



AppleDirections

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Apple News

Developers Commit to Macintosh on PowerPC

Apple Computer's next generation of Macintosh computers, based on the PowerPC RISC microprocessor, received a significant boost of support at May's Worldwide Developers Conference (WWDC) when a group of leading software developers announced they are writing new applications for the platform. The forthcoming software products are being specifically designed to tap the power and performance of the new Macintosh family.

The developers, who collectively represent the most popular applications categories, made separate announcements of support during WWDC.

These new Macintosh on PowerPC products will include general productivity applications, such as word processing and spreadsheets; graphics programs, such as rendering and animation; and publishing products, such as page layout and design. The group of developers who announced commitment to Macintosh on PowerPC at WWDC includes Adobe, ACI, Aldus, Claris, Deneba Canvas, Frame, Insignia, Microsoft, Quark, and WordPerfect.

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Strategy Mosaic

A New Model, a Sure Path

By Gregg Williams, Apple Directions Staff

strategy: skillful management...dealing with the planning and directing of projects

mosaic: a picture...composed of diverse elements combined

With these two definitions from the *American College Dictionary*, I have attempted to distill both the motivation for and the scope of this new "Strategy Mosaic" column.

Apple Computer has committed to developing an overall strategy that it will communicate to its business partners—*you*—and stick to. (For more details, see "Why 'Strategy Mosaic'?" on page 3.) We know we have to do this to provide a business/technical environment that will keep you involved and bring in even more Apple-related development.

A strategy, though, only points to a desired result. To get there, we must decide how to implement the strategy, and we do that with specific *programs*—which we must feel able to change and restructure to meet unexpected opportunities and challenges. (In military terms, such programs of implementation are called tactics; strategies are, so to speak, the other side of the coin.) What I'm trying to say is that Apple will continue to change things in the future, but I am hopeful that most of those changes will be tactical ones, made to improve

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AppleDirections

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Editor's Note

Read Me First

Welcome to the new *Apple Direct*.

Or, perhaps I should say welcome to Apple's new newsletter, *Apple Directions*, the Developer Business Report.

We've changed—both the publication and the name—to better fit developer's needs.

From developers feedback, we learned that what you could use most of all from our monthly newsletter is support for your overall business proposition, help from Apple to remain financially successful in an increasingly competitive, difficult environment. It's more expensive and riskier to create and sell computer products these days; you need to know where Apple is headed so you can plan your business moves effectively and maximize the investments you're making in development and in sales and marketing, as well.

That's what *Apple Directions* is all about: communicating Apple's strategic, business, and technical directions to business decision makers in commercial development firms, software publishers, in-house developers, and others in the developer community.

You might have noticed the word *business* come up a few times in the last couple of paragraphs. That's intentional: *Apple Directions* is Apple's *business* report for developers. Everything in its pages is designed to help you make your business a success.

You've probably already noticed that *Apple Directions* looks—and reads—a little different from *Apple Direct*. That's also in response to your feedback. We've designed *Apple Directions* to be easier, and quicker, to use. Overwhelmingly, developers told us a smaller format would be easier to read and to store, so we've made it a standard U.S.-letter size.

We've also divided *Apple Directions* clearly into sections. The CEO of one development firm summed up many others' descriptions of the "ideal" *Apple Directions* this way: "I'm a pretty frantic guy, so all I really have time for is the top of the news, Apple's strategy, the most important stuff. I'd like to be able to read that material myself, then tear off the technical material for my R&D manager and the business and marketing material that's more for my marketing manager and hand it on to them."

To fill this need, *Apple Directions* has three sections: the front section (this month, pages 1-8) includes Technical Editor Gregg Williams's new column about Apple strategy, "Strategy Mosaic," and late-breaking news from Apple that developers need to know about. If you read only a few pages a month, these are the pages we want you to read; they're designed to put the most important information from Apple in a nutshell.

The Technology section (this month, pages 9-20) provides in-depth material about Apple technologies and products. It also contains articles that appeal to more technically minded readers, like the stand-by CD Highlights and Human Interface columns and the new Shop Talk, as well as news about Apple's technical resources for developers. You won't want to miss the information the Technology section contains, but if you absolutely must, tear it off and pass it around.

You may be used to the *Apple Direct* Business & Marketing section; *Apple Directions* retains that feature (pages 21-32), but adds to it Market Research Monthly, which as often as possible reports Apple's own data on a particular market segment. This section will remain home for the popular marketing "how-to" articles collected every month by Business & Marketing Editor Dee Kiamy. Here you can also read about Apple marketing support and review the *Apple Directions* Listings—hot products from APDA, It Shipped!, and the GetNextEvent calendar.

That's not all. Like any new publication, we'll be continuing to craft our work to better meet the needs of our readers. So expect a few surprises now and again; we want to keep *Apple Directions* fresh, lively, and appealing with new kinds of material and new voices. Let us know if you have requests for material we're not currently providing to help you make your business a success!

That, in a nutshell, is the new *Apple Direct*, I mean *Apple Directions* (it's even going to take me a while to get used to it!). Let us know what you think; we're at APPLE.DIRECTIONS on AppleLink.

Paul Dreyfus
Editor

Strategy Mosaic

A New Model

continued from page 1

the success of our strategy, not changes that exchange the current strategy du jour for a new one.

This brings me to the use of the word *mosaic* in the title of this column. Apple must combine many diverse elements to implement its strategy, and I hope to use this column to tell you about these elements and how they will contribute to the overall “big picture.”

I intend to keep this column short, so that you will want to read it every month. I will also try to keep it focused, emphasizing short- to medium-term elements of Apple’s strategy—the ones that you are most likely to find useful in determining your company’s strategy as it relates to Apple products and services.

With that introduction, I’ll spend the rest of this column talking about, first, an emerging model of computing that will probably affect how you do business, and second, a new path for evolving your Macintosh products, one that is critical to your long-term viability in the marketplace.

A New Model for Computing

So far, Apple has made its reputation on the power of individuals with personal computers on their desks. *But things have fundamentally changed.* Many people are using more than one kind of computer, and they are expecting more from them—both as used individually and in conjunction with each other. Some people need to massage corporate data from a mainframe. Others—especially in the areas of multimedia and high-end desktop publishing—need to manipulate megabytes and even gigabytes of information. Many people are throwing away their data terminals and using desktop

computers to access their file servers, minicomputers, and mainframes. What’s more, they are also finding out that, with desktop computers, they can get more out of their larger computers than they ever could have with simple data terminals.

On the other end of the spectrum, people are turning to smaller computers—in particular, portable computers that they can take with them to perform jobs that *can’t* be done from one fixed location. Some people accomplish many tasks with their portable computers alone. Others want to interact with a desktop computer serving as a “home base.” And in some situations, people use their desktop computers to connect to a bigger computer and the other workers connected to it.

Though it’s a simple observation, I think it’s useful to categorize the kinds of devices that developers and customers are now aware of:

- *mobile devices*—such as portable computers and hand-held PDAs (personal digital assistants)
 - *desktop computers*, which are already on many people’s desks
 - *file servers*, which may be connected to larger computers with corporate data on them
- Many Apple people refer to this triad as a *client-client-server architecture*, and Apple emphasized the client-client-server orientation in many of the talks given at this year’s Worldwide Developers Conference. (Frankly, when I hear client-client-server, I substitute the phrase mobile-desktop-server, which gives me a clearer picture of what’s being talked about.)

Clearing Muddied Waters

Oh, great—desktops *and* mainframes *and* portables *and* making them all talk to each other? That’s just what you need—something to make your life even more complicated! (And your customers feel the same way.) Here’s where we

Why “Strategy Mosaic”?

Helping you to be financially successful is critical to Apple’s future—that’s why *Apple Directions* is doing this new monthly column, “Strategy Mosaic.” Though Apple expects to develop significant new markets, we depend on outside developers like you to help us open and exploit these markets. The compelling products and services that you supply will create demand for Apple’s products and services. In short, our success depends on your success. With this column, I intend on giving you the best information that Apple can provide on where our company is going so that you can decide where you want to work with us.

I feel I have some good qualifications for writing “Strategy Mosaic.” From 1979 to 1988, I was a senior editor at *BYTE* magazine, where I reported on the entire personal computer industry. If you saw the *BYTE* cover stories on the Lisa, Macintosh, or Macintosh II, that was me. (I also did cover stories on such machines as the original IBM PC, the Commodore Amiga 1000, and the Apple IIgs.) Since 1988, I’ve been here at Apple, writing about Apple products, technologies, and strategies and how they affect developers.

I could not have written this column a year ago—to be more specific, I don’t think I could have given you the kind of information I can give you now. Apple is changing. In the managers I’ve talked to and seen give pre-

sentations to outside companies, I’ve noticed a growing awareness within Apple people of the necessity of advising potential business partners of our future directions. (And business partners *remain* potential until we can convince them that our directions are good ones and that we plan to stay with them for a period of time that is measured in years, not quarters.)

No, Apple is not suddenly marching lockstep into the future like the soulless workers in Apple’s famous *1984* commercial—and you wouldn’t want us to be. We are working on a shared goal, but we are an organization of individuals with different ideas of how to achieve it. Our progress (and this is me talking, not Apple) will not be instantaneous, nor will it be line-of-sight perfect. But I believe that it will be reasonably consistent and that it will get better over time.

What I hope to do with each “Strategy Mosaic” column is to describe different pieces of the overall mosaic and tell you why they’re important. Like Apple itself, I *will* fall short of perfection, but I will present as complete and accurate a picture as I can, and I’ll let you know when it changes. Let me know when I’m presenting useful information and—equally important—when I’m not. You can reach me at (408) 974-3264 in the United States, at GREGGW on AppleLink, or by mail at Apple Computer, Inc., 20525 Mariani Ave., M/S 303-4DP, Cupertino, CA 95014, USA. Thanks. ♣

feel Apple can make things better. Two of our greatest, proven strengths are our expertise in making electronic products easy to use and our ability to make products better by tightly integrating the hardware and software. We believe that, drawing on these strengths (and the not inconsiderable quality of our software engineering), we can create a structure for integrating mobile, desktop, and server computers—one that will allow you to develop superior products that cannot easily be duplicated by your competitors. And one reason they'll always be behind is that they will have to

design/build/debug foundation technologies that Apple provides for you to build on top of.

Time to Evolve!

Maybe I'm overreacting, but I think that—right now—you're in the same position as that first pioneer amphibian lying at water's edge, deciding whether to make for dry land or stay in the water, where it's comfy.

The users we've talked to say that *they're* heading inland, which means that you should, too—unless you want to float around in the comfortable waters of yesterday and become an evolutionary

dead end. The reason? Portable computers have already changed both the *way* and the *places* that people work. And PDAs, which will become influential about a year from now, will only accelerate this change.

Today's applications, conceived in a universe that knew only of a single computer on someone's desktop, will become increasingly irrelevant in the face of software that combines mobile, desktop, and server devices and puts them to good use.

For example, how would you like to try selling a pre-Macintosh word processor today? It would print in one unstyled, monospaced font, but it would have to compete with today's extremely full-featured Macintosh word processors, some of which sell for less than \$100. Once people see the advantages of tomorrow's hot new mobile-desktop-server products, your products must do that much and more for you to stay in business.

You should factor "client-client-server" thinking into your future thoughts about your customers, your products, and your company. Think of all the people who work away from their desks (both office workers and people who travel in their work). What do they want to do in a meeting? At a client's office? In an airport lounge? If they carry PDAs with them everywhere, what kinds of anecdotal data might they collect that could later be useful to them, their companies, or their clients? What if the clients were given a good reason to use the PDAs—what useful data might come from them?

A Sure Path for Evolving Software

Apple is on its way to making it easier for you to write software that will run on multiple hardware platforms, and, however that happens, the first step to success is to commit to "going native" on Pow-

erPC. (Remember, Apple has already said that, eventually, every Macintosh made will be a PowerPC Macintosh.) Currently, applications are tied to the Motorola 680x0 instruction set and execution, and that makes it hard for you to convert many programs (especially those containing 680x0 assembly-language code, those not written in C or C++, and those that make specific assumptions about the hardware architecture) to move to native PowerPC programs.

By writing (or rewriting) your programs to be portable, you do much of the work needed to move your program to other platforms in the future. Granted, today's Macintosh applications in object-code form will run acceptably fast, in emulation, on a PowerPC Macintosh, and other source-code and object-code options will be available to convert your programs to native PowerPC Macintosh applications (and we'll report on them in *Apple Directions* as details become available). But creating portable source-code Macintosh applications should eventually be the way your company is going. Once you have expended the extra effort needed—and it may be considerable—you will be poised for long-term gain from that effort.

What You Should Be Doing

First, write your code in ANSI C or C++. Using MacApp 3.0 (which is written in C++) is still a good idea, especially if you've already started your project using it.

Second, rid your program of 680x0 assembly-language code and of code that is tied to 680x0-specific conventions; remember, your code will eventually be running on processors that do things differently. If elimination of such features is impossible, isolate them in as few modules as possible and document the dependencies so you will know what to change later.

That's all for now. See you next month! ♣

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Apple News

Developers Commit

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In addition to this group of leading software vendors, Apple is working with hundreds of other key developers to ensure that a wide range of leading applications will be available with the first PowerPC-based Macintosh computers. Apple is also helping to catalyze entirely new categories of products that will be enabled by the PowerPC architecture. Apple expects to ship its first PowerPC-based Macintosh computer in the first half of 1994.

"Macintosh on PowerPC gives developers a strategic and lucrative new market opportunity. They have the opportunity to differentiate their products and expand their business with innovative applications. This is made possible because of the substantial performance improvements of PowerPC on Macintosh," said Kirk Loevner, vice president of Apple's Developer Group. "Developers are writing both new applications and adding to existing applications, incorporating features such as 3D rendering and animation, speech recognition, text-to-speech, and complex modeling and analysis."

The Macintosh on PowerPC family will include a full line of products from entry-level to high-end Macintosh personal computers. The computers will be based on PowerPC microprocessors, a new line of RISC microprocessors designed by Apple, IBM, and Motorola, and will ship with Apple's standard Macintosh operating system, System 7. The new computers will offer developers and customers high performance and a variety of new features at competitive prices.

For more information on PowerPC Macintosh computers, see the PowerPC Q&A in the Technology

section of this month's *Apple Directions* (page 12).

Newton Is Open for Development

On Wednesday, May 12, the biggest Newton news at the Apple Worldwide Developers Conference was the announcement that the Newton PDA (personal digital assistant) platform will be open and accessible to anyone who wants to develop Newton applications. In addition, Apple will be providing a set of powerful tools for Newton development.

Apple, which devoted most of that Wednesday of the WWDC to Newton, announced that it would soon offer details of a Newton developer support program, which

will include various tools and support programs. (To get more information as it becomes available, send your name, address, and telephone and FAX numbers to the AppleLink address NEWTON.DEVS.)

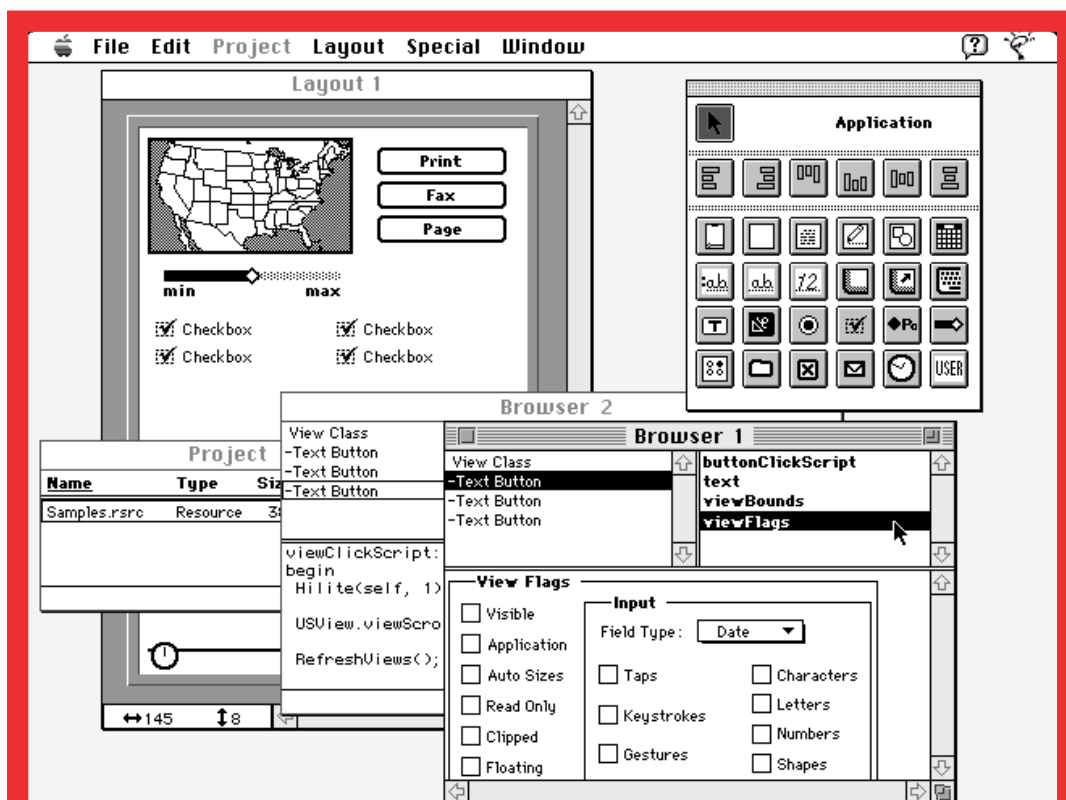
Members of the Personal Interactive Electronics (PIE) division of Apple showed the Newton Toolkit, the development system that people will use to create Newton applications. The Newton Toolkit is a Macintosh application, which makes the resources of a Macintosh computer available during Newton development.

Newton applications are collections of *forms* (which can be thought of as "filters" that visually display part or all of the data inside the Newton device) linked together with NewtonScript code. The Newton Toolkit (see below) provides an interactive environment

for "drawing" forms in a way similar to tools like AppMaker, Prototyper, and MacApp's ViewEdit.

The Newton Toolkit allows you to draw rectangular *views* that will hold data. In addition, it supplies a large number of reusable view components, which are called *prototypes*—things like sliders, buttons, radio buttons, and checkboxes. You can also design, save, and reuse your own prototypes.

Prototypes go beyond previous prototyping elements in that Newton Toolkit prototypes contain significant built-in behavior. This means that you don't have to write "housekeeping" code that explicitly specifies the prototype's normal behavior. If a prototype's built-in behavior isn't sufficient to the task, you can add NewtonScript routines that execute when the user does something to the



The Newton Toolkit. This screen shot shows a Newton form (left) being designed. The programmer can inspect objects with the browser windows (bottom). The floating window at top right is a palette of prototypes available for use.

prototype on the screen. In fact, this is how you will program the Newton.

NewtonScript is a full programming language that contains advanced programming constructs—for example, exception handling, messaging, and closures—not found in most of today's programming languages. It has a readable Pascal-like syntax that most programmers will be comfortable with. It is also object-oriented from the ground up (which can greatly increase the work you can get done with a given amount of code) and can take direct advantage of the various services contained in the Newton hardware and built-in software. In fact, the Newton design team used thousands of lines of NewtonScript code to implement much of the functionality of the built-in applications in the first Newton product.

Apple Directions will report further details on Newton business and development issues as they become available.

Apple/Symantec Joint Venture Promises Faster, Richer Development Environments

On May 12, at the Apple Worldwide Developers Conference in San Jose, California, Apple and Symantec announced an agreement to create an advanced Macintosh development platform, open to enhancements by third-party tool providers, that combines the most successful parts of Symantec's THINK and Apple's MPW (Macintosh Programmer's Workshop) development environments.

The first implementation of this environment will provide a fast, interactive C++ environment with

source-code management tools (for projects that require multiple programmers to work together), source-level debugging, and access to MPW tools. Later environments will let you develop native PowerPC programs for PowerPC-based Macintosh computers and will provide support for Apple and Symantec's future Bedrock cross-platform application framework.

Symantec announced three new products, Symantec C++ 6.0 for Macintosh, THINK C 6.0, and Symantec C++ 6.0 for MPW. Symantec C++ 6.0 for Macintosh is built upon the same technology as the popular THINK C product but includes considerable enhancements—not the least of which is a true C++ compiler. (THINK C 6.0 replaces today's THINK C 5.0 and is a separate product from Symantec C++ 6.0 for Macintosh.)

This new product's major features include:

- A fast, native C++ compiler (not a C++ preprocessor/C compiler combination)
- A full implementation of C++ that includes templates, nested classes, and multiple inheritance
 - An incremental linker
 - A source-level debugger
 - An integrated C++ class browser
 - Automatic project management (that is, the compiler keeps track of what files need to be recompiled to rebuild a program once you have made changes to it)

Apple contributed several technologies that add to the power of Symantec C++ 6.0 for Macintosh:

- SourceServer technology, licensed from Apple to Symantec, gives source-code management to projects requiring multiple programmers
 - Symantec C++ 6.0 for Macintosh can access ToolServer (an MPW-related product from Apple); this brings the power of MPW scripts and tools to Symantec's

C++ environment

- By supporting Apple events and AppleScript, Symantec C++ for Macintosh opens itself to interacting with other development tools

This new version of the popular THINK C environment includes a faster Project Manager and debugger support for larger applications.

This product, which takes the form of an MPW compiler tool, delivers the same fast C++ compiler as is in Symantec C++ for Macintosh. Not only does this make Symantec's C++ compiler technology available to MPW users, it also greatly increases project turnaround time for people using the MacApp 3.0 programming framework (which requires both MPW and C++).

Symantec has announced the following U.S. suggested retail prices for its products (upgrade prices, where applicable, are in parentheses): Symantec C++ 6.0 for Macintosh, \$499 (upgrade \$149); THINK C 6.0, \$299 (upgrade \$89); Symantec C++ 6.0 for MPW, \$499 (no upgrade available). Symantec was scheduled to ship all three products in May, 1993.

Apple has delivered an enhanced Macintosh Programmer's Workshop 3.3, which includes incremental linking (see story, page XX) and will continue supporting it until a future Symantec/Apple product provides a complete replacement for MPW itself. *Apple Directions* will provide you with further PowerPC and Bedrock-related details as they become available.

Apple Ships QuickDraw GX Beta Software to Developers

Apple Computer has begun shipping the beta version of QuickDraw GX, its enhanced imaging

model for System 7. Starting with the 3000 Worldwide Developers Conference attendees, who received the QuickDraw GX beta at the conference, the 15,000 worldwide members of Apple's developer programs should receive their copies of the software by the end of June. The software is included in the New Technologies CD distributed at the developers conference and in next month's (July 1993) issue of the Developer CD series.

QuickDraw GX provides powerful new color, graphics, typography, and printing functionality—capabilities that will help make color publishing, from mainstream business communications to high-end commercial publishing, the new standard for printed communications.

QuickDraw GX translates into developer business opportunities. Applications developers can quickly and easily include powerful new imaging functionality in all their applications by using the more than 500 built-in QuickDraw GX system routines. Because advanced graphics, type, and printing functions are provided at the system level, developers can focus on providing the most intuitive interface for taking advantage of QuickDraw GX features in their applications.

Further, QuickDraw GX, in conjunction with WorldScript, Apple's international software localization technology, helps developers create equivalent software versions worldwide by supporting the display and manipulation of international fonts and text systems. Developing printer drivers for existing and new output devices is also made easier with QuickDraw GX because major print functions are provided as standard objects. Developers can couple printer drivers with printer extensions to create custom solutions for specific markets and functions.

QuickDraw GX is designed to greatly enhance the Macintosh user experience. Says David Nagel, Vice President and General Manager, Macintosh Software Architecture Division, "With QuickDraw GX, Macintosh customers will be able to incorporate professional-quality graphics, color, and type in all their communications, from mainstream business documents and presentations to high-end desktop publishing documents. QuickDraw GX provides a complete architecture for color publishing. We're significantly raising the bar by building advanced imaging features into the operating system and making them available to all applications."

QuickDraw GX is designed to address a wide variety of needs among a broad range of customers. It provides consistent, predictable, easy-to-use color input, display, and output using Apple's Color-Sync color matching technology. Colors in a scanned image, for example, are reproduced accurately and automatically on a color display and in print.

High-quality typography for all applications is also provided by QuickDraw GX, making typographic excellence in all communications the standard. For example, proper kerning and justification and access to special characters (such as ligatures and fractions) are handled automatically within applications that take advantage of QuickDraw GX. In addition, professional-quality typography for all languages worldwide is made possible by extensive, system-level capabilities of QuickDraw GX, including the ability to display text that combines different reading directions (left to right, right to left, vertical) within the same line.

Simplified, yet more powerful printing is also made possible by QuickDraw GX. For example, customers will be able to easily and intuitively manage the printing process via printer icons on the

Macintosh desktop. Customers will also be able to create portable digital documents (PDDs) — documents which can be viewed and printed by others without having the original applications or fonts used to create the documents, facilitating the easy exchange of electronic documents with other Macintosh users.

Apple plans to begin shipping QuickDraw GX to customers by the end of 1993. It will also be available on the PowerPC-based

**QuickDraw GX
provides powerful
new capabilities
that will help make
color publishing
the new standard
for printed
communications.**

Macintosh family when it becomes available in the first half of 1994. A future issue of Apple Directions will provide more details about building QuickDraw GX functionality into applications.

Future Macintoshes To Employ MFM- Only Disk Drives

During the 1994 calendar year, Apple Computer will incorporate new floppy disk drives into some of its high-volume products. These new floppy disk drives lack a few of the key features found in the cur-

rent "SuperDrive" floppy drives. The following differences are those that most affect developers:

- The new floppy disk drives will only read diskettes with data that has been written according to the MFM recording standard, which is commonly used by IBM PC-compatible computers.
- The new drives do not employ the automatic ejection feature used by SuperDrive disk drives. Instead, disks will have to be ejected via a manual eject button.

Early Macintosh systems used floppy disk drives that could only read disks formatted according to the Group Code Recording (GCR) standard. These drives were standard on all Macintosh computers until the introduction in 1988 of SuperDrive disk drives, which can read both GCR and MFM disks. Apple introduced SuperDrive to increase storage capacity as well as allow Macintosh computers to read and write disks formatted on PC-compatible computers.

The most immediate effect on developers will be the method in which software is distributed. To ensure compatibility with future systems, Apple is advising developers to begin, as soon as possible, distributing their software on disks that have been formatted according to the MFM standard. Although MFM allows both 720 K on double-density media and 1.44 megabytes of capacity on high-density media, Apple is encouraging the release of 1.44 MB media, since data on 720 K disks requires conversion by Apple File Exchange before it can be read by the Macintosh Operating System.

Various techniques can be used to continue providing software to users whose Macintosh computers can read only GCR disks, such as providing a special order card with their products that can be returned for disks employing the GCR standard. Compact discs present another possible method of distrib-

ution, especially since the CD-ROM drive is quickly becoming a standard Macintosh feature.

The other major change introduced by the new drives is that users will have to remove disks with a manual eject button. The current automatic disk ejection feature will not be available with Macintosh computers using MFM-only drives, which will affect both the user interface and device driver in the system. Apple is integrating necessary changes into the operating system so they are transparent to the developer. However, some utilities and applications bypass the file system and floppy disk drive driver to eject a floppy disk or determine when a user has inserted a disk. Developers of such software will have to make the changes to allow users to eject disks manually.

Apple Directions will let you know which new Macintosh models will ship with MFM-only drives and provide further information about the new drives when it's available.

MPW 3.3 Adds Incremental Linking

Apple Computer released the latest version of Macintosh Programmers Workshop, MPW 3.3, at the May Worldwide Developers Conference. The new release contains a number of enhancements, including the long-awaited incremental linking feature, designed to speed programming time by quickly relinking applications after minor changes have been made to them.

MPW is Apple's development system, which employs a multiwindow editor for composing source code, executing language compilers and other tools, building applications, and accessing electronic

help databases. Three key MPW features are its ability to link code written in a variety of languages, the integration of an advanced source-code control system called Projector, and its powerful scripting language.

The new version of MPW includes the following new features:

- MPW Incremental Linker

This new tool allows relinking of even large applications after minor alterations in well under a minute

- Three newly rewritten manuals:

—*Introduction to MPW*

—*Building and Managing*

Programs in MPW

—*MPW Command Reference*

- Support for several System 7 features including:

—Apple events, allowing you to send Apple events from MPW to other applications, including ToolServer and SourceServer (see descriptions below), as well as allowing MPW to receive Apple events to execute MPW tools and scripts

—Finder alias resolution, giving the capability for the MPW Shell and all the MPW tools to resolve Finder aliases

- ToolServer and SourceServer

These two tools are stand-alone Apple event-aware applications that allow programmers to access MPW in the background on a local Macintosh or on a remote Macintosh connected via an AppleTalk network. ToolServer can execute MPW tools and scripts, and SourceServer provides access to Projector project management databases. These tools can be accessed from MPW, or from third-party development environments that support ToolServer and SourceServer.

- Updated SourceBug

Supports the MPW Incremental Linker and takes less time to load

information from .SYM files.

- The latest versions of the MPW Assembler, MPW Toolbox Interfaces and Libraries, ResEdit, and MacsBug.

- Improved performance and reliability

MPW 3.3 is also packaged differently from previous releases of the product to make it easier for programmers to get what they need. Instead of offering an array of bundles and stand-alone products, Apple offers a single base product, the MPW Development System (available on either CD-ROM or floppy disks), which includes the basic tools needed to develop on the Macintosh.

Apple has also released updated 3.3 versions of MPW C, MPW C++, MPW Object Pascal, and the SADE debugger; they remain separate products.

MPW requires a Macintosh computer with at least 5 MB of RAM (8 MB of RAM are required to use the MPW Incremental Linker, 16 MB or more are strongly recommended); a 68020, 68030, or 68040 microprocessor; System 7 or later or A/UX 3.0 or later; and a hard-disk drive with at least 10 MB of free space.

The MPW Development System v. 3.3 is available from APDA, either on CD-ROM only (APDA order #R0505LL/A, \$250.00) or floppy disk (APDA order #R0503LL/A, \$300.00; CD-ROM also included). See page xx of this issue for APDA ordering information.

Developers who have purchased a previous release of MPW can update their systems by ordering the MPW Development System v. 3.3 Update, which is available on either CD-ROM (APDA order #R0501LL/A, \$100.00) or floppy disks (APDA order #R0502LL/A, \$125.00). Those who own previous versions of MPW C,

MPW C++, MPW Object Pascal, and SADE may upgrade to the 3.3 version by ordering separate product updates at a reduced price.

New Performas Ship, Increasing Developers' Exposure to New Channels and Customers

Just six months after releasing its first Macintosh Performas Apple has unveiled three new Performa models, the 405, 430, and 450, for sale in the United States. The Performa line is specially packaged for sale to first-time buyers and users in the home via mass-market retailers.

For developers, the significance of the new Performa release is that it signals Apple's commitment to reaching the consumer market, especially the 7 million U.S. households that haven't yet bought computers. Early data about the first Performa release, both in the U.S. and in Europe, indicate that Apple's efforts in the consumer arena are paying off, providing new channels—and a larger customer base—for developers' products. (See "Market Research Monthly: Performa Leads the Way Into Consumer Market" on page 21 of this issue.)

Two of the newest Performas are all based on the Macintosh LC II. The Performa 405 employs a 16 MHz 68030 chip and comes with 4 MB of RAM (expandable to 10 MB), an 80 MB hard disk, and built-in video to display 16 colors (expandable to 256 colors) on its 14-inch Apple Performa Display.

The Performa 430 adds to that a 120 MB hard disk; its built-in video displays 256 colors on the same 14-inch monitor.

The Performa 450, which also comes with a 4/120 configuration, uses a 25 MHz 68030 processor and is based on the Macintosh LC III. It can display 256 colors (expandable to 32,000 colors) on its 14-inch Apple Performa Plus Display (which uses smaller dot-pitch than the regular Performa display).

For the first time, a 2,400-baud data/9,600 baud fax modem from Global Village comes standard with each of the new Performas. All of them have a single processor direct slot and seven expansion ports.

As with the first release, the new Performas ship standard with a package of software and services. Each Performa is preinstalled with a special version of System 7, including At Ease; at least eight applications also ship with each computer, including ClarisWorks or WordPerfect Works, education and games software, and 10 hours free on America Online and an account for Check-Free, an electronic bill-paying service. Apple also provides one-year of in-home service as well as lifetime, toll-free telephone support for all U.S. Performa customers.

The new computers are priced to keep them competitive with low-cost IBM PCs and clones. Prices for the new computers will range from \$1299 for the low-end systems to \$1799 for the high-end systems. (These are approximate U.S. prices, and they'll vary according to the specific configuration offered by each retailer.) ♣

Technology

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Get the most from your development tools; make electronic information available over your network

develop Issue 14: Something for Everyone

Issue 14 of *develop*, *The Apple Technical Journal*, is full of articles and columns in which technical people in every Macintosh development firm should find something of interest. Localization, 3-D interfaces, video digitizing, and QuickTime moviemaking are among the topics covered—and, as always, you don't just get words, you get code on the CD too.

- "Writing Localizable Applications" gives tips and tricks demonstrating "global-aware" text-handling techniques that will help make applications more easily localizable.
- "3-D Rotation Using a 2-D Input Device" describes a user interface technique for intuitive rotation of 3-D objects using a 2-D input device like a mouse or pen.
- "Video Digitizing Under QuickTime" tells you what you need to know about video

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CD Highlights

ROM the World in 80 Nanoseconds

The June issue of the Developer CD Series, *ROM the World in 80 Nanoseconds*, is the first Reference Library Edition, containing almost 500 MB of technical documentation, including all of the released *New Inside Macintosh* volumes and Macintosh Technical Notes in Apple DocViewer format for your searching and cross-indexing pleasure.

Reference Library Highlights

The Reference Library includes the following new or revised items.

Macintosh Technical Notes

All of the Q&A Tech Notes have been revised and corrected. In addition, there are several new Tech Notes you'll want to take a look at. Of general interest will be the Overview Technical Note "10+ Commandments," which contains essential information to help you write code that will continue to run as the Macintosh Operating System evolves. For folks developing networking cards and associated software, the Networking Technical Notes "SNMP Transports" and "Networking Cards & SNMP" will be worth taking a look at. A full list of new and updated Technical Notes can be found in Mac Technical Notes:Indexes:New Notes June 1993.

Human Interface Review, Issue #3

The Human Interface Review discusses products, interfaces, research, and other issues of interest to those involved in interface-related work. Features of Issue #3 include an article on computers in classrooms and a Trip Report about the First International Conference on Auditory Display. Please note that

these are not official guidelines in any sense. The review's purpose is to stimulate thought by calling attention to news, products, and research of importance.



ROM the World in 80 Nanoseconds

develop, Issue #14

See the article on this page for the contents of the latest issue of *develop*, *the Apple Technical Journal*.

The What's New Folder

This month's What's New folder (like every month's What's New folder) includes the following new and revised tools, applications, and system software.

Thread Manager

The Thread Manager is an operating-system enhancement that allows applications to make use of both cooperative and preemptive multithreading within an application context on all Macintosh platforms.

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Human Interface

A Few Tips on Designing for Enterprise Computing

By Peter Bickford

In keeping with a main theme of the Worldwide Developers Conference, that is, client-server application development, I'd like to devote this month's article to enterprise computing. Specifically, I'd like to sketch out some interface guidelines for the big, ugly, hooked-up-to-mainframe systems we all know and (ahem!) love. And while I can't talk about everything (or even all the topics I hit in my talk on Tuesday of the Developers Conference [unabashed plug]), I hope I can give you a few useful tips for building a better interface for your corporate users.

I came up with these tips while thinking mostly about the needs of in-house development, but you'll see that most of them apply to commercial application design, as well.

Mainframes and the Menu Bar

A typical, large mainframe application may have hundreds, perhaps thousands of screens. Typically, the users of these systems need to tunnel down through several levels of on-screen menus to get to the screen where they actually do work. For instance, a purchasing agent who wants to create a new purchase order might have to choose Purchasing from the main menu, Regular Activities from the Purchasing submenu, Order Maintenance from that submenu, and, finally, Create Purchase Order from a fourth menu.

Recently, the makers of these monolithic systems have begun to realize how laborious this sort of thing is, and now allow users to "simply" type the ID number of the screen they want to go to (typically something intuitive like "REQ0425") and press a special function key to actually go there. Oh, how progress marches on!

Faced with the task of putting a Macintosh interface on such a system, the most important thing you can do is also perhaps the simplest: Design a good menu bar.

A Macintosh-style menu bar gives users instant access to the functions they need, without having to wander through mazes of

on-screen menus or recall scores of bizarre screen codes. It also tends to flatten out the strange hierarchies and redundant screens of many large mainframe applications. For instance, a well-designed menu bar would let the purchasing agent in the example just given enter the purchasing application or module (probably the only program a purchasing agent would use), and then choose New Purchase Order from an Orders menu. The difference in productivity, training time, and reduced suicide rates among users can truly be remarkable.

Designing for Data Entry, Part 1: Keyboard Shortcuts Revisited

Perhaps the most common plea among people who do data entry full time is that they "just want to keep their hands on the keyboard." But before you add 147 keyboard shortcuts to your application and abolish all radio buttons, pop-up menus, and checkboxes, you should know a few facts.

First, studies have shown that even the most experienced users of a software package tend to remember only about 25 different keyboard shortcuts for menu commands. Although it's hard to tell which 25 the user will remember, there doesn't seem to be any call for assigning keyboard shortcuts to every conceivable menu command, if only a fraction will ever be used.

Second, and far more strange, although users consistently report that they feel faster when they use keyboard shortcuts rather than menus, the stopwatch almost always proves them wrong. The short explanation is that figuring out which key combination to press is a very different sort of mental task from moving the mouse to choose from a menu. And, basically, the higher-order part of your brain is bored stiff while you choose from a menu, making you think the task takes longer. I realize this sounds like counterintuitive psychobabble, but it really is true.

Keyboard shortcut aficionados will be happy to know, however, that there are a couple of exceptions to this rule. Namely, keyboard shortcuts are faster whenever you can "chord"—that is, work with both hands at once. For instance, Command-X (Cut), Com-

mand-C (Copy), and Command-V (Paste) tend to test faster than their menu equivalents, because the user is able to use one hand to move the mouse to the object to be cut, copied, and/or pasted, and the other hand to press the key combination.

So if nobody remembers all those keyboard shortcuts, and it's usually slower to use them anyway, why use them at all? Because perceived speed is usually more important than real speed. On a practical level, it's usually more important to make your users feel efficient than it is to make them actually efficient—especially when the time differential for doing so is measured in fractions of seconds.

So when designing for data entry, do your best to strike a balance.

People become uncomfortable if more than about 200 milliseconds elapse between their action and the computer's first perceivable reaction.

Put in enough of these “shortcuts” to keep your users happy, but not so many that your application becomes little more than a morass of modifier keys.

Designing for Data Entry, Part 2: Return, Enter, and Default Buttons

Although it follows the letter of the *Human Interface Guidelines*, the following dialog box causes data-entry errors for about half the people attempting to fill it out. Can you guess what their error is?

The answer: They press the Return key to move from field to field, not the Tab key—and, in doing so, inadvertently activate the Save button before all the data is filled in.

The reason is that users tend to think of the Tab key as meaning move over to the right and the Return key as meaning move down. Anytime you design a form that has a vertical arrangement of fields, you'll find users who try to press the Return key to move between them. Unfortunately, if you implement such dialog boxes in strict accordance with the guidelines, pressing Return will either create a second line in a given field (obscuring the insertion point, and definitely not what you want), or it will activate a default button (also not what you want).

This is one time when designing for data entry means departing from the letter of the *Human Interface Guidelines*. In a vertically arranged dialog box, where only one line per field is expected, you should have the Return key move the insertion point to the field below the current field. The Tab key should move to the field to the right, or, if no such field exists, to the next field in order.

Finally, avoid putting default buttons in such a dialog box—don't draw the black border around any button. If you want a default behavior, allow the user to press the Enter key to activate the button that has the closest meaning to “OK” (Save, Find, and so forth). If

you've laid out your dialog box correctly, that button will usually be the one in the bottom-right corner of the box.

Fun With Feedback

Most mainframe systems give terrible, terrible feedback. You enter data, press a function key, and, if you're lucky, the machine changes a blip on the bottom of the screen to indicate that it's busy, and that you should patiently wait the seconds, minutes, or hours until it's not busy. Some systems don't bother giving any feedback at all.

Human beings need feedback. To demonstrate this, I recently conducted a small but slightly evil experiment. In it, I told a number of users that I was conducting a study of different data entry methods; I asked them to input information from a large stack of forms. Unbeknownst to these poor folks, the test was rigged so that as they pressed the Save button on the 47th form, the machine would “go away” for five minutes or so without any explanation. The mouse could still be moved, but the machine would otherwise appear to be unresponsive. What I really wanted to know was how long users would wait if there was no feedback.

The answer: an average of 8.5 seconds. After that, users would either leave the room to tell me the machine was down, or they'd hit the reset switch.

Better studies than mine have shown that people become uncomfortable if more than about 200 milliseconds elapse between their action and the computer's first perceivable reaction. That's one-fifth of one second. And that's the time that your program has for flashing a button, changing the pointer to a watch, or doing something if you want your users to feel that the system is paying attention to them. Moreover, if the delay is going to be very long, you'd better tell the user. Specific feedback (progress bars and “time remaining” indicators) is best, but any feedback (“Please be patient . . .”) is better than none. Remember: It only takes 8.5 seconds. . . .

But busy cursors and progress bars can be more than just a way to keep users from playing with the reset switch. Going back to the idea of perceived speed vs. real speed, it's actually possible to convince users that your application is much faster than it really is, simply by spinning the cursor faster. There are certain limits, of course, but an application that gives prompt and speedy feedback will almost always be seen as faster than one that gives slow, or occasional, feedback. This is true despite the fact that giving all that feedback actually takes more time.

That's all the space I have for this month. Other topics, such as security, network access, database queries, and so on, will have to wait. Next month, it's back to your letters.

Until then,

—Doc

(AppleLink: The.Doktor)

Peter Bickford is a member of the Human Interface Group in Apple's Enterprise Systems Division. He lives for putting good interfaces on big, ugly, booked-up-to-mainframe systems.

Macintosh on PowerPC: Top Developer Q&As

“PowerPC” is a hot topic among Macintosh developers these days — a topic that will continue to heat up as we approach next year’s introduction of PowerPC-based Macintosh computers. To respond to increasing developer inquiries, *Apple Directions* would like to answer some of your most commonly asked questions and help you prepare for the exciting opportunities Macintosh on PowerPC will make possible.

Q. What is PowerPC?

A. PowerPC is the name of a new family of single-chip RISC (Reduced Instruction Set Computing) microprocessors. This new family of microprocessors, announced in October 1991, is being designed and produced by Apple, IBM, and Motorola. These chips will form the foundation for new high-performance, low-cost systems from Apple, IBM, and others. The PowerPC architecture is based on IBM’s Performance Optimization with Enhanced RISC (POWER) architecture, the design used in IBM’s RISC System/6000 line of advanced workstations and servers. Motorola will supply PowerPC chips to Apple and will also market them for other systems and microprocessor applications.

Q. Why is Apple moving to PowerPC?

A. Apple is firmly committed to the Macintosh as its primary computing platform well into the next decade. With this in mind, Apple is bringing the significant power and performance of RISC microprocessors to the Macintosh platform; PowerPC offers substantial price/performance gains over the 680x0 and x86 series of microprocessors. Further extending the

power and performance of the Macintosh platform will enable customers to increase their productivity using today’s computing solutions as well as making brand new solutions possible. As always, Apple is committed to delivering the best personal computing experience to customers.

Q. What is Macintosh on PowerPC?

A. *Macintosh on PowerPC* refers to the next generation of Macintosh personal computers that will be based on the PowerPC microprocessors. Over time, the full line of Macintosh systems, from entry-level to high-end, will be built on the foundation of PowerPC. Macintosh on PowerPC will ship with Apple’s standard Macintosh Operating System, System 7, and offer developers and customers high performance and a variety of new features at aggressive price-performance ratios.

Q. What Macintosh systems will use the PowerPC chip?

A. Apple plans to change the entire Macintosh product line to PowerPC over the next few years, beginning with mid-range and high-end systems.

Q. How much will PowerPC-based Macintosh computers cost?

A. Apple intends to be aggressive in pricing PowerPC-based Macintosh systems across the entire product line from entry-level to high-end systems.

Q. When will the first Macintosh on PowerPC systems ship?

A. Apple is on schedule with its plans to introduce the first Power-

PC-based Macintosh systems in the first half of the 1994 calendar year.

Q. What will the transition from 680x0-based to PowerPC-based Macintosh systems look like?

A. For years to come, the Macintosh personal computer family will include both Motorola 680x0-based and PowerPC-based systems. Apple intends to offer current and introduce new 680x0-based Macintosh systems well after the initial introduction of Macintosh on PowerPC. We expect that different customers will choose to move to PowerPC-based systems at different rates depending on their needs. Since our goal is to meet the needs of our customers, we will look to them to guide the overall transition. In addition, we plan to offer upgrade opportunities to PowerPC for installed base customers.

Q. What performance improvements and new features can we expect?

A. PowerPC offers substantial performance improvements over the 680x0 series of microprocessors. This new level of performance will translate into improved speed and power for today’s applications while enabling developers to further enhance their applications with next-generation features such as speech recognition, voice control, text-to-speech, sound, telephony, video, 3-D rendering and animation, and complex modeling and analysis. With PowerPC, mainstream personal computing customers will gain access to next-generation features that were previously limited, due to cost and complexity, to high-end niche markets.

Q. What system software will ship with Macintosh on PowerPC?

A. System 7, Apple’s mainstream operating system for all Macintosh customers, will be the standard operating system that ships with Macintosh on PowerPC. Future versions of System 7 will offer advanced operating-system capabilities such as preemptive multitasking and memory protection on both 680x0-based and PowerPC-based Macintosh computers. Other capabilities developed as stand-alone system software extensions such as AppleScript, QuickDraw GX, and Apple Open Collaboration Environment (AOCE) will also be available on both 680x0-based and PowerPC-based Macintosh systems.

Q. Do PowerPC-based Macintosh systems require PowerOpen?

A. No. Most PowerPC-based Macintosh systems, like 680x0-based systems, will ship with the standard Macintosh Operating System, System 7. However, customers who want client/server solutions, multi-user applications, or UNIX® applications and services, will be able to use PowerOpen—Apple’s forthcoming open systems platform. PowerPC-based Macintosh systems running PowerOpen will be able to execute MS-DOS, A/UX, AIX, or System 7 applications. A good way to think about it is that PowerOpen will be to PowerPC-based Macintosh computers what A/UX is to 680x0-based Macintosh computers today.

Q. Do I need to modify my existing applications to run on PowerPC-based Macintosh systems?

A. No. Compatibility and protection of customer and developer investment in software is a key priority for Macintosh on PowerPC. Existing 680x0 binaries will run without modification on PowerPC-based Macintosh systems through emulation — a Motorola 68020 processor is emulated in software. (Actual performance of software running on this emulator will be much closer to a 68040 than a 68020 due to the intrinsic speed of PowerPC and other native toolbox accelerations.)

Furthermore, developers who write to System 7 APIs and follow Apple development guidelines (for example, not writing directly to the hardware) will be able to recompile their source to PowerPC Macintosh with minimal modification to their code. In addition, PowerPC-based Macintosh systems will be able to run 680x0 applications side-by-side with “native” PowerPC-based applications through mixed-mode software, which allows an application to make calls to either the PowerPC instruction set or the emulator.

Q. What are the developer options for transitioning to PowerPC?

A. We encourage developers to begin changing their applications to PowerPC to take advantage of higher performance and functionality. Apple and third parties will provide a complete set of tools supporting several approaches to making this transition:

- *Running emulated.* As described earlier, Apple will provide a high-performance, high-fidelity 68020 emulator ensuring compatibility for existing 680x0 applications. This option may be attractive for developers whose applications are not yet affected by performance limitations.

- *Recompilation of the source code to the PowerPC binary.* Development tools for recompilation will be provided by both Apple and third parties.

- *Semi-automatic 680x0 binary to PowerPC binary translation.* Semi-automatic translation systems will be provided by third parties.

- *New application development.* Development tools for new application development will be provided by Apple and third parties.

Q. What development tools will be available for PowerPC and when?

A. Development tools for Macintosh on PowerPC will be provided by Apple and third parties beginning in early 1994. The first development environment available will be the Macintosh on PowerPC SDK (software developer kit). This SDK will be a cross development environment hosted on a Macintosh Quadra running A/UX. The SDK will include MPW 3.3, a new C/C++ compiler, an assembler, a remote source and assembly-level debugger, libraries and interfaces, and documentation on developing for the PowerPC-based Macintosh. Following the introduction of PowerPC-based Macintosh systems in the first half of 1994, Apple will provide a native development environment.

Q. What is the native development environment for Macintosh on PowerPC?

A. The native development environment for Macintosh on PowerPC will be the result of a collaboration between Apple and Symantec Corporation—the developers of Symantec C++ . It will build on the foundation of Symantec’s Symantec C++ and Apple’s interim development tools for Macintosh on PowerPC. The native development environment will be available following

the introduction of Macintosh on PowerPC systems.

Q. Will Bedrock support PowerPC?

A. Apple and Symantec will also support Macintosh on PowerPC with Bedrock, a framework for developing cross-platform applications. Bedrock will allow developers to simultaneously create applications that run on 680x0-based Macintosh, PowerPC-based Macintosh, and Windows platforms.

Q. What can I do today to prepare for PowerPC?

A. There are many things you can do today to prepare for PowerPC. Apple has developed ten “commandments” for developers to follow to ensure as smooth a migration to PowerPC as possible when it becomes available, and we encourage you to start now. See the sidebar “Preparing for PowerPC: Ten Commandments.”

For more information on Macintosh on PowerPC, look to these sources:

- “The PowerPC In Your Future,” in the July 1992 issue of *Apple Direct*

- “PowerPC Development Update,” in the March 1993 issue of *Apple Direct*

- the Macintosh on PowerPC folder on AppleLink (path — Developer Support:Developer Services:Macintosh on PowerPC)

- audio tapes and videotapes from the 1993 Worldwide Developers Conference PowerPC sessions

- Developer University self-paced PowerPC courses, available through APDA this summer

- future issues of *Apple Directions*

Finally, if you are a developer with an innovative idea for exploiting the power of PowerPC in your application, send an AppleLink message to POWERPC.DEVS to be considered for PowerPC Evangelism programs (but please note that these programs are very limited). All general developer inquiries should be directed to AppleLink: DEVSUPPORT. ♣

Preparing for PowerPC: Ten Commandments

Start preparing today to take advantage of the upcoming Macintosh on PowerPC platform! Following these ten “commandments” will ensure as smooth and fast a transition as possible when PowerPC-based Macintosh systems debut in 1994.

1. Write in ANSI C or C++.
2. Ensure data structure alignment.
3. Don’t depend on the 680x0 run-time model.
4. Isolate and minimize use of low-memory globals.
5. Isolate and eliminate use of internal Toolbox calls.
6. Isolate dependencies on 80-bit extended format numeric type.
7. Don’t depend on specific interrupt levels.
8. Be 32-bit clean. This is mandatory!
9. Avoid patching traps.
10. Do the right thing!

LaserWriter 8.0 PostScript Driver Shipped

By Amr Eissa

The LaserWriter 8.0 driver for PostScript™ Level 2 printers has arrived. Its release in late April of 1993 will make it the first implementation of PostScript Level 2 printing for Macintosh computers. Now developers will be able to fully utilize the power of PostScript Level 2, Adobe™ Systems' unification and extension of the PostScript language. Apple Computer, Inc., and Adobe Systems, Inc., jointly developed the new driver. Its primary purpose is to improve the performance and functionality of all PostScript printers and particularly to support the new features of PostScript Level 2.

Supports PostScript Level 2 Features

PostScript Level 2 features include forms and form caching, patterns and pattern caching, device-independent color, data compression and decompression filters, improved halftoning algorithms for color separations, improved memory management, better resource management, and improved support for printer-specific features. In addition, PostScript Level 2 reports errors in real time, making it possible for programs to report printing errors more accurately.

The LaserWriter 8.0 driver takes advantage of Adobe's latest implementation of PostScript. It provides alternative (and, in some cases, more efficient) ways to describe the appearance of a page. The new driver also supports new PostScript techniques for font switching, text composition,

transmission of compressed images, and caching of text and graphics.

Caching allows repeated uses of the same text or pattern, and the LaserWriter 8.0 driver makes use of this Level 2 development. Faster processing occurs because the printer doesn't have to recreate the elements each time they are needed. Pattern cell replication, in particular, provides an efficient and time-saving means for painting an area. PostScript Level 2 also permits faster printing by transmitting compressed files to the printer.

New Driver Improves Resolution

The new driver also makes higher resolution images possible by using another PostScript Level 2 feature, improved halftoning algorithms. This advance dramatically improves the accuracy of the angles and frequencies in PostScript imagesetter halftone screens, making higher-quality images possible.

The LaserWriter 8.0 driver also supports PhotoGrade. Apple introduced this new application-specific technology in the LaserWriter IIf and IIg. PhotoGrade is automatically active in the LaserWriter Pro 630 and becomes active on the LaserWriter Select 300 and the LaserWriter Pro 600 when you add extra printer memory.

PhotoGrade improves the quality of printed images by making dramatic improvements in resolution. It significantly reduces visible halftone dots that exist on 300-dpi and 600-dpi printers and offers more than 11 times the

number of gray shades at any screen resolution. The LaserWriter 8.0 driver's support for PhotoGrade, in addition to its use of the PostScript Level 2 halftoning technology, provides greatly increased image resolution.

Besides increased speed and accuracy, the LaserWriter 8.0 driver can achieve more efficient operation by using the resource management function of PostScript Level 2. This feature can speed up searches for the location, storage, and management of fonts, forms, patterns, font-encoding vectors, and color-rendering dictionaries.

Complete PostScript Support

PostScript Level 2 builds on Adobe's core technology, but does not make existing PostScript products obsolete. Similarly, the LaserWriter 8.0 driver maximizes performance and functionality for all PostScript-compatible LaserWriter printers, including existing LaserWriter printers that support PostScript Level 1.

The designers of the new driver gave high priority to expanding the capabilities of printers utilizing PostScript Level 1. As a result, the new LaserWriter driver provides additional functionality to PostScript Level 1 printers, including improved background printing performance and control of printer-specific features.

The designers also wanted to add support for device-specific features to the new driver. They added PPD (PostScript Printer Description) files for both levels of PostScript in order to support the capabilities of individual

printers. Users will find that printing is easier and more efficient because they can control manual operations, such as the ability to print a cover page before or after a document, from the desktop without touching the printer. Similar features supported by the LaserWriter 8.0 driver include desktop control of multiple paper trays and optional envelope trays.

Compatibility

The LaserWriter 8.0 driver is backward compatible. It not only supersedes the LaserWriter 7.0 driver, but it directly replaces all previous versions of LaserWriter drivers. It combines all the features of the LaserWriter 7.0 printer driver and adds support for features that are specific to individual printers. The LaserWriter 8.0 driver is a complete superset of LaserWriter 7.x functionality, including application compatibility, TrueType as well as Adobe Type 1 and Type 3 font support, and PostScript Level 1 compatibility.

PostScript Level 2 printers will still be able to use the LaserWriter 7.0 driver, although upgrading the driver to version 8.0 improves printing performance and functionality and extends the user's control.

Finally, the LaserWriter 8.0 driver is compatible with the most commonly used system software by supporting Systems 7.x and 6.0.7.

Background Performance Improved

The LaserWriter 8.0 driver improves background perfor-

mance by as much as 10 percent (on average) and 30 percent (for business graphics). The new driver's foreground performance is, for the most part, comparable to that of its predecessor, the LaserWriter 7.1.2. driver. Very large files generating PostScript code (for example, Adobe Illustrator, Quark XPress, Aldus Page-Maker) can slow down the LaserWriter 8.0 driver's foreground mode. Apple will address this problem in the next release of the driver, which is scheduled for the end of this year.

Support for Color Matching

The LaserWriter 8.0 driver now features support for PostScript Level 2 Device-Independent Color. Level 2 specifies colors based on the XYZ color model, an international standard created by the Commission International de l'Eclairage (CIE) in 1931. Both RGB and CMYK, the color models used for describing screen and printer colors, define color in terms of the XYZ model, which can be used to translate color accurately between the two sources. Because PostScript Level 2 supports XYZ, the color calibration process is built into the LaserWriter 8.0 driver, making possible more accurate color mapping from the monitor to the printer.

However, color matching still yields imperfect results because of the difficulty of translating colored light to colored ink. Devices also vary in the range of colors they are capable of producing. In an effort to improve color fidelity, Apple has developed ColorSync, a system-level color-matching technology founded on the XYZ model. The LaserWriter 8.0 driver does not support ColorSync, but Apple and

Adobe developers are giving ColorSync high priority in the driver's next version.

Future Support for QuickDraw GX

ColorSync color-matching capability will be part of Apple's new QuickDraw GX technology, which is an imaging-oriented system software platform. The LaserWriter 8.0 driver supports only the current QuickDraw technology and does not yet support QuickDraw GX, which is to be released later this year.

However, Apple is planning to collaborate with Adobe Systems on a driver engine for this new print architecture. The engine's two components, conversion from QuickDraw to PostScript code and PPD files, are now under development. PPD "printer extensions" files describe the

unique characteristics of particular printers as well as customized functionality through the QuickDraw GX printing architecture.

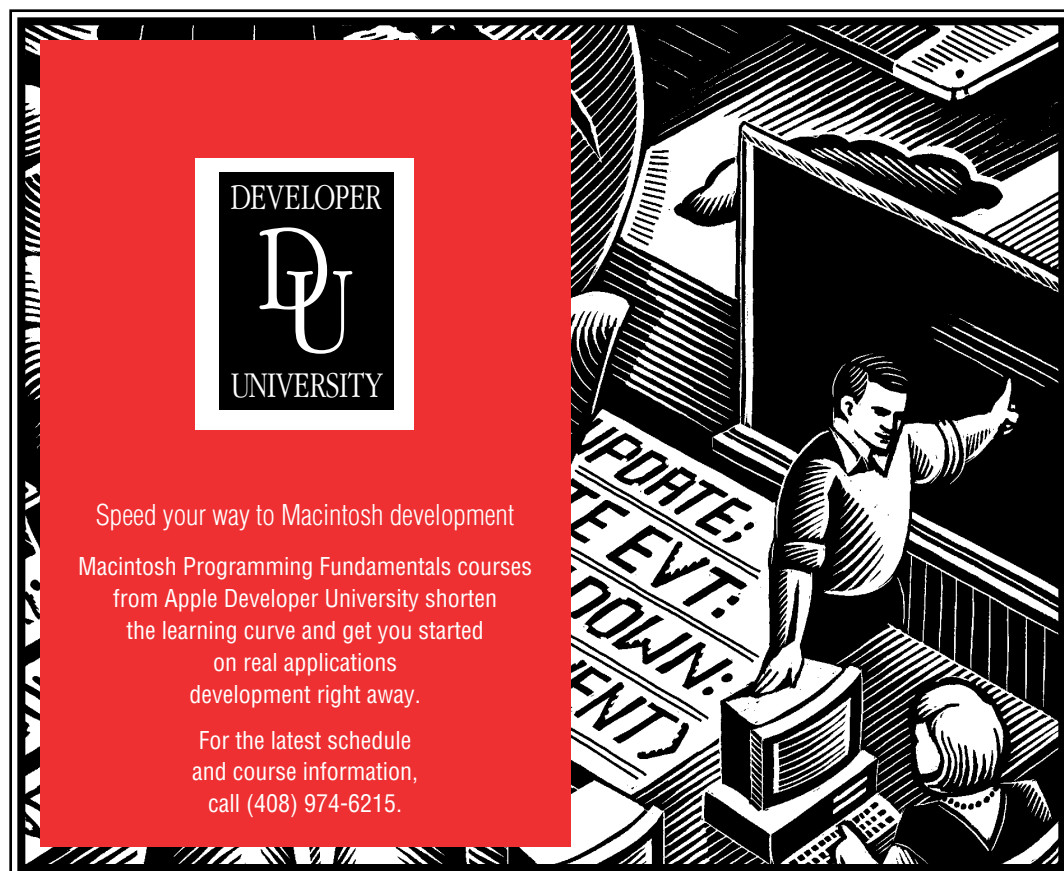
The LaserWriter 8.0 Driver: Available Now

Apple Computer, Inc., and Adobe Systems, Inc. will each market their own version of the new LaserWriter printer driver. The Apple and Adobe products have different filenames and icons, but otherwise the two LaserWriter drivers are identical in features and functionality.

The Apple product, called the LaserWriter 8.0 driver, will ship in June of this year with Apple's PostScript Level 2 printers, the Personal LaserWriter NTR and the LaserWriter Pro 600/630, but it is also available to OEMs and end users.

The LaserWriter 8.0 driver can also be downloaded from AppleLink or purchased from Apple for a nominal fee. The 8.0 driver update containing the driver, PPDs, and documentation is available now. Call (800) 769-2775 ext. 7873 to order.

Adobe is calling its product PSpriinter 8.0, which will be licensed directly to Adobe's PostScript OEMs for distribution with their products. End users will be able to order the driver directly from Adobe for \$24.95. ♣



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Apple Announces Asynchronous SCSI Manager

By Amr Eissa

Apple announced a SCSI system update, SCSI Manager 4.3, at the Worldwide Developers Conference last month. SCSI Manager 4.3 gives application developers and device driver writers a way to achieve dramatic improvements in performance for their products.

SCSI Manager 4.3 resides in the ROMs of 68040-based computers that will be released by Apple later this year, as well as in 68040-based and RISC-based computers to be released in 1994. These computers will all use the new SCSI Manager 4.3, and by late 1993 system software will be available to update Macintosh computers based on the 68040 processor.

Asynchronous Design Speeds Operations

The SCSI Manager now used in all Macintosh computers communicates by means of rigid timing signals. When input or output is required, this synchronous SCSI Manager gains control of the bus, selects the device, issues the command, transfers the data, gets the status, and completes the transaction. The SCSI Manager must supervise this process, and the microprocessor is tied up while waiting for the completion of the transaction.

SCSI Manager 4.3 follows the same process, but its asynchronous design allows more flexibility. After SCSI Manager 4.3 issues a command, the device it has selected may disconnect from the bus to perform its task. While that device is working, the bus is available, and SCSI Manager 4.3 is free to issue

commands to other devices.

Because SCSI Manager 4.3 operates asynchronously, many devices can be operating at the same time, although they can leave or reconnect to the bus at different times. When each disconnected device finishes a command, it gets back on the bus, signals the SCSI Manager, and transfers its data. While the command is executed, the microprocessor remains free to perform computing tasks.

As a result, the new SCSI Manager lets routine processes like "Save" or "Print" run in the background, releasing control of an application to the user immediately after a command is issued.

SCSI Manager 4.3's asynchronous design takes advantage of the fact that computing functions and mechanical operations process data at different rates. Printers, scanners, disk drives, and other devices are slow compared to microprocessors, so it makes sense to free them from performing their tasks in tandem with the microprocessor. The tasks they perform need no supervision, and keeping the SCSI Manager waiting only wastes computing time.

SCSI Manager 4.3 can initiate simultaneous processing by sending commands to many devices in succession. When a device has finished its task, it signals the SCSI Manager from the interrupt level and reconnects to the bus. Address ID numbers, which previously have given priority to each device on a bus, are needed only when two devices are seeking to reconnect at the same moment. At that time arbitration takes place,

and the device with higher priority reconnects first.

Because the SCSI Manager 4.3 is no longer needed for bus micro-management, it is not kept waiting for mechanical operations like disk data retrieval, scan completion, or printing processes. The processor is free to perform other tasks, and all computer operations run faster as a result.

Easier to Use

Because the SCSI Manager 4.3 provides a more hardware-independent API (application programming interface), the SCSI bus-specific tasks a driver must perform are minimized. As a result, drivers are easier to write.

Compatibility Across Platforms

SCSI Manager 4.3 also makes it easier for developers to support multiple platforms by rewriting only a minimum amount of code. The SCSI Manager 4.3 is based on ANSI CAM (American National Standards Institute Common Access Method), though not compliant with it. That standard is growing throughout the PC industry, so code based on ANSI CAM is more easily ported between Macintosh, DOS, and UNIX platforms.

Backward Compatibility

SCSI Manager 4.3 also features backward compatibility with previous SCSI Managers. A special interface accommodates existing device drivers, so they will continue to be supported. However, they will likely be out-performed by new drivers that are written to take advantage of SCSI Manager 4.3 features.

Supports Existing SCSI Hardware and Device Drivers

SCSI Manager 4.3 can now access the full range of devices available. Any printer, scanner, disk drive or other peripheral can be supported, as long as it is compliant with the SCSI-2 standard. Because of Apple's commitment to its SCSI market, devices that work with the previous SCSI Manager are also supported.

SCSI Manager 4.3 supports all existing SCSI devices with minimal or no modification. Developers of the new SCSI Manager felt it was important to provide support for all existing SCSI hardware.

Supports More Buses and Devices

Unlike its predecessors, SCSI Manager 4.3 supports multiple buses and more than seven devices. Under older SCSI systems, it was theoretically possible to support seven devices on one bus. However, in practice, the system does not support that many devices on one bus. Transmission line issues (such as electrical and noise interference, quality and length of cables, and devices of varying engineering quality) compounded the problems faced by users who needed a full complement of devices.

By contrast, SCSI Manager 4.3 is limited only by the physical space available for adding devices to a SCSI system. For example, a modular Macintosh may have two SCSI buses, but it can have up to twelve buses by filling its five NuBus slots with third-party cards that have two buses each. Since each bus can support seven devices, the

SCSI Manager 4.3 interface could support over 84 devices. Since it is improbable that any user could find room for that many devices, the actual number of devices supported by SCSI Manager 4.3 is virtually limitless.

The Original SCSI Manager

Apple engineers developed the first SCSI Manager in 1985 for the Macintosh Plus computer. This SCSI Manager worked in a synchronous mode, as did all of its successors until the Atomic SCSI Manager version.

The Atomic SCSI Manager

By 1989 it was clear that the SCSI software needed rewriting, and a proposed replacement, the "Atomic SCSI Manager," was announced at the 1989 Worldwide Developers Conference.

Apple managers chose not to release that SCSI Manager because Apple's newest product line featured virtual memory, which was incompatible with the asynchronous Atomic SCSI Manager.

Virtual memory uses hard disk space as RAM, and therefore must periodically swap out memory to the disk. The old synchronous SCSI Manager worked with virtual memory because it did not allow more than one disk action to take place at one time.

Because the asynchronous Atomic SCSI Manager allowed simultaneous processing, it was possible for the system to deadlock due to conflicts with virtual memory disk accessing. This formidable engineering problem was finally resolved by the release of SCSI Manager 4.3.

SCSI-2

SCSI-2 is a mechanical, electrical, and logical specification for SCSI systems, and was recently certified as a new ANSI standard. Although the original SCSI Manager became a de facto standard, it was not certified by ANSI.

An optional feature of the SCSI-2 standard offers a means to improve SCSI data transfer rates by using faster controllers and wider data paths. Speed of transmission depends on both the width of the data path and the speed a chip will allow transfer of data. Versions of SCSI-2 that allow acceleration of the data transfer rate are popularly known as "fast SCSI" and "wide SCSI."

Some high-end users need systems accelerated by fast or wide SCSI, and those needs are met by manufacturers of third-party cards and cables. Users of these systems risk possible signal degradation, and they must also put up with bulky cables. These are only two of the possible problems facing any supplier of fast or wide SCSI systems.

Apple serves a wide customer base and does not currently plan to build such features into its own computer systems. However, SCSI Manager 4.3 does allow for new hardware implementation, thereby supporting these optional features of SCSI-2.

Apple engineers have, however, upgraded the original SCSI controller—the NCR 53C80—for the SCSI-2 compatible Quadra and Centris families. To get the system running at 4 MB/sec. on an 8-bit bus, well above the 1.5 MB/sec. normally seen for 68030-based models, they used a new and more sophisticated interface chip, the NCR 53C96.

Other controllers and cables can, with some difficulty, support data transfer rates of 10 to 40 MB/sec. The SCSI Manager 4.3 is designed to support new hardware implementation.

SCSI Manager 4.3 Based on ANSI CAM

Apple engineers on the SCSI Manager 4.3 project determined that replacing the synchronous mode of the previous SCSI Managers would yield significant reclamation of processor time. By changing the structure of the SCSI Manager, they also planned to activate other optional features of SCSI-2, such as disconnect/reconnect, command queuing, and synchronous data transfer.

In redesigning the SCSI Manager, Apple engineers chose to follow the ANSI CAM standard interface to SCSI devices, which explicitly supports asynchronous behavior. Although theirs is not a strict implementation, SCSI Manager 4.3 is based on the same philosophy as ANSI CAM.

Apple's implementation is called ACAM (Apple Common Access Method; within this article ACAM refers to Apple's implementation). Its architecture is virtually identical to the ANSI standard. The structures are similar, but the names are different. In fact, ACAM is ANSI CAM-like, but not ANSI CAM compliant.

Apple engineers also viewed the use of ACAM as a market stimulus. Using this standard, developers find it easier to create peripherals for DOS and UNIX platforms as well as Macintosh models, and vice-versa. Within the Macintosh product line, portability also serves a purpose, since code that works with the 68000-based family of

Macintosh computers can be ported to the upcoming PowerPC platform.

The resulting asynchronous, ANSI CAM-inspired SCSI interface replaces all previous SCSI Manager interfaces. SCSI Manager 4.3 is fully compliant with SCSI-2, and it addresses deficiencies in previous SCSI Managers that make the use of the full complement of devices impractical.

Finally, unlike all previous attempts to rewrite the SCSI Manager, SCSI Manager 4.3 supports virtual memory.

Available in 1993

Apple will release the SCSI Manager 4.3 in 68040-based computers later this year and next year, and in RISC-based computers to be released in 1994. In addition, there are plans to make SCSI Manager 4.3 available on the PowerPC platform.

When this is done, developers and device driver writers will have the tools needed to take advantage of the features of the new SCSI interface. After they use their expertise to adapt applications and device drivers for the SCSI Manager 4.3, Macintosh users will see faster and more efficient computer operations. ♣

Shop Talk

Engineering Support Tools

By Rilla Reynolds

How does your team share development tools such as the monthly developer package you receive from Apple? One effective solution is to make the electronic information available to everyone over a network.

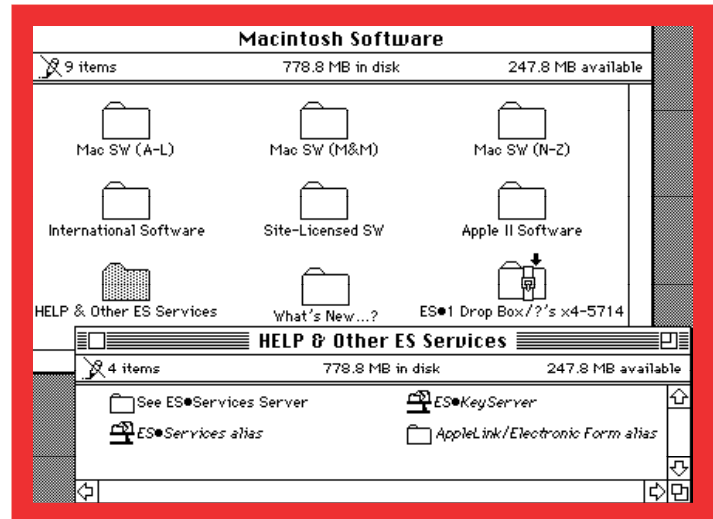
CD-ROM Server

When a new Developer CD arrives at T/Maker (WriteNow, ClickArt), for example, it moves directly from their mail room to the caddy of their dedicated CD-ROM server. Not only does everyone in the office have immediate access to the latest Apple developer information, but engineers who are telecommuting use AppleTalk Remote Access to download new material without making a trip to the office.

It takes just a few minutes to set up a CD-ROM for shared access, once you've collected the necessities: a CD-ROM drive (the new double-speed models are preferable), SCSI and network cables, and either System 7 file sharing or AppleShare. Connect the drive to a Macintosh SCSI port, connect the Macintosh computer to a LocalTalk network, start up the Macintosh, and make sure AppleTalk is active in the Chooser dialog box.

If your CD-ROM server is a Macintosh running System 7 without AppleShare, open the Sharing Setup control panel, fill in the Network Identity boxes, and click the File Sharing Start button, as shown in the example below.

Last, select the CD-ROM drive icon on your desktop, choose Sharing in the File menu, and set up user access privileges for the CD—



and voilà, your Developer CD is on line! Giving “Everyone” CD-ROM access is easiest, but for network privacy you may prefer to specify users and passwords with your Macintosh server’s Users & Groups control panel. To set up a group of users, drag your named user icons over a group icon and name the group icon.

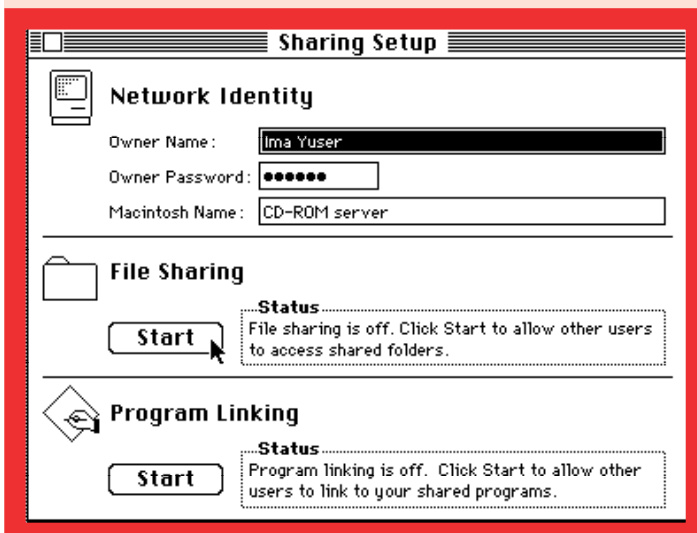
You’ll need to turn off file sharing in your Sharing Setup control panel before switching CDs, but look for a new UnmountIt utility on the June Developer CD to simplify the process. It checks for users, turns off file sharing, unmounts the volume you’ve indicated, and turns on file sharing again.

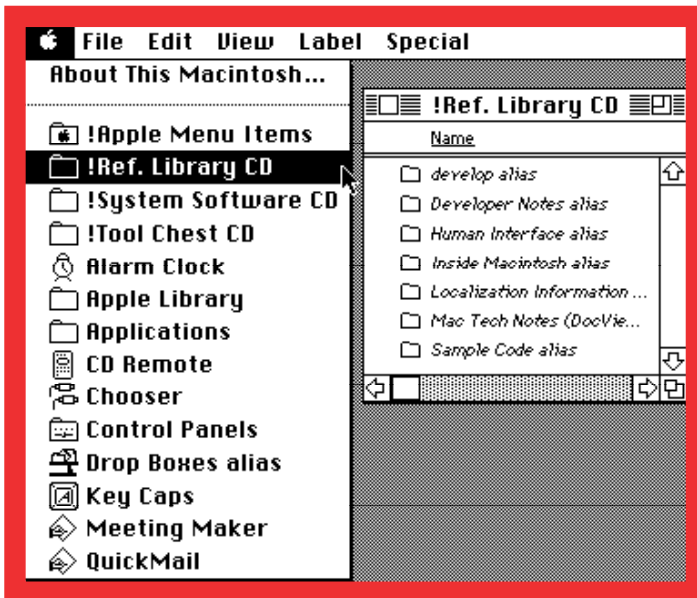
Setting up a CD-ROM server using AppleShare is similar. Remotely, shared volumes look the same to users, whether you use System 7 file sharing or AppleShare. File sharing, as part of System 7, costs less than AppleShare, but AppleShare is faster and has more features. For example, it allows more users access to a server at the same time, it lets you mount and unmount CDs on the fly, and it has better network administration support.

AppleTalk Remote Access (ARA) works with both System 7 file sharing and AppleShare. ARA lets you access your CD-ROM server, along with other network services, from home or on the road using a standard phone line and a 2400-bps or faster modem.

Both AppleShare Server 3.0.1 (#M0090LL/B) and AppleTalk Remote Access (#M0033LL/A) are available from Apple’s Hardware Purchase Program for developers. Check AppleLink at Apple Sales & Mktg:Price Lists:Developer Programs Confidential Price List for the latest price and ordering information.

APDA offers three network guides as resources for building or expanding an information system for your business. *Understanding Computer Networks* (C0080LL/A) is a primer covering topics such as how protocols are used to transfer information over a network. The *Network Solutions Guide* (M6198/D) describes network design considerations as well as hundreds of Apple and third-party distributed computing products. *Planning and Managing AppleTalk Networks*





(T0471LL/A) is a guide for planning and maintaining AppleTalk network systems.

Aliases

Apple's engineering teams use AppleShare along with ARA to access libraries of source code, tools, and various system software configurations. The figure below shows how one engineering library is configured to help individuals keep their software versions updated. Notice how aliases for folder names are included to make it easy to leap across campus to get files from other servers without having to choose volumes and find files. This server's administrator suggests that you make aliases for folders instead of files, so users don't spend time starting up applications over the network. He also recommends that you use a product such as Nok Nok (TriK, Inc., 800-466-TRIK) or Server Manager (Santorini, 415-563-6398) to disconnect users who haven't accessed the library for, say, 15 minutes.

Network architects, administrators, and other specialists support Apple's worldwide network. In addition, network aficionados within

Apple have formed an informal organization called FoNT (Federation of Network Technologists). Members exchange training information and help others who aren't so fluent in the language of servers and gateways.

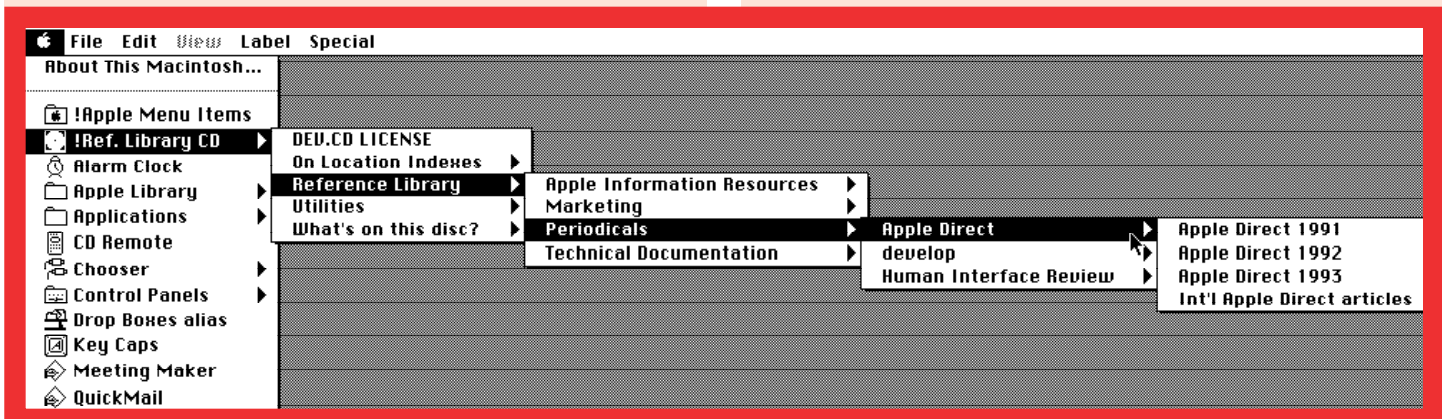
Apple's engineers use aliases for volumes, folders, and files abundantly. Did you know you can make aliases for read-only media? The Finder puts aliases for CD-ROM discs on your desktop, which is convenient because you can then organize the aliases into folders on your desktop or add them to your Apple menu.

You create aliases by selecting Make Alias in the File menu after highlighting one or more volumes, folders, or files. Aliases show up in your Apple menu when you move them into the Apple Menu Items folder in your System Folder. To save time moving aliases to and from this folder, you can make an alias for your Apple Menu Items folder itself and place the alias in the Apple Menu Items folder. That adds the alias to your Apple menu, as shown in the figure below, making it easy to access the folder quickly.

In the example to the left, we've also included folders of aliases for the latest Developer CD Series disc, the latest E.T.O. (Essentials • Tools • Objects) CD, and QuickTime 1.5. (Be sure to get a site license for CD-ROM discs such as E.T.O. and QuickTime before sharing them over your network.) You can set up folders such as these for aliases for CD-ROM folders and files that you frequently use. The MountAlias control panel, in the Inits/cdevs/DAs folder on your quarterly Tool Chest CD, creates a volume alias automatically for you when you mount an AppleShare volume. Individuals at Apple also use At Ease to make aliases for all applications on a volume quickly.

To eliminate the step of making folder and file aliases for each new CD release, you can make an alias for just the CD's name and use a tool such as Now Utilities' NowMenus to traverse your CD's folder structure, as in the example below.

Making aliases lends itself to all sorts of creative ways to access libraries of shared information quickly. We hope you'll contribute some of your favorite aliasing tricks as well as other development tricks to this column. Please send your shop talk to APPLE.DIRECTIONS. ♣



CD Highlights

*continued from page 9***Clipboard Magician 0.75**

This desk accessory lets you look at and manipulate the contents of the Clipboard. Developers and users can add their own modules to manipulate the data. Clipboard Magician can also be used as an Apple event server. Also included is a collection of code resources that can be invoked from a desk accessory to operate on the contents of the Clipboard. The same set of code resources can be used as an Apple event handler when run from an application shell. You can have Clipboard Magician talk to another copy of Clipboard Magician or another application through Apple events.

Navigable Movie Toolkit 1.0.1

This HyperCard® stack is designed to assist in making navigable movies of environments, using a specially configured set of off-the-shelf

hardware and software. The user can control the view of a navigable movie by clicking and dragging the mouse in the movie's window. The user's experience is that of peering around the space as if one were moving one's head horizontally and/or vertically. This toolkit is the result of an investigation in Apple's Advanced Technology Human Interface Group.

Instance Variables for HyperCard

Objects in HyperCard are not allowed to have variables inside them—until now. Instance variables are useful for storing more data with a button or field. This stack script allows you to have variables attached to a button, shared field, or other HyperCard object. An object may have any number of variables. Values are preserved when you quit, and then they stay with your stack when you drag it to another disk. The objects that can have variables are card buttons, card fields, the card itself, back-

ground buttons, shared fields, or the background itself.

LockVol 1.4

A nifty control panel device (cdev) that can instantly lock and unlock volumes, for use in testing and debugging your applications.

MPW Interfaces 7.1

This folder contains the latest version of the MPW Interface files, including the AIncludes, AStructMacs, CIncludes, CLibraries, Libraries, PInterfaces, PLibraries, RIncludes, and ROM Maps folders.

Next month, we'll return to the beginning of the three-CD cycle with the second System Software Edition, which will contain the beta version of QuickDraw GX as well as new and updated system enablers and much, much more.

*Sharon Flowers
Developer CD Project Manager*

*develop**continued from page 7*

digitizing whether you're developing a digitizer, writing an application to control one, or just curious about how it all works.

- "Making Better QuickTime Movies" discusses how to optimize your QuickTime movies for quality playback from CD-ROM.

- "Syncing Up With ColorSync" tells all about ColorSync, Apple Computer's color-matching technology.

This issue also includes columns on derived media handlers in QuickTime, system enablers, and common graphics problems. Dave Johnson shares his thoughts on nanotechnology, KON and BAL provide another difficult debugging puzzle, and the Q&A section covers a variety of topics from Apple events to QuickTime for Windows.

So if you've been thinking it's not for you, look again—on *ROM the World in 80 Nanoseconds*, this month's edition of the Developer CD Series, or on paper if you subscribe to the printed copy. Whatever the medium, we hope your pleasure will be large! And please, take a small amount of time to tell us what you think about it; we really want to hear from you at AppleLink DEVELOP. ♣

*Caroline Rose, Editor
develop*



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Business & Marketing

Market Research Monthly

Performa Leads the Way Into Consumer Market

It's a business truism that you can't know enough about the market for your products.

With that in mind, each month *Apple Directions* will provide information about Apple's customers and markets to help developers plan, position, and sell their products. As often as possible, we'll provide Apple's own data and analysis.

This month, we look at the consumer market, mostly in the United States and partly in Europe. The numbers come from Apple research about early Macintosh Performa computer customers in the United States and about the overall consumer computer market in Europe.

Apple introduced the Performa line of Mac-

intosh computers just over six months ago, targeted for sale to home buyers through mass-market retailers like Sears and Montgomery Ward as well as office superstores and home electronics outlets. Since then, the Macintosh Performa has been released in Europe, and Apple has added three new models to the line (see news story on page 8).

In the United States, the Performa line is aimed at selling to the approximately 7 million households that have never before purchased computers. In Europe, the Performa is tapping a home computer market that Apple estimates to be worth nearly \$5 billion, or more than 2.5 million units.

Inside This Section

Developer Outlook 22

Editor Dee Kiamy examines some of the challenges that "offshore" companies face when entering the U.S. market. Get a new perspective, and advice, on how this market is perceived by others.

Opportunities for Developers

The key findings as far as Macintosh developers are concerned is that early Performa sales in the United States and Europe represent significant opportunities to reach new buyers with products designed for home use.

In their first six months of sales since they were introduced last September, the Macintosh Performa 200, 400, and 600/600 CD sold 150,000 units in the United States and Europe. (More than 80 percent of those sales—120,000 units—took place in the United States, because the line has been available in Europe for only three months.) Apple analysts suggest that the Performa line's amounts of sales will be comparable to the first-year sales of PowerBook computers.

All of this adds up to a huge potential market for developers's products if they're designed and positioned carefully for the home buyer.

Early Performa Buyers

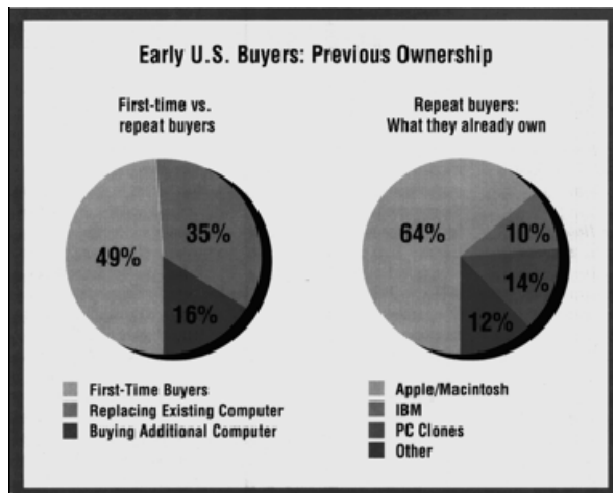
The Performa line is attracting a great many people to the Macintosh platform who are brand new customers, both for Apple and for developers of Macintosh products.

Earlier this year, Apple performed a study of U.S. customers who purchased Macintosh Performa computers in the last three months of 1992. The most remarkable characteristic of these customers was that nearly half of them—49 percent—had never before bought a computer. Of those who were repeat computer purchasers, 24 percent bought a Macintosh Performa to replace an IBM or DOS personal computer clone (see "Early U.S. Buyers:

Early U.S. Buyers: Previous Ownership

First-time vs. repeat buyers

Repeat buyers: What they already own



Previous Computer Ownership” on the previous page).

How those users are actually employing their new computers can help developers trying to position products to take advantage of this new market: The primary use and reason for purchase of a Performa was for educational purposes. “Early U.S. Buyers: How They Use Their Computers,” (see figure this page) shows how those participating in the study are using their computers. European buyers break down their usage of Performa in approximately the same way, although uses vary slightly from region to region.

To interpret this data, if you’re a developer or software publisher who has traditionally sold educational products to schools, home Performa purchasers may give you a market for a home version of the same product. Also, the more than half those in the study group who use their computer to work at home will need second copies of the software they use in the office. To discourage piracy of that second copy, you might consider giving a discount to those who

need additional copies of your programs.

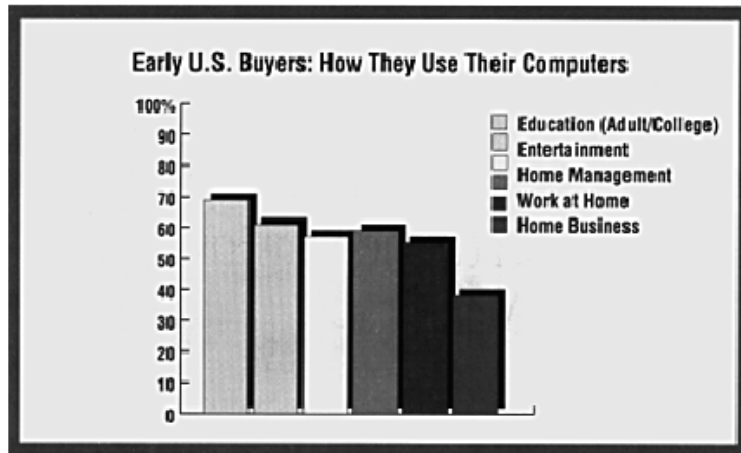
Another noteworthy number from the Performa marketing effort: Macintosh computers are now sold in more than 2300 additional outlets in the United States (and 1000 in Europe) than they were before the Performa introduction. Apple expects the number of U.S. Performa outlets to

reach 3000 by year-end, also giving commercial developers 3000 more potential outlets for their offerings.

Within the U.S. outlets, Apple has trained more than 4500 salespeople in the last six months and anticipates training another 6500 in the near future. This gives the entire Apple community a great many more voices spreading the news about our products.

Future issues of *Apple Directions* will tell you more about how to be successful in the consumer marketplace. Until then, you may want to refer to “Cross-Marketing Educational Products” and “Cracking Several Markets With the Same Product” in the July and September issues, respectively, of *Apple Direct*. ♣

Early U.S. Buyers: How They Use Their Computers



Developer Outlook

Breaking Into the U.S. Market

Developer Experiences

By Dee Kiamy,
Apple Directions Staff

Editor's Note: Approximately half of our readership is outside the United States. But even if you're a U.S. developer who is first entering the market or doing new market development in the United States, I urge you to read on: You face many of the same challenges that these offshore companies do; therefore the perspectives and advice presented here may be

useful. It's also interesting and useful to see the U.S. market as it is perceived by others.

The U.S. market. *Hmmm.* It's a tough nut to crack, as they say in America. It would be misleading to tell you that breaking into the U.S. market is simple or straightforward, or that it's like anything else you've ever tried. It's not. The country is large, the competition fierce, the number and kind of local products vast, and the distribution channels complex.

However, it may be a mistake to summarily discount the notion of

cracking the U.S. market. Bear in mind that because the overall market is so large, it may be worth the perceived risk if you can become even moderately successful there. Furthermore, some companies feel that doing business in America helps boost their home-country credibility; these developers say they are perceived at home as being more profitable and stable if they are successfully doing business in a country as large as the United States.

Several non-U.S. developers (even very small companies) are witness to the fact that breaking

into this market isn't out of the question if you do your homework, take time to understand the cultural and business dynamics of the country and its market—and adapt yourself accordingly.

To help you weigh the issues and better understand what it takes to be successful in the United States, I spoke with four companies—ACI, InterOptica, Logal, and Blyth Software—about their experiences in cracking this nut. What follows is some of the advice they offered. For profiles of these companies and stories about how they broke into the United States,

see "Companies That Have Made It in the United States" on page 24.

A Few Key Pieces of Advice

Each of these companies chose a different path into the U.S. market. But while their early beginnings differ, their advice about what it takes to succeed in the United States is strikingly uniform, with only a few exceptions. Their anecdotes and suggestions unfortunately are too extensive to fit here, so here are a few of the key considerations they feel are important for developers trying to crack the U.S. market.

Don't make qualitative comparisons; instead, look at the differences. Mindset is critical when you approach a market as vast and complex as the United States. When examining the U.S. market, it's tempting (and natural) to make qualitative comparisons between it and your home market.

But how you look at the differences is critical. You'll make a big mistake, say developers who have succeeded in the United States, if you predispose yourself to harboring a "good/bad" or "right/wrong" mindset.

Instead, look at this challenge from the perspective of "What are the differences between my market and the American one? How can I adapt, adjust the way I do business to accommodate those differences?" That, these developers say, will put you in the right frame of mind to create a successful plan of attack.

Also, if you probe for and try to understand the differences you'll be less likely to take them for granted. "You can't take anything for granted when you approach the U.S. market," says ACI CEO Marylène Delbourg-Delphis. "Everything is different there. If you're receptive to that fact, then you'll be much more successful in the United States." (Much of the advice in this article thereby may

seem to underscore the obvious, but embodied in it are often-overlooked details that are easy to take for granted.)

Learn as much as possible about American business practices. The business environment and practices in the United States are likely to be very different from those in your local market. To succeed, you'll probably have to forfeit many of your basic assumptions about the way you do business and, as much as it may at first rub you the wrong way, adopt patterns and habits that are more "American."

"America is such a huge country that it doesn't need to look outside itself for products and resources to the same degree that Asian and European countries do," says InterOptica Managing Director Catherine Winchester. "Therefore, Americans are accustomed overall to doing business mostly with Americans. They feel comfortable with that, and for them to feel comfortable doing business with you it's important that you do things the American way," she says.

A variety of practices differ, but here are two key ones that Winchester identified:

- *Working hours and days.* Americans work different hours and days of the week than do businesses in some other countries. For example, Winchester points out, in Hong Kong many offices are open on Saturday mornings, and in some countries, such as China, companies operate a full six days each week. But most U.S. corporations (large and small) conduct business from Monday to Friday, usually for eight to nine hours a day between 8 A.M. and 5 P.M. While individual workers or the occasional company may choose to work weekend hours, the norm is Monday through Friday.

"For that reason," says Winchester, "on the whole it would be

unrealistic to expect American companies to be responsive to your requests on the weekends."

- *Pace.* The business pace in the United States often tends to be more frenetic than in other countries. Because many U.S. companies make extensive use of such tools as electronic mail, voice mail, and toll-free telephone numbers, they usually expect to be able to move quickly on almost any issue.

"Americans live in a culture that breeds instant gratification. They want to pick up the phone and get things done—not sit down, write a letter, fax it, and then wait for the response," says Winchester. They also don't expect a business phone to go unanswered; they expect a line to be picked up at least by an answering machine or voice mail.

Therefore, electronic mail services such as AppleLink—which can be accessed from an increasing number of other on-line services such as Internet, MCI Mail, CompuServe, and others—are effective, quick-response tools for doing business with U.S. companies and customers.

Business pace also affects how you'd structure customer service operations. In the U.S., customers often expect to be given toll-free telephone numbers for making product inquiries and obtaining technical support. These phone lines sometimes are staffed 24 hours a day, seven days a week. So it might be unrealistic to ask customers to pay for a long-distance telephone call to get technical support or order products, as it would be to expect them to stay awake until midnight in their local time zones to reach you in your offices.

"Likewise," adds Winchester, "faxes are viewed differently in the United States than in some other countries. In the States, people don't send faxes when they want to get information fast. Instead, they pick up the telephone and call the person they want to do business

with. My experience says that I could send a hundred faxes to the United States and it would accomplish far, far less than it would here in Asia. Americans just don't view the fax machine as a quick-response tool. But in Asia, we rely very heavily on faxes. When I'm sitting in Hong Kong trying to do business with the United States via fax, I can't accomplish anywhere near as much as our U.S.-based office can."

Be adaptable. As you can see, the American marketplace operates very differently than most other markets. Understanding those differences is the first step; adapting to them is the next critical challenge.

Being flexible and patient is a step in the right direction, says Logal President Yoel Givol. "To get the attention of U.S. companies, you must be very flexible and willing to listen, which is often difficult," he says. "After a while we realized that we couldn't just call the shots in the huge U.S. market, especially because we come from such a small country as Israel. Furthermore, saying things like, 'Well, it works this way in Israel' won't get you anywhere because Americans do business their own way. You have to listen and learn how the market works there, immerse yourself in the system.

"If you want to work with a publisher or distributor, you really must prove yourself over a long period because it is much easier for American companies to find someone to do business with next door. You also must be patient, because it takes time for U.S. companies to become confident in developers from other countries who do things differently and who may be 6,000 miles away. From the U.S. point of view, it's very risky for a publisher or distributor to contract with a company that is far away, perhaps even in a country they've never visited," says Givol.

That is why Logal entered the U.S. market in two stages. "First we worked with a research center and a codeveloper, each of whom had experience in the U.S. market; their experience helped us understand how to demonstrate that our product would work in the American market," says Givol. Armed with that insight, Givol was better positioned to pursue a business relationship with a U.S. republisher/distributor.

Don't underestimate U.S. geography and diversity; segment accordingly. It's ironic that the same thing that makes the U.S. market seem so daunting is also the factor that makes it an

immensely appealing proposition for businesses—its sheer size, in terms of geography and number of customers.

The country encompasses five time zones, tropical and arctic climates, and an incredibly diverse—and large—number of potential customers. That's reflected in the quantity of Macintosh computers sold in the country: Currently, industry estimates indicate there are upwards of six million units in the installed base, a number that is expected to grow substantially in the next few years.

"Europeans get dizzy when they think about the size of the U.S. market," says Delbourg-Delphis of ACI. "When we first decided to

enter this market, it occurred to me that there were more Macintosh computers in California alone than in all of France. I decided that if we could be successful with our product in California, then we could survive in the United States."

The lesson here is to ignore the natural inclination to view the United States as a single market. It actually is composed of a plethora of market segments, a variety of buying patterns, and a large number of opinion leaders and buying influencers. Each geographic area of the United States has its own peculiarities, mini-cultures, and customer attitudes. While Americans share many things in common, remember that demographic

traits such as the average income and education level and general degree of computer literacy can vary widely from region to region.

For example, the average degree of computer literacy in northern California is heavily influenced by the presence of Silicon Valley. People in the heartland of Iowa, however, where a major industry is farming and food production, may have a totally different outlook on purchasing computer technology.

It's important to carefully choose exactly which segments to target and which ones to ignore. If you target wisely, then what is otherwise an almost impenetrable giant becomes an approachable entity.

Companies That Have Made It in the United States

Here are the stories of the four companies we interviewed for this article, who each have successfully broken into the U.S. market.

Logal/Israel. Logal is an education software developer who successfully entered the U.S. Macintosh market in late 1990. Today, the 30-employee firm sells a lineup of more than 20 products in the United States, including such titles as the Explorer series (including Physics Explorer, Biology Explorer, and Geometry Inventor) and the What's the Story? series. Currently, about 40 percent of Logal's total revenues come from sales to U.S. customers.

Getting started in the United States was a long process for Logal that began in 1987 when a group from the Boston Science Museum visited Israel. After seeing demonstrations of Logal's PC-compatible education products, the museum invited the developer to make a presentation in the United States to a select group of Boston-area publishers and university professors.

Despite its efforts at that time, Logal was unsuccessful at establishing a U.S. publishing and distribution arrangement for Step (an early incarnation of the Explorer series). However, two years later research and development specialist BBN, based in Cambridge, Massachusetts—who had experience in the U.S. education market—pointed out that Logal had a "great idea, great product—wrong machine" and suggested that the developer rewrite the application for the Macintosh.

Being a small company with limited resources, Logal was forced to find creative ways to fund porting its product to the Macintosh. It applied for and received a design and development grant from the Bird Foundation, an industrial research and development foundation that funds up to 50 percent of qualified joint projects between Israeli and U.S. companies. By 1989 the Macintosh product was ready to ship and Logal and BBN signed an agreement with Sunburst, an American firm who would publish the product in the

United States. BBN acted as consultant and codeveloper, and Sunburst as the U.S. publisher.

Sunburst provided Logal with guidelines for localizing the product for the United States. In late 1990 Sunburst began marketing this product as Physics Explorer-Gravity under its Wings For Learning name. The product has been sold mostly by Sunburst through mail-order catalogs. But now, Logal is considering expanding its U.S. distribution.

ACI/France. ACI, the French company that produces the well-known 4D database application, began its U.S. success story in 1987, just two-and-a-half years after becoming established in France. Prior to that, says CEO Marylène Delbourg-Delphis, there had been no successful database application for the Macintosh and no U.S. distributor interested in such a product.

However, in 1987 the Macintosh market expanded and market interest in a variety of Macintosh products, including databases, began to grow. Because Apple showed a strong interest in 4D (and after a U.S. firm offered to purchase it), ACI felt the product's market potential was large enough to justify entering the U.S. market on its own. The company subsequently opened a subsidiary in Cupertino, California, in the heart of Silicon Valley (and on Apple's doorstep). The business has grown steadily, and today ACI has offices in seven other U.S. cities—and has plans for more.

ACI, known at that time in the United States as ACIUS, began its U.S. distribution through Apple's traditional retail channels—computer dealers—one of the channels in which ACI still distributes its products. However, the company also aggressively marketed itself directly to customers and to the "fourth-party" development community. (These developers design and market custom applications that help make 4D even more attractive and useful to users.)

One-third of ACI's total revenues now come from the United States, where the company lays claim to approximately 65 percent of the database application market share.

Be realistic about the nature of U.S. competition. The sheer size and diversity of the United States breeds fierce competition. American customers have an amazingly large and diverse array of locally produced products to choose from. (To really get an appreciation for this, visit a U.S. computer superstore or browse through one of the many mail-order catalogs.)

Delbourg-Delphis of ACI says, "People in the United States aren't just sitting and waiting for European products to come to them. They have so many resources at their disposal and the United States is pretty much self-sufficient, considering the size of the country." If you have a realistic

understanding of the scope and ferocity of competition in that country, you'll be more likely to make sound decisions.

To be adequately prepared to move into any U.S. market segment, you therefore must conduct a thorough assessment of your U.S. competition: the audience it reaches, pricing, distribution, marketing strategies, and other important aspects. Armed with this information—and a solid, technically excellent product—you can make a more realistic decision about whether and how to break into the market.

You must localize for the United States. Applications that succeed in

the United States are, almost without exception, English-language products. Therefore, a product—and its documentation—sold into this market should be thoroughly localized for culture and language, paying particular attention to the use of American English.

"It's my perception that, on the whole, American consumers are intolerant of products that aren't totally localized," says Michael Minor, president and CEO of Blyth Software. "They aren't like Europeans who are willing to accept the English-language or quasi-localized versions, because in the United States it's very competitive; customers have such a wide range of

products to choose from."

However, localizing your product for the United States also means localizing your own mindset. "There are many cultural differences between the United States and other countries, and setting up business in the United States requires a significant change in one's life and mindset," says ACI's Delbourg-Delphis.

"You can't project your own cultural habits onto Americans. You have to get rid of your bias, forget what you've heard people in your country say about what they think the United States is all about, and look at the U.S.—how the people live, how they think—with a fresh eye. And to understand the U.S.

InterOptica/Hong Kong. InterOptica is a privately-held Hong Kong-based publisher of CD-ROM travel titles such as *Great Cities of the World* and *Great Wonders of the World*. Having created products from scratch especially for the U.S. market, InterOptica earns 99 percent of its revenues from U.S. customers. The company was founded in early 1990 by Catherine and Simon Winchester. Catherine, a programmer, and husband Simon, a travel writer, decided to combine their talents to develop and publish CD-ROM titles.

The company first broke into the market in 1991 by bundling its discs with hardware sold by original equipment manufacturers (OEMs) such as NEC and Sony. Winchester originally thought the titles market would first explode in Japan where most of the discs and drives were manufactured. However, she soon discovered that the installed base was developing much faster in the United States. At the same time, OEMs such as NEC encouraged her to do business with their U.S. subsidiaries.

InterOptica hired an agent in the United States to negotiate agreements with OEMs and to provide customer technical support. Even though the company had only five or six major OEM customers, it essentially had thousands of end users who required support for its CD title. To handle that support locally and give customers the attention InterOptica felt was needed, it quickly opened a U.S. branch office.

In 1992, after a series of successful bundle deals with U.S. subsidiaries of non-U.S. OEM companies—and with the installed base of CD-ROM drives growing at a much swifter rate—InterOptica began capitalizing on the mass appeal of its titles. (Because the titles were originally intended for bundling, InterOptica had created them to appeal to as broad an audience as possible.) The company began selling its titles in U.S. retail channels such as CompUSA, Radio Shack, and others. Because selling through multiple retail channels entailed a much more complex series of negotiations and reached more customers who would require support, InterOptica's decision to open a U.S. branch office paid off.

Currently, retail sales yield approximately 25 percent of InterOptica's U.S. business, a number that is expected to grow. And to help increase its U.S.

exposure, InterOptica also does "work for hire," developing CD titles for such large U.S. publishers as Random House and Macmillan New Media.

Blyth Software/United Kingdom. Blyth Software is the developer of the Omnis Seven client-server application development environment. The company started life in the United Kingdom but has since shifted its headquarters to the United States.

After becoming successful in the United Kingdom, Blyth first attempted to break into the U.S. market in 1985 with a personal database product and applications. Because at that time industry interest in a Macintosh database product had not yet developed, Blyth made the decision to develop across platforms and created a Windows version of Omnis to increase sales. That product was sold in U.S. retail channels and enjoyed only a modest degree of success.

Blyth moved its company headquarters to the United States in 1987 to better position itself to compete in the larger U.S. market. In 1991, Blyth was struggling, somewhat, to compete with both a Windows and Macintosh version of its product in the cutthroat retail channels against competitors that sold in the \$400–\$500 range. It was making headway, says CEO Michael Minor, but not achieving the volume that its competitors enjoyed.

The breakthrough came in 1992 when Blyth repositioned the product (and company) to attract corporate customers instead of individuals, small businesses, and department work groups. The company also repositioned its product from being a stand-alone database application to a client-server product that could take advantage of the corporate multi-platform environment.

Repositioning entailed making a number of changes, including pulling out of retail channels and selling directly to corporate customers, which Blyth now does with a 16-person North American and U.K. sales force. The company has also aggressively pursued its relationship with fourth-party developers, and industry vendors such as Apple Computer and IBM.

Those decisions set the company on its current course. Today, approximately 70 percent of Blyth's revenues come from U.S. sales. ♣

cultural prototype requires complete immersion in that culture. I don't think it's the kind of thing that can be totally explained to you. It has to enter through your skin, so to speak, and you must be receptive to the differences.

"This includes everything from the way you look at images to the way you position your software.

**Being perceived
as a local
company is,
without a doubt,
very important.**

For example, in the European database market you generally focus first on a product's technical capabilities. In the U.S. database market you must of course sell a technically excellent product—but focus on the interface. That is just one example of how you must change your point of view," she says.

Developers interviewed for this article seemed to feel strongly that localizing a product *in* the United States is important. Seemingly subtle details can make your product scream "I'm not American!" Making a simple mistake such as using the British word *colour* (instead of the American *color*), or using metric units of measurement and degrees Celsius instead of feet, inches, and Fahrenheit can be deadly. Localizing a product in the United States helps avoid such oversights. And if you can get U.S. customers to give you input or participate in that process, all the better.

Do everything possible to create a local presence. Being perceived as a local company, at least one that does business locally, is without a doubt an important component of success in the U.S., especially given the heated competition in that country. Depending on your particular situation, there are steps to take beyond localization that can help create the impression that you're a local player.

Logal has successfully entered the U.S. market by developing a relationship with a publisher there. That publisher handled Logal's manufacturing, distribution, and technical support—everything needed to get the product off the ground and selling in America.

When you're far away from customers and business partners, how well you communicate with these constituencies and handle such things as time differences can have a major impact on whether you're perceived as being a local player.

The effort needed to stay in touch with the market and cultivate partner and customer relationships can be proportionate to your distance from the United States "We have the largest AppleLink bill in Israel," jokes Logal's Givol, who adds that he couldn't do business in the United States without it.

"We do almost everything by electronic mail, including shipping our code to our U.S. publisher. However, we've made the 10-hour time difference work to our advantage. In essence, we work with the publisher 24 hours a day: During our work day, we create things and ship them via AppleLink to California at the end of our day—just as our U.S. partners are starting theirs. Then, while we sleep they work, and when we come into the office the next morning the cycle repeats itself," says Givol. Working from afar also means frequent visits to the United States and extensive travel within the country.

On the other hand, ACI, Blyth Software, and InterOptica chose to open subsidiaries or branch offices to handle their business in the United States. (For an explanation of why and how one company chose to open a U.S. office, see "Branch Office Business" on page 27.)

However, if you opt to open a U.S. office, take care to be realistic about how much it will cost to do business in America. The size of the U.S. market, the degree of competition, and the number of opinion leaders all lead to one question: What must you spend to achieve the presence you need?

Of course, there's no single answer. When assessing this important factor, bear in mind the need to travel extensively in a very large country; attending a variety of major trade shows; the cost of advertising and public relations; meeting with channel representatives (who may be spread across the country); and other important budget eaters.

Learn U.S. channels. If you opt to open a U.S. office and work the distribution channels yourself, you should first become well versed in the nature and scope of those channels. Distribution in the United States is markedly different than in other countries; there are a wide variety of channels, and again, competition can be fierce. Dealing with a U.S. distributor is also likely to be more costly than working with your local one.

For example, in many countries distributors are responsible for creating market demand for the products they carry and often foot the bill for the necessary activities (sometimes including product packaging and manufacturing). In America, on the other hand, distributors often expect developers themselves to create the demand that will draw customers into stores to buy products—an undertaking that can sport a high price tag. (For a detailed description of

how one national U.S. distributor operates, see "Understanding Distribution Realities" in the October 1992 issue of *Apple Direct*.)

However, if you opt to partner with a U.S. publisher—who may include packaging, marketing, and local manufacturing in the deal—your partner then may shoulder much or all of the responsibility for working in U.S. channels. (For a listing of some distribution resources in the United States, see "U.S. Distribution Resources" on page 28.)

Get good legal advice. In addition, the legal aspects of doing business in the United States are certainly different from those in your home country. Trademark and copyright protection laws differ between countries, as do other key practices such as those regarding contracts, patents, and other such items. In the United States, some commerce and tax practices are governed not only by the federal government but also by individual states. Getting solid legal advice regarding doing business in the United States can help you avoid potential problems that you may otherwise be unaware of, and will help you get off to a good start.

Get close to U.S. customers. Developers who have succeeded in the United States invariably emphasize the importance of getting to know the mindset and motivations of customers in that country, and developers go to great lengths to foster strong relationships with customers. A key, say these developers, is to shed your tendency toward an inner-company focus and look outward into the customer community.

Blyth CEO Michael Minor calls it "partnering with customers." "It's especially difficult to get close to customers if you distribute products through an intermediary such as dealers and distributors, who generally are more at arm's length

from users," says Minor. Therefore the burden falls on the developer to keep a finger on the pulse of the user community.

He adds: "Lots of people think that the key to success is creative marketing. But today, with technology changing so rapidly and new competitors continuously entering the ring, the only true safety net is being very close to your customers. Because of this, we proactively canvas customers. Of course we try

to address customer technical problems when they call us, but we also solicit customer input about our products and services and visit them as much as possible. Furthermore, our engineering teams meet with customers regularly to get their input about market requirements for future products. In that sense, we are partnering with customers."

Staying close to customers has other important benefits. In the

long run, to be successful in the United States where technology plunges rapidly forward, it's particularly important to have a long-term vision of where your technology, market, and competition are going and to manage your business accordingly. "That's very difficult," says Minor, "but one thing that helps is staying close to your customers and making sure you understand their needs. Then you must take steps to ensure that

those needs are met by your current and future products."

Many developers who have been successful in the United States spend a great deal of time traveling there and meeting with customers in various venues. Meeting with user groups, for example, was a key entrée into the U.S. customer base for ACI.

"If you think you're selling to 'a market,' you're off track," says CEO Delbourg-Delphis. "The

Branch Office Business

Whether to open an office in the United States is a difficult (and sometimes downright scary) decision. It's a big step for any developer, and one that shouldn't be taken lightly. However, it would be a mistake to automatically discount the possibility of opening a U.S. office just because your gut feeling is that it might be too costly and difficult. Even smaller companies have successfully opened and maintained branch offices in the United States. To give you an idea of what's involved, here's InterOptica's story.

Based in Hong Kong, InterOptica opened a U.S. office (in San Francisco, California) for several reasons. "We had to support a large number of users who had received our product bundled with the hardware they bought. And as we moved into retail channels, we realized that it would be too much to expect that key people such as buyers, distributors, and manufacturer's representatives stay up until midnight to phone us. Let's face it: There are so many local companies located right there in their own time zones that they can buy from, and we had to remove any barriers to doing business with us," says Managing Director Catherine Winchester.

"Based on our experience, my advice would be for a foreign company to open a U.S. office as soon as it can possibly afford it," says Winchester. "Otherwise, it may land in a chicken-and-egg situation: The company may never be able to afford a U.S. office if it doesn't get the necessary volume of sales, and it may not get the volume if it doesn't sell from a local base."

What the branch office does. The U.S. branch office serves several purposes for InterOptica. "On the technical side, the office provides support to U.S. customers. It also offers valuable information to our development teams in Hong Kong and China, because virtually every hardware and software tool we use is from a U.S. company," says Winchester.

"The heart of the multimedia world is in the United States, and we need to have immediate access to industry changes and developments. That's particularly important for us because it usually takes new hardware and software many months to arrive here, and we would rarely see early or beta versions of products if we didn't have a U.S. office. We need to be on the seed list for beta versions, and our San Francisco office acts as a liaison for gathering this information," she explains.

InterOptica's U.S. office also manages manufacturing, which is done in the United States. A main reason: "The language barrier can present some

interesting problems," Winchester says. "I make my discs in the United States because we make a large number of shipments to U.S. customers. If anything gets lost in the translation when we issue manufacturing or shipping instructions, we're dead in the water—and we can't afford that. Basically I feel it's safer if, when we need to ship discs to Idaho, the shipper knows where Idaho is," says Winchester.

Another major responsibility of the branch office is sales and marketing. While most of the strategy is planned in Hong Kong with input from the U.S. office, says Winchester, it's up to the U.S. employees to implement the strategies. They also do such things as organize and work the major U.S. trade shows (eight major ones in 1992!)—a gargantuan task that would be all but impossible to manage from Hong Kong alone, Winchester says.

Staffing the Office. The logistics of opening a branch office—finding office space, arranging for utilities, and the like—were fairly straightforward, Winchester says. However, finding the people to staff the office was more difficult.

Winchester explains: "Finding the right people to run your U.S. office is essential. Since you, as the manager, are far away and out of sight, you need people you can trust, people who are reliable, hardworking, and ambitious. You don't want a branch office 5,000 miles away being run by people who feel they can get away with working short hours and coming and going as they please. So, hiring people who really know what they are doing and who really care about the company and want it to succeed is crucial. And we've been lucky; we found those people."

She also says that hiring local talent is a must. If you don't hire Americans to work in your U.S. office, people who know their ways around in the everyday U.S. business environment, you may defeat some of the benefit you hoped to gain from opening a U.S. office.

What it Costs. The branch office, located in downtown San Francisco, costs InterOptica approximately \$20,000 a month to operate, including salaries, rent, phone and other services, travel, and so forth. "It may sound like a lot of money, but the cost of trying to do business in the United States from Hong Kong would probably be even higher, in that we wouldn't be able to get the sales we need to be successful in the U.S.," says Winchester. "We could try to do business from our Asian base, but we feel we couldn't properly represent ourselves from way over here in Hong Kong." ♣

reality is that individual people are your customers, and they are the ones you should be trying to reach. User groups are composed of these individuals; in many cases they are Macintosh fanatics—a very valuable audience. Overall, we really care about getting feedback from individuals.”

She also says that many developers are under the mistaken impression that user groups are made up mostly of home users. “Not true,” she says. “These groups are made of people from large corporations as well as small busi-

nesses, and everything in between.”

Indeed, user group members have proven to be strong buying influencers for many products. These “fanatics” often are quite vocal about their product preferences and they are frequently called on to recommend products to friends and colleagues. They also act as impromptu training and technical support people for other group members, family, and friends.

These customers are so important that Apple Computer devotes

significant resources to fostering and supporting user groups, and often helps developers take advantage of its relationship with this constituency. (For information about the user group opportunities Apple makes available to developers, contact the Apple Developer Support Center at (408) 974-4897. You may also send an AppleLink message to USER.GROUPS.)

Another example of getting close to U.S. customers comes from Logal, who with its U.S. partner, Sunburst, also works with

education constituencies such as the National Science Teachers Association. They sponsor booths at exhibitions and offer workshops at their conferences.

Yet another way to get closer to customers from afar is to use U.S. on-line services. They can provide excellent feedback from users at a relatively low cost. For example, you can start a discussion or forum on CompuServe or America Online that allows you to “converse” electronically with customers regardless of distance or time zone.

Likewise, you may opt to

U.S. Distribution Resources

There are a variety of resources available to help you investigate and learn more about U.S. distribution, and several publications publish channel information and issues. Here are two of them:

Channel Compass, a newsletter published by The Ambit Group
Contact: Linda Kazares
665 Third Street, Suite 527
San Francisco, CA 94107
(415) 957-9433
(415) 957-0504 (fax)

U.S. Software Channel Marketing and Distribution Guide, by Linda Kazares, published by the Software Publishers Association, 1992.
Contact: Software Publishers Association
1730 M Street, N.W.
Washington, DC 20036
(202) 452-1600

Here is a partial list of U.S. distributors, stores, and mail-order companies:

Distributors

*INGRAM MICRO
Barry Eveleth, Product Manager
1600 East St. Andrew
Santa Ana, CA 92799
(714) 566-1000

*MERISEL
Dean Jones, Marketing Manager
200 Continental Blvd.
El Segundo, CA 90245
(310) 615-3080

*TECH DATA, INC.
Terry Bazzone, Software Group
5350 Tech Data Cr.
Clearwater, FL 34620
(813) 539-7429

KENFIL
Mary Ann Carlson, Director of Purchasing
16745 Saticoy Street
Van Nuys, CA 91406
(818) 785-1181

* Participates in Apple's Authorized VAR program

Storefronts

EGGHEAD (software only)
Brian Mitchell, Manager, New Products
22011 South East 51st
Issaquah, WA 98027
(206) 391-0800

MICROAGE
Michelle Riley, Sr. Product Manager
2308 South 55th St.
Tempe, AZ 85282
(602) 968-3168

STAPLES, INC.
Robert Arseneau
100 Pennsylvania Ave.
Framingham, MA 01701
(508) 370-8500

Mail Order

BAKER & TAYLOR SOFTWARE
(previously SoftKat)
John Ohanian, Product Acquisition Manager
20630 Nordhoff Street
Chatsworth, CA 91311
(818) 700-9000

MACCONNECTION
Paul Stolzenburg, Macintosh Purchasing Agent
14 Mill Street
Marlow, NH 03456
(603) 446-7701

MACWAREHOUSE
Deborah Cooper, Director Macintosh Marketing
47 Water Street
South Norwalk, CA 06854
(203) 854-0247 ♣

publish your own bulletin board on the AppleLink network. By posting such things as pricing information, parts lists, data sheets, and technical information to your bulletin board, you can give customers and channels increased access to your company—virtually 24 hours a day. (For information about how one developer uses AppleLink this way, see “How We Use AppleLink as a Marketing and Support Tool” in the February 1993 issue of *Apple Direct*.)

Partner wherever you can. Taking on the U.S. market on your own can seem a gargantuan task. However, if you partner with other companies who have experience in the United States, you'll in essence create allies who can help you negotiate the complex maze of opportunities and challenges. You'll also increase the clout you get with your limited resources, and will receive input that will help you position a product and decide what other offerings would be good candidates for the market.

Logal is a good example of partnering; the sidebar “Companies That Have Made It In the United States” on page 26 describes how that company joined forces with a U.S. firm and a research foundation, each of whom had U.S. experience. This was critical to Logal's ability to establish a business relationship in the United States.

“We also try to take advantage of Apple's comarketing opportunities,” says Logal President Givol. When Apple introduces a major new product, it offers developers who have a new product that showcases that product or technology an opportunity to participate in a variety of activities. They include such things as participation in press briefings and introduction events. “We participated in the introductions of both the Macintosh LC and System 7,” says Givol.

“For example, Biology Explorer-Genetics was one product Apple used to demonstrate System 7.”

However, as you might expect, these highly sought opportunities are limited. (For more information about Apple's comarketing opportunities and to help determine if you are eligible to participate, see “How to Comarket New Products With Apple” in the July 1992 issue of *Apple Direct*, or refer to AppleLink [path—Developer Support:Developer Services:Marketing Information and Services:Marketing Services:Apple Services].)

“I think customers are also good partners,” says Blyth Software's Michael Minor. “Developers sometimes view customers only as buyers of technology, people who write checks. However, they can be partners who help you position your current technology and create new products. We therefore spend a lot of time thinking about how our U.S. customers can help us. This is especially important with a product such as our database, which sells to corporations: Customers incorporate our technology into theirs, and can therefore give us valuable insight and feedback about what works well and what they'd like to see in future products.” Blyth also participates in activities sponsored by U.S. industry associations, such as MacIS (a large group that focuses on technology needs in corporations), who have their fingers on the pulse of Blyth's target market.

Another example is InterOptica, who joined the Multimedia Publishers Group in the United States, a consortium of companies with similar interests who pool resources to buy such things as advertising space. “Because we're a small company, it's been more effective to combine our resources with those of other companies who have similar target markets. For example, as a group we can buy a full-page magazine ad for

multiple products, instead of each having to buy a tiny ad by ourselves,” says Winchester.

That company also hired a public relations firm in the United States for eight months to get additional exposure. “They got us airtime on CNN twice during that time, as well as exposure in the *New York Times* and many trade and user publications. We learned a lot from working with that company and now do most of our public relations in house,” says Winchester.

Put pressure on the pressure points. The fast pace of technological change and the swift technology adoption rate in the United States often make it difficult for buyers to choose products. Therefore, they turn to sources of authority that they trust. These sources are the industry opinion leaders (sometimes called “pressure points”) and include a select group of industry analysts, editors, and other experts.

The U.S. computer industry's opinion leaders have a tremendous following both within and outside the industry, and they wield strong influence over buying choices in the United States. In essence, by reaching the opinion leaders you reach large numbers of customers. If you make these people your allies, you'll have made major strides in influencing the decision-making process of a large number of customers.

“In the United States there seems to be more of these industry pressure points than in most other countries, and they are often a fragmented bunch who are spread throughout the country. This may make the job of getting your message to them and differentiating yourself more difficult in the United States than it is in your home country,” says Blyth Software's Minor.

However, in the United States there are hundreds (maybe thousands) of public relations and other kinds of communications companies that specialize in helping developers reach opinion leaders. Money spent on well-thought-out opinion leaders and product review campaigns can lead to increased market awareness of your product and company, and increased sales. (For in-depth information about what constitutes an effective opinion leaders campaign, see “Influencing the Opinion Leaders” in the March 1992 issue of *Apple Direct*. For information about getting U.S. product reviews, see “Getting Product Reviews” in the October 1991 issue.)

Adopt a can-do attitude. The final and immensely important piece of advice these developers offer is to approach the U.S. market with a positive attitude and open mind. Penetrating a market as large as the United States can seem daunting, especially to smaller developers. However, if you do your homework, learn the differences between doing business in the United States and your home country, adapt to these differences and then adopt a can-do attitude, breaking into the United States will be more feasible.

Blyth Software's Michael Minor says it well: “Depending on your mentality you can look at the differences as major obstacles—or instead view them as challenges and opportunities.” ♣

Dee Kiamy has been the business and marketing editor of Apple Directions for more than two years. She is also president of Open Door Communications, a communications consulting practice located in San Jose, California, that serves high-technology companies.

It Shipped!

Through the It Shipped! program, you can announce new and revised third-party products in Apple Direct. It Shipped! listings are also made available on the 3rd Party Connection AppleLink bulletin board. You can obtain an It Shipped! application by downloading it from the AppleLink network (AppleLink path—Developer Support:Developer Services:Apple Information Resources:Developer Program Information:It Shipped! @ Program). Or call Todd Luchette at (408) 974-1241 (voice) or (408) 974-3770 (fax).

Once you've completed the application, send it to Engineering Support, Apple Computer, Inc., 20525 Mariani Ave., M/S 42-ES, Cupertino, CA 95014, Attn: It Shipped! Program. Or send it by AppleLink to IT.SHIPPED.

The following products shipped in April 1993:

Publisher	Product (version)
ATTO Technology, Inc.	ExpressStripe 1.1 SiliconExpress 3D 1.4
Avocat Systems, Ltd.	Law Office Manager 3.0
AXiON	AXiON Intelligent Electronic Serial Port Switch 2.2
Connectix Corporation	CPU - Connectix PowerBook Utilities 2.0
Digital ArtForm	Blotto 1.0 CosmoCalc 1.0
Digital Eclipse	The si/ci Upgrade
Dynamic Engineering	MacPortable HDD Upgrade
Emergent Behavior	QuickApp 1.0
Excel Software	MacA&D 4.0 MacAnalyst 4.0 MacAnalyst/Expert 4.0 MacDesigner 4.0 MacDesigner/Expert 4.0
ISM, Inc.	G-Netix 1.0 Presenting Now 3.0
Foundation Solutions, Inc.	EHelp for 4th Dimension
InterCon Systems Corp.	Dispatcher/MacX.400 for QuickMail 1.0 NFS/SHARE 1.3 TCP/Connect II 1.1

Mediacom, Inc.	AdClips Volume One
Neon Software, Inc.	LANsurveyor 1.0
Power R Inc.	MODEL CC-10 1.0
SofTrack Systems	QuickClock 1.0
StepUp Software	InstallerPack 1.0

Hot Products From Apple

Special introductory offer!

AppleScript Software Development Kit Bundle

Build AppleScript into your applications to support custom solutions for your users.

Get in on the scripting revolution with this special offer.

Order the AppleScript Software Development Kit and Tutorial Bundle before September 30, 1993 and get 20% off!

AppleScript is Apple's powerful new scripting system that works across applications and networks to deliver automation, customization and application integration capabilities for the Macintosh.

AppleScript will make custom application development faster and easier because commercial applications can be used as components with AppleScript acting as the "glue" between them.

Look what AppleScript offers you when you build it into your application:

- increases the value of your products—Apple is making scripting an integral part of the Macintosh computing environment
- positions you to take advantage of emerging technologies like speech recognition
- lets you expand into new markets—Apple is opening up new business markets that will demand AppleScript-compatible products
- allows for customization—AppleScript will allow your products to accept functional add-ons
- reduces time to market by allowing your applications to be combined with other packages
- creates a cross-platform scripting foundation

Special Offer**AppleScript Software Development Kit Bundle Offer**

This special bundle contains both the AppleScript Developer's Toolkit and the Apple events/AppleScript Programming Tutorial. The AppleScript Developer's Toolkit is designed to help you build AppleScript support into your applications. It contains a Macintosh disk, one CD-ROM, *AppleScript Language Guide*, and *Getting Started With AppleScript*. The Apple events/AppleScript Programming Tutorial is a self-paced disk and workbook tutorial that teaches you the basics of the AppleScript architecture.

B1282LL/A Special price \$275.00 (U.S.)

Special savings on Developer University Self-Paced Training Products!

Save up to \$395 on DU's self-paced training courses. Until September 30, 1993, you can order either Macintosh Programming Fundamentals or the new Intermediate Macintosh Application Programming course for only \$395! Or, buy them both at the special bundle price of \$695!

New! Intermediate Macintosh Application Programming

Extend your knowledge and Macintosh programming skills beyond the basics. This course teaches you how to build on the skills you learned in the Macintosh Programming Fundamentals course. Write code that extends the functionality of a single-Finder graphics editor to include QuickTime movies, Publish and Subscribe, Cut, Copy, Paste, TextEdit, TrueType fonts, required Apple events, MultiFinder, and more.

R0438LL/A Regular price \$495.00 (U.S.) Special price \$395.00 (U.S.)

Macintosh Programming Fundamentals

Build highly functional Macintosh applications through mastery of fundamental Macintosh ROM routines and the application programming interface.

M0997LL/B Regular price \$595.00 (U.S.) Special price \$395.00 (U.S.)

Get both and save \$395! MPF/IMAP Bundle

Contains both the Intermediate Macintosh Application Programming course and the Macintosh Programming Fundamentals course.

B1287LL/A Regular price \$1095.00 (U.S.) Special price \$695.00 (U.S.)

APDA Top Ten


The following were the APDA's top-ten selling products in April 1993

1. M0895LLB E.T.O. Starter Kit
2. B0943LLB MacTCP version 1.1.1 Developer's Kit
3. B0879LLA MPW C/C++ CD Bundle version 3.2.3
4. M0997LLB Macintosh Programming Fundamentals version 1.0.1
5. R0453LL/A QuickTime for Windows Developer's Kit version 1.0
6. B0473LLC Getting Started in Macintosh C Programming
7. R0438LL/A Intermediate MacApp Programming Self-Paced
8. R0147LL/B QuickTime for Macintosh Developer's Kit version 1.5
9. B0031LLI MPW C/C++ Disk Bundle version 3.2.3
10. B1011LL/B DAL for AS/400 Server 1-8 users

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 via 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*.

GetNextEvent

The  indicates the trade shows/events at which Apple Computer, Inc. is scheduled to exhibit as of press time. This list may be incomplete. If you have information about a show that you want listed here, contact Developer Technical Communications,

20525 Mariani Avenue, M/S 75-3B, Cupertino, CA 95014.
For further information check the Events folder on AppleLink (path—3rd Party Connection:Events).

June 3 through 5

Apple Expo

Lyon, France
Contact: Catherine Massot
AppleLink: FRA.PROMO
33-1-6986-3620

June 14 through 15

DB World

Boston, MA
Contact: Steve Taglio
AppleLink: TAGLIO
(408) 974-7538

June 23 through 25

Digital World

Beverly Hills, CA
Contact: Julie Marquette
AppleLink: MARQUETTE1
(408) 974-3664

July 1 through 2

Japan Developers Conference

Tokyo, Japan
Contact: Liz Marron
AppleLink: LIZ.MARRON
(408) 974-4575

June 5 through 8

CES

Consumer Electronics Show
Chicago, IL
Contact: Eliza Lape
AppleLink: ELIZA
(408) 974-1248

June 17 through 18

German Developers Conference

Germany
Contact: Leo Bonengl
AppleLink: BONENGLL
43-1-711-8241

June 28 through 30

NECC National Educational Computing Conference

Orlando, FL
Contact: Sue Collins
AppleLink: COLLINS3
(503) 346-3537

July 28 through 31

NACS

Seattle, WA
Contact: Jeryl Gerhardt
AppleLink: JERYL
(408) 974-2368

June 8 through 10

Apple Education Consortia

Anaheim, CA
Contact: Daryl Weiner
AppleLink:WEINER1
(408) 974-8566

June 21 through 23

French Developers Conference

Deauville, France
Contact: Catherine Massot
AppleLink: FRA.PROMO
33-1-6986-3620

June 29 through July 1

PC EXPO

New York, NY
Contact: Jeryl Gerhardt
AppleLink: JERYL
(408) 974-2368

August 3 through 6

Macworld

Boston, MA
Contact: Dave Billmaier
AppleLink: BILLMAIER1
(408) 974-4371