutbacks, we've seen overall software sales in the education channel growing. Many communities are really proselytizing technology. In some cases, they are earmarking funds just to make sure computer technology is available in schools—and some places with foresight are even allocating money to training, an important component of any computer-based curriculum. Schools are often viewing technology as a key component of education reform plans.

On the consumer side of the early learning market, the channel is exploding in complexity and number of competitors. Publishers can no longer sign a deal with one or two major chains and live happily ever after. Every day a new channel category starts to play, and they all require different marketing tactics. For example, the mass merchant segment doesn't use endcaps, shelf talkers, or any of the merchandising tactics that the traditional channel uses, necessitating the development of whole new ways of marketing your products.

This channel expansion also means you have to make your marketing resources stretch over a much larger number of sales venues. This makes it increasingly important to isolate those segments of the channel that offer the best opportunity for your product, and focus your resources there.

Finally, having representation out on the retail front lines is much more important than it used to be. A field marketing force, which can be staffed either with company or contract employees, can give you a significant advantage in terms of mind share, shelf placement, and execution of marketing programs.

### A Final Word

Though the early learning market isn't enormous today, it's growing rapidly. As computers increasingly penetrate the home market, there will be a growing demand for good software. In the education channel, technology is just beginning to reach critical mass in early learning classrooms. With efforts like Apple's discounted preschool hardware bundles, more Macintosh computers are going to make their way into early school environments, and the demand for Macintosh-compatible early learning products will continue to grow.

We believe that the early learning market is one of the most rewarding segments in the software business. And there's nothing we love more than developing a love of learning in children. ♣

*Tina Ruppelt is vice president of education marketing and sales, Carolyn Bickford is vice president of retail marketing, and Donna Stanger is vice president of development at Edmark Corporation. Edmark is based in Redmond, Washington.*

# APDA Ordering Information

To place an APDA order from within the United States, contact APDA at (800) 282-2732; in Canada, call (800) 637-0029. For those who need to call the United States APDA office from abroad, the number is (716) 871-6555. You can also reach us by AppleLink; the address is APDA. If you're outside the United States, you may prefer to work with your local APDA contact. For a list of non-U.S. APDA contacts, see the "International APDA Programs" page in the *APDA Tools Catalog.*

APDA products can be purchased though most international locations. Contact the international APDA offices listed below if you are interested in purchasing tools and documentation locally.

**Australia**
Christine Tucker, AAPDA
16 Rodborough Road
Frenchs Forest NSW 2086
Australia
AppleLink: AAPDA or AUST0772
Telephone: 61-2-4528245
Fax: 61-2-975-6397
Fax (toll free in Australia):
61-2-1800-674-615

**Bahrain, Jordan, Kuwait, Lebanon, Oman, Qatar, Syria, United Arab Emirates, Yemen**
Georges Fadel
Arab Business Machines
POB 55563
ARBIFT Tower, 21st Floor
Dubai
United Arab Emirates
AppleLink: ABM.PM
Telephone: 971-4-233438
Fax: 971-4-227670

**Brazil**
CompuSource Distribuidora Ltda.
Rua Rui Barbosa, 167
01236-010 São Paulo-SP, Brazil
AppleLink: LAI0031
Telephone: (011) 253-6780
Fax: (011) 288-6250

**Bulgaria**
Nikolai Savov
World Trade Center, Office 811
36 Dragan Tsankov Blvd.
1057 Sofia
Bulgaria
AppleLink: BULG.ABS
Telephone: (359-2) 73-27-91
(359-2) 73-26-41
Fax: (359-2) 73-28-05

**Croatia**
Mladen Kmetic
Adria Computer Systems, Ltd.
Maksimirska 111
41000 Zagreb
Croatia
AppleLink: ACS.TECH
Telephone: 385 41 23 21 60
385 41 23 21 14
Fax: 385 41 23 21 28

**Czech Republic**
James Guidi, TIS
Evropská 94
16000 Prague 6
Ceská Republika
AppleLink: CZ.IMC
Telephone: 42-2-311.92.84
Fax: 42-2-311.18.38

**Denmark, Finland, Iceland, Norway, Sweden**
APDA Nordic
Ole Stakemann
Fortunvej 55
DK-2920 Charlottenlund
Denmark
AppleLink: DK0016
Telephone: 45 31 64 10 68
Fax: 45 31 64 34 68

**Egypt**
Nagla Mohamed, PACC
49 El Hegaz Str. Mohandessin
Cairo, Egypt
AppleLink: PACC.DEV
Telephone: 202 3455951
Fax: 202 3034259

**France**
Christine Crulis
Prim'Vert/APDA France
36 Rue des Etats-Généraux
78000 Versailles
France
AppleLink: PRIMVERT
Telephone: 33-1-39-02-33-44

**Germany**
Thilo Bretschneider
Promo GmbH
Waterloohain 6-8
D-22769 Hamburg
Germany
AppleLink: GER.APDA
Telephone: 49-40-43-13-60-66
Fax: 49-40-43-13-60-60

**Greece**
Demetra Egarchou
Rainbow Computer S.A.
75 Elia Eliou
GR 117 44 Athens
Greece
AppleLink: IT0026
Telephone: 30-1-90.12.892
Fax: 30-1-90.12.540

**Hong Kong**
Thomson Lee
Leed & Wood Co. Ltd.
2F, Shop A8 Star
Computer City
Star House, 3 Salisbury Road
Tsimshatsui
Kowloon, Hong Kong
AppleLink: FED0004
Telephone: (852) 2-730-7873
Fax: (852) 730-5025

**Hungary**
Erika Kormány
Graphisoft Trading Ltd.
H-1145 Budapest
Mexikói út 28/b.
Hungary
AppleLink: MG.OPS
Telephone: (36)-1-252-6155
Fax: (36)-1-183-7761

**Israel**
Michal Levin
Yeda Computers Ltd
29 Jabotinsky Str.
Ramat-Gan, 52511
Israel
AppleLink: ISRAEL.LOC
Telephone: 972-3-7521690

**Italy**
Paola Reitano
Essai srl c/o Apple Computer
via Milano 150
20093 - Cologno Monzese (MI)
Italy
AppleLink: ITA.APDA
Telephone: 39-2-27326334
Fax: 39-2-27326553

**Japan**
FIX, Inc.
APDA Business Office
Mitsui Seimei Sapporo Kyodo
Bldg. 4F, N4W5 Chuo-ku
Sapporo 060 Japan
AppleLink: FIXJAPAN.DVJ
Telephone: 03-5802-0755
Fax: 03-5802-0756

**Korea**
C.H. Lee, Elex Computer Inc.
27-2 Yoido-Dong
Youngdeungpo-Ku
Seoul, Korea 150-010
AppleLink: IT0103
Telephone: (82) 2-780-4545
Fax: (82) 2-785-4838

**Poland**
Radek Tryc
S.A.D. Ltd.
ul.Mangalia 4
02-758 Warsaw Poland
AppleLink: POLAND.IMC
Telephone: 48-26-427008
48-26-427009
48-26-427004

**Portugal**
Servisoft, Lda.
R. Barbosa BoCage, 23 1ºC
4100 Porto, Portugal
AppleLink: SERVISOFT
Telephone: 02-699742
Fax: 02-698806

**Russia, Belarus, Armenia, Georgia, Latvia, Lithuania**
Vladimir Matskovsky, RUI
2 Vysheslavtsev per., 17
103055 Moscow
Russia
AppleLink: RUI.DEV
Telephone: 095 258-1801
Fax: 095 284-5746

**Saudi Arabia**
Bakhit Al Farhan
JeraisyTech. Establishment
P.O. Box No. 17340
Riyadh-11484
Kingdom of Saudi Arabia
AppleLink: SAUDI.IMC
Telephone: 966-1-462-1660
966-1-462-4597
Fax: 966-1-462-1695

**Spain**
Lidia Paret
CDIS, Catalana D'Importacions i Serveis, S.L.
Avda. Verge de Montserrat, 195, at. 3
08031 Barcelona, Spain
AppleLink: SPA0323
Telephone: 93-456 04 11
Fax: 93-456 02 96

**Turkey**
Cahide Akkuzu
Bilkom A.S.
Abdi Ipekci Cad. Altin Sok. no. 2
80200 Nisantasi-Istanbul
Turkey
AppleLink: TURK.S.S
Telephone: 90-212-2250260
Fax: 90-212-2251970

**Ukraine**
CDV Ltd., Apple Computer IMC
65 Prospect Peremohy (3rd Floor)
Kiev, 252062
Ukraine
AppleLink: UA.PM
Telephone: 442 12 05
442 92 12
Fax: 443 12 01