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Apple Introduces Macintosh 630, PowerBook 150 Computers

Apple Computer, Inc., broadened its product line last month with two low-cost
products, one for desktop users and the other for mobile computer customers:
the multimedia Macintosh 630 computer and the lightweight PowerBook 150
computer.

The Macintosh 630 computers, priced as low as $1,300, are configured and
marketed under three brand names—Performa, Macintosh LC, and Macintosh
Quadra—to meet the varied computing needs of customers in home, education,
and business environments. Each of them includes multimedia features that
make it easy—and affordable—for people to create, use, and combine graphics,
text, music, video, and images on a computer. The computers can also be
upgraded to PowerPC technology with a forthcoming PowerPC processor
upgrade card. Complete details about the Macintosh 630 computers are
included in this month's Strategy Mosaic (in the same folder as this file) and in
"Inside the Macintosh 630 Series Computers" (in the Technology folder for this
issue).

The PowerBook 150 computer replaces the PowerBook 145B computer as the
least expensive model in the PowerBook line. The intended markets for the
newest PowerBook, which is priced at $1,449 (U.S. Apple price), are higher

education students and home and small office users as well as customers buying their first mobile computers.

If you're developing software for the PowerBook 150 computer, you'll find it very similar to the model it replaces, with one notable exception: Like the Macintosh 630 computers, the PowerBook 150 uses an internal Integrated Drive Electronics (IDE) hard drive. For more information about IDE hard drives, see "Inside the Macintosh 630 Series Computers" and Developer Note #10, which was included in the August 1994 Tool Chest Edition of the Developer CD Series.

The new system provides several enhancements over the PowerBook 145B computer. Its 33-megahertz Motorola 68030 processor makes it faster, while it also includes a larger screen, a larger hard drive, and increased RAM expansion—from its standard 4 MB up to 40 MB. Additionally, the PowerBook 150 computer, at 5.5 pounds, is 1 pound lighter than the PowerBook 145B system. Also, the new computer ships with a software bundle incorporating ClarisWorks and the PowerBook Mobility Bundle.

The PowerBook 150 computer includes built-in SCSI, LocalTalk, and an optional fax/modem.

Accessories used in current PowerBook 100 series computers, including AC adapters, batteries, battery rechargers, and modems, are all compatible with the PowerBook 150. Modems designed for use in the PowerBook 145B as well as memory expansion cards designed for the PowerBook 200 series are also compatible with the PowerBook 150.

Macintosh 630 and PowerBook 150 systems are currently available worldwide. Also see pricing information below.

(text box) Configurations and Pricing for New Systems

Macintosh Quadra 630 computer with 4 MB memory, 250 MB hard disk—$1279.

Macintosh Performa 630 computer with 4 MB memory, 250 MB hard disk, modem, 14-inch monitor, and bundled software—$1499–$1549*.

Macintosh Performa 630CD computer with 4 MB memory, 250 MB hard disk, built-in AppleCD 300i double-speed CD-ROM drive, modem, 14-inch monitor, and bundled software—$1899–$1949.

Macintosh Performa 636 computer (available to higher-education markets only) with 4 MB memory, 250 MB hard disk, 14-inch monitor, and bundled software—$1399–$1449.**

Macintosh Performa 636CD computer (available to higher-education markets only) with 4 MB memory, 250 MB hard disk, built-in AppleCD 300i double-speed CD-ROM drive, 14-inch monitor, and bundled software—$1699–$1749.**

Macintosh Performa 638CDV computer with 8 MB memory, 350 MB hard disk, built-in AppleCD 300i double-speed CD-ROM drive, modem, 15-inch monitor, video/TV input, and bundled software—$2299–$2349.

Macintosh LC 630 computer (available to education markets only) with 8 MB memory, 350 MB hard disk, built-in AppleCD 300i double-speed CD-ROM drive, video/TV input, and video output—price not available.

Options for Macintosh 630 computers: Apple Video System—$149; Apple Video/TV System—$249; Apple Presentation System—$299; Apple Multiple Scan 15 Display—$505; AppleDesign Keyboard—$85

PowerBook 150 computer with 4 MB memory, 120 MB hard disk, built-in 1.4 MB Apple SuperDrive floppy disk drive, battery and AC adapter, ClarisWorks, and PowerBook Mobility Bundle software—$1,449

Note: All prices for the U.S. market only; pricing varies in other markets.

*Since Macintosh Performa computers are sold in retail channels, each Performa model is given a range of suggested list prices.

** These Performa models do not come with a monitor. However, for comparison purposes, the prices listed here include a 14-inch monitor.

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Courting the Under-$2000 Market

Market Is Key to Apple's Success, Presents Opportunities for Developers

By Gregg Williams, Apple Directions staff

Different markets have different needs—a simple statement that answers a
question you may be asking right now: "If PowerPC is the future, why did Apple
just come out with a new line of 68040 Macintosh computers?" (See the
Macintosh 630 article in the Technology folder of this issue for more details on
the new 630 series of Macintosh computers.) Apple Computer, Inc., realized that
a significant new market—the under-$2000 market—has different needs from
those customers who want Power Macintosh computers. This article explains
Apple's overall strategy, the under-$2000 market, and the opportunities you
have for selling to this newly recognized market.

In brief, Apple's desktop CPU strategy is to sell media-rich 68040 systems
(upgradable to PowerPC) to the under-$2000 market, and sell PowerPC
processor–based systems, $2000 and up, to business users and professionals
who need the highest performance possible. You will still want to create
PowerPC processor–based software wherever performance is a selling point,
but the under-$2000 market customers will reward software and hardware
vendors who give them simple, functional product solutions at consumer prices.

The Under-$2000 Market

Why the under-$2000 market? Because it's where the most customers are. The figure "$1000–$1999 computers dominate new purchases" indicates that more computers were bought in this price range than in any other. (Note that these numbers document a consumer's most recent purchase of a "personal computer" for home use. The numbers reflect both MS-DOS/Windows and Macintosh computer sales, but that doesn't invalidate their use here.)
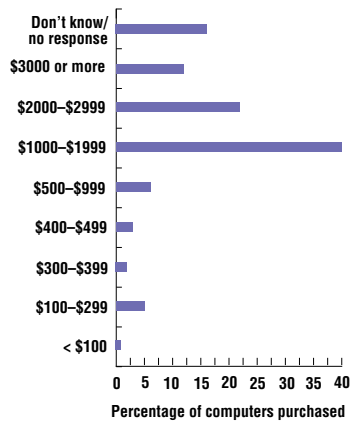
Who's in this market? Four groups of people: consumers, buying for home use; educators, especially those buying for the K–12 market; entry-level users of multimedia; and small- to medium-size businesses. These people have one or more of the following characteristics:

• They're very cost-conscious. They don't want to pay for features they won't use.

• They want to protect their investment by upgrading it instead of replacing it. Many are first-time buyers and are afraid of making a mistake, so they're more likely to buy a computer they can upgrade.

• They're interested in adding new features—if the features are compelling and the cost is modest. And they want solutions, not just accumulated sets of features.
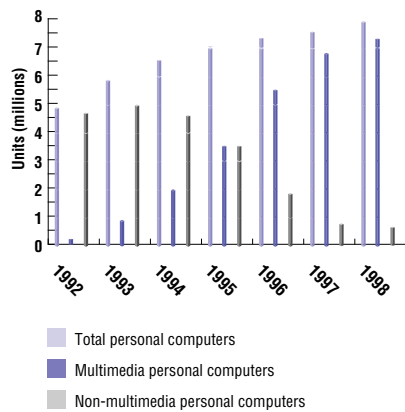
They Want Multimedia

Apple surveyed potential buyers of under-$2000 computers and found that they are increasingly aware of multimedia. LINK Resources Corporation reports the same thing. In a report published last October, LINK reported findings from a survey of 500 "PC-owning households": an increase of 5 percent (from 41 to 46 percent) in consumers who said they are "interested" or "very interested" in multimedia—and, of course, that figure is probably higher now. In addition, LINK predicts that, each year, a larger percentage of all personal computers manufactured will have multimedia features—including at least a CD-ROM drive and sound output of moderate quality—reaching 50 percent by next year and 90 percent in three years.

With the under-$2000 market defined, let's see what Apple is offering in the new 630 series of Macintosh computers.

Don't know/no response | $3000 or more | $2000–$2999 | $1000–$1999 | $500–$999 | $400–$499 | $300–$399 | $100–$299 | < $100

Percentage of computers purchased

0 5 10 15 20 25 30 35 40

(figure) Price of most recently purchased consumer computers. The data is from a survey reported in October 1993 by LINK Resources Corporation, New York.

(below) Yearly PC (DOS/Windows and Macintosh) Sales

Units (millions)

8 7 6 5 4 3 2 1 0

1992 1993 1994 1995 1996 1997 1998

Total personal computers
Multimedia personal computers
Non-multimedia personal computers

(figure) In 1995, multimedia computer unit sales will equal those of non-multimedia computers. By 1997, the former will outsell the latter by a ratio of 9 to 1. The data is from a survey reported in June 1994 by LINK Resources Corporation, New York.

The 630 Series

Apple is marketing the 630 series of Macintosh computers under three brand names: Macintosh Performa (for home), Macintosh LC (for education), and Macintosh Quadra (for small- to medium-size businesses). After consulting with potential buyers and dealers, Apple devised configurations that will meet customers' needs:

• The Macintosh Performa 630 line will come in six configurations (two for higher education sales only). Four of the six configurations include a built-in tray-loading, double-speed CD-ROM drive. All the Performa 630 models come with plenty of bundled software (including ClarisWorks 2.1), so owners can become productive immediately. The Performa 630 models come in multiple configurations because the typical Performa owner wants to buy the exact configuration desired and not have to add anything to the computer.

• On the other hand, the Macintosh Quadra 630 comes in only one configuration, because most business purchasers want a minimal system that they can customize to their needs. Because of the requirements of business users, the Macintosh Quadra 630 uses a Motorola 68040 processor, which contains a floating-point unit (FPU) for faster calculations. (The Macintosh Performa 630 series and Macintosh LC 630 computers use the 68LC040 processor, which does not include an FPU. The audiences for these computers generally don't want an FPU; by taking it out, Apple is able to add other, more valued features.)

• The Macintosh LC 630, sold only through educational channels, is a top-of-the-line multimedia model, complete with 8 MB of memory, a 350 MB hard disk, a built-in CD-ROM drive, the Apple Video/TV System (video/TV-in), and the Apple Presentation System (video-out).

630 Series Options

Lucky you! For once, Apple didn't release a half dozen new models, greatly increasing your compatibility testing burden. Instead, with the Macintosh 630 series, Apple released one computer (the main logic boards are identical in all models) plus options that let users customize the basic computer to meet their needs. These options implement the first half of Apple's "Does more, costs less" slogan—they allow the Macintosh 630 series computers to offer features completely unavailable on DOS/Windows computers.

The next six sections examine the various options that enable the Macintosh 630 series computers to meet a variety of customer needs.

Apple Video System

The Apple Video System includes a plug-in board that enables a Macintosh 630 series computer to take the signal from any standard video source (camera, VCR, camcorder, or laserdisc player) and display it in a resizable window. (See "The Apple Video System video window.") New video architecture circuitry allows the Macintosh 630 series computers to display the incoming video without any performance drain on the main processor. In addition, these computers use two video buffers to give a "glitch-free" video image. The U.S. Apple price of the Apple Video System is $149.

The Apple Video Player software, included with the Apple Video System, allows the user to capture a still frame or record a video clip from the incoming video signal simply by clicking a button. (See "The Apple Video Player control window.") The U.S. version also includes Avid VideoShop, a video-editing package, to make the Apple Video System a "complete solution" out of the box. (Because of language issues, Apple divisions outside the United States have the option of not bundling VideoShop with the Apple Video System. Currently, only France and Spain are not offering VideoShop as part of the Apple Video System.)
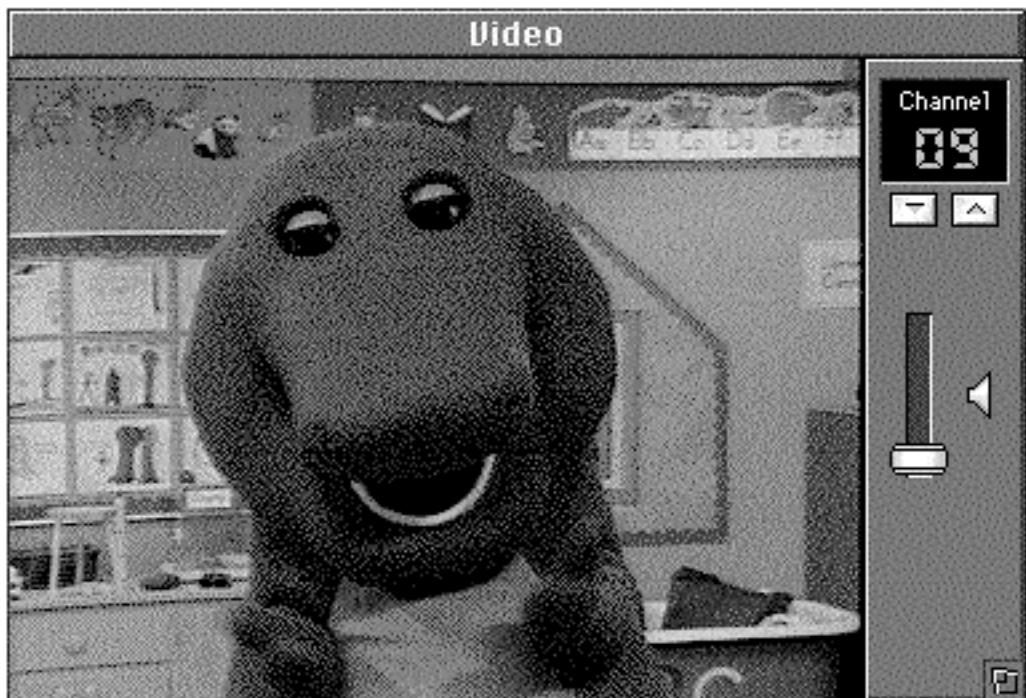
(figure) The Apple Video System video window. The standard image size is 320 by 240 pixels, but it can be shown at other sizes. The Apple Video/TV System uses pixel doubling to show the video image at its maximum size of 640 by 480 pixels.

(figure) The Apple Video Player control window. You use this window to control the video source, sound, and closed captioning. You also use it to capture both still frames (pictures) and video clips (movies).

Apple Video/TV System

Mark my words: People will buy Macintosh 630 series computers just for this add-in. What does the Apple Video/TV System provide that people will want so much? The ability to watch television while you work! It's a compelling gadget; its price (U.S. Apple price of $249), the quality of its image, and the ease of implementation make it even more compelling.

The Apple Video/TV System includes all the features of the Apple Video System, plus the ability to receive 181 broadcast and cable channels (in the U.S. version—the number of channels supported may vary, worldwide). The Apple Video/TV System is able to display closed-captioned information, and the European version supports teletext. Given that the Apple Video Player will make it incredibly easy to capture a still frame or video clip, who knows what the Apple Video/TV System will do for personal letters, reports, and presentations?

Apple Presentation System

This external "drop box," which connects to any Macintosh computer that has a DB-15 video-out connector, enables you to send the computer's image to any standard television or VCR. Not only does this let you use large-screen televisions as computer monitors, it also allows you to "print to tape" (that is, record the video display on videotape). In this way, you can view (or send) Macintosh-based demos and presentations anywhere a VCR and television are present. The U.S. Apple price of the Apple Presentation System is $299; this includes the Interactive Multimedia—Getting Started CD-ROM, from Interactive Media Corporation. This CD contains a "trial" version of IMC's Special Delivery multimedia authoring software, demo versions of applications such as Adobe Photoshop and Premiere, Fractal Design Painter, VideoFusion, libraries of "clip" movies, photos, sounds, and music, and tutorial information on making multimedia productions.

Communication Solutions

Some Macintosh 630 series customers want Ethernet, others want a fast internal modem—but they don't want to pay for features that go unused. That's why the Macintosh 630 series computers contain a communications slot (the same as first appeared in the Macintosh LC 575) that can hold either an Ethernet card or a 14.4-Kbaud fax modem card. Apple offers the 14.4-Kbaud Macintosh Fax Express Modem card, which sells in the United States with an Apple price of $199. Apple also offers three Ethernet cards, the Apple Ethernet CS Thin Coax, Twisted Pair, and AAUI Cards; in the United States, each of these sells for $99.

Power Macintosh Upgrade

The Macintosh 630 series audience—which includes home users, schools and educators, multimedia users, and small- to medium-size businesses—is particularly concerned with how long their computers will retain their value. The Macintosh 630 series computers have a good answer for that concern: a PowerPC-based microprocessor upgrade card. The Macintosh Processor Upgrade card, currently projected to cost around $600 and be available in late 1994, contains a PowerPC 601 processor running at 66 MHz. (This card will also work in other 68040-based Macintosh computers; on models that run at 25 MHz, the Macintosh Processor Upgrade card will run at 50 MHz.)

Other Upgrade Options

The Macintosh 630 series computers have two other upgrade options: an I/O expansion slot (on the main logic board) and the digital audio/video (DAV) connectors on the Apple Video and Video/TV System boards. The I/O expansion slot has the same connector as the processor-direct slot (PDS) in the Macintosh LC III and later computers. Because this connector is not directly connected to the processor, LC PDS cards designed to interact with the processor—cache or FPU cards, for example—will not work; but other LC PDS cards will, and you can design new I/O expansion cards that will work in both the new Macintosh 630 series computers and in older Macintosh LC models.

The DAV connector gives you access to the cards' raw video-in data and control signals. For example, you might use it to make the digital video-in signal available to an I/O expansion card that compresses or manipulates the video signal in real time.

Video—Twenty Minutes Into the Future

The Macintosh 630 series computers represent a quantum leap toward the integration of video into the average computer. Now that people can capture still frames and video clips with (literally) one or two mouse clicks, I'm sure they'll find plenty of places to use them. At the very least, they'll use the video-in feature to enhance presentations, newsletters, letters, résumés, and other documents with still frames and video clips. Whatever else they use them for will depend on you and the creative new video-based solutions you devise.

Since you can embed QuickTime movies in the documents of most word processors, presentation programs, databases, and other applications, the Macintosh 630 series computers make it easy for customers to add video to corporate presentations, training materials, and documents of all sorts.

The Apple Presentation System extends the reach of the computer in two ways. First, the ability to hook a Macintosh computer to a large-screen television makes the Macintosh more likely to be used for presentations, primarily in educational and business situations. Second, people can use the Apple Presentation System to "print to tape." Business users, for example, can videotape presentations and show them anywhere they have access to a VCR. Similarly, teachers can videotape simulations, multimedia presentations, and other content and show them in any classroom with a VCR. Home users can edit camcorder footage on their Macintosh 630 series computer and save the result on videotape.

Apple's Desktop CPU Strategy

Now that you've seen the details, let's reexamine the desktop CPU strategy I summarized at the beginning of this article. Apple's 68040 strategy is as follows:

• gain market share in the fastest growing segment, the under-$2000 market (home, education, multimedia, and small- to medium-size business)

• remain competitive with comparably priced DOS/Windows machines and offer more than the competition (multimedia through CD-ROM and QuickTime 2.0, an upgrade path to RISC and DOS/Windows compatibility, and affordable video and TV input and output)

• offer one machine that can be expanded to meet the various needs of the under-$2000 market and prepare that market for the transition to PowerPC

• introduce even more new customers to Macintosh computers by driving the price of 68040-based Macintosh computers even lower in 1995

 Apple's complementary strategy for PowerPC processor-based Macintosh is to

• provide maximum performance to those who need it, especially professionals and business users, through computers that currently sell in the over-$2000 price range

• drive the price of PowerPC processor–based Macintosh computers below $2000 in 1995

• prepare for the eventual conversion to a PowerPC-only product line sometime after 1995

"So," you ask, "what's all this #$&%* about pushing everybody to develop for PowerPC?" It's not #$&%*—PowerPC is the future, but through the installed base, Motorola 680x0-based Macintosh computers are going to be in active use for the next three to five years.

Apple recommends that you develop for both the 680x0 and PowerPC processors if you possibly can. If you simply can't do both, develop a 680x0 version if you want to sell to the under-$2000 market and the 680x0 installed base, or develop for the Power Macintosh platform if performance is an essential selling point for your product. (Don't, for example, do a high-end video-editing or page-layout program for the 680x0 platform only.)

Challenges in a New Market

You may find selling to the under-$2000 market challenging, because it will require you to sell a new kind of product to a new, cost-conscious market. These buyers are looking for something different: not "does-everything," feature-laden products costing hundreds of dollars, but simple, functional product solutions at consumer prices.

Though innovation is always welcome, it shouldn't be the focus of your attempt to create new products for the under-$2000 market. Instead of trying to design something spectacular that's never been done before (or one product with all the features that anyone will ever need), you might try taking an existing product and paring its features and price down to something that's easy to learn and easy on the pocketbook.

The under-$2000 market is looking for what one Apple manager calls "a complete and safe solution." So, for example, don't think of an all-in-one video editor and retouching application at $800 or even $200—think, instead, about a simple video editor that the novice can use to edit and title home movies, and sell it for $50 to $99. Hardware vendors should think about low-priced solutions, too—for example, a telephony solution, including software and a 9600-baud modem card, for about $150.

Software Opportunities

Take the major 630-series features—video-in, video-out, video capture, closed captioning, teletext, the communications slot—and add to that list such technologies as QuickTime 2.0 (with its MIDI music support and its bigger and faster movie playback) and Macintalk Pro (the text-to-speech component of Apple's speech technology). Now pair each item in that list with the various groups within the under-$2000 market—consumers, education, multimedia, and small- to medium-size businesses—and almost every combination will suggest one or more software opportunities.

When thinking of possible products for the under-$2000 market, keep two characteristics of these buyers in mind: their need for "a complete and safe solution," and their expectation of products at consumer prices (that is, as inexpensive and as close to "impulse buys" as possible). Here's a random list of ideas to get you started:

• Many schools will be able to hook Macintosh 630 series computers to large classroom television sets. This should increase the market for educational software that involves the class, the teacher, and one computer. Also, if you own or produce educational software in laserdisc format, consider converting it to CD-ROM format—this will lead to a whole new market for an existing product.

• Two possibilities for video-authoring software: a simple version for home users, and a more robust version for classroom use. (Many children will learn how to use multimedia as they grow up; by the time they get to high school and college, they'll be doing pretty sophisticated work.)

• Anyone who makes a good interface to the Internet will have a successful product—especially if the price is modest. And since different kinds of users have different needs, the market will welcome a variety of Internet tools.

• With people doing a lot of multimedia, there'll be a market for MPEG (Motion Picture Experts Group) compression and decompression in software.

• In European markets, software that turns a Macintosh 630 series computer into a teletext terminal will be a good product—especially if the software does more than a teletext terminal can.

• According to a recent survey, home buyers rated "entertainment" for the first time as the main reason for having bought a computer, clearly outranking the previous number-one reason, "word processing." The market for games and other forms of entertainment should continue to grow. With built-in CD-ROM and almost as much power as a Macintosh Quadra 950, the Macintosh 630 series computers (which lack only the Quadra 950's FPU) have more than enough horsepower and features to create great games and interactive CDs.

• Many parents will be interested in a "watchdog" program that will limit children's access to the computer's television. Also, you may find some use for a utility that captures or manipulates the closed-captioned text that comes from the television signal.

Hardware Opportunities

The expandability of the Macintosh 630 series computers makes a number of hardware (or hardware/software) products possible. As with software ideas, keep the dual criteria of price and "complete solution" in mind. Here are some ideas:

• low-cost still or video cameras

• telephony solutions that enable the computer to help manage telephone usage (however that makes sense for your target audience)

• graphics acceleration cards

• 24-bit color cards

• 16-bit sound-input cards (and sound-editing software)

• MPEG video compression/decompression cards

Change and Opportunity

It's hard not to see the eventual effect of the under-$2000 market as forcing you to decrease your software's profit margins. I see two responses, both relevant to

this point of view. The more idealistic response is, "Yes, your margins will be lower, but you'll be selling (eventually) to a much larger audience and you'll make up the difference in volume." Admittedly, this is a hopeful statement that may or may not be true in your situation.

The second response is considerably more brusque and boils down to something like, "Tough—you may not like it, but that's the way things are. (It's already happened to hardware—why should software be any different?) If you're smart, you can find a way to stay alive or maybe even turn the situation to your advantage. If not, perhaps you should find a new line of work." Cynical? Me? Nah.

So there you have it—just another way of saying that you can see change as either a problem or an opportunity. If your products go after the high end of the market, then nothing's changed for you, and enlarging the installed base can only be good news for anyone who develops Macintosh software. However, you might still want to consider the under-$2000 market—getting their loyalty (and many of them will be first-time buyers) can pay significant dividends in the future.

The Macintosh 630 series computers are exciting because they continue the Apple tradition of expanding the definition of ordinary, everyday personal computing. They also further Apple's intention of increasing its market share in the industry, as well as give customers an incentive to buy a computer today, rather than wait for Power Macintosh prices to come down—all of which should make your life more exciting. But, hey, that's why you're still in this business, right?®

(text box) Bundling Opportunities

Of course, you know about the bundled software that ships with each Macintosh Performa computer. But if you open the Apple Presentation System box, you'll see something new: The hardware component of this product comes from Focus Technologies, and it's even got Focus' name on the box! (What's more, Focus is responsible for service and customer support.) Years ago, Apple didn't do bundling of any kind, but the message today is clear—if bundling makes sense, Apple's interested.

First, some caveats: Obviously, Apple bundles only a few products at a time, so very few developers will actually benefit from the information below. Opportunities arise as new products are introduced. Since bundling lasts through the life of the product, though, you should expect major opportunities roughly once a year.

With those warnings in mind, if you think you have a product that might really make sense bundled with an Apple product, two people at Apple are interested in talking to you—no promises, but you never know.

Gene Longo (AppleLink LONGO2) is in charge of education and entertainment software. He's looking for software in the following categories: family entertainment, children's creativity and productivity tools, CD-ROM reference titles, children's titles, value-added utilities, and clip art.

Brad Crystal (AppleLink CRYSTAL) is in charge of home productivity and SOHO (small office/home office) applications. He's interested in software for productivity, home office, personal finance, home publishing, and PIM (personal information management).

Again, bundling is a possibility for only a very few, and you can probably judge whether or not your product might be a serious candidate for bundling. But if it is, bundling is an opportunity you may want to pursue.

Into the Black

I'm sitting at my desk on a Friday morning, watching Apple's stock climb (courtesy of an ingenious screen saver module that checks a server and then posts the stock's value on my computer's display). Kind of nice, for a change.

So was the news last week that seems to be driving the stock up: that Apple Computer, Inc., reported more-than-respectable profits for the first time this year: Apple's net earnings for Q3 1994, which ended in June, were nearly $140 million. Revenues were $2.15 billion, up 15 percent from the same quarter a year ago. There's been a lot of doom and gloom about Apple, but I feel like we've turned a corner, and that our business prospects are enjoying the sunshine again.

Press reports have pointed to increased unit sales, especially of Apple's new Power Macintosh RISC-based computers, as the reason behind Apple's dramatic leap back into the black. But behind those sales are another important factor—YOU.

Why? Apple is justifiably proud of the current acceptance of the Power Macintosh computers we announced in March. As of mid-July, over 200,000 Power Macintosh computers and upgrade cards had been sold.

But that never would have happened without you developers, who have been with Apple all along on its PowerPC strategy. To the many of you who have taken your products native so that they could take advantage of Power

Macintosh performance, Apple's hats are off! To the many more of you who are still putting in the effort, keep it up! Apple, and Apple's installed base needs you.

You see, Apple owes all of you a debt of gratitude. When Power Macintosh systems first debuted in March, Apple knew the computers couldn't be successful without native software. More than one industry skeptic predicted doom because of the few native applications available the day of introduction. Events since have proven them wrong.

As of the end of July, more than 200 of your applications, covering every major software category have "gone native" and now take advantage of Power Macintosh RISC performance. (So many native applications exist that I can't list all of them on two pages in Apple Directions, which is why the monthly listing of native products won't appear anymore.) Even more are expected to be announced at Macworld Boston, which happens between when this issue reaches you and when it reaches you. In Europe alone, more than 60 native products have been announced.

Your native applications have given customers plenty of reasons to buy Power Macintosh computers. Some might say that people buy your applications so that they can use their computers, but I'm not so sure about that. More and more customer research suggests that people buy computers to accomplish a set of specific tasks, not just to use a computer. What that says is that customers are buying Apple's computers so they can use your applications.

Now, of course, Apple's marketing and technology have had at least something to with this success. But those efforts would have fallen, and will continue to fall, on deaf ears without the software you provide that gives customers a tangible reason to own a computer.

From our unique perch inside Apple, we know that Apple will expand on its current marketing push and continue to provide the most innovative, fun, and easy-to-use personal computing technology. It's up to you to take that technology and make it real for customers, so they can use computers to change—and improve— their lives. Apple technology; your applications—that's the crux of Apple's partnership with all of you, a partnership that right now is continuing to make the Macintosh computer a success.

Paul Dreyfus
Editor

Five Reasons to Go Native

We publish IndustryWatch every month to help you keep track of what's going on in the personal computer industry beyond Apple Computer, Inc. We want you to know how industry trends affect you, and how you can position yourself to take advantage of them.

In March, Apple started its own trend when it introduced the Power Macintosh line of computers. Since then, we've been repeating a message that you'd already been hearing for some time: Go native, that is port your application so it takes advantage of the enhanced power of PowerPC processor-based Power Macintosh systems, which run at speeds of up to 80 megahertz.

Lately, it seems like events outside of Apple's walls, and certainly beyond Apple's control, are at least whispering (if not shouting) the same message. This month's IndustryWatch describes five of those events, each of which provides a new reason to go native.

It's true that going native isn't for every application; as Gregg Williams points out in this month's Strategy Mosaic (in the same folder as this file), there is still a substantial market for 680x0 products among customers looking to spend less than $2000 for personal computer systems. However, if your company has been thinking about whether to commit the resources for native versions of products that appeal to high-end users—or brand-new applications designed specifically

to take advantage of the power and features of the new architecure—we hope these reasons will convince you to make the transition, today.

Reason #1: Intel Endorses Apple's RISC Strategy

Returning to the subject of last month's Editor's Note, "Hardware Wars," (see page 2 of the August 1994 Apple Directions), there's one implication of the Intel/Hewlett-Packard microprocessor technology announcement we want to reiterate. Just to remind you, the two companies announced that they would collaborate on advanced processors capable of running both 80x86 and RISC instructions, although the chips probably won't ship until the end of the decade.

Implications/Opinions: We think this announcement provides an unprecedented marketing opportunity for Apple Computer, Inc., and developers with applications that run in native mode on RISC-based Power Macintosh computers. With this widely reported announcement, Intel has acknowledged that the x86 architecture is losing the performance race to RISC and admitted that emulation is a legitimate way to move the installed base from CISC (complex instruction set computer) architecture to a more advanced architecture. Some of you might have seen Intel's ads aimed at Macintosh users urging them to "stop and ask directions." Suddenly, we think it's Intel's customers, not Macintosh users, who need to follow the Intel ad's advice. And what does that mean for you? Go native, and sell, sell, sell to a market that's ready to make the transition to RISC today (and that doesn't want to wait until the end of the century).

Reason #2: Power Macintosh Computers Outsell Pentium Machines

Speaking of the RISC-hungry market . . . according to Storeboard, a market research firm that tracks U.S. computer sales through the retail channel, Power Macintosh computers outsold Pentium-based machines for March and again for April. Similarly, a study released in June by Computer Intelligence Infocorp concluded that through May 1994, Power Macintosh computers outsold Pentium PCs by more than 25,000 units.

Implications/Opinions: We think that the lower sales of Pentium-based PCs resulted in part from the lack of availability of machines, demonstrating how far Intel's performance lags behind its promises. These sales numbers are also testimony to the rapid acceptance of Power Macintosh technology and the demand for native applications.

Reason #3: Macintosh Operating System Is the "Preferred" PowerPC OS

Recent press articles report that IBM now plans to delay releasing Windows NT for PowerPC processor–based systems until a PowerPC version of OS/2 is ready. Customers, analysts, and even IBM itself appear confused about which will be the "preferred" operating system for the PowerPC platform.

Implications/Opinions: If you find it confusing not knowing which operating systems will run (and when they'll run) on the PowerPC architecture, you're not alone. But here's all you really need to know: Apple is aggressively marketing the Macintosh operating system as the only mainstream operating system that runs RISC-based personal computers; since none of the other popular operating systems will be able to run on PowerPC processor–based systems in the foreseeable future, System 7 (and soon System 7.5) is the "preferred" (that is, volume) operating-system platform for PowerPC processor–based computers. This means that your native Power Macintosh applications will have a path readied for them in the marketplace. At the risk of sounding like a broken record, you'll want to go native soon to take advantage of the window of opportunity you and Apple will have thanks to the confusion on the other side of the personal computer world.

Reason #4: Sun's Loss, Your Gain?

An International Data Corporation study reported that Sun Microsystems' share of the workstation market, by number of units sold, has dropped below 50 percent. Sun sold 260,000 units in 1993, or 48.5 percent of the total workstation market, down from 53.2 percent in 1992. IDC showed HP and DEC's Alpha gaining units, with IBM and MIPS losing. The total workstation market grew 15 percent to about 536,000 units. By comparison, IDC said that personal computer shipments grew 25.8 percent last year to 36 million units. The IDC numbers seem to point in the same direction as other sources.

Implications/Opinions: If you've previously developed workstation applications, Sun's loss is your potential gain. Its competitors are better positioned for success in the profitable server market, and workstations face growing competition from personal computers equipped with Pentium and PowerPC processors. In the long term, Sun's SPARC microprocessor architecture faces intense competitive pressure from high-end Power Macintosh computers, which offer strong performance at a much lower price than Sun workstation. Where do you fit in? Traditional workstation applications ported to run in native mode on Power Macintosh systems will obviously sell well into this market, once Power Macintosh computers have begun to make inroads.

Reason #5: Microsoft Leaves Itself Vulnerable

Microsoft is beginning to deemphasize the role of Windows NT as a mainstream enterprise client operating system in favor of Chicago (Windows 4.0), and is

focusing more attention on Windows NT as a workstation operating system. Microsoft has renamed the client version of Windows NT "Windows NT Workstation." A current Microsoft advertising campaign declares, "Windows NT Workstation. Massive Power. Now you've got UNIX power and flexibility." This clearly positions NT as a workstation operating system.

Implications/Opinions: Microsoft is saying to the market that its only client operating system that runs on RISC, Windows NT, is for workstations (a vertical market) and servers. By strongly identifying NT as a workstation and server operating-system platform, Microsoft limits its future flexibility. Microsoft's future mainstream desktop environment, Chicago, was not designed to be portable to RISC. We think that this leaves Microsoft vulnerable to competition from personal computers based on RISC, such as (you guessed it) Power Macintosh computers. We'll just say it one more time: Your native software can help exploit this vulnerability. ®

The complete paper version of *Apple Directions* is available from APDA. To

contact APDA, call them at 1-800-282-2732 from locations in the United States,

1-800-637-0029 from Canada, and 1-716-871-6555 from other locations; or you

may contact APDA using AppleLink; the address is APDA.

For more information, see "About Apple Directions" in this folder.

System 7.5 Comarketing

You've been working with the beta version of System 7.5 for a few months to make your application easier to use and more robust, thanks to the many technical innovations of the new Macintosh operating system. Your application is now Apple event–savvy, it uses Macintosh Drag and Drop, and it incorporates the PowerTalk Mailer as well as QuickDraw GX print dialog boxes. Now what?

Well, if you haven't already, you need to get in touch with Apple Computer, Inc., because, chances are, your product qualifies for the System 7.5 comarketing program. The program is designed to help qualifying products get the exposure they need to be successful, which, in turn, will help boost acceptance of System 7.5 in the marketplace.

To qualify for the program, your product must ship by December 1, 1994, and incorporate at least one of the seven key System 7.5 technologies. If it does so, you automatically qualify for at least the base level of comarketing support from Apple—being listed in System 7.5 Intro News, which will be distributed at events this fall leading up to (and including) Macworld San Francisco in January. Additionally, your product will be included in System 7.5 press kits and other introductory materials.

The seven key technologies you need to support are

• Apple Guide

• Macintosh Drag and Drop

• AppleScript

• QuickDraw GX print dialog boxes

• the QuickDraw GX type engine

• the Thread Manager

• PowerTalk

If you incorporate more than one of the key technologies so that it greatly enhances the user experience, you can also qualify for greater levels of support, many of which are free. For example, your application may be selected to be used for demonstration purposes at Macworld San Francisco or made part of a special System 7.5 brochure that highlights key products.

Other parts of the program include an in-box product guide shipped with System 7.5, video advertisements shown on Macworld TV during Macworld San Francisco in participating hotels, as well as product listings on eWorld, CompuServe, and other online services. The basic parts of the program are free of charge for qualifying products, while fees for the optional programs range from $100 for online posting of product information to $7,500 for running the video advertisement.

If you want to participate in the System 7.5 comarketing program, look on AppleLink for the program participation package, which includes an application form (path—Developer Support:

System 7.5 Talk:System 7.5 Comarketing Opportunities). You can also call (408) 974-1872 or send an AppleLink message to COMARKET. ®

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New AppleSearch Product Ships in September
By Robert Patrick

In July Apple Computer, Inc., announced an updated software package that gives customers and developers an on-ramp, as well as a road map, to the "information superhighway." AppleSearch, which lets users search for and retrieve information on local area networks, has now been expanded to find information on the Internet. AppleSearch version 1.5 is aimed at organizations that want to allow users to search the internet through the AppleSearch interface sharing a single point of access at the server. If you're interested in using the new AppleSearch features within your applications, an upgraded version of the AppleSearch Client Developer Kit will also be made available.

Additionally, Apple announced a new site license to allow more widespread use of AppleSearch. The site license allows organizations to make unlimited copies of the AppleSearch client software without incurring additional cost. Since as many as 50 concurrent users can access an AppleSearch server, the total cost of each active client connection to an AppleSearch server can be as low as $36 per active user. This will give content developers access to a larger AppleSearch user base without incurring additional costs.

AppleSearch software consists of two components, the AppleSearch Server that sits on a Macintosh computer used as a server, and the AppleSearch Client that sits on the individual user's system. If the AppleSearch Server is connected to the Internet, AppleSearch version 1.5 allows a server administrator to choose Internet wide area information servers (WAIS) to appear as AppleSearch

information sources to users connected to the server. This allows AppleSearch users to search content on either their local area network or the Internet. Multiple AppleSearch users within an organization can share Internet access without having to connect to it separately. AppleSearch users can be more productive because they don't tie up their computers with an Internet connection.

Wide area information servers are computers on the Internet that house a wide range of published information, from the contents of The Wall Street Journal and New York Times to government policies and scientific reports. Selected WAIS servers appear to AppleSearch users like any other information source on their local network.

AppleSearch features include "reporters," which are sophisticated search agents that search documents on an AppleSearch Server or on selected WAIS servers, regardless of their format, to deliver information users need. Reporters can be assigned, or scheduled, to keep users updated as new and relevant information appears on the chosen information sources. AppleSearch combines features found on high-end bibliographic, full-text retrieval software with Apple's traditional ease of use and administration. It can tap into information sources such as server-mounted CD-ROM discs, news wire services or other online services that feed into an AppleSearch Server.

Many developers have already recognized the opportunities presented by developing their own AppleSearch clients. If you'd like to consider designing your own clients, here are a few applications ideas to get your imagination working:

• Applications to load content onto an AppleSearch Server in a manageable fashion, for example, automatically downloading internet messages and news onto an AppleSearch server.

• "Broker" applications that notify and/or forward AppleSearch updates via E-mail.

• Applications to create custom updates using the update file format specification included in the AppleSearch Developers Kit. Some examples include providing the ability to save documents as AppleSearch updates or read/view an update from within an application; you could also create an OpenDoc component to update or view files.

You can write your own client application to access AppleSearch Servers in one of two ways. First, you can write an application that replaces the AppleSearch Client provided by Apple. In this case, the client application must use Apple events to communicate with the AppleSearch Communications Extension, which in turn communicates with the AppleSearch Server. Alternatively, you can link your application directly to AppleSearch Client Library, a part of the AppleSearch Communications extension, with C calls that communicate with the server.

Apple will upgrade the AppleSearch Client Developer's Kit to version 1.5 (available from APDA—U.S. price $299) in September. For APDA ordering information, see page 32. For more information on AppleSearch 1.5, you can call the Apple Network Information Line at (408) 862-3385. AppleSearch 1.5 and software upgrades for current AppleSearch customers will be available worldwide through authorized Apple resellers by October 1, 1994. ®

[Editor's Note: Robert Patrick (AppleLink: PATRICK.R), is an evangelist in Apple Business Systems' Servers and Services group.]

For more information, see "About Apple Directions" in this folder.

develop Issue 19: All About New Technology

There's a lot about new and, even, upcoming technology in the latest issue of develop, Apple's award-winning technical journal. The cover article this time is about OpenDoc, whose final release has yet to happen, and there are two substantial QuickDraw GX articles, a couple of PowerPC–related columns, and more.

• "Building an OpenDoc Part Handler" provides an overview of how to write code to support Apple's new compound-document architecture. You'll see that it's a lot like writing any Macintosh application.

• "Adding QuickDraw GX Printing to QuickDraw Applications" tells how to support the new printing capabilities of QuickDraw GX with a minimum of effort. Even if your application doesn't need the advanced graphics capabilities of QuickDraw GX, your users will love these new printing features.

• "Making the Most of QuickDraw GX Bitmaps" is a primer on handling bitmapped graphics in QuickDraw GX: tips, tricks, and whizzy effects.

• Our regular Balance of Power column covers tuning PowerPC memory usage, and a special column, "Designing Applications for the Power Macintosh," provides some useful tips from the guys who wrote the Graphing Calculator.

• "Pick Your Picker With Color Picker 2.0" tells how the new Color Picker Manager is flexible and customizable, allowing much tighter integration of color pickers with your application.

•"Implementing Inheritance in Scripts" describes how to support inheritance in your application's scripts so that they can share handlers and global variables (it isn't as difficult as you might think).

You'll also learn about a cool QuickDraw GX clipping effect and about media capture using the sequence grabber. And no issue of develop would be complete without our Q&As—for both Macintosh and Newton—and our popular Veteran Neophyte and Puzzle Page columns (this time there's a guest puzzler; we hope you'll send in puzzles of your own).

So if you want to stay technically current and just enjoy some good reading, you'll want to be sure to check out this issue of develop. Issue 19 and its accompanying code is on this month's edition of the Developer CD Series along with all back issues of develop. For maximum pleasure and edification, we recommend subscribing to develop so that you'll get the printed copy; it's available through APDA. Enjoy!

Caroline Rose
Editor, develop

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Reference Library Edition, September 1994

Our featured selection this month is the new Subject Index folder at the top level
of this disc. Within it, you'll find folders organized similarly to subject areas in the
Inside Macintosh book series, with a few additions. Each folder contains aliases
to various documents scattered around the CD that relate to the folder's subject;
you'll also find an Apple DocViewer Collection file containing references to all
the DocViewer documents on that subject. (There's one exception: develop
magazine. I'm working on a way to automagically include appropriate articles
from develop, which should be ready by the next Reference Library edition.)

The new set of universal interfaces I hoped to include this month isn't ready yet;
by the time you read this, it should be posted on AppleLink, and I'll put it on the
next available CD. Otherwise, in addition to some new Inside Macintosh books
and a new technical note, here are this month's new and revised folders.

C.S.M.P. Digests

This is a collection of article threads from the Internet news group
comp.sys.mac.programmer. It's designed for people who read c.s.m.p.
semiregularly and want an archive of the discussions. Note: This is not a
product from Apple Computer, Inc. It is provided on an "as is" basis. Apple is
responsible for neither its contents nor any problems you may encounter while
using it.

HyperCard Products & Services

This folder contains a directory of HyperCard products and services, including demos. Note: This is not a product from Apple Computer, Inc. It is provided on an "as is" basis. Apple is responsible for neither its contents nor any problems you may encounter while using it.

Lurkers MPW Tool

Lurkers searches a directory for files that can be modified, including files not in a project, files checked out for modification, and modify-read-only files. It's much, much faster than the old FindLurkers script. (The tool takes one minute to search the entire Finder source tree; the script takes forever.)

MacCalendar

MacCalendar is a complete snippet that illustrates how to write a module for the Control Strip Manager, which is available for PowerBook computers. If you click the MacCalendar icon in the Control Strip, it displays the current month's calendar. A separate application lets you configure the font, font size, and weekday labels of the calendar.

Macintosh Easy Open
Version 1.1 GM

Macintosh Easy Open version 1.1 (also known as the Translation Manager) allows users to open documents created by applications they don't have. This folder includes the golden master version of the developer's kit, which allows you to create Macintosh Easy Open–savvy applications as well as translation systems that actually perform translation.

PCI Information

This includes the information on the PCI bus that was distributed at the 1994 WWDC. It features slides about PCI, a preliminary draft of the PCE seed note Designing PCI Cards and Drivers for Power Macintosh Computers, and some sample code snippets.

Coming Next Month

(Or, given my recent track record predicting these things, within the Next Year.)
A bright, shiny new system software release, new Universal Interfaces, and the usual big pile of enablers and installers and stuff.

Alex Dosher
Developer CD Leader

Sound + Vision

Part 1: Things That Go "Boop!" in the Night

By Peter Bickford

Way back in the mid-1980s, one of the major computer magazines did a feature-by-feature comparison of the various brands of computers. As I recall, it was in the form of a chart, with the columns showing the various types of computers (Apple II, IBM PC, Macintosh), and the rows containing the various specifications (processor speed, bus architecture, and so on). It was all pretty dry stuff until it came down the the row labeled "Alert sound." In the Apple II column the listing read "Beep." In the IBM PC column the listing read "Beep." In the Macintosh column it read something like "Beep! Ping! Whirr! Miaow!" with a footnote to point out that the Macintosh alert sound could be customized to match the user's preference.

In the years since then, hundreds of megabytes of custom beep sounds have been produced, and finding the perfect system beep has become something of a national pastime among Macintosh owners. For all this, however, nobody seems to have found a way to make sound a sensible part of the overall interface. This column is about doing just that, to be followed next month by a set of tips for mixing in animation and QuickTime movies in an effective way.

Theory and Reality

If you search through the various academic journals, it's obvious that researchers have a strong feeling that sound can play a big role in fashioning a compelling human interface. A palpable plethora of papers have been published, including everything from dry theses about the benefits of multichannel input to unpardonable puns about how great it would be if we all used "earcons" to represent items in our interfaces. (Yes, some wiseacre actually did this as a take-off on the "eye-cons" [icons] that we perceive visually; the truly sad part is that the researchers who followed seemed to forget it was a joke and insisted on using it as if it were just another computer term.)

If you can ignore the horrible puns and dubious technobabble, you'll still find all sorts of good research pointing out how useful sound can be in the interface. Sound can provide feedback for users' actions, let them know what is happening with the system, and increase their overall effectiveness. Some of the more interesting research includes a study that proves video-game players score higher with the sound turned on, and Jonathan Cohen's study of sounds used to cue users about the status of background tasks. In fact, when a sound we've grown accustomed to for status information is taken away, we often experience a level of anxiety (such as when we can't hear the hum of our car's engine, or the quiet shuffle of the drive heads tracking over a floppy disk, which leaves us to wonder if the disk is functioning properly).

So why is it that today, no matter what's going on, the computer pretty much stands mute throughout? And when it does open its mouth, it seems to know only one word (albeit in a countless number of sonic languages): "Beep!" Why is is that every time we try to incorporate these great lab results into people's offices, a large number of users respond by turning off the volume altogether?

Use Different Sounds to Indicate Different Meanings

The answer seems to have several parts. For a start, even though sounds are great at conveying meaning (for example, roar of tiger = "move, or you'll be eaten"), our interfaces have generally used the same sound to mean everything (beep = "the printer is out of paper," "you have a meeting coming up," "the copy is done," "you have a new mail message," and so on). It's like a baby's cry: you have to figure out whether he's too hot, too cold, his diaper needs changing, or he's just demanding to watch the Barney videotape again.

New parents and computer owners need to rely on other clues and a sort of psychic sense to guess what the real problem is. Still, even the most basic baby models come standard with at least a few different sounds to express their state information (shrieks = "I'm really, really terrified!"; gurgle, coo = "I'm happy and

am probably drooling on you"). Top-of-the-line computer owners, on the other hand, just get the same old "Beep!".

If our computers are going to have any hope of closing the information gap between them and the toddlers, they're going to have to learn some new sounds. If it's practical, you may want to let the user exercise some control in this regard, choosing the sounds that are commonly used by your program for various messages or states.

Use Different Volume Levels for Different Messages

The second big problem with the way sound is used today is that different types of sonic messages require radically different volume levels. My microwave oven, for instance, makes at least three different kinds of sounds at volumes appropriate to the message being conveyed. It gives me the following sounds:

• Input feedback in the form of a quiet "bip" sound each time I press a button on the keypad. This, along with the numerals that appear, gives me confidence that it's accepting my input. The soft click of your mouse button can fill the same psychological need when you use a computer.

• Ongoing status information in the low hum of the fan as the oven operates. This lets me know that the "job" is still in progress, although the sound's volume is low enough that it doesn't intrude on my concentration. The whir of a laser printer as it prints is another good example of this.

• Alert notification in the shrill "Beeeep!" that sounds when the food is done. This lets me know that I should put down what I'm doing and retrieve my dinner. The machine is purposely demanding my attention and uses a volume that is sufficient to do so. (My only wish is that I could have it substitute a sound like the one Norton Speed Disk uses when your disk optimization is complete.)

In contrast to my microwave's appropriate use of sound, my fax machine (and my computer) use one volume level for everything. The only thing I can control is how loud or soft that one level is. So, whether I'm punching in somebody's fax number, being told the message was sent successfully, or being summoned to change the paper when the roll is empty, I simply have the choice of "beep, beep, beep" or "BEEP! BEEP! BEEP!". What I really need is something more like the microwave: very quiet sounds for input feedback, fairly soft sounds for ongoing status information, and relatively loud, attention-grabbing tones for alerts.

On our computers, we also need (a la QuickTime movies) to be able to control sound on an application-by-application basis, and preferably independent of the volume set in the Sound control panel's Alert Volume slider. An application such as a game is meant to be an all-encompassing experience, but your word processor should probably not be.

Characteristics of "Good" Sounds

When color monitors first became common on desktop computers, you saw an awful lot of interfaces that were downright desperate to prove how colorful they could be (take a look at any of the adorable neon color schemes of Windows 1.0 to see what I mean). By the same token, just about all Macintosh users go through a stage in which they go nuts with fonts, sending their friends death-threat–like notes set in San Francisco font and choking their printers by trying to use two dozen different typefaces on the same page. Eventually, however, people learn the benefits of subtlety and restraint, and turn toward conveying information instead of just displaying pure flash.

The same needs to happen with sound. Just as there are "good" fonts and color schemes for an interface, there are also "good" sounds. A big factor in this is picking sounds that people can easily tolerate hearing often. In general, these are sounds with the following characteristics:

• They're fairly short in duration (a few seconds, at most).

• They aren't intentionally humorous or emotionally loaded. Jokes grow stale with time, and the sounds of insects or cars screeching becomes progressively more irritating.

• They're of medium complexity—neither too simple (for example, a sine wave) nor too complex. It's interesting to note that the same seems to hold true for popular music. Most rock music, for instance, sits in that "happy complexity medium" between folk ditties and modern symphonic pieces.

Calling in the Pros

The next time you watch a big-budget science-fiction movie (I recommend Aliens), stick around until the end of the credits and you'll see several people listed under the title "Foley Artists" or "Foley Effects." These are the folks whose job it was to create and record the sounds of everything from a pulse rifle being fired in an abandoned space colony to the alien monsters crawling on the metal grating above your head. In many ways, these folks make you believe what you see by adding in sounds that reinforce that reality.

When we go about using sound in our own interfaces—especially in products such as multimedia games, in which a great deal of sound runs continuously throughout the interface—we ought to consider hiring someone who knows how to use sound to its fullest. Just as a graphic artist can transform the visuals of these programs, a musician or sound engineer can take you from isolated sound effects to a sonic tapestry that enriches what the user sees onscreen.

Till next time,

Doc

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

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How Do I Use Apple Guide?
By David Gleason

Recently we've told you a lot about the direction that Apple has chosen in the development of the Macintosh operating system, including such features as OpenDoc, scripting, and Apple Guide. Together, these new features provide what Apple is calling active assistance; if you read Gregg Williams's Strategy Mosaic in the June 1994 issue of Apple Directions, you are already familiar with Apple's active-assistance strategy and the general features of Apple Guide. In this article, I'll go into the details of Apple Guide, how it works, and how you can begin working with Apple Guide right away. I'll also have something to say about the kinds of opportunities that Apple Guide can give you as a developer.

The reasons for Apple's adoption of the active-assistance strategy are many, but the primary motivation is the fact that while computing power has increased exponentially over the past decade, users are still not taking advantage of the power on their desktops. "What is happening today in software development is that more and more tools are being provided, with more and more options, and people aren't keeping up with all the learning that is needed to take advantage of them," explains Glenn Katz, an Apple Guide human interface engineer.

Power users have certain needs and ways of learning; novices have totally different needs and learning styles. Since both must use the same application,

it's incumbent upon software developers to provide assistance that addresses the individual needs and preferences of a wide range of users. Providing users with 400-page manuals to browse through is not the entire answer, nor is an extensive online help system. Both choices force users to make decisions that they may not feel comfortable making, and both options take a lot of time.

"The point," says Katz, "is to contextualize the tools—like the tools on a work bench. The tools alone cannot tell you how to make something useful, like a cabinet." That knowledge is found in the head and hands of the carpenter, and different carpenters use tools differently. "Similarly, users need to understand the task before them, then apply the best tool to perform that task. This is what Apple Guide supports."

Apple Computer, Inc., and many others, have spent years researching this problem, and the findings indicate that the best way to provide users with the information they need is by allowing them to select a goal. As Katz says, "Users are better at finding questions that match their current needs than they are at finding software feature names." It may be appropriate therefore that the help system provide a number of questions, and then direct the user to answers to each question.

"It is much better to present features through the tasks they support," says Katz. "Then the tool can be put to use when it is appropriate, and when it makes sense to the user why it's the right tool at the right time."

Ask a Guide to Show You

So, you ask, how do most people learn a computer task? Katz says, "Most people prefer to have someone show them, someone who already knows how. Not a manual or a video, but a person, a guide."

Hence Apple Guide, the Macintosh system extension that implements the first stages of active assistance, by allowing us to say, "Show me how to do it." Once we have mastered the essential steps of completing a task, we can then spend some time learning the principles behind the steps. But our first priority is usually to get the job done, quickly and correctly.

Task-Oriented Assistance

An essential feature of active assistance is that it is task-oriented, focusing on tasks and their completion. Apple Guide provides users with access to topics in a variety of access methods. For example, in Macintosh Guide, a component of Apple Guide that is provided for the Finder with System 7.5 (available now on the WWDC 1994 New Technologies CD), three buttons permit you to search either by topics, by alphabetical index, or by key word. If you press the Topics

button, a listing of topic areas appears, such as "Files & Disks," "Printing & Fonts," and "Troubleshooting" in the left half of the access window (see "Macintosh Guide full access window"); the topic areas that correspond to the most frequently asked questions are listed first. If you select, for example, the topic area "Printing & Fonts," a list of tasks related to printing and fonts appears in the right-hand column of the window—in this case, the tasks include "How do I print switch printers?" or "How do I share a printer with other users?" The Index button provides an alphabetical listing of the same topic areas, so users can search for a particular topic. Or they can search by keyword using the Look For button, which allows them to type a word or series of words into a text box and click Search.

You can use Apple Guide with your application to provide the same access methods for tasks that you define; the order in which you present these tasks, and the degree to which you explain them, is up to you.
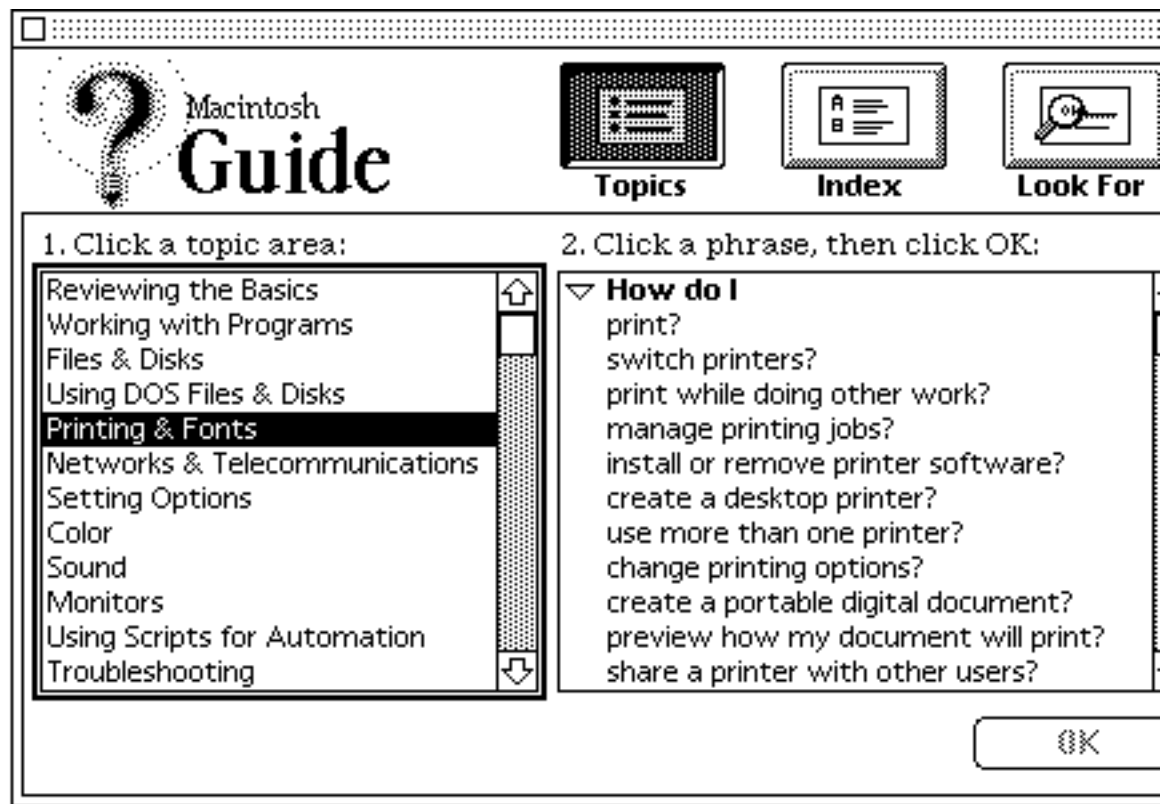
(figure) Macintosh Guide full access window

Apple Guide Is Interactive

A second important feature of Apple Guide is that it is interactive; the system is not merely a list of topics and tasks, nor is it simply a reorganization of a typical online help system. Rather, it is a set of additional features that augment and enhance your existing online help system. With Apple Guide, you can actually walk your users through a series of steps, and at each point, provide ways of either verifying that the step was performed correctly, showing users how to do the step if they can't figure it out quickly, or, if you are willing to do some programming, actually performing the task for them.

These features are implemented through a variety of Apple Guide elements, including

• controls, which include checkboxes and radio buttons

• context checks, which Apple Guide uses to look ahead or behind to other parts of the guide to determine if the user has performed certain tasks or if certain conditions have been met

• coach marks that highlight interface elements to "coach" the user through steps

These features are all available in Macintosh Guide, and they are also available to your application guide, without necessarily requiring an extensive amount of coding. In this article, I'll show you how to create a simple guide, and then direct you to more information about the optional programming aspects of implementing Apple Guide. Without changing a line of code or recompiling your program, you can benefit from the most important features of a help system that puts the user more in control than ever before. And if you are willing to modify your application's source code, Apple Guide becomes a powerful tool for providing many active-assistance features.

Apple Guide Provides Consistency

Before I get into the details, let me point out a third major benefit of Apple Guide: The interface is consistent for all guides, including the Macintosh Guide (provided with System 7.5), the guide that comes with a developer's product, and the smaller guide that a systems integrator designs for a single customer. This consistency provides a great deal of benefit to you as a developer, as I'll explain later on.

"Buy-In" From Large Developers

To convince you of the value of Apple Guide, it might help to relate comments from some major software developers who have already embraced Apple's notion of active assistance and the value it adds to their products. John Pavley, Manager of Future Integrated Product Development at Claris Corporation, says that Claris "has bought into the idea of active assistance. If you read the reviews of products, talk with end-users and analysts, they are looking at help solutions like Apple Guide as a key feature. Apple Guide allows the user to walk through things, and not pay attention to the details, but learn the task."

The reason for this, according to Pavley, is that "only some small percentage of the population really needs to understand how to use computers. We need to open the market up to many, many more people. The problem for them is direct manipulation of the user interface—for a large segment of potential customers, there is a fear of not doing things correctly, of corrupting their data or breaking something. This is an audience that Apple Guide addresses."

Tom Sanders, Director of Development for WordPerfect/Macintosh, says that WordPerfect Corporation has "seen a trend away from written documentation throughout the industry, especially among Macintosh users. They tend to shy away from manuals—they prefer to play with the system and figure it out that way."

Sanders explains that "at WordPerfect we agree with the Apple philosophy of showing a user how to perform a task. There is no match for step-by-step instructions." This is especially important with new releases of products; as Sanders says, "users aren't learning about new features; they learn a small handful of tricks, and use them over and over. Apple Guide with its step-by-step coaching provides an opportunity to expand our customers' repertoire of tricks, making them more effective users of our product."

It's important for you to realize that Apple Guide is a chance for you to increase the power and effectiveness of your help system, without adding to your staff or overhead. "Our publications group is always urging us to increase the functionality of our online help," says Sanders. "We have a small development team, and to the extent that we focus on new online help features we neglect the word processing features. Apple Guide allows us to focus on word processing. Our writers now have tools to provide top-of-the-line coaching."

Another advantage of Apple Guide's design is that its features are readily available to developers to use for their applications, because it is built into the Macintosh operating system. As Pavley says, " Apple Guide is an example of the best of Apple technology. Apple Guide really does belong in the operating system, where Apple has put it. I'm a big believer in leverage—a good object-oriented programmer does as little as possible. The idea is to take advantage of the features that are provided by the operating system and its extensions, and work with that. Apple has solved most of the problems, so I don't have to."

In fact, Apple Guide is designed to work across multiple applications, so you can write a guide that will operate interactively with other software, including the Finder.

Inside Apple Guide

Now let's take a closer look inside Apple Guide, a powerful system-wide help environment that already contains a great many features, its own programming language (called Guide Script), and an application programming interface (API) to many of its features. Its beauty lies in its ease of use on a rudimentary level, allowing you to create your own guides without writing or recompiling any source code, and in the complexity that you can achieve if you have the time and resources to exploit Apple Guide fully.

Apple Guide is implemented as a system extension, which contains the delivery engine, made up of a stay-resident portion (with a memory footprint of less than 20K) and an application portion (memory footprint of about 400K) that starts up Apple Guide when the user requests it from the Help menu. Currently Apple provides two guides at the Finder level—Macintosh Guide and Shortcuts (which are launched from the Help menu). If you have already installed the Beta version of System 7.5, take a look at these guides to get a feeling for what Apple Guide can do and how it is organized.

All About Guide Files

Guide files—also called guides—are the essential element of Apple Guide. You create help content for your own guides from text files, which you embed with Guide Script commands, a process known as "tagging" a text file. The tagged text file—which can define not only blocks of text, but graphics and QuickTime movies—is then compiled into guide files using the Guide Maker application. You tag (or identify) Apple Guide components in your guide file—windows, panels, buttons, controls—using the Guide Script command language, which is fully documented in the Guide Script Command Reference (available on the WWDC 1994 New Technologies CD). Guide Script commands define the look, content, and navigation path of your guide. In a guide file, each command line begins with a command keyword surrounded by angle brackets (< >); for example, the command keyword <Help Menu> defines the help item name and guide file type.

Apple has defined five types of guide files. You are free to use any or all of these guide file types; you will at least want to include an About guide file and probably a Help guide file. Here are the five guide file types Apple has defined:

• About. An About guide file describes the use and contents of the help system (like the About box in any application).

• Tutorial. A Tutorial guide file describes the basic features of an application, and is intended to bring the user to a basic level of proficiency before using the application. A Tutorial guide file can be written to enforce a strict sequential order for the user to follow, or it can encourage the user to proceed in a certain order.

• Help. A Help guide file provides task-oriented information, such as step-by-step instructions on how to perform certain tasks. It is often the first place a user goes for initial information about the application—for example, to answer the questions "How do I do this task?" "What is this object on my screen?" "Why can't I do this action?"

• Shortcuts. A Shortcuts guide file is intended to contain condensed reference material—for example, syntax rules, keyboard shortcuts, or command lists.

• Other. You should use an Other guide file for information that does not conform to any of the previous categories. An Other guide file can include specialized information—for example, a quick reference guide or a more advanced tutorial for experienced users.

In addition, you can create "mix-in" files (also called guide file additions) to update existing guide files. Mix-in files do not appear in the Help menu as separate items, but their contents are folded into the existing guide file without recompilation. This is a quick and convenient way to update an existing guide file—for example, at the time of a product update—with a minimal amount of work.
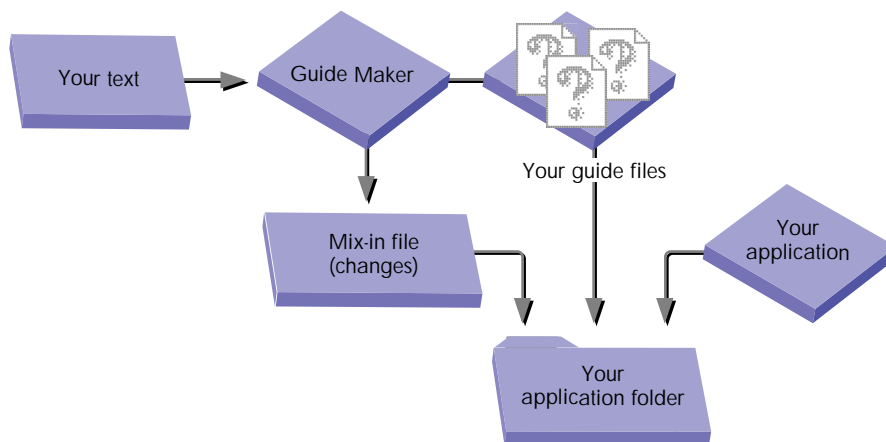
Creating A Guide File

The next step in creating a guide, once you have created and tagged a text file, is to compile it into a source file. In general, the process of creating a guide runs as follows:

1. Plan and design the help content that you want. You will probably want to work with an instructional designer, either on your team or from outside.

2. Create a source file from an existing word-processor file by tagging the file (embedding Guide Script commands into the file).

3. Compile the source file into a guide file, using the Guide Maker application.

4. Test your file, using the diagnostic features of Guide Maker, or by opening it within your application.

5. Carry out additional steps, which may include integrating the guide file into your application using the Apple Guide API and Apple Guide Apple events.

6. You (or someone else who is a programmer) will need to write source code into your application if you want your guide to use context checks other than those built into Apple Guide.

Apple Guide expects a guide file to reside in the same folder as its corresponding application. (You can do otherwise, but you will have to add some code to your application.) There are slots in the Help menu for one guide file of each type, plus as many Other guides as you want.

(figure) Using Guide Maker to create guide files.

Access Windows

All Guide files must provide access windows, which appear whenever the user selects a guide file from the Help menu. The access window provides a list of tasks, allowing users to select the help that best matches their current problem.

There are three types of access windows:

• full access windows for extensive guide files; they allow you to cross-reference your help topics (the Macintosh Guide window shown earlier is an example of a full access window). Full access windows provide three views of the help information: Topic Areas, Index, and Look For.

• single list access windows for short lists of tasks; these are simpler than full access windows. and are best for displaying short and focused lists of topics.

• simple access windows, which take the user directly to help information. See "Macintosh Shortcuts simple access window" for an example; this simple access window provides access to six separate sequences, each accessed through a button in the window (several types of buttons can be defined as guide elements).
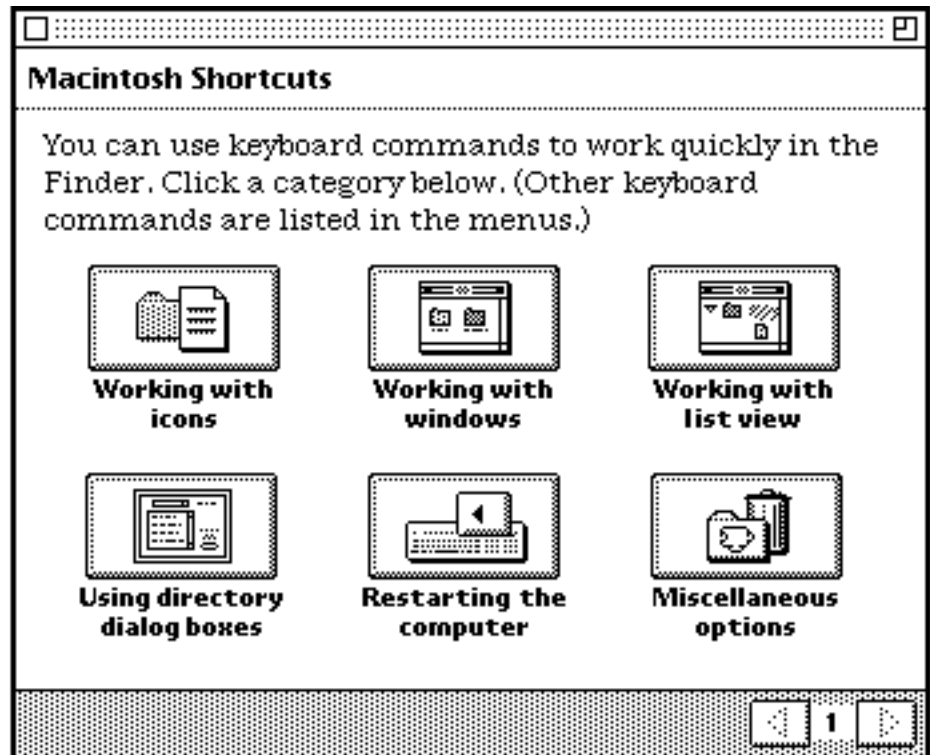
(figure) Macintosh Shortcuts simple access window

Panels

When a user selects an item in an access window, a panel appears. A presentation panel is a window that usually contains one step in a procedure or one item of information. A sequence of panels is a set of related panels that explain a task, either through a defined series of steps, or by means of a variety of optional paths that the user chooses.

For example, if you select "How do I switch printers?" in the Macintosh Guide access window, you see the panel shown in "Macintosh Guide presentation panel."
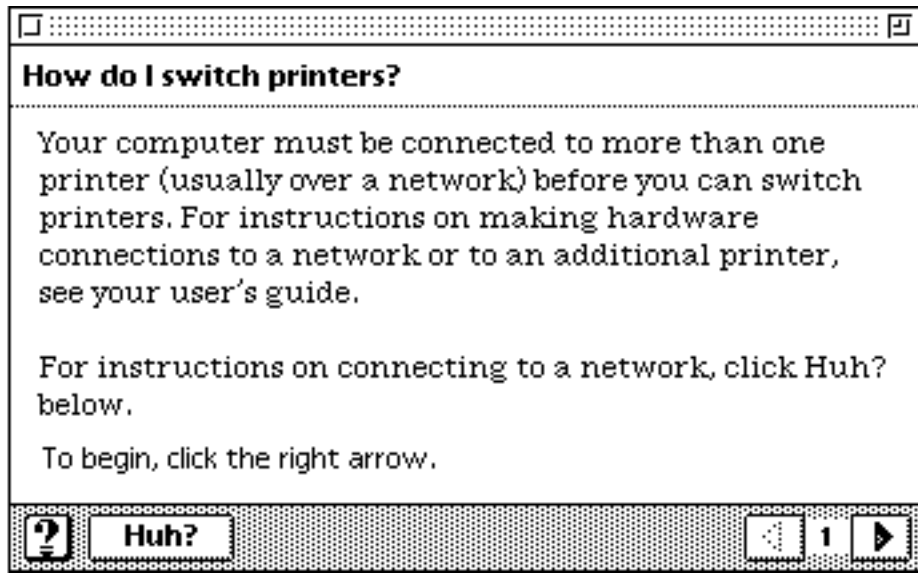
(figure) Macintosh Guide presentation panel.

Presentation panels contain several elements, including

• title area

• content area

• navigation bar

• prompts

• navigation buttons

For example, the Macintosh Guide presentation panel uses all of these elements; note that the navigation bar at the bottom of the panel includes navigation buttons, and a Huh? button that, when pressed, takes the user to a Huh? panel. You are free to use these features as you choose, but Apple will be providing guidelines to help you determine which features to use and how to use them.

Apple has defined several types of panels, including

• Huh? panels that provide information the user must know in order to fully understand the panel. Huh? panels appear when the user presses the Huh? button.

• Oops panels that appear when a user has incorrectly performed a specified task in an action panel. Your guide can identify such errors if it provides context checking.

• Continue panels that offer to have Apple Guide perform the task for the user. In many cases, you can have AppleScript perform the task (you must first determine if it is programmatically possible for Apple Guide to perform the task).

To create a panel, Guide Maker uses the source-file commands you enter between the commands <Define Panel> and <End Panel> to build the panel. You can give a panel special features such as graphics, three-dimensional buttons, or a QuickTime movie by using the Guide Script commands <PICT>, <3D Button>, and <QuickTime>. Guide Maker uses default settings to automatically place panel text and objects in the panel, or you can specifically place text and objects yourself using format and placement commands.

Coach Marks

Coach marks are an intriguing feature of Apple Guide. They provide a graphical and attention-getting way of drawing the user's eye to the exact part of the screen that needs the user's immediate action—a menu item to be selected, a control panel to be opened, or a radio button to be clicked—and the coach mark highlights the item so clearly that the user can hardly miss what to do next.

A coach mark works by sending an Apple event to the target application. Your application doesn't need to handle the event, but it does need to be able to receive it—which is a good reason to make sure that your application is aware of high-level events.

Apple Guide provides four built-in coach marks:

• a red circle, which surrounds a limited or enclosed area to show the user where to click (this is the default coach mark)

• a red underline, which shows the user where to input text

• a red arrow, which points to a location on the screen

• a green X character, to mark something or specify a place for input

Apple Guide gives you five ways to use coach marks:

• A menu coach is a coach mark for a specific menu, menu item, or command. When Apple Guide opens a panel that includes a menu coach, it uses that coach's style and color (defined by Guide Script commands) to draw a coach mark for the specified menu. For example, in Macintosh Guide, items are identified in the Apple menu by a red, underlined menu coach.

• An item coach is for an item in a dialog box or other interface element in a window that has a dialog item ID or balloon rectangle associated with it. When Apple Guide opens a panel that names a item coach, it uses the specified coach style to draw a coach mark for the item; for example, a help balloon that you want to highlight.

• An object coach is based on a rectangle that your application returns for the specified object. When Apple Guide opens a panel that names a defined object coach, it sends an Apple event to your application that requests it to return a rectangle for the named object. Object coaches require Apple Guide event handlers in the application.

• A window coach is based on a rectangle you specify within a window or desktop. When Apple Guide opens a panel that names a window coach, it uses the specified coach style to draw a coach mark in the location of the rectangle. For example, a window coach can highlight the Trash icon on the desktop.

• An AppleScript coach uses a script (created by AppleScript, Userland's Frontier scripting environment, or CE Software's QuicKeys) to determine the location of the object to mark. When Apple Guide opens a panel that includes a command naming a defined coach, Apple Guide executes the specified script. Once the script returns a rectangle for the object, Apple Guide draws the coach mark.

Context Checking

Context checking is another powerful feature of Apple Guide that lets you assess the state of the user's computer (for example, if a window is already open), or the state of the application, to determine what the user needs to do next. You can dynamically adjust the guide's next action, based on the current situation. Conditions can be based on two situations—either on the state of certain controls (such as radio buttons or checkboxes) on the panels, or on context checks that have been defined in external code modules. Apple Guide evaluates each situation as either true or false, and makes adjustments to the

sequence of panels accordingly. You can also attach an Apple event to a control—for example, in a presentation panel.

Apple Guide provides four types of context-checking commands:

<Skip If>/<Show If>

<If>/<Else>/<End If>

<Make Sure>

<Start Making Sure>/<Stop Making Sure>

"If" statements provide conditional branching. "Make Sure" conditions can be used to determine if the user has correctly completed a step that Apple Guide has shown. If the "Make Sure" condition returns FALSE, then the user sees either a special "Oops" sequence to redirect the user to a prior panel, or a continue sequence to perform the task for the user (your application can use continue sequences if it uses Apple events).

Apple Guide currently provides two built-in context checks: one that determines the state of a checkbox, checkBoxState, and one for a radio button, radioButtonState. Both of these context checks look to see if the checkbox or radio button is turned on or off. You can define your own conditions with the <Define Context Check> command that is documented in the Apple Guide Script Command Reference.

Working With Guide Maker

Guide Maker is an application (included on the WWDC 1994 New Technologies CD) that lets you compile help source files into a guide files. It also contains testing, diagnostic, and localization tools.

A simple implementation of Apple Guide requires you to create a guide file by compiling your help source files using Guide Maker. Note that the guides you create must reside in the same folder as the application. Mix-in files must also reside in the same folder.

 The Guide Maker application lets you perform five primary operations:

• compile a source file into an Apple Guide file using the Build command

• test the tasks that you have included in your guide file using the "Look For" command

• diagnose Apple Guide status messages as you navigate through a guide file using the Diagnose command, which is the key utility for run-time testing (to display these messages, you must be running the special debug version of the Apple Guide extension)

• convert Microsoft Windows files from Microsoft's Rich Text Format (RTF) into Apple Guide format (other file formats can also be converted) using the Convert command

• create or merge localization files containing content strings using the Localize command. With Guide Maker, you can extract the text from the source files that you have created and convert it into resource files, translate the text in the resource files using ResEdit or AppleGlot, and merge the text back into source files using Guide Maker. You can also use Guide Maker to localize any context checks in your guide file

When you have successfully built a guide file, you can then place it in the same folder with your application, and it will appear in the Help menu. For example, see "The Help menu with guide file Developer Demo Guide" for the menu appearance of a guide file, type Other, that was created with the sample code shown in "A simple guide content source file."

You can assign key combinations for opening your guide; in this case, Developer Demo Guide is assigned the key combination Command-L.

The listing in "A simple guide content source file" (based on the sample provided in The Guide Maker User's Guide) show how you define guide panels and panel sequences.

Note that each command has parameters; in the case of <Help Menu>, the parameters are: file name "Developer Demo Guide"; file type OTHER; and command-key equivalent "L".

If you create a guide file like this one, you can drop it into your application's folder, and it will appear in the Help menu when you launch the application. It includes panels A and B, and sequence tasks 1 and 2 are defined. However, note that not all of the elements included in panels are functional; for example, while there is text in the panels, the navigation buttons that are part of a panel have not been defined. This requires additional tagging and text input.

(figure) The Help menu with guide file Developer Demo Guide

Opportunities for Developers

So now that we have reviewed the particulars of Apple Guide, what opportunities does it provide for you, the developer? Brian Lawley, Apple Product Manager for Apple Guide, has an abundance of ideas for creating useful and commercially viable products quickly using Apple Guide. "There is already a demand for products such as building a guide to help the user create documents by merging files," says Lawley; "for example, merging addresses from a guide file with word processor documents such as form letters." Remember that Apple Guide is designed to work across applications, so you are not bound to your product—you can write guides for integration with other applications, and you don't have to alter an application to create a guide file for it.

Lawley adds, "There are chances for partnerships with larger, third-party developers, creating Apple Guide systems for page-layout applications, spreadsheets, or graphics packages. These require little investment and bring a great deal of benefit to customers. Every product would benefit from a guide that offers a section on the Top Ten Features of a product, or of a new release, to highlight competitive advantages of your product. It's a form of promotion within the product, and at the same time, teaches access to the product's best features."

Developers certainly don't have to be large institutions to take advantage of Apple Guide. Lawley says, "There is a demand for a wide range of shareware products, such as those sold in computer catalogs, selling for perhaps $19.95 and performing very specialized tasks. Someone will make money writing a PostScript troubleshooting guide for service bureaus!" For information service departments and value-added resellers, there are opportunities for providing custom help systems for custom applications and integrated solutions that can be marketed to departments or narrowly targeted audiences.

Claris's John Pavley suggests that for the small developer, there are three major advantages to using Apple Guide:

• You save yourself time, energy, and resources, and you reduce development costs and add features that could not otherwise be considered because of limited resources.

• Your product looks more professional. Apple Guide gives the impression that a large organization was responsible for the development of your application, because you have the same features and interface for your guide as are found in the big applications.

• Perhaps most important, if you are considering selling your product or even your company sometime in the future, you will want your products standardized with Apple Guide. That way, there is no need for the firm that buys your product or your company to completely rework your product's "look and feel."

The Only Interface They See

As Apple Guide becomes pervasive, users will realize how it changes the nature of the user experience, and it will generate expectations for more and more assistance. "For many people," says Pavley, "Apple Guide will be the only interface that they see. In the future, assistance gets better and better down the road, becoming more proactive." WordPerfect's Tom Sanders comments, "We like the fact that our customers will get used to this, that Apple Guide will be something they already understand and know how to use. It's important to draw customers to our help, that it is familiar to them, and that it is the same in other applications and on the Macintosh system as well."

Apple's Brian Lawley points out that soon "Apple Guide will be as pervasive as cut-and-paste is today. It assures you as a developer that your hard work doesn't go to waste, and provides true customer satisfaction with your product. And remember that Apple Guide is a centerpiece of Apple's active assistance strategy for the future." Keep in mind, too, that Apple Guide with its task orientation fits in perfectly with Apple's long-term strategy of moving to OpenDoc and a task-oriented system software architecture.

Phasing In Apple Guide

The flexibility that is built into Apple Guide allows each application developer to determine which features to use and how to create the active assistance that is appropriate for that particular application. Sanders says, "We are using a phased approach. We continue to support our existing online help system to provide reference information to our customers and we will add Apple Guide for task-oriented guidance. We see this as part of the overall transition to active assistance. We will include Apple Guide support in our WordPerfect version 3.1 release, which will come out around the time that Apple releases System 7.5."

How to Get Started

If you haven't already begun working with Apple Guide, see the Apple Guide folder on the WWDC 1994 New Technologies CD. You can begin working with the MoGuide application, a guide that demonstrates many Apple Guide features; the source code is provided on the Developer CD Series Reference Library CD, along with an article by John Powers, "Giving Users Help with Apple Guide." This article, which is also in develop, issue 18, discusses integrating Apple Guide into your application.

 You will want to obtain the following materials:

• Available on the WWDC 1994 New Technologies CD:

Apple Guide API header file and documentation (Apple Guide 1.2 API)

Guide Maker

Apple Guide Debug extension

Standard include files

Apple Guide documentation:

Introduction to Apple Guide

Guide Maker User's Guide

Guide Script Command Reference

MoGuide application and Assistant Guide file

Sample Finder Guides: About Help, Macintosh Guide, and Shortcuts

 • develop article and code (mentioned earlier)

Once you have these materials, you will want to begin designing how, where, and when to use Apple Guide in your products, and review your current help system to find ways to integrate Apple Guide.

Conclusion

Apple Guide is here to stay, and it is part of Apple's strategic direction in active assistance; in time, Macintosh computer users will come to expect Apple Guide and other features of active assistance just as today they expect menus,

toolbars, and icons. If you take advantage of the extensive features that Apple provides with Apple Guide, your users will learn more, do more with your application more quickly, and feel empowered rather than controlled or limited by the computer.

To grasp the full significance of active assistance and Apple's direction with it, it's important to keep in mind that Apple Guide is only a step in the direction, not the final destination. As Apple Fellow Don Norman pointed out in his keynote address at this year's Worldwide Developers Conference, "Apple is looking for chances to provide more opportunities for Macintosh developers. Apple Guide today is not the whole answer. But it is the future." Apple Guide is not an interim solution, but a building block in the platform upon which future key technologies will rest. ®

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(text box) A simple guide content source file

```
#define name of this guide file as it appears in the Help menu
# and define it as a guide file of type OTHER
<Help Menu> "Developer Demo Guide", OTHER, "L"

#set the startup window to a Full access window with Topics
# initially selected
<Startup Window> FULL, TOPICS

#define a panel
<Define Panel> "My Panel A"
So, this is a guide file panel.
<End Panel>

#define another panel
<Define Panel> "My Panel B"
Here is a second panel for this guide file.
<End Panel>

#define a sample sequence that uses Panel A
<Define Sequence> "SequenceTask1", "let's define what needs help"
        <Panel> "My Panel A"
<End Sequence>

#define a sample sequence that uses Panel B
<Define Sequence> "SequenceTask2", "Are you ready?"
        <Panel> "My Panel B"
```

```
<End Sequence>

#define a single topic area
<Topic Area> "Things we must accomplish"
        <Header> "How do I ..."
                <Topic> "choose a problem?", "SequenceTask1"
                <Topic> "determine how long it takes?", "SequenceTask2"

#define a single index term
<Index> "Sample index term"
        <Header> "How do I ..."
                <Topic> "get ready for another step?", "SequenceTask1"
#That's all!
```

The complete paper version of *Apple Directions* is available from APDA. To contact APDA, call them at 1-800-282-2732 from locations in the United States, 1-800-637-0029 from Canada, and 1-716-871-6555 from other locations; or you may contact APDA using AppleLink; the address is APDA.

For more information, see "About Apple Directions" in this folder.

Inside the Macintosh 630 Series Computers

The Macintosh 630 series computers combine the power of the 68040 processor family, a rich feature set (including easy-to-use video input, video output, and video capture features), and low prices that are competitive with their DOS/Windows counterparts. This month's Strategy Mosaic column, "Courting the Under-$2000 Market," explains why Apple Computer, Inc., created the Macintosh 630 series computers. See "Apple Introduces Macintosh 630, PowerBook 150 Computers," in the News folder for this issue, for prices and configurations.

Hardware Summary

The following is a summary of the hardware features of the Macintosh 630 series. (Note: The Macintosh 630 series includes the Macintosh Quadra 630, the Macintosh LC 630, and Performa 630 family. Each of the systems are very similar, with the exception of the different processor used.)

• processor: Macintosh Quadra 630—Motorola MC68040 with floating-point unit (FPU) processor running at 66/33 MHz; Macintosh LC 630 and Macintosh Performa 630—Motorola MC68LC040 processor running at 66/33 MHz

• RAM: 4 MB built in; expandable to 36 MB by means of one 72-pin SIMM

• ROM: 1 MB on the main logic board

• case design: modular, low-profile, designed to rest under an external video monitor

• monitor support: built-in video interface provides up to 16 bits per pixel at a resolution of 640 by 480 pixels on Apple monitors of up to 15 inches, plus up to 8 bits per pixel at a resolution of 800 by 600 pixels on the new Apple Multiple Scan 15 Display

• video input: optional NTSC, PAL, and SECAM video card for real-time video display, capture, and overlay

• TV receiver: optional internal TV tuner

• video output: optional video output (NTSC or PAL) using external "drop box" (external interface box that connects to computer's DB-15 video-out port)

• remote control: built-in infrared remote control

• hard disks: one internal 250 or 350 MB 3.5-inch IDE (integrated-drive electronics) hard disk, depending on the model; external SCSI port for additional SCSI devices

• floppy disk drive: one internal 1.4 MB Apple SuperDrive floppy disk drive

• CD-ROM drive: optional double-speed, tray-loading, internal CD-ROM player

• standard Macintosh I/O ports: two serial ports, sound input and output ports, a SCSI port, and an ADB port

• communications slot: optional internal card can provide either a modem or an Ethernet interface

• sound: external port for stereophonic sound (mixed to monophonic) input; front and rear ports for stereophonic sound output; single built-in speaker; integrated 16-bit stereo playback from CD-ROM player

• expansion slot: accepts most processor-direct slot (PDS) cards designed for the Macintosh LC series, Macintosh Quadra 605, and Performa series of computers

• power switch: controlled from keyboard and from remote control; reset switch on back panel

Processor Clock Speeds

The MC68040 and MC68LC040 use two processor clocks: one for the system bus and another, at twice the speed, for the internal processor. In the Macintosh 630 series computer, the system bus clock runs at 33 MHz and the internal processor in the MC68040 and MC68LC040 runs at 66 MHz.

Access to the Logic Board

Just above the I/O connectors on the back of the computer are two projecting tabs. By pressing down on the tabs, users can remove the back panel and pull the logic board out. This design allows users to add extra memory or any of the video and communications cards designed for the Macintosh 630 series computers.

Apple Video System

The video input card in the Apple Video System accepts video from an external source and displays it in a window on the computer's screen. The video input card has the following features:

• video input in NTSC, PAL, and SECAM formats

• connectors for stereo sound, composite video, and S-video

• video display in a 320-by-240-pixel window

• pixel doubling for 640-by-480-pixel full-screen display

• video overlay capability

• movable and resizable window

• YUV or RGB format for digitized video

• a DAV (digital audio/video) connector for adding a video processor on an expansion card

The video input card provides audio-visual features similar to those of the Macintosh Quadra 660AV, with one key improvement. Where the Macintosh Quadra 660AV converts color video into a 16-bit RGB format, the video input card uses a digital YUV format. Because a standard television signal has more information in its luminance (intensity) channel than in its chrominance (color) channels, digitizing the video signal as YUV format results in a clearer picture.

The video input card can accept video input from either an external device such as a VCR or camcorder, or from the internal TV tuner card. The external device can be connected to the video input card either through the composite video adapter or the S-video connector.

The default window size is 320 by 240 pixels; you can resize the window to up to 640 by 480 pixels—the full screen on a 14-inch monitor. The large image uses pixel doubling of the 320-by-240-pixel image.

The video input card does not support monitors with screens larger than 15 inches. It will support 800-by-600-pixel monitors that have a 60-Hz refresh rate.

The video input card plugs into a dedicated slot on the main logic board. The slot connector is a 60-pin edge-style connector. The card fits only in its proper slot and in the proper orientation so that users cannot install it improperly.

The video input card has a separate connector called the DAV (digital audio and video) connector. The DAV connector provides access to the video input card's 4:2:2 unscaled YUV video input data bus and associated control signals. By means of a cable to the DAV connector, an I/O expansion card can gain access to the digital video bus on the video input card and use it to transfer real-time video data to the computer. Such an I/O expansion card could contain a hardware video compressor or other video processor.

Apple Video/TV System

The TV tuner card turns the computer into a television receiver, complete with remote control. The features of the TV tuner card are similar to those of the TV tuner in the earlier Macintosh TV computer with two primary improvements: The television picture can be viewed in its own window on the desktop, and the television signal is carried in YUV format for improved color definition.

Here are the features of the TV tuner card in the Macintosh 630 series computer:

• versions for NTSC, PAL, and SECAM

• ability to tune 181 broadcast and cable channels

• an F-type coaxial connector for a TV antenna or cable input

• television picture in a resizable and movable window

• YUV format for improved color definition

• support for closed captioning

- software password protection

- automatic and manual channel programming

- single remote control for television and for playback of audio CDs

The television picture appears in its own window, whose default size is 320 by 240 pixels. You can resize the television window up to a size of 640 by 480 pixels or down to a size of 160 by 120 pixels. Larger or smaller window sizes are obtained by sample rate conversion. The TV tuner card creates a 640 by 480 pixel window using pixel doubling.

The TV tuner card works in conjunction with the video input card, which converts the video data into digital YUV or 16-bit RGB format and stores it in the display buffer.

The Apple TV/Video System comes with

- a video input/TV tuner card

- a remote control

- the Apple Video Player application

- VideoShop (shipped in the United States and most other countries)

You can customize the operation of the TV tuner by adding or removing television channels that are unused or unwanted. The computer can program the channels automatically, scanning through all available channels and disabling those that do not have a valid signal. When you then scan for the next channel using the remote control or the Tab key, the tuner skips the disabled channels.

The software that supports the TV tuner card is the Apple Video Player application. It includes password protection for the disabled channels, a feature parents can use to prevent children from watching undesirable channels. Apple Video Player has several other advanced features, including the ability to capture or freeze a single frame of video or record a short segment of video as a QuickTime movie.

Why YUV Looks Clearer

You may be wondering how the digital YUV format used in the Macintosh 630 series computer provides a clearer television picture than the RGB format used in the Macintosh TV computer—after all, picture information can be freely converted between the two formats.

The difference is due to the way the bits are allocated. The RGB format used in the Macintosh TV computer is a 16-bit format using 5 bits each for red, green, and blue, with the remaining bit unused. The YUV format used in the Macintosh 630 series computer is also a 16-bit format (encoding is analogous to what is done in television systems), giving better luminance resolution (8 bits per pixel) at the expense of less chrominance resolution (U and V are only 4 bits per pixel). Since the human eye perceives luminance resolution better (using rods) than chrominance resolution (using cones), the YUV format picture appears clearer.

Apple Presentation System

The video output drop box (the hardware component of the Apple Presentation System) is an external module that can be used with any Macintosh model that has a 15-pin video output connector. This module converts RGB and system signals to the appropriate composite video NTSC or PAL signals for a separate television screen. The video output can also be recorded on a VCR.

A standard television monitor uses overscan; to ensure that the entire screen is filled, the image is larger than the screen, causing the outer parts of the picture to be cut off by the edges of the screen. The video output module provides a video signal with a 640-by-480-pixel display inside the television's "safe display" area, so that no information is lost.

The video output module supports video mirror mode. In that mode, the image on the television screen is the same as that on the computer's primary monitor. That mode of operation is appropriate,

for example, for presentations, so that the audience and the presenter can see the same displays.

Apple expects to provide separate video output modules for NTSC and PAL systems.

Communications Cards

The main logic board in the Macintosh 630 series computer has a communications slot that is compatible with the communications slot first introduced in the Macintosh LC 575 computer. The slot allows the computer to support a communications card without occupying the expansion slot.

The communications slot in the Macintosh 630 series computer supports all communications cards developed for the Macintosh LC 575, including

• the Apple Ethernet CS Thin Coax Card

• the Apple Ethernet CS Twisted-Pair Card

• the Apple Ethernet CS AAUI Card

• the Macintosh Fax Express Modem

Expansion Slot and Compatibility Issues

The I/O expansion slot in the Macintosh 630 series computer is compatible with the processor-direct slot (PDS) in the Macintosh LC II and LC III family of computers, but it is not actually a PDS—it does not directly access the processor. Like the expansion slot in the Macintosh LC 475 and the Macintosh Quadra 605, the I/O expansion slot in the Macintosh 630 series computer supports many PDS cards designed to operate with the MC68030 bus, including bus masters, such as Ethernet expansion cards, and bus slaves, such as display cards.

While the I/O expansion slot accepts PDS cards designed for the Macintosh LC II and LC III, some of those cards are not supported. Here are some types of cards that are incompatible with the I/O expansion slot:

• Cards designed to work as coprocessors with an MC68020 or an MC68030 or as replacements for those processors. Such cards include accelerators, 68882 FPU cards, and cache cards. That type of card won't work because the processor is different and because the slot signals are not connected directly to the processor. The Macintosh 630 series has superior performance over these cards; therefore, they have little utility in a Macintosh 630 series.

• Cards with drivers that include incompatible code. Some drivers that do not follow Apple's programming guidelines won't work on computers that use the MC68LC040 processor. For example, some of those drivers write directly to the cache control register in an MC68030. Such code won't work on an MC68LC040.

• Cards with drivers that include code to check the gestaltMachineType value and won't run on a newer Macintosh model. The idea of such code was to protect users by not running on a model that the cards haven't been tested on. Such cards have compatibility problems with all new Macintosh models.

The Macintosh 630 series computers do not support the Apple IIe Card for the Macintosh LC computer.

Architecture

The architecture of the Macintosh 630 series computer is based on the architecture of the Macintosh Centris 610 and Macintosh Quadra 610. This architecture has two internal buses. The system bus is connected directly to the MC68LC040 processor and runs at the same clock speed. The I/O bus is partially buffered from the MC68LC040 and runs at a 16-MHz clock speed. A custom chip buffers the data portion of the I/O bus and provides a compatible interface for I/O devices and software designed for use with the MC68030 processor. The Macintosh 630 series computer supports 32-bit addressing exclusively.

Processor

In the Macintosh Performa 630 and LC 630 series computers, the MC68LC040 processor is installed in a socket. This allows customers to upgrade the computers by removing the MC68LC040 from its socket and replacing it with the MC68040. This does not void the warranty.

Bus Arbitration

The system bus can support one or two bus masters, including the MC68LC040 main processor and one I/O bus master. The I/O master has higher priority. Either bus master can control the bus as long as no higher priority master requests it.

Display RAM

The display memory in the Macintosh 630 series computer is separate from the main memory. To reduce the cost of the computer, the display memory is implemented with dynamic random-access memory (DRAM) devices instead of more expensive video RAM (VRAM) devices. The display memory consists of 1 MB of 60-nanosecond (ns) DRAM devices configured to make a 32-bit data bus. The display memory cannot be expanded.

The display memory contains three separate frame buffers. The first frame buffer holds the graphics data—the display that is generated by the computer. The other two frame buffers hold video data from the video input card. The video data frame buffers are used alternately: While one is supplying data to be sent to the monitor, the other is receiving the next frame of video input.

The display data generated by the computer can have pixel depths of 1, 2, 4, 8, or 16 bits for monitors up to 640 by 480 pixels, and 1, 2, 4, or 8 for larger monitors and for the 800-by-600-pixel display on a multiscan monitor. Data from the video input card is always stored

and transferred at 16 bits per pixel. The video frame buffers support live video in a 320-by-240-pixel frame at 30 frames per second.

4Because the Macintosh 630 series computer cannot display live video from the video input card on monitors larger than 800 by 600 pixels, Apple does not recommend the use of higher resolution monitors with this computer.

IDE Hard Disk

The Macintosh 630 series computer has an internal hard disk that uses the standard IDE (integrated-drive electronics) interface. This interface, used for IDE drives on IBM AT–compatible computers, is also referred to as the ATA interface. The implementation of the ATA interface on the Macintosh 630 series makes use of logical block addressing (LBA), which makes the computer compatible with IDE drives that have capacities greater than 512 MB. Some older IDE drives may not support LBA and so are not compatible with the Macintosh 630 series.

SCSI Bus

The Macintosh 630 series computer has a SCSI bus for the internal CD-ROM player and a SCSI connector on the back panel for one or more external SCSI devices.

Sound

Like other Macintosh computers, the Macintosh 630 series computer can create sounds digitally and play the sounds through its internal speaker or send the sound signals out through the sound output ports. The Macintosh 630 series computer can also record sound from several sources: a microphone connected to the sound input port, the video input card, or a compact disc in the CD-ROM player.

The Macintosh 630 series computer has two sound output ports, one on the front and one on the back. Both output ports are connected to

the sound amplifier; the port on the front is intended for headphones. Inserting a plug into either port disconnects the internal speaker.

The Macintosh 630 series computer has a sound input port on the back for connecting an external microphone or other sound source. The sound input port accepts a standard 1/8-inch phone plug, either monophonic or stereophonic (two signals plus ground).

The sound input port accepts either the Apple PlainTalk Microphone or a pair of line-level signals. A custom chip mixes the stereophonic signals into a monophonic signal.

The Apple PlainTalk Microphone requires power from the computer, which it obtains by means of an extra-long, four-conductor plug that makes contact with a 5-volt pin inside the sound input port. Due to its low output level, the microphone used by the Macintosh LC and LC II does not work with the Macintosh 630 series computer.

Routing of the Sound Signals

Sound input signals on the Macintosh 630 series computer can be routed in two ways: They can be recorded (digitized) or they can be sent directly to the sound output ports and speakers.

The current sound mode is set by a call to the Sound Manager. The sound circuitry normally operates in one of three modes:

• sound playback: computer-generated sound is sent to the speaker and the sound output ports

• sound playback with playthrough: computer sound and sound input are mixed and sent to the speaker and the sound output ports

• sound recording with playthrough: input sound is recorded and also fed through to the speaker and the sound output ports

When recording from a microphone, applications should inhibit playthrough to prevent feedback from the speaker to the microphone.

The Macintosh 630 series computer can record sound at either of two sample rates: 11K samples per second and 22K samples per second. The sound circuits include input and output filters with switchable cutoff frequencies that correspond to the two sampling rates: 3.5-kHz cutoff for the 11K sample rate and 7-kHz cutoff for the 22K sample rate.

The sound system always plays samples at the 22K sample rate; when playing samples recorded at the 11K sample rate, the software writes each sample to the sound buffer twice.

RAM Expansion

The Macintosh 630 series computer comes with 4 MB of system RAM on the main logic board. You can expand the RAM up to a maximum of 36 MB by plugging in one 72-pin SIMM.

The video display buffer uses separate on-board DRAM. The display DRAM cannot be expanded.

The single SIMM slot can hold 1, 2, 4, 8, 16, or 32 MB of memory. This gives the Macintosh 630 series computer memory configurations of 4, 5, 6, 8, 12, 20, and 36 MB. The access time of the DRAM devices must be 80 ns or less.

ROM Software

The ROM in the Macintosh 630 series computer is based on the ROM for the Macintosh Quadra 610 and 650 models, with the necessary changes to support model-specific hardware.

The ROM code has been modified to support the memory addressing used by the Macintosh 630 series computer. ROM code determines the size of memory and sets up the memory-management unit (MMU) to make the memory addresses contiguous. The ROM includes descriptions of the memory space needed for setting up the MMU.

The ROM code also creates the physical-space tables the computer needs in order to run virtual memory. The computer uses the 32-bit Memory Manager and runs in 32-bit mode.

System Software

The Macintosh 630 series computer requires System 7.1.2 or a later version of system software. The disk labeled Install Me First includes a system enabler file that contains the resources the system needs for starting up and initializing the computer.

The system disk includes an installer application that installs the control panels for the new features of the computer.

The system software includes the following new features:

• system enabler for these computers

• Power Saver control panel

• video-input digitizing component (to support QuickTime digitization of video)

IDE Software

Support for IDE hard disk drives is incorporated into the ROM software. System software for controlling IDE hard disk drives is included in a new IDE device driver and the ATA

Manager.

At the system level, the IDE device driver and ATA Manager work in the same way that the SCSI Manager and associated SCSI device drivers work. The IDE device driver provides drive partition, data management, and error-handling services for the operating system, as well as support for determining device capacity and controlling device-specific features. The ATA Manager provides an interface to the IDE hard disk drive for the IDE device driver.

IDE hard disk drives appear on the desktop the same way SCSI hard disk drives currently do. Except for applications that perform low-level services, such as formatting and partitioning utilities, applications interact with the IDE hard disk drives in a device-independent manner through the File Manager or Printing Manager.

The IDE software for the Macintosh 630 series computer supports synchronous data transfers only.

Conclusions

The Macintosh 630 series computers put an innovative new video architecture and 68040-family power into a more affordable package, thus bringing the Macintosh computing experience to even more people. Whether you are developing software or hardware, these computers give you new opportunities to create innovative products. ®

The Emerging Asian Software Market

Investing Today for Big Returns Tomorrow

By Doug Nelson, Market Development Manager, Apple Far East

Just the thought of the more than 2 billion people in Asia buying computers is enough to quicken the pulse of the most conservative marketing manager. As these countries rapidly modernize, they'll need billions of dollars of software and hardware solutions to catch up with other industrialized nations.

The testimonials of companies who have ventured into this market are fairly consistent: Selling in Asia will consume more time, money, and patience than you'd ever anticipate. But if you sit on the sidelines, you could miss the biggest business opportunity of your generation.

Today the Macintosh is the second most popular computer in Japan, and Japan is Apple's largest market outside of the United States. At Apple Far East, we're working to replicate this success in key Asian countries. Having great localized Macintosh products in these countries is essential to reaching this goal. And to this end, we're proactively helping developers enter these markets. This article explains why we think the Asian region offers Macintosh developers a high-growth, high-reward opportunity, and it tells how Apple Far East can help you break into this market. (This article focuses on opportunities in Apple Far East's sales region, which includes Bangladesh, Guam and Micronesia, Hong Kong,

India, Indonesia, Korea, Laos, Malaysia, Nepal, Pakistan, China, the Philippines, Singapore, Sri Lanka, Taiwan, Thailand, and Vietnam. For recent Japanese market data, see "Power Macintosh Market Outlook," pg. 34-35, Apple Directions, April 1994.)

Betting on Long-Term Growth

Though the Asian computer market is not large right now, it is growing rapidly as these countries catch up with the industrialized West. For software and hardware developers, the potential can be summed up in three simple bullet points:

• 2 billion consumers

• rapidly growing economies

• very little competition

Of course, of those 2 billion consumers, few have the financial means to buy computers today. The important point is, if you're a Macintosh developer willing to make an investment in the worldwide growth of your company, the pay-back could be big. Really big. And because recent system software changes have made it easier than ever to localize Macintosh software, once you've localized for the Japanese market, it's much easier to localize for other Asian countries.

And finally, when you're trying to justify an Asian investment, look for parallels between the Macintosh market in emerging Asian countries and the Japanese market five years ago. Most of the developers who are reaping the rewards in the Japanese market today invested early and benefited from a time-honored law of marketing: It's easier and less expensive to gain market share and brand awareness in an emerging market than a mature one.

The Big Apple in Asia

Apple Computer is making significant inroads into the Asian market. This year the Far East region is Apple's fastest growing market, with about a 50-percent unit shipment growth over last year and an installed base of more than 250,000 Macintosh computers. (This doesn't include the million-plus computers that have been shipped to Japan.)

Because it's made some important Asian infrastructure and software technology investments made during the last couple of years, Apple Computer, Inc. expects rapid growth to continue in this region. As a result, Macintosh developers can benefit from these advantages:

• The best Chinese-language computing platform. The Chinese version of the Macintosh operating system is fully localized for simplified Chinese (China and Singapore), traditional Chinese (Taiwan and Hong Kong), Korean, and Thai languages. Great pains have been taken to ensure that these versions are authentic in look and feel. In fact, in creating the simplified Chinese version, Apple worked with localizers in mainland China to verify its authenticity, since experience has shown localizers in Hong Kong or Taiwan sometimes miss the local nuances used in mainland China. Operating-system features such as vertical scrolling and the proper handling of two-byte characters give Macintosh systems the native feel that users in this region appreciate. (See "The Importance of Localization" for more information on localizing your applications.)

• Leading price/performance computers. Asian consumers are price-sensitive, and the arrival of high-performance/low-cost Power Macintosh computers should rapidly expand the installed base and magnify the opportunities that exist for Macintosh developers. (Apple estimates that more than 25 percent of the Macintosh computers sold by Apple Far East this year will be Power Macintosh computers.)

• A strong Apple marketing presence in Asia. Apple Far East is building a strong regional team that's making it easier for Asian computer users to buy Apple and third-party Macintosh products. Apple has a regional headquarters in Hong Kong and two subsidiary offices in Singapore and Taiwan. And in 1993, Apple significantly strengthened its presence in China by opening offices in Beijing and Shanghai and a computer training center at the Tsinghua University. Apple has also built up its Indian and Korean business units to increase its presence in these markets.

A Foot in the Door: Selling to English-Speaking Asia

Even if you don't have the resources to localize your product for Asian markets, you're leaving money on the table if you haven't set up distribution in the English-speaking parts of Asia. English is the primary business language of Hong Kong, Singapore, Malaysia, Indonesia, and India, and almost all the systems and applications sold in these countries are based on English.

What makes Macintosh computers so attractive to users in these multilingual regions of Asia is the availability of Apple's Japanese and Chinese Language Kits. (The Korean Language Kit is currently under development, but no introduction date has been announced.) With these kits, multilingual users in Asia and other parts of the world can easily input, display, and print text from different languages on a single system. No other personal computing platform (including DOS/Windows and UNIX) provides the same multilingual flexibility. And this flexibility means you benefit from a larger worldwide Macintosh market

when you localize or make your application "WorldScript-savvy"—in other words, when you use WorldScript application programming interfaces (APIs) to create software that can handle all the complexities of different written languages, such as contextual formatting and right-to-left scripts.

The Importance of Localization

Though selling your English-language products in Asia is a good first step, we can't overemphasize the importance of localizing versions of your product.

"It used to be acceptable to ship your localized product versions 12 to 14 months after a U.S. introduction. But now consumer expectations are higher, and to keep from losing competitive ground, you need to release these versions as soon after your English version as possible. The only way to do that is to plan for rapid localization from a product's inception," says Roger Gulrajani of Aldus.

First and foremost, you need to design your applications to support two-byte characters. By providing this support in your core product from the beginning, it will be much faster and easier to create versions for other Asian countries.

And what exactly does "two-byte support" mean? A big difference between most Asian- and Roman-script languages is the storage space required for individual characters: Most Western languages have one-byte character sets, while the character sets of Chinese, Korean, and Japanese require two bytes per character due to the complexity and large number of characters (for example, there are over 10,000 characters used in traditional Chinese). The representation and input methods of two-byte characters present the main obstacles to product localization. Products that aren't designed to support two-byte script systems may cause users difficulties deleting characters, sorting, and even keeping track of the cursor.

In addition to two-byte support, you need to make your applications WorldScript-savvy. The WorldScript extensions allow a single computer to use more than one script system at the same time and greatly simplify the localization process for Apple and developers alike.

Brian Coleman, director of International Sales and Marketing at Abacus Concepts, appreciates the advantages of WorldScript. "Because we followed all the rules in making our Statview product WorldScript-savvy, we saved hundreds of lines of code when we localized our U.S. version into Japanese. Other than translating all our English screen text into Japanese, we only had to change five lines of code to create the final Japanese version." According to Coleman, Statview (a data analysis application) has done tremendously well in Japan, and Abacus Concepts is considering localizing this product for the Korean, traditional Chinese, and simplified Chinese languages. Coleman adds, "Once you've localized your product for Japanese, localizing for other Asian languages is simply a matter of translating the text to the new language."

To further your competitive advantage in the Asian market, we recommend support for two other important software technologies: QuickDraw GX and QuickTime. QuickDraw GX support is important because it facilitates the manipulation and line layout of complex Asian fonts. This is critical for non-Roman languages whose text isn't read from left to right. And QuickTime is a standard technology used by Asian multimedia content developers.

Shopping for Distributors

Once you've committed to localizing your product for a specific country, your next challenge is to find a distributor. The retail channel in Asia is very different than in the United States, so you need to look for a different type of distributor. In Asia, most consumers buy software from small independent computer resellers at the same time they purchase their computers. Computer "superstores" like CompUSA and software mail-order companies are almost non-existent. (The only mail-order catalog that has ventured into the Pacific is The Mac Zone, which opened a Hong Kong office this year.) Recently we've seen a tremendous growth in retail. For example, in the last two years, the number of retail outlets in Hong Kong has grown from 5 to 33 stores.

In the United States, a distributor's primary job is to make sure that products are moved efficiently from developers to the retail channel. In Asia, it's important to find more than a box mover. You need a "value-added" distributor who can invest time and money in creating demand for your type of product—especially if your product isn't well known in a particular country. This type of "boutique distributor" typically handles everything from creating ads, to printing brochures, to running product seminars and training classes. Usually smaller and more focused than their U.S. counterparts, these distributors give you the attention needed to get a new product and market segment moving. And, of course, your distributor should have a good process for keeping your products in stock, since cost-effective methods of shipping can take weeks.

The best way to begin looking for distributors in Asian countries is work with the market development group in Apple Far East's Hong Kong office. As a first step, fax or e-mail a brief description of your product and market expansion plans to the contact listed at the end of the article. We can introduce you to reliable distributors through marketing events, road shows, and the Reseller Connection, our regular reseller/distributor mailing. And we can help you get more information about important Far East trade shows—Macworld Asia (in Hong Kong), Macworld Singapore, and China Computerworld.

The Reseller Connection is Apple's direct link with its extensive distribution network throughout Asia. It provides you with the easiest, most effective way of getting information about your product into our channel. All developers are invited to participate in this mailing—all you have to do is provide us with sufficient mailing quantities.

"Road shows" provide another opportunity for developers looking for Asian distributors. At a recent Apple Far East Power Macintosh road show, ten leading software vendors displayed their "native" Power Macintosh applications to over 3,000 customers, with excellent results. (This campaign, which was launched before the Power Macintosh introduction, targeted Asian markets with large English-speaking populations.) Developers sold many products during the tour, and several found distribution partners on the trip. All participants came away with a much better understanding of the potential of the Far East markets and how to get started. Because of the success of this event, we'll be organizing future road shows like this one. Our next road show will be held later this year and will feature products localized for the Chinese and Thai markets.

Our Reading of the Tea Leaves—Tremendous Growth Ahead

Taking the big leap over the Pacific isn't right for every developer. It takes localization and sales resources that many companies don't have right now. But for companies that can afford to make a long-term investment, the upside potential for growth and profit is extremely attractive. Developers entering this market in the near term will find a wide-open competitive landscape and a rapidly growing installed base of software-hungry Macintosh owners. If you're seriously considering breaking into Asian markets, contact the Apple Far East office. We'll help you size up the opportunities and risks, and we'll introduce you to the right local business people. ®

Doug Nelson is responsible for market development in Apple's Far East region. He is currently focused on establishing publishing centers in China and India, setting up Power Macintosh comarketing activities, and helping independent software vendors selling products in Asia. For information about this region, send requests by e-mail or fax to Doug Nelson in Hong Kong, telephone: 852-506 8864; fax: 852-506 2833; AppleLink: AFE.INFO.

(text box) How Aldus Cracked the China Market

In 1989 Aldus Corporation became the first software vendor based in the United States to localize a major software application—PageMaker—for the Chinese market. With the experience of six Chinese-language products under its belt, Aldus will soon expand into the Korean market.

Roger Gulrajani, Aldus's Pacific Rim director of sales and marketing, says that what really helped them break into the market was finding the right Asian

partners. "It takes a tremendous investment to get a new market segment like page-based publishing up and running. In the United States it took the synergy between Aldus, Adobe, and Apple. In China, Taiwan, and Hong Kong, we succeeded in carving out a niche with the help of the Apple Far East people and key distributors in each of these countries."

"In the Far East, it's important to be there in the beginning, because this market is going to really take off. But set realistic expectations—selling in China isn't a one-quarter investment with a one-quarter pay-back. It may take you 48 to 60 months to recoup your investment."

When Aldus first considered selling products in China, they found an environment similar to that of the United States before desktop publishing took off—there were no high-quality Chinese-character fonts anywhere. "We had to team up with third-party Asian font developers and get them to bundle their fonts with our product," says Gulrajani. They also ran into another unexpected font-related obstacle—they found out that users needed an expensive LaserWriter NTX printer with a 20 MB font disk to be able to print Chinese characters. (Editor's Note: Because of software technologies like TrueType and QuickDraw GX, fonts no longer have to reside on the printer, and users can print Asian fonts using inexpensive printers.)

Gulrajani offers this advice to developers considering entering this market: "Work closely with Apple's Far East and Taiwan offices. Their team was instrumental in getting us into the marketplace. They gave us valuable business advice, helped us get in touch with the right local people, and helped us get a revenue stream going. Get involved with Apple-sponsored marketing events. And most importantly, travel to individual countries so you can talk face-to-face with distributors and get a first-hand look at your competition."

(text box) Regional Asian Market Opportunities

Apple's most lucrative Far East markets are Korea, Hong Kong, Singapore, and China. Over the coming years, China, India, and Thailand are expected to grow the most rapidly. And in Korea, Taiwan, and China, fully localized software in any category is in high demand.

To help you decide which markets to approach first, we've summarized our market outlook on Asian developer opportunities. For more detailed country and distributor information, order the Apple Far East Market Guide 1994 (see the end of this article for ordering information).

• South Korea. The Apple computer market in South Korea has grown 117 percent this year (unit shipments), and it is Apple's second-largest market in this region behind Japan. This country is a global leader in electronics and automotive manufacturing, and its high literacy rate has fueled the growth of the Macintosh market. Apple's HangulTalk operating-system software provides a

solid development foundation for Korean language applications. Apple has a strong presence in South Korea's publishing and graphic design markets. By the end of this year, we predict that we'll sell more Apple systems in South Korea than in Apple's Dutch-speaking markets; and by the end of 1995, the South Korean market should surpass that of Italy.

• Hong Kong. British-administered Hong Kong is slated to return to Chinese rule in 1997, but growth remains strong as the transition approaches. Most experts feel the city-state will continue to prosper long after the Union Jack is lowered. Major infrastructure growth and an unrelenting property boom support Hong Kong in maintaining its position as one of the region's strongest economies. Apple's vertical market strengths are in publishing, graphic design, and education.

• Singapore. Singapore has emerged as an important regional center for high technology development and manufacturing. Growth of the personal computer (PC) market remains strong, with unit growth expected to average better than ten percent in 1994 and 1995. Although most of the population is bilingual, the language of business is English.

• China. As China continues to modernize at a furious pace, the demand for up-to-date technology is certain to increase exponentially. Though the PC market is still embryonic, the PC installed base is expected to grow to more than 5.5 million by the year 2000. Our Beijing and Shanghai offices are actively helping developers build relationships with government and business partners in China. Apple products shipped to China are used widely for office productivity, publishing, and multimedia applications. One obstacle to selling into China is that it has a fixed currency exchange rate, making it difficult for foreigners to exchange Chinese money into other currencies at fair market rates. This currency situation, however, is expected to improve in the future.

• Taiwan. Despite its relatively small geographic size, Taiwan has created one of the region's biggest economies. The installed base of PC users is expected to surpass 2.1 million in 1995, and there's a strong market for advanced Chinese-language applications. Apple is strong in Taiwan's education and business productivity markets.

• India. India is a country of amazing contradictions and incredible potential. India's literacy rate is only 52 percent, but the country boasts more university graduates that any other nation. The PC market is still relatively small in India due mainly to prohibitive import tariffs that have made foreign machines too expensive. These restrictions have been substantially eased in the past year, along with software tariffs. (In 1994 import duties on software fell from 85 to 20 percent.)

(text box) For Further Reading

Apple Far East Market Guide 1994. This report provides an overview of the personal computer market in emerging Asian countries. It includes market growth projections, distributor names, and Apple contacts who can help you learn more about specific country markets. To order this document, send your name and address by e-mail or fax to Doug Nelson in Hong Kong, telephone: 852-506 8864; fax: 852-506 2833; AppleLink: AFE.INFO.

China—A Wall Street Journal Report (December 10, 1993). This 20-page reports offers valuable market information, advice, and contact names for businesses evaluating the Chinese market. You can obtain reprints of this report by mailing a check for $2.00 per copy to:

China, Dow Jones & Company, Inc., 200 Burnett Road, Chicopee, MA 01021, (413) 592-7761

China Business Strategies for the '90s by Arne J. De Keijzer (Berkeley, CA: Pacific View Press, 1992). This book provides information on the Chinese business climate, trade policies, and equity ventures, and offers advice on how to enter this market. It uses case studies to illustrate important points.

eWorld Marketing Opportunities

By Arwyn Bryant, eWorld Services Manager

No matter what type of computer-related product or service you sell, Apple can now offer you inexpensive access to a large global community of Macintosh and Newton users through eWorld, our new online service.

eWorld for Macintosh is an online service with a unique personality. Its top-level interface is modeled after a "town square," providing subscribers with friendly access to information and services. People locate specific topics by clicking on an icon of a building where they might find that information in real life. For example, they click on the Newsstand to review current events, the Computer Center for computer assistance, the eMail Center to send mail, and so on. (If you haven't had a chance to try out eWorld, see the section "Why eWorld Will Make Your Customers :) " .)

While selling products or services through any commercial online service can make and save your company money, eWorld offers Apple developers several advantages.

• eWorld will ship with every Apple Macintosh and Newton, so every time Apple sells a computer, you'll gain direct access to another Apple user. (eWorld

currently ships with most Macintosh computers. In-box shipments with the other systems will soon follow.)

• It provides you with some of the most efficient online publishing tools in the business.

• Its rich graphics environment allows you to differentiate your online area with your corporate identity.

• Sometime next year, you'll be able to create eWorld areas with restricted access and transaction services, enabling you to implement new revenue-generating services.

• Many of eWorld's charges for promotional facilities are waived during the initial build-up of our subscriber base.
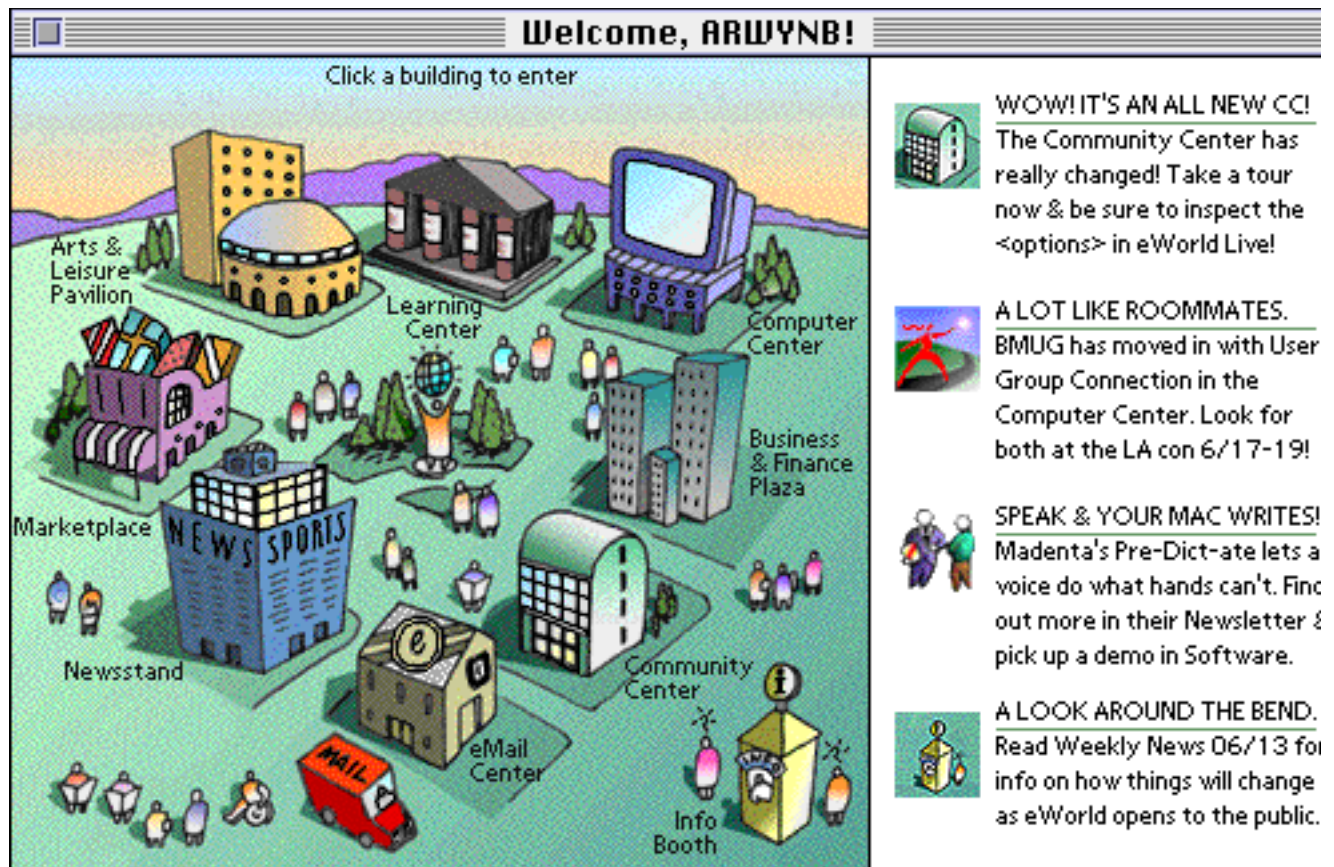
(figure) The opening eWorld screen is modeled after a town square, offering users a quick and friendly way of finding information they need. Throughout, the interface uses color-coded organizational schemes, a carefully designed language of icons representing standard eWorld functions, and thoughtful sound integration that provides helpful feedback.

Using eWorld to Reduce Marketing and Support Costs

You're probably familiar with the advantages of using online services to reach customers and prospects. You get your product information in front of computer owners eager for advice on what software to buy—without expensive mailing costs. You reduce marketing collateral costs by providing prospects with convenient online product information. And, if you provide support services online, you decrease support costs and gain quick access to customer feedback.

With eWorld's global reach, you'll be able to provide your customers with a consistent level of worldwide support at very competitive costs. E-mail and posted information eliminates many expensive support calls. Your customers will have access to support information around the clock, from any time zone. And you'll avoid having to hire redundant product experts in multiple countries.

Claris Corporation recently began supporting its customers through eWorld. Nydia Estrada, a technical support manager there, says her company handles about 40 percent of all support transactions through eWorld, America Online, CompuServe, and Claris's BBS. "Using online services has made it possible for us to service our customers more efficiently and reduce costs considerably. With a cost-per-call industry average of $25, you need to look at how to service your customers better and be cost-efficient at the same time."

The eWorld Developer Advantage

Though it may make sense for you to maintain a company presence on more than one online service, we think you'll find that eWorld requires less administrative overhead and provides a richer, more flexible promotional environment than other commercial services.

Kennedy Brandt of SuperMac Technical Services sums it up best: "It gives our company a tremendous amount of organizational control over our product information, and it presents it to our customers in a very attractive and accessible way. I've published information on three other major online services, and eWorld is by far the best."

Whether you're promoting or providing support online, here are some unique eWorld features you can benefit from:

• Access to more new computer owners. Since all Macintosh and Newton systems will be shipped with eWorld software, you'll be able to reach millions of new users each year—an audience that's likely to buy a lot of computer-related

products in the first few months of ownership. And in 1995, eWorld is expected to be available to Microsoft Windows users too.

• Access to your existing customers. An extensive marketing program to sign up existing Apple customers will provide you with another venue for promoting Apple-compatible product upgrades and support services. And you'll soon be able to communicate with all Apple employees and the Apple development community, since AppleLink's 60,000 subscribers will move to eWorld in the coming year. (See "The AppleLink-to-eWorld Transition" for details.)

• Global reach. Apple has announced plans to make eWorld a worldwide service. A Worldwide English version will be made available in many countries this year; and Japanese, French, and German versions of eWorld are expected to come online in 1995. Worldwide operations are possible because of eWorld's distributed architecture. This architecture supports multiple languages for both content and publishing applications, a global/local content model that allows publishers to reach a global market and still post information of local interest, and local access points that save global subscribers long-distance calling costs.

• Better publishing and administrative tools. eWorld engineers have designed publishing and content-maintenance tools that simplify the creation and management of online information. There are tools that allow publishers to easily design and prototype new online products. And later in 1994, we'll release tools that enable seamless, regular data updates from a publisher's hard disk to eWorld's global server infrastructure.

• Restricted information access. Another advantage to using eWorld is the "Views and Permissions" facility that will be added over the coming year. This facility will enable you to limit access of specific information to specific groups of users. You can use this feature to provide sensitive information to development partners or to provide value-added information, such as support information, to users who pay an additional fee.

• A more effective selling environment. One of our eWorld design priorities was to provide vendors and information providers with the richest possible online promotional environment. Today you can customize and graphically differentiate your product and service screens. In the near future, eWorld will provide you with an online facility that allows subscribers to send in their credit card information and order products directly from you. (A pilot test of this capability will be conducted sometime in 1995.)

• Potential for inexpensive software updates. Future application programming interfaces (APIs) and system enhancements will make it easier for developers, especially Newton solution providers, to automatically distribute software revisions online.

• A focused conduit for customer communication. The eWorld online service provides you with a convenient way to reach a large number of your customers.

You can use it to query customers for feedback on your products, stage interactive conferences between your customers and staff, and organize worldwide discussion boards that encourage customers to help one another.

eWorld Value-Added Opportunities

Our flexible eWorld software framework presents enterprising developers and information providers with many opportunities to generate incremental revenues for their products and services.

"We're currently developing Macintosh and Newton APIs that will give developers the tools to evolve eWorld into the premier communication service of the decade," said Richard Gingras, the manager of Apple Online Services' Worldwide Services Group.

These APIs, due out in 1995, will help you create eWorld extensions that enable you to do things like the following:

 • Access data from remote servers. You'll be able to write a script that automatically moves data to and from eWorld. For example, you could develop an intelligent agent (software that carries out a task without your intervention) that periodically downloads stock quotes from eWorld to a firm's portfolio analysis program. And with the proliferation of information available online these days, there's a real need for more "intelligent" services that help people conduct periodic searches for specific information on remote servers.

• Embed eWorld mail capabilities into applications. By integrating eWorld mail capabilities into your applications or forms, you'll be able to automatically receive critical information from subscribers, such as credit card approvals or computer configurations.

• Add an online component to your applications. You could sell applications for which new content modules (for example, the latest tax tables) are automatically downloaded to a customer's desktop on a regular basis. This approach would extend the usefulness of a customer's original application, while providing you with a new revenue stream.

The Newton Connection

Another unique aspect of eWorld is that it's integrated with the Newton family of personal digital assistants. NewtonMail, eWorld's messaging service for Newton, ships on every Newton from Apple and its licensees. Each eWorld account, password, and mailbox allows cross-platform access from eWorld for Macintosh, NewtonMail, and future eWorld versions (including eWorld for Windows). This means Newton owners can pick up their eWorld mail while

they're on the road, and they can easily exchange text messages with users on Internet or other online services.

Using the forthcoming NewtonMail APIs, you'll have some great opportunities for creating custom mail-enabled solutions. These APIs will enable you to integrate NewtonMail capabilities into your applications, easily update data within these applications, and download entire applications via NewtonMail.

eWorld Promotional Options

eWorld provides you with two main ways to promote your products and services. The most visible option is to set up a Vendor Booth in the "Straight to the Source" section of the Computer Center. (There's a screen shot of a typical Vendor Booth on this page.) This is a dedicated area where you can promote and support your company's wares. On a screen customized with your company's graphics, you can post items such as your company newsletter, support information, product discussions, a product demo library, and software updates.

(figure) In eWorld's Computer Center, you can post your product information within the Info & Samples area for no charge or establish a Vendor Booth in the highly visible Company Connection section.

To qualify for a Vendor Booth, you have to assign one person to take responsibility for creating, promoting, and maintaining your eWorld booth in accordance with our guidelines. This task also entails keeping information current, regularly monitoring discussion boards, and promptly answering customer questions. Setting up a Vendor Booth requires a one-time fee of $500. Upon acceptance, you'll be sent a Vendor Booth Construction Kit that includes publishing tools, manuals, eWorld publishing guidelines, and one eWorld account free of connect-time charges.

The second marketing alternative is to post your company's information under the Info & Samples icon, which is also in the "Straight to the Source" section. In this area, any computer-related vendor can post information in specific categories, such as Business Software, Games, Utilities, and so on. This option requires very little effort on your part, but still offers subscribers 24-hour access to your company information.

Other promotional opportunities abound for developers publishing in the Computer Center. You can post important announcements in the What's Hot area, a revolving Calendar of Events, or our monthly newsletter that is provided online to all our subscribers. You can even set up a special company conference to help publicize a new product or major event. (For an overview of all these options, review the chart on page X.)

The Best Town in Cyberspace, With Your Help

With eWorld, Apple has tried to build a new interactive world that makes it easier for people to find information they need, meet new people, and explore. Apple's aim is to turn each subscriber's computer into a window opening onto the world. By bundling eWorld with our computers, we'll get a lot of people to try it out. But we realize the real challenge is filling our community with great content and interesting people. Only with your support and your quality content will eWorld become the best interactive town in cyberspace. ®

Arwyn Bryant is an eight-year Apple globetrotter. He's worked for Apple Australia, Apple Japan, and now Apple's Cupertino headquarters. As eWorld services manager at Apple Online Services, he's responsible for developing content and services for eWorld's Computer Center. You can reach him online through eWorld at ArwynB or through AppleLink at Bryant.A.

(text box)The AppleLink-to-eWorld Transition

Over the course of the next 12 months, Apple will move all AppleLink subscribers to eWorld. This is good news for developers, since you'll benefit from lower service costs, access to more potential customers, and new promotional opportunities. This process will start as soon as "Views and Permissions"—the technology that allows information access to be restricted to specific audiences—is added to the service.

So what should you do while this transition is taking place? If you're actively promoting your products on AppleLink today, we suggest that you publish on both AppleLink and eWorld until the majority of the AppleLink audience has migrated to eWorld. This should occur sometime during the first quarter of 1995. If you aren't currently publishing on AppleLink at all, we recommend that you begin publishing solely on eWorld.

(text box)Why eWorld Will Make Your Customers :)

Apple's decision to move away from the nine-year-old AppleLink online service was difficult but essential in meeting subscriber needs, as well as our company's financial and technological goals. Most important, by developing our own service, we could afford to bundle inexpensive information access with every Apple computer. We also gained the opportunity to create a truly great online user experience that could evolve technically with our product line.

The development of eWorld began after extensive research of our subscribers' needs and an analysis of the features that were successful on other services. The current version of eWorld consists of a new interface and a layer of features built on top of a software architecture licensed from America Online. With eWorld, we feel we've combined the best features of existing services with the valuable lessons that Apple has learned about human interface.

eWorld is extremely appealing to users. The online experience is made familiar and comfortable through the use of a consistent interface design. The interface uses color-coded organizational schemes, a carefully designed language of icons representing standard eWorld functions, and thoughtful sound integration that provides helpful feedback.

Here are some of the features of eWorld that we feel are big improvements over features of other online services:

• Easy navigation. For new users, there's a friendly top level and a second level with informative descriptions of the content below. And experienced users can move quickly to familiar areas with "shortcut" key combinations.

• Consistent interface guidelines. New publishers on eWorld receive a manual of "zoning regulations" that defines presentation and design standards and keeps eWorld from amassing a confusing proliferation of icons.

• Well-orchestrated live discussions. We feel that the live discussions in eWorld have been raised to a new level through extensive host training and thoughtful online standards and guidelines. For instance, eWorld has addressed one common problem with live discussions. This problem is that every time new participants open up a live discussion window, they have to interrupt the discussion to quickly get up to speed on the topic and direction of the conversation. The solution: During eWorld discussions, hosts automatically send new participants a welcoming executive summary of the discussion in progress.

Roger Smith at CE Software is enthusiastic about eWorld's conference design: "I manage all the online services on which CE Software participates, including America Online, AppleLink, CompuServe, Internet, and eWorld. I've found that eWorld's online discussion forums are easy to manage and easy to navigate, easing the burden of all the work I need to do."

• Robust mail service. Apple has enhanced the basic mail service licensed from America Online so that users can review who's read a message and can recall messages sent in error. Future releases of mail will incorporate many of the "industrial-strength" mail features of AppleLink, including group addresses and the ability to "auto-forward" your mail.

• 9600-baud and Internet service with no surcharges. Unlike CompuServe and GEnie, there are no additional charges for using faster 9600-baud data communication lines. And there are no surcharges for Internet mail access.

• "Net-iquette." In an attempt to keep a friendly, small-town feel to our service, we've established guidelines for conduct on the network. One example of this concerns screen names—each subscriber is allowed one consistent eWorld screen name, so users can't hide behind multiple-screen-name aliases.

(text box) eWorld Promotional Areas
This is a summary of eWorld areas that developers can use to promote their products or services. To apply for a booth, conference, or listing, e-mail an eWorld Vendor Booth and Forum Application to Kent Fillmore at the eWorld address STTS or the AppleLink address DRACO. A copy of this application can be downloaded from AppleLink [Path: AppleLink HelpDesk: Publishing in eWorld] or eWorld [in the InfoBooth].

| Areas | Description | Developer responsibilities | Costs |

Vendor Booth	A custom vendor screen	Assignment of a booth manager	$500 startup fee
	where you can post your • company newsletter • support information • product discussions • software demos and updates • company logo	who keeps information current and monitors discussions	
Info & Samples	A general area where vendors can quickly post • press releases • promotions • product information • software demos and updates	Formatting and posting of information to a restricted area	No charge at this time
What's Hot	An area listing top computer industry news, updated daily	Send your announcement to the contact listed above	No charge
Calendar of Events	A calendar of product events, training classes, and conferences	Send your announcement to the contact listed above	No charge
Company Conferences	Live online conferences, often sponsored by product vendors	Send your announcement to the contact listed above	No charge
Monthly Newsletter	A monthly online newsletter of important eWorld events made available to all eWorld subscribers	Send your announcement to the contact listed above	No charge

APDA Ordering Information

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