Inside this issue

(see)

IF YOU DON'T GET all the details right in your applications, they could be all wrong. So says human interface writer Peter Bickford.
(see)

BUSINESS & MARKETING

TWO INGRAM MICRO managers describe in this month's Marketing Feature how their company and other distributors evaluate products before carrying them.
(see)

APPLE COMPUTER is Number 1 in sales to the home market, according to two independent research firms.
(see)

(Note: Developer Outlook will return next month.)

Technology: System 7.1

By David Gleason

A long-term goal of computer technology is the seamless integration of all the world's human languages on one platform. Apple has moved a significant step closer to that dream with the release of System 7.1.

Unlike System 7.0, which dramatically changed the face of the Macintosh, System 7.1 is largely an "under the hood" set of added features that significantly enhance Apple's support of the world's most complex and diverse languages, including Japanese, Arabic, Korean, Hebrew, and many others. These changes are important in strengthening the Macintosh's position as the preeminent personal computer platform worldwide. And they greatly enhance the ability of developers to create products for markets around the world, including those that require the use of complex writing systems.

KanjiTalk 7 was released as part of System 7.1, for the first time synchronizing the release of the Japanese system with other system releases worldwide. See the article on KanjiTalk 7 in this issue.

WORLD-READY

With System 7.1, the Macintosh is now world-ready—meaning that every model of the Macintosh, in virtually every country or region of the world, will be able to run the same version of the Macintosh system software and will support the language, script, time, date, and currency formats native to that country or region. As Rick Spitz, senior director of Macintosh System Software, said, "The WorldScript technology included in System 7.1 gives the Macintosh operating system the inherent ability to support languages worldwide."

We are calling this new Macintosh capability *WorldScript* because it provides access to the full range of Macintosh script systems for anyone using System 7.1. These include single-byte scripts that support context-sensitive languages—for example, Arabic, where the shape of one "letter" can be changed by the letters before or after it. System 7.1 also supports double-byte scripts like Korean, Chinese, and Japanese, as well as a variety of input methods for these languages. (Double-byte scripts are named as such because they require two bytes per "letter.") The underlying software required for each of these input methods is now a part of Macintosh system software.

System 7.1 is thus Apple's first "reference version" of system software because it is capable of simultaneous distribution worldwide. Previously, Japan and other regions with complex languages required their own release of system software, and they were often released later than in the U.S. and Europe.

For developers, the release of System 7.1 means increased opportunities to distribute your products to markets that you previously may have considered closed because of the high cost of localization and the complexities of displaying and manipulating text in the native languages. By adding WorldScript to System 7.1, Apple has done even more localization groundwork than before, making it much easier for you to localize your product. And with Apple's standardized support of complex languages like Japanese, the user can count on a more elegant and familiar Macintosh interface.

Core System Enhancements. In addition to WorldScript, System 7.1 enhances the basic architecture of System 7 with the following items:

- QuickTime 1.5 (except Japan—see "Distributing System 7.1" below for details)
- System enablers, which (when needed) allow Macintosh models to use System 7.1, without necessitating a new version of system software
- Improved font management, including a new Fonts folder in the System Folder
- System 7 Tuner included as part of the system
- Miscellaneous performance enhancements

In addition, with the release of System 7.1, Apple has decided to discontinue users' "right-to-copy" most of the Macintosh operating system. *Apple Direct* will have more details on this new policy next month (the November/ December 1992 issue).

For specifics on the distribution of System 7.1 in various regions of the world, see "Distributing System 7.1," on this page.

QuickTime 1.5. In brief, QuickTime 1.5 provides features such as faster and better playback of QuickTime movies, support for Kodak Photo CD technology, and better performance for movies on CD-ROM and networks. Version 1.5 was made available in most markets on October 19. Look for details about QuickTime 1.5 in next month's *Apple Direct.*

System Enablers. In the past, each time new Macintosh models were released, a new version of system software was required to support them. This created a number of “current” system software versions that had no significant feature differentiation. This led to a confusing proliferation of system software versions. Despite Apple’s recommendation not to upgrade existing machines, users still did so, sometimes to maintain compatibility with the printer drivers used by other Macintoshes on a network.

Also, as new applications came to market, users sometimes found they couldn’t run the new software without a system upgrade. Furthermore, developers had to test an ever-growing number of Macintosh models with new versions of their applications for compatibility. There had to be an easier way.

With System 7.1, a single file, called a *system enabler,* can be placed into the System Folder of a new Macintosh computer to make that Macintosh run under System 7.1. Period. That’s all that’s needed. System enablers are included in all the new Macintosh computers released October 19. They are not required for any Macintosh models that were available prior to that date. In the future, new Macintosh computers will require at most a system enabler to run new system software—but generally, they will not.

System enablers help make it possible for Apple to be able to ship new Macintosh models without having to revise system software—Apple’s system software development cycle can now be independent from the development cycles of new Macintosh models. System enablers also mean that you can add new Macintosh models to existing networks without having to contend with incompatibilities among versions of system software on the network.

For developers, system enablers will greatly simplify the testing process by reducing the number of versions of system software that customers could be running on any given Macintosh model.

Apple will also use the system enabler technology to allow 32-bit addressing for the Macintosh II, IIx, IIcx, and SE/30, so that users can access more than 8 megabytes of memory. In System 7, this capability was provided by a product called Mode 32; it has been replaced, and the new enabler is required to add 32-bit addressing to the Macintosh computers listed above.

New Font Folder. System 7 gave users a simpler way of adding and deleting fonts. The old Font/DA Mover was replaced by simply dragging font suitcases into or out of the System file; PostScript fonts were placed in the Extensions

folder. The problem was that the System file could become unwieldy when a large number of fonts were added, and sometimes users were confused about why different fonts resided in different places.

Japanese TrueType fonts also presented a problem because the number and complexity of their characters resulted in huge font files—currently, Japanese TrueType fonts range in size from 5 to 8 megabytes.

Apple has introduced a better way with System 7.1. Now, the System Folder contains a new Font Folder that holds all bitmapped, TrueType, and Adobe Type 1 fonts. This makes it easier and quicker to install, locate, and delete fonts, regardless of font type; it also helps keep the user's System file down to a more manageable size.

For customers working in Japanese, Chinese, and Korean, System 7.1 support for very large fonts is limited only by the customer's disk space. The size of fonts a user can install is virtually unlimited, except that the Font folder can open a maximum of 128 files at one time (with suitcases, any number of fonts can reside on a hard disk). See the article on KanjiTalk 7 in this issue for more details.

Built-In Tune-Up and Other Improvements. Apple released the System 7 Tuner extension earlier this year to provide faster printing and other performance improvements. The Tuner features are now included in System 7.1.

QuickDraw is faster on System 7.1 (usually showing an improvement of 10 percent or more). Font management has been simplified by the new Fonts folder. And the Macintosh platform has been made more powerful and versatile with QuickTime's multimedia support. These benefits are available to all users of System 7.1 worldwide.

MULTILINGUAL SUPPORT WITH WORLDSCRIPT

System 7.1 also provides greater support for the more complex language systems via what are called the WorldScript components. System 7.1's enhancements provide unified and comprehensive support for many of the world's major languages:

• WorldScript I is a system extension that installs all the necessary support resources for single-byte script systems—including those that require

bidirectional and contextual script extensions: Thai, Arabic, Persian, Greek, and Hebrew. Roman, Cyrillic, and other simple single-byte script systems are fully supported by the base System 7.1 without need of a WorldScript I system extension.

• The WorldScript II system extension installs the necessary support resources for double-byte script systems, including traditional Chinese, simplified Chinese, Korean, and Japanese.

WorldScript II includes new Toolbox managers to provide enhanced input for double-byte languages. The *Text Services Manager* (TSM) provides support for a variety of text input methods. The *Service Window Manager* provides a floating input window for non TSM-aware applications. WorldScript II also provides an open application programming interface (API) for developers to create their own input methods. See the section on Japanese input methods in the KanjiTalk 7 article in this issue.

• The International Control Panel has been replaced by individual control panels that allow a user to alter such localizable features as date and time formats, currency symbol, number format, and sorting order.

DEVELOPER IMPACT

System 7.1 is significant to developers because, first of all, having one version of system software means that Apple will be able to bring new Macintosh models to market more quickly. These new models will provide opportunities for new products.

System 7.1's WorldScript enhancements provide standardized support for complex languages, making localization of your products easier so that your resources can be applied more to adding new features. With system enablers, you will have to do less testing for each new Macintosh model and will therefore be able to get your product upgrades to users more quickly.

Perhaps most important, you will have incentives to develop products for international markets that you may, in the past, have considered too costly too enter.

Taking Advantage of System 7.1. To take full advantage of System 7.1, you should consider the following for your applications:

• First of all, make sure your applications run properly with System 7.1. Note that the new Macintosh models (including the ones announced October 19) ship with and require System 7.1. Future extensions of system software, such as AppleScript and the Open Collaboration Environment (O.C.E.), will require the version of Macintosh system software that is current when the extensions are released (in other words, System 7.1 or later).

• If your application handles text, look closely at the text-related features in System 7.1. Use the Toolbox managers provided by the WorldScript extensions to make your application *WorldScript-aware,* meaning that users can switch to any available script within the application. Being WorldScript-aware means you allow yourself the option to expand into new markets later on—and you will have an advantage over those who don't.

If your application is not WorldScript-aware, you should make it *WorldScript-compatible,* so that if it cannot handle a certain script, the user is notified in an elegant manner—perhaps by a dialog box or by graying out the unsupported fonts in your font menus.

• If you develop fonts, you should consider expanding into non-Roman font markets (if you haven't done so already). Font-development tools need to work with the various script systems and font formats supported by WorldScript. Don't assume that fonts can fit into main memory (double-byte fonts can require several megabytes of disk space).

• With System 7.1, the LaserWriter driver has been changed to look in the Fonts folder for fonts that can be downloaded. If this affects your application—for example, if it now looks for fonts in the System folder—you may need to rewrite some code to locate the fonts that are now in the new Fonts folder.

System 7.1 allows developers to write one version of an application and have it provide access to the global market. What this means is that eventually, many developers, as well as Apple, are likely to create language modules that will allow users to work in multiple languages within one application. Features such as these will bring us even closer to the goal of the completely multilingual computer. The release of System 7.1 is a strategic step in that direction. ◆

David Gleason is a free-lance writer and former localization manager for Apple Computer, Inc.

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Distributing System 7.1

System 7.1 was announced on October 19, 1992 along with several new lines of Macintosh computers, and was made available worldwide that day. All of these new Macintosh models, beginning that day, ship with System 7.1. For the existing product line of Macintosh computers, System 7.1 will be included shortly after the October 19 announcement.

Users of System 6.x who wish to upgrade to System 7.1 have various options, depending on geographic localization, and whether the system upgrade purchase is individual or in a multipack. Users of System 7.0 in the U.S. can get a System 7.1 Update Kit.

• *System 7 Personal Upgrade Kit:* For individual users in the U.S., System 7.1 will be packaged on floppy disks. As an initial promotional offer, Apple will provide its alternative user interface, At Ease, as part of the package.

• *System 7 Multipack:* This includes a CD-ROM containing System 7.1 in the U.S. It includes network administration software and manuals. The license for the System 7 Multipack is limited to 10 users.

• *System 7.1 Update Kit:* This is a new kit designed specifically for current System 7 users. It is available only from Apple in the U.S . The System 7.1 Update Kit includes the System 7.1 floppies and a brief manual describing the differences between System 7.0 and System 7.1.

• *Site Licensing:* To provide solutions that meet their needs, Apple is also making volume licensing agreements available to large customers. With System 7.1, it will be much easier for groups and large corporations to upgrade to the latest version of system software.

• *Europe:* The System 7.1 Personal Upgrade Kit is available in Europe, localized into 21 languages. The System 7.1 Multipack is also available, localized into more than 15 languages.

• *Pacific*: In Canada, Australia and Latin America, the Pacific kits (System 7.1 Personal Upgrade Kit and System 7.1 Multipack Kit) are the same as their U.S. counterparts, with U.S.-specific information removed and relevant local information included and repackaged. In some Latin American countries, a Spanish version will be available.

• *Japan:* In Japan, KanjiTalk 7 is a fully localized version of System 7.1 with Japanese-specific features, including seven TrueType font faces, and a high-quality input method. See the sidebar on KanjiTalk 7 on page 14.

• *QuickTime:* QuickTime 1.5 is available to users in the U.S., Canada, Europe and the Pacific (other than Japan), in all of the upgrade kits listed above. In Japan, QuickTime version 1.0 is included in all the packaging options. ◆

Technology: PowerBook 160 and 180

By Gregg Williams,

A casual comment someone made about MS-DOS laptops helped me realize why everybody *instinctively* loves PowerBook computers. The remark went something like this: “MS-DOS users really want the conven- iences of a portable computer, so they’re willing to put up with a compromise in quality—a crowded keyboard, poor screen quality, things like that.”

“Willing to put up with...”! It was a moment of aha! insight for me: PowerBook users don’t *put up* with them. My PowerBook 140 (on which I’m writing this article, sitting outside in the clear September air) is just as much a Macintosh as my Macintosh II at home or my Quadra 900 at work. I can (and sometimes do) use my PowerBook all day and do not feel that I am being shortchanged. My PowerBook is a Macintosh computer that happens to weigh 6.8 pounds.

The new PowerBook 160 and 180 take all the features of the *extremely* popular PowerBook 140, 145, and 170 and add the features that customers most often asked for:

- More computing power
- A 16-gray-scale, liquid-crystal display (LCD)
- A video-out signal for external monochrome and color monitors.

The following sections describe some of the technical details of these two PowerBooks.

Improved Display. Display technology has improved measurably since the design of the PowerBook 100, 140, and 170, and both the PowerBook 160 and 180 take advantage of new technology. The fluorescent tubes (which are vertically aligned to the left edge of the display) are smaller and deliver more light for less power—enough to make the PowerBook 160 and 180 batteries last a bit longer.

The backlight consists of a sheet of transparent plastic (called a *light guide*) underneath the display, with a fluorescent tube attached to the right edge of the light guide. Light spreads across the area of the light guide and bounces off a series of bumps on the back of the light guide, going through a diffuser (to even out the light intensity) and finally through the display itself. Like the fluorescent bulb itself, the light guide in the PowerBook 160 and 180 is more efficient than before, resulting in brighter backlighting for the display.

PowerBook 160 Display. Since the PowerBook 160 uses a supertwist display and the PowerBook 180 uses an active-matrix display, we have to discuss how each display achieves its gray-shaded image. The PowerBook 160 uses the same supertwist display as the PowerBook 140 and 145—it is the video controller hardware, which drives the display itself, that is different in the PowerBook 160.

In a supertwist display, pixels can only be totally off (black) or on (transparent, letting the backlighting through), so the only way to give the appearance of shades of gray is to turn pixels on and off very rapidly. Since the human eye blurs together images that change rapidly, pixels appear lighter in proportion to the amount of time they stay on.

The controller hardware changes pixels up to 120 times a second, varying the placement and duration of the pulses to minimize any visual artifacts that the human eye might see. (If the PowerBook 160 displays large areas of a certain few gray shades, you can see a slight shimmering effect, but you have to look closely to see it.)

Another visual artifact in the PowerBook 160 supertwist display is a moderate smearing effect that is visible if an object moves across the screen quickly enough. This occurs because the supertwist liquid-crystal material used in the PowerBook 160 has a visual persistence of 125 ms (that is, it takes 125 ms—1/8 second—to change from black to transparent or vice versa).

PowerBook 180 Display. In a more whimsical mood, I might have titled this section “The Case of the Missing Gray Shade.” Even though images in the PowerBook 180 have sixteen shades of gray internally and display all sixteen shades on external monitors, the PowerBook 180 active-matrix display shows only fifteen shades of gray, including black and white (transparent). The paragraphs that follow explain why this occurs.

Because each pixel in an active-matrix display is controlled by a thin-film transistor and such transistors can accept analog input, the controller for the PowerBook 180 display can send an analog voltage to individual pixels and get not just a totally *off* (black) or totally *on* (transparent) pixel, but a pixel from a finite range of shades of gray. As it turns out, the PowerBook 180 active-matrix display can show a total of eight shades of gray, including black and white.

That's a good start, but it's still short of the engineers' goal of sixteen shades of gray.

To get extra shades of gray, the Apple engineers have the controller hardware constantly change between the two adjacent gray shades (again, up to 120 times per second). This appears to the human eye as an intermediate gray shade that is between the two adjacent gray shades. However, between eight shades of gray are only seven intermediate steps, giving a total of fifteen gray shades.

To provide the sixteen gray shades that the PowerBook 180 was designed for, Apple engineers decided to represent both white and the shade of very light gray next to it—call it *gray 1*—into white. (This is for the PowerBook 180 display only. Inside the computer, white is still distinct from gray 1, as it would be if you were to show the image on an external gray-scale or color monitor.)

The active-matrix display in the PowerBook 170 has a contrast ratio of about 20:1. On the PowerBook 180, the contrast ratio is five times greater, about 100:1. Most of this improvement comes from the addition of what is called a *black matrix,* which is a grid of fine black lines on the display that run horizontally and vertically to cover the slight gaps between pixels. This eliminates the stray light between pixels (which is visible on the PowerBook 170 display) and makes a much higher contrast ratio possible. One artifact of this improvement is that the PowerBook 180 display may seem darker to users than the PowerBook 170 display does.

To accommodate an image stored in 16 gray shades in the PowerBook 180, the PowerBook's internal video buffer has grown from 32K in the PowerBook 170 to a contiguous block of 128K in the PowerBook 180. As with other Macintosh models that support 4-bit video (16 gray shades), the PowerBook 180 display also supports 1-bit (black-and-white) and 2-bit (4 gray shades) video modes.

External Video. Most PowerBook owners wish they had this option built into their PowerBooks. (Third-party add-in video adapters do exist, but many people would rather have Apple provide this option.) Some people will use external video to make color presentations, others want to connect their PowerBooks to a color monitor when they're at work, and still others just want a bigger desktop on which to work.

The PowerBook 160 and 180 supply a video-out signal to the back of the PowerBook via a new, compact connector called a VID-14. (The PowerBook 160 and 180 include an adapter cable that will allow the PowerBook to connect to standard Apple video cables.)

Inside the PowerBook 160 and 180, the external-video circuitry was designed to "look like" a NuBus™ card in slot $E. 512K of video memory (located in NuBus slot $E's memory space) allow the PowerBook to provide 8-bit output (256 colors or shades of gray) to all Apple monitors, up to and including the Macintosh 16" Color Display. These two PowerBooks can even connect to some DOS VGA and Super VGA monitors and overhead-projector displays (if they have the an adapter cable that tells the PowerBook what type of external display is present). The only exception to this is the Macintosh Portrait Display, which displays up to 4-bits per pixel (16 shades of gray).

Normally, an extra monitor presents itself as more desktop "real estate," in which you can open more windows (this is also called *dual display*). Through a control-panel program, you can also change the PowerBook 160 or 180 to do what's called *video mirroring,* in which the external monitor presents the same image as the PowerBook. (Of course, if you've attached a color monitor, the PowerBook will display the image in color, even though the image appears in gray-scale on the PowerBook 160 or 180 display.)

PowerBook Express Modem. Starting in January of 1993, Apple will be selling its PowerBook Express Modem. With a U.S. suggested retail price of $319, this internal modem can communicate at up to 14,400 bits per second (bps) and can send and receive faxes at 9600 bps. (The Macintosh PowerBook Express Modem comes in a slightly different physical form for the PowerBook Duo version, but all the information here is valid for both the PowerBook 160/180 and PowerBook Duo versions.)

A clever design by a Paris-based team of Apple communications engineers resulted in a 14,400 bps modem at an aggressively low price. As the accompanying figure shows, the Apple engineers drastically brought down the modem's material cost by removing an expensive microcontroller and its associated memory and ROM. They replaced all this with a less expensive off-the-shelf microcontroller and associated software (about 300K of code, estimated at costing over 10 person-years of programming—yikes!). Apple feels that the best developer opportunities in relation to communications will be in

creating software that uses the features of the Express Modem to provide new communication services to the user.

Memory Cards. The PowerBook 160 and 180 can use today's PowerBook memory expansion cards if they meet the electrical and physical guidelines that Apple has set down. These "compatible" memory cards can contain up to 6 megabytes of 100 ns pseudostatic memory (PSRAM), and will incur an extra wait state on the PowerBook 180 only.

However, you can also design "fast" memory cards that work only in the PowerBook 160 and 180 and future PowerBook models. These cards can contain up to 10 megabytes of PSRAM, which can bring a PowerBook 160 or 180 to its maximum memory of 14 megabytes. However, the memory should be 85 ns memory (or faster), and you must ground the /FASTRAM signal on the card (which tells the PowerBook that this is a "fast" memory card). ◆

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That's all for the PowerBook 160 and 180. Be sure to read the strategy article in this issue of *Apple Direct.*

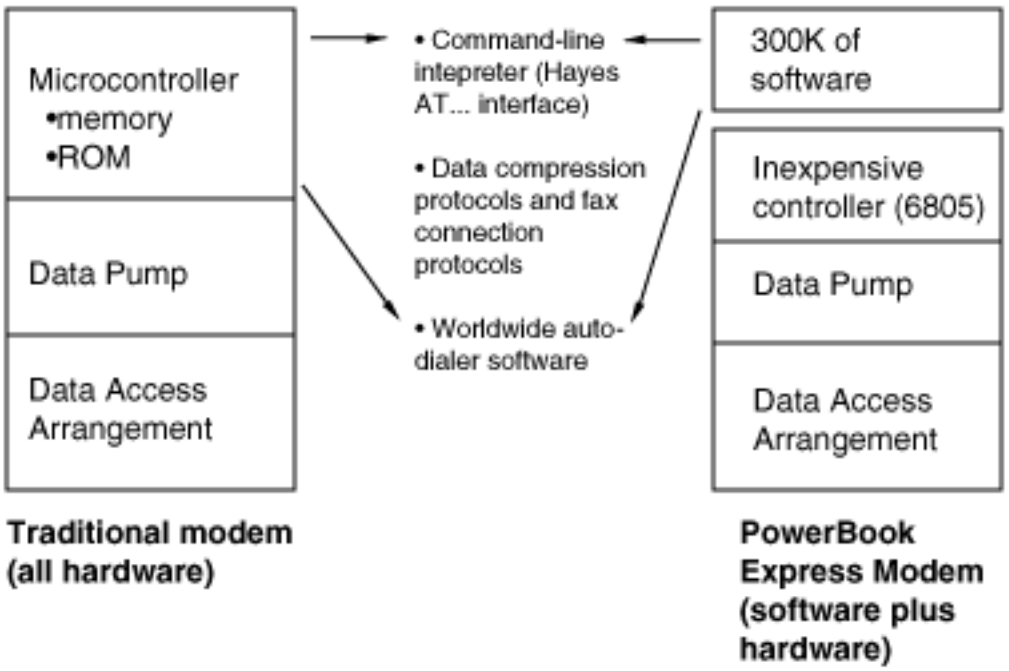

Figure 1: How the PowerBook Express Modem Differs From Conventional Modems.

Macintosh PowerBook 160 and 180 Fact Sheet

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	PowerBook 160	PowerBook 180
Micro-processor	• 68030, running at 25 MHz (can also run in 16 MHz power-saving mode)	• 68030, running at 33 MHz (can also run in 16 MHz power-saving mode)
Memory	• 4 megabytes (MB) of pseudostatic memory (PSRAM) on the motherboard and one internal memory expansion slot • Expand to up to 14 MB of memory using a single memory expansion card • 1 MB of ROM	• Same as PowerBook 160
Disk drives	• One internal 80 or 120 MB SCSI hard disk • Built-in Apple SuperDrive 1.4 MB floppy disk drive; reads, writes, and formats Macintosh, MS-DOS, OS/2, and ProDOS disks	• Same as PowerBook 160
Internal video display	• Built-in 10-inch (254 mm) diagonal monochrome liquid-crystal display (LCD) • Backlit supertwist LCD • 640 x 400 pixels • Displays 16 shades of gray	• Built-in 10-inch (254 mm) diagonal monochrome liquid-crystal display (LCD) • Backlit active matrix LCD • 640 x 400 pixels • Displays 16 shades of gray

External video display	• Built-in support for external color monitors (up to 256 colors) and gray-scale monitors (16 shades of gray) • Supports Apple monitors up to and including the Macintosh 16” Color Display	• Same as PowerBook 160
Battery	• Nickel cadmium battery • With the EverWatch Battery Saver technology, provides 2.5 to 3 hours of usage before recharge needed	• Same as PowerBook 160
Keyboard	• Built-in 63-key keyboard with standard Macintosh layout (64 keys in international version) • Two-level tilt adjustment	• Same as PowerBook 160
Trackball	• 30 mm-diameter dual-button trackball	• Same as PowerBook 160
Interfaces	• Two serial (RS-422) ports for LocalTalk networking, printers, modems, and other devices • Port for optional modem • Apple Desktop Bus (ADB) port • HDI-30 port for SCSI peripherals • Video-out port • Monophonic sound-in and sound-out ports • Hole for anti-theft device	• Same as PowerBook 160
Modem (Optional)	• Optional internal PowerBook Express Modem • Available in January 1993 • Communicates at up to 14,400 bits per second (up to 57,600 bps when communicating with a compatible CCITT V.32bis modem with V.42bis enabled) • Complies with CCITT V.42 standard, MNP classes 2-4 • Can do up to 4:1 compression using V.42bis, up to 2:1 compression using MNP-5 standard • Can send and receive faxes at 9600 bps (includes Express Fax software)	• Same as PowerBook 160
Electrical requirements	• Line voltage to AC adapter: 110 to 220 volts AC at 50 to 60 Hz	• Same as PowerBook 160
Size and weight	• Height: 9.3 in. (23.6 cm) x 11.25 in. (28.6 cm) x 2.25 in. (5.7 cm) • Weight: 6.8 lb. (3.03 kg)	• Same as PowerBook 160
Other	• CloseView and Easy Access software (for users with disabilities) • Battery and AC adapter • System Software 7.1 • Documentation and training software	• Same as PowerBook 160

Prices (U. S. Suggested Retail Price)	All models include 4 megabytes of memory • $2,429 (includes 40 MB hard disk) • $2,789 (includes 80 MB hard disk) • $3,149 (includes 120 MB hard disk) • Optional Duo Express Modem—$319 • Macintosh PowerBook Rechargable Battery—$69 • Macintosh PowerBook 4MB Memory Expansion Kit—$309	All models include 4 megabytes of memory • $3,869 (includes 80-megabyte hard disk) • $4,229 (includes 120-megabyte hard disk) • Optional Duo Express Modem—$319 • Macintosh PowerBook Rechargable Battery—$69 • Macintosh PowerBook 4MB Memory Expansion Kit—$309

Apple Enters Mail-Order Market

Apple has begun selling computers by mail via *The Apple Catalog,* which will include not only Apple products but a limited number of developers' products as well. The new direct-mail catalog will be mailed to the more than 1 million Apple customers who have returned warranty registrations cards.

The catalog, scheduled to be updated and mailed quarterly starting this month, advertises 450 products. The vast majority of the products advertised in the new catalog will be Apple computers, peripherals, supplies, and accessories.

Developers whose products complement Apple's, and can help the Macintosh provide a complete customer solution, will be considered for inclusion in the catalog. For example, the first catalog features a spread on desktop publishing which includes a variety of both Apple and non-Apple products.

If you'd like your product to be considered for *The Apple Catalog,* send literature about it to Apple Computer, Attn: AD Catalog Product Manager, 2420 Ridgepoint Drive, MS 198-CAT, Austin, TX 78754 (no phone calls or faxes, please). Apple will be unable to respond to every inquiry.

To obtain a copy of the catalog, call (800) 795-1000. ◆

Strategy: Apple’s New Products

Understanding the October Harvest

By Gregg Williams,
Apple Direct *Staff*

Personal computing technology shows no signs of slowing down, and Apple plans on staying ahead by creating leading-edge products, by constantly folding new technology—based on what customers want—into existing products, and by providing *solutions* that meet our customers’ needs.

On October 19, 1992, Apple announced a crop of ten new products: four major products in the new Macintosh Duo System, two new “all-in-one” design PowerBooks, two new members of the Macintosh II line, a higher-performing version of QuickTime, and a new “world-ready” version of Macintosh System 7.

Ten new products! Amid all the details, we lose all sense of why the products themselves exist. That’s where this article comes in; it attempts to explain the strategies behind this year’s crop of Macintosh computers and related software. (For more details about four of these products, see the other articles in this issue. Look for an extended article on QuickTime 1.5 in the November issue of *Apple Direct*.)

This article looks at these new products, who we expect will be buying them, and why. Once you know the *product,* the *customer,* and the customer’s *motivation,* you will be more able to decide what products you and your company need to develop.

OVERVIEW

These new products capitalize on the strengths of their predecessors and add features that will draw new customers into the installed base of Macintosh users:

• The Macintosh PowerBook Duo 210 and 230 are 4.2-pound (1.9 kg) notebook-sized PowerBooks that can also “dock” inside the Macintosh Duo Dock, delivering a full-featured desktop Macintosh that automatically has all the work from your notebook in it. Away from your desk, you can add the 1.24-

pound (0.56 kg) Macintosh MiniDock to connect to things like SCSI peripherals and external video monitors and floppy-disk drives.

• The Macintosh PowerBook 160 and 180 take the performance of the popular PowerBook 170 and add the features that Apple customers have asked for: a better display (with 16 shades of gray), several video-out options, two video-out modes, and other improvements. Both PowerBooks set a new level of performance for notebook-sized Macintosh computers—the PowerBook 160 is as fast as the older PowerBook 170, and the PowerBook 180 is 30 percent faster than the PowerBook 170.

• The Macintosh IIvi and IIvx include many successful features of previous models and add new features like an optional built-in CD-ROM drive—resulting in two powerful new mid-range members of the Macintosh II product line.

• QuickTime 1.5 makes movies play faster, look better, compress to smaller sizes, and work well with Kodak's Photo CD technology. (For more details, see "Multimedia Made Easier With Photo CD," on page 1 of the September 1992 issue of *Apple Direct*.)

• System 7.1 makes System 7 technology available throughout the world and sets the stage for high-quality applications in all major Macintosh markets worldwide.

The sections that follow describe the strategy behind each of these products and what developer opportunities you may want to consider.

THE MACINTOSH DUO SYSTEM

Even by itself, either the PowerBook Duo 210 or 230 is a Macintosh you'd want to own. Among its many interesting features (see Table 1 on page 5), each Duo notebook is a high-powered, full-featured 68030 Macintosh PowerBook that is 1.4 inches thick, weighs in at 4.2 pounds (1.9 kg), has a 16-gray-level backlit display, and can contain up to 24 megabytes of memory and 120 megabytes of disk storage. Add to that, though, the ability to insert the Duo notebook into a desk unit called the Duo Dock and you end up with a desktop Macintosh with a color display, full keyboard, and NuBus-based expandability. This gives you an extremely tempting combination: a full-featured, high-powered desktop Macintosh that is also a light, slim PowerBook notebook computer.

The Macintosh Duo System contains multiple parts, and customers can buy the parts that fit their needs (see Tables 1-3 in the Macintosh Duo System

article). For the richest set of options in a non-portable setting, customers will want the Duo Dock. They can also buy the Duo MiniDock to augment the Duo notebook while maintaining portability, or they can buy the PowerBook Duo Floppy Adapter if they need nothing more than connection to an external SuperDrive floppy-disk drive.

The Duo 210 and 230 notebooks achieve their light 4.2 pound weight by making the floppy-disk drive external. Both Duos come with large internal hard disks and built-in AppleTalk, and they can easily access floppy-disk drives while docked with one of the above three units. Because of these features, the absence of a built-in SuperDrive in the Duo notebook—one of its few similarities to the PowerBook 100—should not be much of an issue.

The Advantages of Duo. Convenience and peace of mind are two big advantages of the Duo system. Since your main hard disk is inside the Duo notebook, you never have to worry about whether or not the latest version of your file is on your notebook or your desktop computer. In fact, you always have *all* your files (as well as desktop layout and other preferences) with you.

Another way in which the Duo system ensures peace of mind is with its *PowerLatch* technology, which makes sure that docking and undocking is done automatically and without data loss. The first component of PowerLatch is hardware. Like the Macintosh floppy-disk drives, which automatically inject (pull in) and eject the floppy disk for you, the hardware component of PowerLatch takes the Duo notebook from you and safely inserts it into the Duo Dock. (No more wondering whether the connector is inserted correctly or whether you've accidentally bent any connector pins.)

PowerLatch also has a software component that ensures that undocking will not cause you to lose any work. (Before it undocks, it reminds you of any unsaved files and gives you a chance to save them first). The PowerLatch technology contrasts sharply with other notebook/dock systems, where you are responsible for ensuring that the docking operation has been done safely and where you have the ability to undock—safely or not—at any time.

Reduced cost is another PowerBook Duo advantage. The cost of a PowerBook Duo Dock plus either the Duo 210 or 230 notebook is considerably less than that of a desktop Macintosh plus some other PowerBook model. This is particularly important in certain business situations where it is hard to justify the purchase of a second computer. In some business and school situations,

the people who provide Macintosh computers may be able to save money by giving other users PowerBook Duo notebooks and letting them share a smaller number of PowerBook Duo Docks.

Overall quality distinguishes the Macintosh Duo System from other portable/desktop computers, most of which involve some significant compromise. Compared to a desktop computer, most notebooks have one or more shortcomings: a low-performance processor, small or hard-to-read display, cramped keyboard, or insufficient memory or hard-disk storage. Like all other PowerBooks, the Duo 210 and 230 are more capable than many desktop Macintosh models and good enough to be used all day. And when you dock them inside a Duo Dock, they get even better.

Interlude: PowerBook Duo vs. the PowerBook 160/180. Why am I suddenly bringing up the other PowerBooks within this section on the PowerBook Duo? There's a reason: The next section is on Duo developer opportunities, and you need to understand the Duo customer before you can think about the developer opportunities.

For the moment, let it suffice to say that the PowerBook 160 and 180 are based on the same architecture as the PowerBooks you already know about. (The next major section below covers the PowerBook 160 and 180 in greater detail.) Why would a customer buy a Duo notebook instead of a PowerBook or vice versa? Both are very powerful and portable, and both deliver the full Macintosh-computer experience. Many customers can buy either a Duo or a PowerBook notebook and be equally satisfied.

The key to understanding the Duo market versus the PowerBook market is not to look at what kind of work the customer does (as is the traditional way of matching a customer to the right computer) but rather *how—and where, over a long period of time—the customer does that work.*

The traditional PowerBook users are more likely to be technological nomads, working equally at several locations (like a salesperson on the road, for example) and wanting everything they normally use to be with them wherever they go. Such people are attracted to the all-in-one design of existing PowerBook models and the new PowerBook 160 and 180.

Granted, Duo/Duo Dock users, strictly speaking, also have everything they need to work wherever they are, but their pattern of usage and their priorities are likely to be different. Think of these users as "explorers" who want to take

their computing power with them (to home or meetings) and like the Duo's low weight. It's also important to note that they periodically return to a central base where they have the comforts of "home" (like color display and EtherTalk access to a network through a NuBus expansion card) and that they spend a substantial amount of time there.

You can think of PowerBook and Duo users as being at opposite ends of a continuous spectrum. On one end, the "extreme" PowerBook users are always on the move and equally at home everywhere. On the other end, the "extreme" Duo users work with a docked Duo notebook to do significant work at one location but take the undocked Duo notebook with them for the convenience of being able to work wherever they go.

Duo Developer Opportunities. Of course, any application or utility that makes sense for a PowerBook makes sense for a PowerBook Duo. This includes smaller applications that consume less memory and disk space, file-reconciliation utilities, personal information management (PIM) programs, "works" applications (which integrate a word processor, spreadsheet, list manager, drawing program, and other similar applications into one package), and power-management utilities.

The Macintosh Duo System offers several developer opportunities of its own. On the hardware side are the basic add-ins like internal memory cards; a PowerBook Duo can have up to 24 megabytes of memory. On the software side, there are opportunities for making communications-related products that build off the Macintosh PowerBook Express Modem (see the article on the PowerBook 160 and 180, on page 1, for more information on the PowerBook Express Modem). It's also probable that someone will think of software utilities that will build off Duo features and make the Duo easier to use.

The docking feature of the PowerBook Duo opens the possibility of developers creating customized computers by plugging a Duo notebook into an external hardware unit called a *dock.* Apple will publish the specifications of the 152-pin connector in the back of the Duo notebook and will license several hardware chips that greatly simplify the design of docks.

We want to encourage developers to create custom docks; one good example of a dock is Apple's own PowerBook Duo MiniDock. Specialized docks could, for example, oversee the collection of scientific instrument data, connect to an

EtherTalk network, or provide connectivity to multiple serial ports, SCSI peripherals, or floppy-disk ports.

In addition, the docking feature of the PowerBook Duo may suggest possibilities for specialized NuBus cards that will make a PowerBook Duo notebook do more when it's connected to a Duo Dock (or any third-party dock twith NuBus slots).

THE POWERBOOK 160 AND 180

With over 300,000 units purchased worldwide in the first nine months of sales, the PowerBook line of Macintosh computers has become one of the most successful product lines ever introduced by Apple. The PowerBook's ergonomic features, all-in-one design, and no-compromise Macintosh quality have all contributed to its overall success and its numerous awards.

The PowerBook 160 and 180 are the next iterations of the PowerBook's all-in-one design. Brought from initial design to public availability in ten months, they are examples of Apple's commitment to making existing products (in this case, the PowerBook 145 and 170) more useful and getting new products to customers quickly.

PowerBook 160 and 180 Advantages. As Table 1 on page 3 shows, the PowerBook 160 and 180 are powerful computers that build on the success of previous PowerBook models. Among their most important features are the following:

• *16-gray-level video.* The PowerBook 160 includes a backlit supertwist display like that of the PowerBook 140 and 145, while the PowerBook 180 includes a crisp, backlit active-matrix display. Improvements in both displays increase their brightness and contrast, while doing so with less energy. All PowerBooks before these have used black-and-white displays, but both the PowerBook 160 and 180 (and the PowerBook Duos) display up to 16 shades of gray. These displays are easier to read and offer a richer visual image to the user.

• *Versatile, easy-to-use external video.* Customers said they wanted to hook up external monochrome and color monitors to their PowerBooks, so we added that to the PowerBook 160 and 180. Both of them have external video ports that can drive monochrome monitors as large as the Macintosh Portrait Display (in

up to 16 shades of gray) and color monitors as large as the Macintosh 16" Color Display (in up to 256 colors). With the right adapter, they can also connect to many DOS-compatible VGA and Super VGA monitors and overhead-projector displays. Even though the PowerBook 160 and 180 themselves display only a gray-scale image, they can handle color images internally, displaying them in color on an external color monitor. This feature will make these PowerBooks even more useful for making color presentations “on the road” by using the client’s color monitor and supplying only the PowerBook.

• *Multiple video modes.* Many DOS notebooks do not support any kind of connection to an external video display. Those that *do* support external video in what is called *video mirroring* mode—that is, the external monitor shows the same image as the one on the DOS notebook’s display. The PowerBook 160 and 180 can do video mirroring; they can also do *dual display,* in which both the external and internal displays show different parts of a larger desktop. This means that PowerBook 160 or 180 owners can use the PowerBook in mirroring mode to run a presentation, or they can use the dual display mode when they want to view lots of documents at the same time.

• *Higher performance.* In general, the PowerBook 160 and 180 have larger capacities than previous models: larger hard disks (up to 120 megabytes), almost double the memory (up to 14 megabytes), and more computing power (the PowerBook 160 operates at the same 68030 processor speed as the PowerBook 145, and the PowerBook 180’s 33 MHz processor is 32 percent faster than the PowerBook 170’s 25 MHz processor). Also, the PowerBook 180 includes the same 68882 math coprocessor chip that the PowerBook 170 has.

• *SCSI disk mode.* This mode allows you to connect the PowerBook 160 or 180 to another Macintosh, restart the Macintosh, and have the PowerBook’s hard disk appear as an external SCSI hard disk on the other Macintosh’s desktop. (Many people use this mode to transfer lots of files easily between their desktop Macintosh and their PowerBook.) So many people liked this feature from the PowerBook 100 that Apple engineers adapted these models to do the same.

PowerBook 160 and 180 Developer Opportunities. As stated in the “Duo Developer Opportunities” section above, any application or utility that makes sense for a PowerBook makes sense for the PowerBook 160 and 180. These PowerBooks can use existing internal memory cards (if they were built to

Apple's stated specifications) for the PowerBook 140, 145, and 170, but there will also be a market for 160/180-only memory cards that can add up to 10 megabytes of memory, for a total system capacity of 14 megabytes.

Look also for software and hardware products that take advantage of the PowerBook 160's and 180 displays' video with 16 shades of gray, external color video, larger memory capacity, and higher level of processing power. The PowerBook 160 and 180 are candidates for heavy-duty programs that might be slow or infeasible on previous PowerBooks.

MACINTOSH IIVI AND IIVX

Sixty percent of all Macintosh users upgrade to a higher model within two years, and the Macintosh IIvi and IIvx will give users two reasons to upgrade: These two computers give users the most popular Macintosh II-line features in one computer, and they do it for less cost (seeTable 1 on page 10 for details). FYI, the Macintosh IIvi runs about 20 percent faster than the Macintosh IIsi, and the Macintosh IIvx runs about 10 percent faster than today's Macintosh IIci (with Macintosh IIci cache card).

One interesting note: The Macintosh IIvi and IIvx make visible Apple's status as a worldwide company that offers products targeted to the different needs of different markets. In this case, Apple will be offering the Macintosh IIvi worldwide *except* in the United States.

Though it may seem arbitrary to exclude the Macintosh IIvi from the U.S. market, there are some solid reasons for doing so. In the U.S., Apple is developing a strong retail channel, and Apple is offering the higher clock-speed Performa 600 through that channel. (A Performa 600 is equivalent to a Macintosh IIvx without a memory cache or a math coprocessor chip. Apple announced the Performa product line in the U.S. last month.) Apple doesn't yet have as strong retail channels outside the U.S., so it is offering the Macintosh IIvi outside the U.S. through existing *computer* channels.

Another reason for Apple USA's decision is that the U.S. business community typically has longer evaluation cycles before adopting new computer models, and Apple USA will continue to sell Macintosh IIci computers as long as businesses want them. (The fact that in late September, Apple USA reduced the

suggested retail prices of the Macintosh IIsi and IIci lines by about 24 percent won't hurt sales, either.)

Macintosh IIvi and IIvx Advantages. The main advantages of these two Macintosh computers include the following:

•*Expandability.* The Macintosh IIvi and IIvx offer expandability through 3 built-in NuBus slots, memory expansion up to a whopping 68 megabytes, and an internal accelerator slot. Both are the first mid-range Macintosh models to include the space for an internal 5.25-inch mass storage device (which can hold a CD-ROM drive, a removable-cartridge hard disk, magneto-optical hard disk, or other similar device).

•*Internal CD-ROM drive option.* Along with the Performa 600 CD, the Macintosh IIvi and IIvx are the first Macintosh models that can be purchased with a new internal CD-ROM drive, the AppleCD 300i. This CD-ROM drive can transfer data at twice the speed of previous Apple
and most third-party CD-ROM drives.

The availability of an internal, high-performance CD-ROM drive from Apple marks a higher level of Apple commitment to CD-ROM technology as part of mainstream Macintosh computing. To let users immediately benefit from CD-ROM technology, Apple is shipping nine CD-ROM discs with each AppleCD 300i-equipped Macintosh. In the U.S. and Pacific market, the titles are: *From Alice to Ocean* (a multimedia CD about the Australian outback), *Mozart: String Quartet in C Major* (from The Voyager Company), *Kodak Photo CD Sampler, Games Sampler* (from Apple—contains demo versions of over 30 games), *Applications Sampler* (from Apple—contains demo versions of over 120 business, K-12 education, desktop-publishing, accounting, and database applications), *Chronicles* (from Apple—a multi-lingual news "magazine"), *Apple CD-ROM Title Sampler, Cinderella* (Discis), and the *Best of Nautilus* (from Metatec/Discovery Systems, who puts out the monthly *Nautilus* CD-ROM "magazine"). In Europe, Apple will substitute *Just Grandma and Me* (Broderbund) and *EuroCD* (Apple) to replace the *Cinderella* and *Best of Nautilus* discs.

Apple is also including the *Apple Catalog of CD-ROM Titles,* a catalog that will list over 260 new titles, and a coupon good for a free issue of *Macworld* magazine on CD-ROM.

• *Kodak Photo CD support.* The AppleCD 300i will also introduce its users to digital photography through support for Kodak's Photo CD technology. Photo CD allows camera users to have one or more rolls of film transferred onto a CD-ROM disc—up to 100 images per disc. The QuickTime extension file (discussed later in this article) will allow users to access a Photo CD disc as a QuickTime movie; they can also access the images as documents of type 'PICT' that are represented on the desktop by document icons that are miniature "thumbnail" versions of the image itself. Photo CD support means that users can easily paste their own photos into their word-processing, drawing, spreadsheet, and other documents—in fact, into any application/document that uses PICT data.

• *Separate video memory for better performance.* Early Macintosh II-line models with built-in video support (like the Macintosh IIci) use part of the main memory for video; this slows down the 68030 processor's access to other locations in the same memory bank. Both the Macintosh IIvi and IIvx include either 512K or 1 megabyte (depending on the configuration) of separate video memory. This allows the processor to run faster. It also accounts for the fact that the Macintosh IIvi is 20 percent faster than the Macintosh IIsi, even though the Macintosh IIvi has a slower clock speed than the Macintosh IIsi's (16 MHz versus 20 MHz, respectively).

With 1 megabyte of video memory (optional on the non-CD-ROM Macintosh IIvi, standard on both the Macintosh IIvi with the AppleCD 300i CD-ROM drive and the Macintosh IIvx), the user gets 16-bit color (32,768 colors). Sixteen-bit color allows both QuickTime and Photo CD to show their images to their best advantage.

• *Better performance through a math coprocessor chip and a memory cache.* Both these components make the Macintosh IIvi and IIvx run faster. The Macintosh IIvi can optionally include a math coprocessor but cannot have a cache. The Macintosh IIvx includes both the coprocessor and the cache as standard.

Macintosh IIvi and IIvx Developer Opportunities. The installed base of mid-range Macintosh II computers continues to grow, and the Macintosh IIvi and IIvx will only further this trend. Look for a large number of these mid-range Macintosh computers to include an AppleCD 300i CD-ROM drive.

Since the AppleCD 300i (and other CD-ROM drives that come after it) can run at two different speeds, you may want to rethink how you place data on a CD-

ROM disc. In particular, you may want to record your data onto disc at two different data rates and have your software play back the one that matches whatever CD-ROM drive is present.

Macintosh IIvi and IIvx models that ship with the AppleCD 300i CD-ROM drive also come 5 megabytes of memory and the full 1 megabyte of video memory. This ensures that CD-ROM applications will have plenty of memory in which to run (4 megabytes isn't enough for some applications) and that the applications' displays will be of high quality.

Another interesting fact about the Macintosh IIvi and IIvx is that both computers can start up from a properly configured CD-ROM disc. This means that you can create startup CD-ROM discs that configure and control the Macintosh the way you want. Since the System Folder consumes "only" 10 to 15 megabytes, this still leaves over 630 megabytes for your application and its data.

The Macintosh IIvi and IIvx are machines of great capacities: memory of up to 68 megabytes, hard disks of up to 230 megabytes (as sold by Apple), and CD-ROM drives that can hold up to 650 megabytes of programs and data. These capacities suggest opportunities for you to develop programs that you couldn't run on smaller Macintosh models.

Third-party hardware vendors can also create 5.25-inch mass-storage systems that fit the Macintosh IIvi/IIvx internal bay. This includes high-capacity SCSI hard disks, Bernoulli and Syquest removable-cartridge drives, magneto-optical drives, and DAT (digital audio tape) and other kinds of tape-backup drives.

Because these computers are based on existing Macintosh II-line technology, program compatibility is extremely high. Any program that runs correctly using System 7.0.1 should run correctly on the System 7.1 software that is supplied with these two computers.

QUICKTIME 1.5

Since QuickTime 1.0 was introduced in December of 1991, it has been one of the most exciting technologies ever to grace the Macintosh platform. Well, now it's time for QuickTime 1.5, which makes QuickTime even better and addresses the limitations of QuickTime 1.0 that kept some people from using it.

Advantages of QuickTime 1.5. In general, QuickTime 1.5 makes everything *better.* Here are the most important points:

• *Larger/faster software-only playback.* QuickTime 1.5 adds the Compact Video Compressor, a new compression/decompression component (also called a *codec*). This compressor allows you to play back quarter-screen (320 x 240 pixel) movies from a CD-ROM disc at 15 frames per second or 160 x 120 pixel movies at 30 frames per second. This is 2 to 4 times faster than QuickTime 1.0, and it makes it possible to use CD-ROM discs to store and play back QuickTime movies with acceptable quality. The Compact Video Compressor gets its speed from both its speed in decompressing movie frames and its ability to compress a movie to smaller sizes than other compressors can. (Obviously, this is a good thing, because QuickTime movies have a way of getting very large very quickly!)

• *Full-screen movie playback at 30 frames per second with hardware assist.* QuickTime 1.0 accepts only uncompressed RGB (red/green/blue) pixels for storage and playback. In contrast, QuickTime 1.5 can manipulate the *compressed* video pixels created by hardware video cards like SuperMac's DigitalFilm. With the proper hardware support, a Macintosh running QuickTime 1.5 can play a full-screen (640 x 480 pixel) movie at 30 fps.

• *Built-in support for Kodak Photo CD technology.* As mentioned above in the section titled "Macintosh IIvi and IIvx Advantages," software within QuickTime 1.5 automatically translates a Photo CD disc to look like a normal Macintosh volume. Each photographic image is stored on the disc in five resolutions, ranging from the lowest resolution of 192 x 128 pixels to the highest of 3072 x 2048 pixels. Two nice touches: each document's icon is a color miniature of the document image, and QuickTime 1.5 creates a QuickTime movie that contains each photograph stored on the Photo CD disc. QuickTime 1.5 makes every photograph on the disc look like a PICT file (and is stored in a compact form invisible to an application). Any application that can use PICT files can use the photographs stored on a Photo CD disc.

Photo CD comes with an application that lets the user browse the images on the disc and launch another application to open images. This means that you don't have to write an elaborate browsing feature into your Photo CD-savvy application; you can simply use the browsing application, whichshould always be available wherever Photo CD is present.

• *Optimized playback for CD-ROM or network.* The MovieShop utility supplied to developers with QuickTime 1.5 allows an existing movie to be compressed

according to conditions that the developer can set. One of the most useful parameters that can be specified is the data rate (in kilobytes per second) at which a movie will be played. By specifying the appropriate rate for a given storage medium (like a CD-ROM disc or a file elsewhere on the network), you can ensure that your movie will play back with higher quality than it would have under QuickTime 1.0. You can use QuickTime 1.5 with the high-performance AppleCD 300i CD-ROM drive to create movies that can make use of the drive's two-times-normal data transfer mode. Of course, QuickTime 1.5 correctly plays existing QuickTime movies (which were made before double-speed CD-ROM drives were available).

• *Custom track types.* QuickTime 1.0 defined two kinds of data that can reside in a QuickTime movie—*video* and *audio.* QuickTime 1.5 lets you create custom tracks that contain whatever data you want—instrument data, for example. Once you do that, you can then manipulate that track with the help of QuickTime 1.5 itself. By manipulating a custom-defined data type, you can get QuickTime 1.5 to handle data that isn't really a movie—for example, real-time images from a video camera. Apple will provide the documentation you'll need to do this.

As an example of a custom track, Apple will provide support for a new data type—*text.* The text data type is useful in itself—it makes adding text (for example, lyrics to a song) to a QuickTime 1.5 movie as easy as cutting the text from an editor and pasting it into the movie.

• *Improved dithering for using QuickTime 1.5 on one-bit Macintosh displays.* People like to use PowerBooks for presentations and other similar uses. QuickTime 1.5 has improved its one-bit dithering algorithm, which makes it more usable for displaying movies on black-and-white (including PowerBooks) displays.

QuickTime 1.5 Developer Opportunities. It's hard to be specific about developer opportunities because QuickTime 1.5 is such an open-ended technology. You might as well ask, "What kind of developer opportunities are there for using styled text?" The QuickTime movie is as basic a data type as styled text is, and both can be used to enhance countless applications.

Don't forget that QuickTime (both versions 1.0 and 1.5) present two different compressors for still images (the Photo JPEG and Graphics compressors). Even if you don't need QuickTime movies, you can use these compressors in your

application to store more static color images in less memory—and you don't even have to implement the QuickTime movie interface.

QuickTime 1.5 can deliver movies that include audio, video, animation, text, or custom data types. You can use movies to provide either audio or video on-line help, to show the user how to do something, or to show dynamic data that would be hard to present using text or static images. When it makes sense to do so, your program's documents should be able to accept QuickTime movies anywhere it accepts PICT images. Also, in some cases, it might make sense for your program to *create* QuickTime movies for other programs to use.

SYSTEM 7.1

Like the other new Macintosh products featured in this article, System 7.1 builds on the strengths of its predecessor—in this case, System 7—and it adds new features and capabilities intended to greatly increase the Macintosh customer base around the world. (For more details, see "Technology: System 7.1," on page 1 of this issue.)

One important note: The release of System 7.1 marks a significant departure for Apple's software licensing policy in that users do not have the right to freely copy System 7.1. Previously, users had unlimited rights to copy Macintosh system software, whether from each other's computers, from bulletin boards, or from user groups. With System 7.1, this "right-to-copy" no longer exists; only certain system extensions, like QuickTime, will be made widely available with free right-to-copy. See next month's *Apple Direct* for more details about this new policy.

Advantages of System 7.1. In a word, System 7.1 makes the Macintosh *world-ready.* There are two basic categories of enhancements:

• *Core system enhancements.* System 7.1 includes QuickTime (the first time it is included as part of Macintosh system software), a new upgrade method for permitting all Macintosh models to run a single version of system software (these upgrade methods are called *system enablers*), improved font management with a separate Fonts folder, and the System 7 Tuner included as part of the system's code. These enhancements will simplify system upgrades for users and make testing much easier for developers, as well as provide greater power to the Macintosh system out of the box. (In most markets, System

7.1 will include QuickTime 1.5. In Japan, however, System 7.1 will include QuickTime 1.0.)

• *Multi-lingual support.* The Macintosh has long been a leader in supporting complex writing systems such as Japanese and Arabic. With System 7.1 adds more support for these and other languages. WorldScript system enhancements automatically install all the necessary resources for support of single-byte and double-byte script systems. With System 7.1, the Macintosh becomes a more global system that can run in many languages and countries, world-wide. Users can easily modify localizable features such as date and time format, currency symbol, and sort order by selecting choices from a new set of Control Panels.

For developers, System 7.1 is a breakthrough in simplifying the tasks of localization and software development for multiple languages, thus making it easier to enter a greater number of the world's markets, including countries like Japan, where text entry is complex. The underlying features provided by System 7.1 give developers extensive support for creating applications that can be more easily localized into virtually any language.

System 7.1 Developer Opportunities. System 7.1 offers two important benefits. First, the fact that there is only one version of system software worldwide will make it easier for you to thoroughly test your software. Second, System 7.1 brings you one step closer to the global market. It will be easier for you to localize your program to other languages, and the added ease of doing so may make the difference between doing or not doing the localization.

You might also consider designing new fonts. With WorldScript in place, a much larger market for fonts will exist, especially in numerout international markets where the Macintosh platform is just becoming popular.

SO NOW YOU KNOW...

Whew! This marks the end of *Apple Direct*'s strategic overview of the products that Apple announced October 19, 1992. If you're interested in technical details, read the accompanying four technology articles in this issue. (The only component not covered is QuickTime 1.5; look for an article in the November/December *Apple Direct*.) My thanks go to David Gleason, who wrote the System 7.1 article on page 1 and the overview of System 7.1 above. ◆

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Technology: Macintosh Duo System

Developers Can Enhance Duo Notebooks

By Gregg Williams,

It's called the Macintosh Duo System for a reason. Apart from the PowerBook Duo 210 and 230 notebook computers—marvelous in their own right—the Macintosh Duo System includes:

- Macintosh Duo Dock (a desktop unit that turns a Duo notebook into a powerful desktop Macintosh)
- Macintosh Duo MiniDock (a small unit that plugs into the rear of a Duo notebook to add additional services to it), and
- Macintosh Duo Floppy Adapter (which adds an external floppy and an Apple Desktop Bus port).

One interesting developer opportunity—though not the only one—is the possibility of creating supplemental hardware units, generically referred to as *docks,* to create in essence a Macintosh computer configured to whatever market you're trying to reach.

This article talks about docking and other technical topics related to the Macintosh Duo System. See tables 1 through 4 below for more information on the system's components.

Apple's Docking Philosophy. Apple differentiates between two different kinds of hardware add-ons. *Docks* add several functions to a PowerBook Duo notebook: The Macintosh Duo MiniDock, for example, adds ports for external video, a floppy-disk drive, an ADB device, a SCSI peripheral, a second serial port, sound-in and sound-out, and an anti-theft mechanism.

On the other hand, *adapters* do one thing, and do it well and inexpensively. The Macintosh Duo Floppy Adapter, for example, exists primarily for on-the-go PowerBook Duo users who just want to connect to the Macintosh HDI-20 External Floppy Disk Drive. (Okay, the adapter also adds an ADB port, the reason being that it costs almost nothing to do so—more on that later in this article.)

PowerLatch. Docking a Duo notebook to a Macintosh Duo Dock (and undocking it) is much like inserting (and extracting) a videocassette from a VCR. The Duo Dock *injects* the Duo notebook (takes it from you) and ensures that the Duo notebook's expansion connector mates firmly and safely with the Duo Dock's connector. The Duo Dock similarly disconnects the Duo notebook from itself when you press its eject button, and system software automatically warns you if you need to save open files before the Duo notebook is ejected.

Apple calls this combination of hardware, firmware, and software functions the Duo PowerLatch feature. It's an important feature because it gives the Duo user convenience and peace of mind about the docking procedure, something that other docking systems don't deliver.

The Duo Expansion Connector. To put a high-end 68030 Macintosh in a 1.4-inch (3.6-cm) thick package, Apple engineers had to make the limited back-panel space as useful as possible. They did so by connecting the 68030 processor and related system signals to an external 152-pin *processor-direct socket* (abbreviated as PDS, which in other Macintosh models stands for a "processor-direct slot" *inside* the computer).

The Duo expansion connector is critical to the PowerBook Duo's success. With all the signals that the expansion connector makes available, you can add to the Duo notebook just about any expansion or peripherals you want. And the fact that *all* the signals go through one connector makes it possible for the Macintosh Duo Dock to take responsibility for reliably docking and undocking the Duo notebook from the Duo Dock.

The most interesting thing about the Duo expansion connector is that, though it is a PDS in hardware, to the *software* of the Macintosh Duo System, any dock connected to the Duo notebook "looks like" a NuBus card. To keep the overall dock interface versatile and open to new ideas, Apple engineers chose the Slot Manager model—the interface used by NuBus cards—as the software interface between docks and the PowerBook Duo notebooks.

The Declaration ROM. Just like a NuBus card, a dock must include a declaration ROM (sometimes called a *configuration* ROM) that tells the Duo notebook about the needs and capabilities of the dock it's attached to. This includes:

- Support for docking, undocking, and shutdown

- Information about the dock's hardware (for example: Does the dock have video? Does it have a SCSI port available after the Duo has been awakened?)
- Video driver (for external video) and device drivers for the other dock functions.

In addition, the declaration ROM works with the EverWatch microcontroller chip on the motherboard and system software to implement what's called *smart wakeup.* In the case of the Duo MiniDock, smart wakeup allows you to dock a sleeping Duo notebook to a Duo MiniDock. When you wake the Duo notebook up, system software can dynamically add certain services: audio, video, Apple Desktop Bus, floppy-disk drive, modem, and SCSI. This saves you time and battery power and is more convenient than having to turn the Duo notebook off before docking with a Macintosh Duo MiniDock.

The Macintosh Duo System allows the dynamic addition of services while the Duo notebook is asleep, but it doesn't allow the dynamic *removal* of services. (This limitation comes from the behavior of many Macintosh applications, which "see" new services when they are added and therefore expects them to be there.) Because of this, once a Duo notebook connects to a Duo MiniDock that is using external video or open serial connections other than Local Talk, the Duo notebook can no longer go to sleep.

Another implication of the last paragraph is that a sleeping Duo notebook can wake up to the Finder when connected to a Duo MiniDock but not a Duo Dock. The reason: A Duo MiniDock video connection adds another video display, leaving the built-in display active. On the other hand, Duo system software needs to deactivate the built-in display when the user inserts a Duo notebook into a Macintosh Duo Dock and reroutes the Duo notebook's video to the Duo Dock's external video display. The Macintosh applications cannot handle the absence of the flat-panel display when they come out of the sleep state. So the bottom line for the Macintosh Duo Dock is that a Duo notebook must be shut down before it can work with the Duo Dock itself.

A piece of the PowerLatch comes into play here to ensure that the user doesn't get confused or lose data. If you insert a sleeping Duo notebook into a Duo Dock and hit the power-on key, it turns on and senses the Duo notebook's sleeping state, wakes up the Duo notebook, tells it to display a certain dialog box, then tells the Duo notebook to go back to sleep. The Duo Dock then ejects the Duo notebook and turns itself off. When you awaken the Duo notebook,

there will be a dialog box on the display. The dialog box tells the user to save any pending work, shut the Duo notebook down, and reinsert it into the Duo Dock to begin the docking process.

Building Your Own Dock. In addition to publishing the specifications of the Duo expansion connector, Apple will be licensing several chips that will make it easy for you to add the basics to any dock you want to make. By doing so, we can ensure the overall quality of said basics and, more importantly, we can free up your time to concentrate on the value that only you can add to your design.

We recommend that every third-party dock (dock, not adapter) includes sound-in and sound-out ports, an Apple Desktop Bus port, and a SuperDrive floppy-disk drive port. The first, sound-in and sound-out ports, are trivial to add. The Apple Desktop Bus port is also easy to add because the ADB circuitry needed is already present on the PowerBook Duo notebook.

It's also easy to add a floppy port because Apple will be licensing the SWIM II floppy-interface chip; I'm told that all you have to do is connect the right leads from the Duo expansion connector to the SWIM II chip and from that chip to the floppy-disk connector. (For reasons of nostalgia, I will add here that "SWIM" stands for "Super Woz Integrated Machine." Today's Macintosh floppy-interface chip is a descendent of the original data-encoding algorithm that Steve Wozniak used on the original Apple II.)

Apple will also be licensing two more custom chips. The Combo chip contains much of the circuitry needed to implement two serial ports and the SCSI interface (for external SCSI hard disks and other peripherals); you will probably want to use this chip in your dock, because serial and SCSI ports are pretty fundamental parts of the Macintosh computer. (Remember that, by itself, each of the Duo notebooks contain only one serial port and, if the internal modem is present, a modem port.)

You may or may not want to license the third chip, depending on what features you want your dock to have and what enhancements you specifically want to make.

The VSC (Video Subsystem Controller) is a custom ASIC (application-specific integrated circuit) that controls SCSI, serial, video, floppy-disk, and NuBus signals; its video circuitry supports all Apple monitors sixteen inches or smaller. Within the Macintosh Duo System, both the Macintosh Duo Dock and Duo MiniDock use the VSC.

Internal Modem Option. Though the physical packaging is slightly different, the Macintosh PowerBook Express Modem is the same design for both the PowerBook Duo and the PowerBook 160 and 180. See the PowerBook 160 and 180 technology article for more details.

Duo Display. The PowerBook Duo 210 and 230 notebooks use the same display that the PowerBook 100 uses, a 9-inch-diagonal backlit supertwist liquid-crystal display (LCD) measuring 640 x 400 pixels. (This display has a dot pitch of 0.30 mm, slightly less than the 10-inch-diagonal, 0.33 dot pitch displays used on the PowerBook 140/145/ 160/170/180.)

Unlike previous PowerBooks, the internal displays of the PowerBook Duo 210 and 230 (as well as those of the PowerBook 160 and 180) can show sixteen shades of gray.

Except for its size, the PowerBook Duo display technology is identical to that of the PowerBook 160. For more technical details, see the section on the PowerBook 160 display.

Memory Expansion. The PowerBook Duo 210 and 230 come with 4 megabytes of memory soldered to the motherboard (in what are labeled banks 0 and 1) and can be expanded to a maximum of 24 megabytes. Apple will be selling a 4-megabyte expansion cards that fills banks 2 and 3 with 512 Kbit x 8 low-power, self-refresh dynamic memory chips (DRAM), as well as an 8-megabyte expansion card that can similarly fill banks 2-5. (These add 2 megabytes of memory per bank.)

By using larger chips or denser packaging in banks 4 and 5 (achieving 8 megabytes per bank in banks 4 and 5 only), you can create a 20-megabyte expansion card that gives the Duo PowerBook 24 megabytes of memory. These memory modules will not work in any PowerBookother than the Duo, nor will existing PowerBook memory expansion cards work in a PowerBook Duo.

If you read the last paragraph carefully, you may have noticed that the Duo memory expansion card uses low-power, self-refresh *dynamic* memory (DRAM), not the pseudostatic memory (PSRAM) that is used in the original PowerBooks. Since the design of the first generation of PowerBooks, the difference in power used between PSRAM and DRAM has narrowed considerably (75 mA versus 80 mA during memory access). Also, today’s DRAM chips are both smaller and

less expensive than their pseudostatic counterparts, so it made sense for Apple to make the switch.

Miscellaneous. One interesting note about the Duo notebooks is that each contains an internal magnesium “skeleton” that helps make the Duo notebook strong, thin, and light. Also, the 68030 processor inside the Duo notebook uses part of the frame as a heat sink! (A 68030 running at 33 MHz generates a lot of heat, and the PowerBook Duo design is too compact to allow space for air cooling.)

Another interesting topic is that of serial-port mapping. Alone, the Duo notebook contains one serial port, port A, which can be used (with some limitations) for either an external printer or modem. Adding either the Duo Dock or Duo MiniDock enhances serial port A and adds serial port B, resulting in two serial ports functionally equivalent to the ones found on most other Macintosh models.

On both the Duo Dock and Duo MiniDock, it turns out that port A is configurable, but port B is not. Because of this, an external modem must be connected to port A and the printer to port B. Traditionally, Macintosh applications expect printers to default to port A and the modem to port B. For the convenience of the user, Duo system software transparently maps the printer function (which expects to use port A on the Duo notebook) to port B. This way, the user doesn’t have to reassign the serial port that the printer uses every time the user docks or undocks a Duo notebook.

Finally, the Macintosh Duo MiniDock contains one of the most popular features of the PowerBook 100, the SCSI *disk mode.* With it, you connect the Duo MiniDock (attached to a Duo notebook) to the SCSI chain of another Macintosh, then restart the other Macintosh. The Duo notebook’s hard disk then appears on the other Macintosh’s desktop, and you can transfer files between the two computers quickly and easily.

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That’s all for the Macintosh Duo System. Be sure to read the strategy article on page 1 of this issue of *Apple Direct.*

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Macintosh PowerBook Duo 210 and 230 Fact Sheet

	PowerBook Duo 210	PowerBook Duo 230
Micro-processor	• 68030, running at 25 MHz	• 68030, running at 33 MHz
Memory	• 4 megabytes (MB) of low-power, self-refresh dynamic memory (DRAM) on the motherboard and one internal memory expansion slot • Expand to up to 24 MB of memory using memory expansion card • 1 MB of ROM	• Same as PowerBook Duo 210
Disk drives	• One internal 80 MB SCSI hard disk • External floppy disk storage available with Duo Floppy Adapter, Macintosh Duo MiniDock, or Macintosh Duo Dock (Duo Dock supplies built-in SuperFloppy drive, space for an internal hard disk)	• Same as PowerBook Duo 210, except that the Duo 230 ships from Apple with either an 80 or 120 MB SCSI hard disk
Video display	• Built-in 9 in. (229 mm) diagonal monochrome liquid crystal display (LCD) • Backlit Supertwist LCD • 640 by 400 pixels • Displays 16 shades of gray	• Same as PowerBook Duo 210
Custom chips	• MSC (main system controller) chip controls dynamic memory, ROM, built-in I/O, sound, and some power-saving features • EverWatch microcontroller chip provides intelligent power management	• Same as PowerBook Duo 210
Battery	• Nickel hydride battery • With the EverWatch Battery Saver technology, provides 2 to 4.5 hours of usage before recharge needed	• Same as PowerBook Duo 210
Keyboard	• Built-in 63-key keyboard with standard Macintosh layout (64 keys in international version) • Two-level tilt adjustment	• Same as PowerBook Duo 210
Trackball	• 19 mm-diameter recessed, dual button trackball	• Same as PowerBook Duo 210
Interfaces	• One serial (RS-422) port for LocalTalk networking, printers, modems, and other devices • Port for optional modem • Monophonic speaker and microphone (embedded below the display) • 152-pin processor-direct socket (PDS) • See table 4 for interfaces added to Duo system by Duo Floppy Adapter, Macintosh Duo MiniDock, and Macintosh Duo Dock	• Same as PowerBook Duo 210

Modem (Optional)	• Optional internal PowerBook Express Modem • Communicates at up to 14,400 bits per second (up to 57,600 when communicating with a compatible CCITT V.32bis modem with V.42bis enabled) • Complies with CCITT V.42 standard, MNP classes 2-4 • Can do up to 4:1 compression using V.42bis, up to 2:1 compression using MNP-5 standard • Can send and receive faxes at 9600 bps (includes Express Fax software)	• Same as PowerBook Duo 210
Electrical Requirements	• Line voltage into AC adapter: 85 to 270 volts AC at 47 to 63 Hz	• Same as PowerBook Duo 210
Size and weight	• Size: 8.5 in. (21.6 cm) x 10.9 in. (27.7 cm) x 1.4 in. (3.6 cm) • Weight: 4.2 lb. (1.9 kg)	• Same as PowerBook Duo 210
Other	• CloseView and Easy Access software (for users with disabilities) • Battery and AC adapter • System Software 7.1 • Documentation and training software	• Same as PowerBook Duo 210
Prices (U. S. Suggested Retail Price)	• $2249 (includes 4 MB of memory, 80 MB hard disk) • Optional Duo Express Modem—$319 • Macintosh Duo Dock—$1,079 • Macintosh MiniDock—$589 • PowerBook Floppy Adapter—$135 • Macintosh HDI-20 External 1.4MB Floppy Disk Drive—$199 • Macintosh PowerBook Duo Rechargable Battery—$69 • Macintosh PowerBook Duo 4MB Memory Expansion Kit—$235 • Macintosh PowerBook Duo 8MB Memory Expansion Kit—$459	Same as PowerBook Duo 210, except: • $2609 (includes 4 MB of memory, 80 MB hard disk) • $2969 (includes 4 MB of memory, 120 MB hard disk)

Table 2: The Macintosh Duo Dock

Coprocessor	• Optional 68882 math coprocessor
Disk storage	• Internal 1.4 MB Apple SuperDrive floppy disk drive • Bay for optional 1-inch high 3.5-inch SCSI mass storage device
Video	• Built-in support for most Apple displays, up to and including the Macintosh 16” Color Display; support includes both dual-display and video-mirroring modes • Supports some DOS VGA and Super VGA monitors and overhead-projector displays (with adapter cable) • 512K of video memory—supports up to 256 colors or shades of gray • Optional 512K of video memory—brings total number of color supported to 32,768
Interfaces	• Apple Desktop Bus • Video out (up to 256 colors or shades of gray) • 152-pin connector to Duo notebook PDS • Two RS-422 serial ports • Pass-through port for optional modem • HDI-30 SCSI port • Monophonic sound-in and sound-out ports
NuBus expansion	• Two internal NuBus expansion slots
Other	• SCSI disk mode (makes Duo notebook’s hard disk appear on the desktop of the Macintosh that it’s connected to) • Duo notebook can be locked inside the Duo Dock, which can in turn be connected to an anti-theft cable • Duo Dock can also be locked to prevent docking with a Duo notebook (thus protecting data on an internal hard disk from unauthorized access) • Switched AC-output socket (for power to external video monitor) • Weight: 13.1 lbs (5.95 kg) • U.S. Suggested Retail Price—$1079

Table 3: The Macintosh MiniDock

Video	• Built-in support for most Apple displays, up to and including the Macintosh 16” Color Display; support includes both dual-display and video-mirroring modes • Supports some DOS VGA and Super VGA monitors and overhead-projector displays (with adapter cable)
Interfaces	• Apple Desktop Bus • Video out (up to 256 colors or shades of gray) • 152-pin connector to Duo notebook PDS • Two RS-422 serial ports • Pass-through port for optional modem • HDI-30 SCSI port • HDI-20 port for external floppy-disk drive • Monophonic sound-in and sound-out ports
Other	• SCSI disk mode (makes Duo notebook’s hard disk appear on the desktop of the Macintosh that it’s connected to) • Provides slot for anti-theft device that protects Duo MiniDock (but attached Duo notebook can still be removed from Duo MiniDock) • Weight: 1.24 lbs (0.56 kg) • U.S. Suggested Retail Price—$589

Table 4: Rear-Panel Connections Within the Macintosh Duo System.

System component	Ports made available
Macintosh Duo Dock	Video 152-pin processor-direct socket Apple Desktop Bus Serial (2 ports) Modem SCSI Sound-in Sound-out
Macintosh Duo MiniDock	Video Floppy disk Apple Desktop Bus Serial (2 ports) Modem SCSI Sound-in Sound-out
Macintosh PowerBook Duo Floppy Adapter	Floppy disk Apple Desktop Bus

NOTE: In addition to the rear-panel ports listed above, the Macintosh Duo Dock also contains a built-in SuperFloppy drive, 2 NuBus slots, and space for an internal hard drive.

Editor’s Note

No doubt about it: Apple wouldn’t be where it is today without its developers.

Without your great applications, tools, peripherals, cards, etc., our great computer and system software just wouldn’t be anywhere. Period. Together we offer the great solutions that make the Macintosh so popular and it’s customers so loyal.

Supporting developers has always been a top priority for Apple; what’s more, we think we do a pretty good job of it. Sure, we hear complaints—we ain’t perfect, and you wouldn’t be able to deliver the great products you do without having penetrating, even challenging ideas about what’s right for Macintosh. (And one thing I’ve noticed about developers: many of you aren’t shy about expressing those ideas!) But we like to think of ourselves as #1 in developer support.

Apple has recently reinforced the significance of our developer community and made it easier for us to deliver even stronger support: Kirk Loevner, leader of the Apple Developer Group (ADG), the 200-plus-member organization charged with supporting developers, has been made a vice president of Apple Computer.

Kirk’s taking a step up in the org chart shows not only his success, but yours, as well. Further, ADG’s increased importance is indicative of our mutual successes. And it’s not only admission of how you’ve contributed in the past, but also recognition of your key role in the Apple of tomorrow.

Here’s part of what Roger Heinen, senior vice president of Apple’s Macintosh Software Architecture Division, had to say upon announcing Kirk’s promotion:

“Over the past several years, Kirk has earned an exceptional reputation with the third-party developer community as a spokesperson for Apple and their advocate within Apple.

“Kirk has led ADG in a transformation from a cost center technical support organization to a strategic business partner for developers. By acknowledging Kirk in this way, we are acknowledging the role of the developer community, software and the ADG organization as critical success factors in Apple’s future.”

In other words, Apple and the Apple Developer Group will be right there with you as you continue to turn out great new products and push the edge of the personal computing technical envelope.

Speaking of which, you might have noticed that *Apple Direct* filled out its envelope pretty well this month. We've expanded the current issue to give you details about the new products Apple just released—the new Macintosh Duo system, two new PowerBooks, the "world-ready" version of System 7, QuickTime 1.5, and the Macintosh IIvi and IIvx. Next month we'll complete the story with in-depth details about QuickTime 1.5 and our new policy regarding right-to-copy system software.

You've probably already noticed that we're covering the new products differently than we have before: The feature "strategy" story on page 1 explains how all the new products fit our strategy and why they're important to developers. "Technology" articles about the individual products fill you in on the technical details of each of them.

Special thanks are due Gregg Williams for his Herculean efforts assembling and writing the material on the new products. Please see Gregg's request for feedback about our new approach on page 11.

And speaking of feedback, it's still not too late to send responses to the questions I asked about *Apple Direct* in this column last month. Thanks to those of you who took the time to write. Next month, I'll tell you about the feedback we received.

Finally, we're trying something else new this month that I think you'll enjoy: a human interface contest. See the Human Interface article for details. (Thanks to *develop* Magazine Technical Editor Dave Johnson for coming up with the "really bad" dialog box for the contest.)

Until next month.....

Paul Dreyfus

CD Highlights

Greetings and welcome to the October issue of the the Developer CD Series, *The Hexorcist.* Despite the entrance of Hurricane Iniki into our publication cycle we are pleased to offer you a number of significant new tools.

Friday afternoon, September 11, I had the dubious fortune of spending the better part of five hours, clinging to a door jam, at a resort on Kauai as the deafening winds of Iniki tore at the roof, collapsed ceilings, shattered windows, and sent torrents of water and debris swirling about my feet. As I have said to my friends, “I didn’t know I had that much adrenalin.” Indeed, if it were not for the exceptional courage and competence of the resort staff, that day might have ended quite differently for myself and the hundreds of other people sheltered there. And I used to think life at Apple Computer could be frenetic!

Fortunately, I came back in one piece, and I’m especially grateful to be able to offer you the important new materials contained on this month’s disc.

System Software: System 7.1 & WorldScript: First, we are pleased to include the new golden master version of System 7.1. This is the first release of the Macintosh system software reference version. It focuses on international support of System 7 and establishes a foundation for a future Macintosh software release architecture. Also included on this disc is WorldScript, Apple’s new technology that gives the Macintosh operating system the inherent ability to support languages worldwide. (See this month’s page 1 article for complete information about System 7.1.)

Please don’t copy System 7.1, which is included for testing and development purposes only! With the release of System 7.1, Apple has decided to end its former policy of allowing the right to copy Macintosh system software. Please be sure to read the enclosed license agreement before using these materials.

MPW Related Tools: Several of our most popular MPW related tools have been updated. Look for the updated version of the MPW 411 files, the on-line documentation for use with MPW 3.2 or later. Also see the latest version of the MPW Interfaces and Libraries as well as a new revision of Tags *ƒ*. The Tags suite is a collection of MPW tools that help you navigate source code. You can quickly and easily locate the source definitions of subroutines, structs and RECORDs, global variables, and more.

People Surveyor Stack: This new tool makes it easy to survey people on electronic networks. Responses are transmitted to a central server. Results can then be compiled with the touch of a button and imported into word processors, spreadsheets, or statistics packages.

Road Map to A/UX: We are pleased to offer you the new *Road Map to A/UX.* This book gives a technical overview of the A/UX operating system and a description of the A/UX documentation and learning path. “An Overview of A/UX” provides a basic top-level description of A/UX. “A Closer Look at A/UX” delves deeper into A/UX, including the system software development environment and networking environment; and “A/UX Documentation” includes detailed descriptions of the A/UX documentation suite.

Draft of new Devices chapter for *New Inside Macintosh:* Thanks to the synergistic efforts of our DTS engineers and Tech pubs, we have been able to include a draft of the new Devices chapter for *New Inside Macintosh.* Remember, this is just a draft! We hope it gives you a head start on development in this essential area.

Tech Notes: Macintosh, Enterprise Systems Division (ESD), and Apple II Technical Notes have new additions this month. Our new Macintosh Technical Notes include: 21" RGB Specs, AppleEvents Send to Self, Color, Windows, and 7.0, Icon Drawing in 7, Little PowerBook Sleep, PictComments Real Deal, and PowerBook Miscellanea.

Worldwide Marketing Resources: Take a look at the updated list of Apple Computer International Third-Party Marketing and Developer Services contacts. Also find the new Worldwide Market Guides. These country-specific guides give you information on how to distribute and support your product globally.

Testing & Debugging: See the new VU Assist Module for MacApp. This package contains source code for VUAssist, a module which can be built into a MacApp application to make it fully “testable” with Virtual User. This version is compatible with MacApp 3.0b2PQR.

Also see the updated versions of MiniLauncher and ATrapper. MiniLauncher can be used to launch applications by typing the name of the application into an edit text field (used mainly with Virtual User under 6.0.x). ATrapper is an application that records A-Trap calls that occur between the time ATrapper is installed and removed.

Communications Toolbox (CTB) Development Resources: This folder contains a large number of sample code intended to assist in developing a CTB compatible application or CTB tool. Some of the components included are: CTB API overview (TEXT file), MPW 411 files, MacsBug dcmd files for Tool debugging, and much more.

Intriguing Inits & cdevs: Many new tools have been included here. Among our intriguing inits and cdevs is ScriptSwitcher, a simple control panel that switches the system script to any installed script system. Backlight Control is a control panel for PowerBooks which can be used to maximize the battery power by turning off the backlight while the PowerBook is inactive for a specified amount of time. A new version of Extensions Manager allows you to enable and disable system extensions. New features include customization of file types considered as extensions, start-up items, and sets. The updated version of Mini Grinders is a small collection of desktop utilities that perform a single function on a group of files dropped on it. These utilities are Apple event aware and use the 7.0 Finder “dropping” feature to achieve this ease of use.

Even more tools: Don’t miss the System 7 Icon Interfaces. These interface files are included in MPW C, Pascal, and Assembler. System Picker, a utility application, allows the user to choose the folder that will be the active System Folder upon restart. The new Color Picker has an open architecture allowing many different types of pickers to be used within a consistent and more integrated framework. Disinfectant has been updated to version 2.9 Also see the new Installer 3.4. These are just a few of the new tools available.

Stay tuned next month for another plethora of new materials. We will be bringing you several Developer Notes for new products, and an excellent collection of new LISP tools as well as LISP Q & A’s. Yes, and also look for exciting new QuickTime materials. Happy programming!

Technology: the Macintosh IIvi and IIvx

New Models Add CD-ROM and Photo CD Capabilities

By Gregg Williams

The Macintosh IIvi and IIvx were designed with the future in mind. In fact, they were designed and brought to market in less than a year—which also indicates Apple's plans for the future: to bring out new designs quickly to meet customer needs, to do so by enhancing successful products with additional technology, and to do so for the same or less money.

The Macintosh IIvi and IIvx certainly fit these descriptions. The fact sheet on page 10 gives a full overview of both models. To summarize, though, we can say that both the Macintosh IIvi and IIvx have inherited features that have proven to be popular and successful in previous Macintosh II product-line models:

- Multiple NuBus slots (in this case, three slots)
- Built-in video for a wide range of monitors, and availability of high-quality color video (in this case, up to 16-bit color)
- Internal memory cache (on the Macintosh IIvx only) and separate video memory, both of which improve the system's overall performance
- Availability of a math coprocessor chip
- Sound input and output
- A SuperDrive floppy disk drive, which can read Macintosh, DOS, and OS/2 3.5-inch floppy disks.

To this, Apple has added several important new features to the Macintosh IIvi and IIvx:

- An accelerator slot (a subset of the Macintosh IIci cache slot, meant here to be used with accelerator cards)
- An internal 5.25-inch bay for mass-storage devices like cartridge hard disks and CD-ROM drives (until now, available only on Quadra 900 and 950 computers)
- The AppleCD 300i, an optional double-speed CD-ROM drive—and with it, support for Kodak's Photo CD technology, which allows users to shoot a roll of photographic film and get back a CD that contains digitized versions of the photographs they took.

The following sections provide technical details about the Macintosh IIvi and IIvx.

Performance. Both the Macintosh IIvi and IIvx offer performance increases over the most popular entry-level Macintosh models. In monochrome mode, the Macintosh IIvi is 3.7 times faster than a Macintosh Classic; in 8-bit color, it's 1.6 times faster than a Macintosh LC and 1.2 times faster than a Macintosh IIsi. (For the record, the Macintosh LC II is not appreciably faster—less than 10 percent—than the original Macintosh LC quoted above.) And, of course, the Macintosh IIvi has other important advantages, like more color support for larger monitors and more NuBus slots.

The Macintosh IIvx provides a healthy amount of computing power (after all, it does have a 32 MHz 68030 processor in it). In monochrome mode, it's 7.0 times faster than a Macintosh Classic, 2.6 times faster than a Macintosh LC, and slightly (1.1 times) faster than a Macintosh IIci running with a IIci cache card.

Dedicated Video Memory. The numbers above indicate that a Macintosh IIvi is around 20 percent faster than a Macintosh IIsi. But wait a minute—the Macintosh IIvi has a 68030 running at 16 MHz, while the Macintosh IIsi has a 68030 running at 20 MHz. Surely there's something wrong here?

No, and that's what's interesting: The 20 percent difference is largely attributable to the Macintosh IIvi's dedicated video memory. Several Macintosh computers use what's called *RAM-based video,* which means that the computer's video circuitry uses a part of main memory to store the image. Unfortunately, when the video circuitry is accessing this memory, the processor can't access any memory location within the same memory bank. Depending on the video mode and the size of the memory bank, RAM-based video can make a significant difference in the performance of a Macintosh computer.

Acceleration. Apple's and users' collective experience has taught us that an accelerator card is the most cost-effective way to significantly increase the computing power of an existing Macintosh. Because of this (and because customers want it), Apple engineers designed a 120-pin accelerator slot into both the Macintosh IIvi and IIvx. This slot contains a subset of the signals in previous implementations of the slot (like the Macintosh IIci's). Though the slot

is designed specifically for accelerator cards, we're sure that somebody will find other uses for it as well.

AppleCD 300i. The availability of a built-in CD-ROM drive in a Macintosh computer is an important step forward—so much so that in Canada, you can't buy a Macintosh IIvi or IIvx without one!

(Users' needs for flexibility is the main reason that the AppleCD 300i doesn't come standard with every Macintosh IIvi and IIvx. Personally, I'm a big fan of CD-ROM technology, but other people—especially people doing desktop publishing—feel just as strongly about using the internal space for a removable cartridge hard-disk drive, and still others want to use the space for a tape backup unit, a really large magneto-optical drive, or some other mass-storage device.)

The AppleCD 300i drive runs at twice the speed (in revolutions per minute) of today's CD-ROM drives andt can deliver up to twice the data transfer rate of today's drives. Of course, the overall speed increase depends on both the application running and the speed of the Macintosh in use.

Photo CD Support. Photo CD support gives many users something they've never had before: the ability to use photographs they make in their Macintosh documents. Most Macintosh users don't have a color scanner, and many of those who do *don't* use them because scanning a color photograph is tedious and time-consuming.

Photo CD is as easy to use as scanners are difficult. You hand your roll of film (and some money—somewhere in the ballpark of $25) to a participating Kodak photo finisher, and you get a CD-ROM back with your photographs on it. The photos are stored on the CD-ROM in five different resolutions, ranging from a 192 x 128 pixel size up to a 3072 x 2048 size. Images are represented as document icons, and all the images of the same resolution are in their own named folder.

Also, the Photo CD window shows a movie icon that represents all the images on the roll of film; you can then browse through the images by stepping through the frames of the film.

With Photo CD technology, you can store up to 100 images on each disc. A set of images is called a *session,* and you can add multiple sessions to a CD disc until it is full. Almost all CD-ROM drives today are *single-session drives;* this

is a fundamental limitation of the drive's hardware and cannot be corrected with software. One significant feature of the AppleCD 300i is that it is one of the first CD-ROM drives that can read multiple *sessions.*

Miscellaneous. Compatibility shouldn't be an issue with the Macintosh IIvi and IIvx. These computers were designed using existing technologies, and any software that runs correctly under System 7.0.1 should run on them. (The Macintosh IIvi and IIvx require System 7.1, but any program that runs on System 7.0.1 should also run on System 7.1.)

The Macintosh IIvi and IIvx announce a radical new change in the Macintosh II product line—both these computers have a physical housing that is mostly metal! (The front and back panels are still plastic; they insert into a rectangular tube made of metal.)

This change reduces costs in two ways: First, it allows the design to meet EMI standards without the use of an expensive metal coating. Second, the machines that press the metal bodies last three times longer than the machines used to create the plastic bodies. By using different front and back panels, Apple can continue to give each Macintosh model a distinctive look, while retaining a technology that is reusable across different Macintosh models. ◆

• • •

That's all for the Macintosh IIvi and IIvx. Be sure to read the strategy article in this issue of *Apple Direct.*

Macintosh IIvi and vx Fact Sheet

	Macintosh IIvi	Macintosh IIvx
Microprocessor	• MC68030, running at 16 MHz • On-chip Page Memory Management Unit (PMMU) • Optional 68882 math coprocessor	• MC68030, running at 32 MHz • On-chip Page Memory Management Unit (PMMU) • Includes 68882 math coprocessor
Cache	• Not available	• 32 kilobyte cache
Memory	• 4 megabytes (MB) of main memory on the logic board (5 MB if computer ordered with AppleCD 300i CD-ROM drive) • Expands to up to 68 MB of memory	• Same as Macintosh IIvi
Expansion hardware	• Three NuBus slots	• Same as Macintosh IIvi
Disk drives	• Built-in Apple SuperDrive 1.4-megabyte floppy disk drive • Optional internal SCSI hard disk (size varies with market)	• Built-in Apple SuperDrive 1.4-megabyte floppy disk drive • 80 or 230 MB internal SCSI hard disk (in U.S.—other markets may offer other configurations)
On-board video display	• Supports Apple monitors (with up to 8-bit color or shades of gray), including: —Macintosh 12” Monochrome and RGB Displays —AppleColor High-Resolution RGB Monitor —14” Macintosh Color Display —Macintosh Portrait Display (up to 4-bit gray scale) —some VGA monitors (with proper adapter)	• Same as Macintosh IIvi
Video memory	• 512 kilobytes (for 8-bit color), upgradable to 1 MB (for 16-bit color) • 1 MB of memory is standard if computer ordered with AppleCD 300i CD-ROM drive	• 1 MB (for 16-bit color)
Interfaces	• Two Apple Desktop Bus (ADB) ports, supporting a keyboard, mouse, and other devices • Two serial ports • SCSI interface, for external peripherals • Video-out port • One internal accelerator slot (provides access to the CPU bus) • Monaural sound-in and stereo sound-playthrough ports • Built-in LocalTalk through serial port	• Same as Macintosh IIvi
Keyboard and mouse	ADB Mouse supplied; supports all Apple Desktop Bus keyboards	• Same as Macintosh IIvi

Sound	• Supports monaural sound-in (through external microphone, supplied) • Sound playthrough mixes (to speaker or headphones) CD-ROM audio, system beep, and Macintosh-generated sounds • Sound playthrough is stereo to headphone jack, mono to internal speaker	• Same as Macintosh IIvi
Microphone	• Electret, omnidirectional; output voltage is 4 mV, peak to peak, at normal volume	• Same as Macintosh IIvi
Electrical Requirements	• Line voltage: 100 to 240 volts AC, at 50 to 60 Hz • Power: 112-watt power supply (sufficient for 3 NuBus cards)	• Same as Macintosh IIvi
Size and weight	Main unit: 6.0 in. (15.2 cm) x 13.0 in. (33.0 cm) x 16.5 in. (41.9 cm) • Weight: 25 lbs. (11.3 kg) (weight varies based on internal devices installed)	• Same as Macintosh IIvi
Other	• ADB mouse, clock/calendar chip and battery; CloseView, Easy Access, and visible beep software (for users with disabilities) • Space for one 5.25-inch half-height mass storage drive, like AppleCD 300i CD-ROM drive	• Same as Macintosh IIvi
AppleCD 300i CD-ROM drive (optional)	• Can be ordered as part of the computer • Operates at twice the speed of most CD-ROM drives • Supports Kodak Photo CD technology • Computer can start up from a CD-ROM disk with system software on it	• Same as Macintosh IIvi
Prices (U.S. Suggested Retail Prices)	• This model is not for sale in the U.S.; prices outside the U.S. had not been set when this was written	• With 4 MB memory, 0.5 MB video memory, 80 MB hard disk: $2949 • With 4 MB memory, 0.5 MB video memory, 230 MB hard disk: $3319 • With 5 MB memory, 1 MB video memory, 80 MB hard disk: $3219

Apple Announces DAL Server for AS/400; Apple–IBM Partnership Passes 1-Year Mark

The latest result of Apple's joint technology agreement with IBM is the Data Access Language (DAL) server for AS/400 systems, announced by Apple in September. The new DAL server is one of a series of recently-released products designed to integrate Macintosh computers into IBM environments; this was one of the goals of the landmark Apple-IBM accord announced a year ago, on October 2, 1991.

Other areas covered by the Apple-IBM agreement are development of the PowerPC (RISC) chip family, multimedia technology by Kaleida labs, the PowerOpen operating system, and Taligent's object-oriented operating system.

Apple has begun its push toward the PowerPC Macintosh (see *Apple Direct,* July 1992) and announced that Kaleida technology will be employed in a new line of personal digital assistants (PDAs) to be codeveloped with Toshiba. Specifics about the other technologies have yet to be released.

DAL is Apple's SQL standard-based connectivity language providing Macintosh users with easy, uniform access to data stored on host systems, including IBM, Digital, and UNIX. It also provides the ability to integrate information into off-the-shelf applications for further analysis, manipulation, and reporting. DAL is integral to Apple's VITAL (Virtually Integrated Technical Architecture Lifecycle) integration framework, a detailed set of technical guidelines to assist with corporate information systems planning, design, and development. (For more about VITAL, see the July 1992 *Apple Direc*t.)

With the new server, DAL-based applications can transparently access relational databases on the IBM Application System/400 family of computers, which many consider the easiest to use midrange computing systems available. Applications written with DAL can now reach into thirteen major database host operating environments, making DAL an even more powerful tool for connectivity developers.

"This is further evidence of the strides we have made integrating the Macintosh into multivendor environments," said Morris Taradalsky, vice president and general manager of Apple's Enterprise Systems Division. "The DAL Server for AS/400 combines the powerful yet easy-to-use Macintosh user interface with the AS/400's built-in database capabilities and extensive suite of applications."

Other recent Apple products that help integrate the Macintosh into IBM networks include the Token Ring 4/16 NB Card, a network adapter using an IBM chip set that enables the Macintosh to communicate across IEEE standard Token Ring networks, and the SNA•ps Gateway and SNA•ps 3270, now available with new features including 3287 printing and a 3270 Application Programming Interface (API).

With these enhancements, Macintosh users can now print host output directly to Apple printers and run third-party 3270-based terminal, front end, data base access, and client/ server applications over SNA•ps connections via concurrent 3270 and APPC sessions.

The new DAL server will be available by December 1992. Pricing will vary depending on the number of clients on a network. For more information, contact Apple Software Licensing at (408) 974-4667. ◆

It Shipped!

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

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

The following products shipped in September 1992.

Publisher	Product (version)
Ariadne Language Link Co., Ltd.	NihonogoWare 2 (NW-210)
Attachmate Corporation, Inc.	Extra! for Macintosh (1.0)
Fretware	UltraCat (1.5.1)
High Performance Systems	Stella II (2.2.1)
Image Club Graphics Inc.	newFaces Summer 1992 Typeface Collection (1.0)
Imaja	Listen (2.1.3)
Interactive Media Corp.	Special Delivery (1.0)
Interplay Productions	Battle Chess Enhanced CD-ROM (1.0)
Kiwi Software, Inc.	Kiwi Power Menus (1.0)
Logitech, Inc.	Logitech Kidz Mouse (1.0)
Max Stax, et cetera	Cell Reproduction (1.0)
	Coral Reef Stratification (1.0)
MediAlive/CD Technology	America Alive (1.0)
Micro Planning Int"l Ltd.	Micro Planner Manager (1.0.3)
	Micro Planner X-Pert (2.0.3)
Objectic Systems, Inc.	Fast Pitch (2.0 Pro)

Plusware, Inc.	Plusware Numeric Keypad for PowerBook (1.0)
Quadmation, Inc.	ZPS-40LC (A)
SoftArc Inc.	FirstClass (2.0)
Surf City Software	SurfGuard Backup Utility (2.2)
Technovation Training, Inc.	Your Medicare Counselor (1.0)
Transware Corporation	Financial Life Planner (Flip) (1.0)

KanjiTalk 7 Opens Door for Japanese Development

One of the biggest advantages of System 7.1 is that it makes possible a new, vastly improved version of the Japanese Macintosh OS. KanjiTalk 7, as it is known, is being released in Japan simultaneously with System 7.1. The good news for developers is that KanjiTalk 7 is a localized version of System 7.1, supporting all the enhancements brought to the Macintosh by the new, world-ready System 7.

The timing of this release couldn't be better: Japan is the fastest growing market for Macintosh, with some estimating that unit sales have increased 50 percent over a year ago. Apple Japan estimates that, as of late summer 1992, the installed Macintosh base in Japan stood at 450,000, and Apple Japan anticipates that the base will grow to well over half a million by year end.

Applications running under the new KanjiTalk will be easier to use and have a more sophisticated look and feel. KanjiTalk 7 introduces a new input method that makes entering Japanese characters a less tedious process. Further, TrueType is part of the new version of KanjiTalk, which ships with additional Japanese TrueType fonts. Also, the new system introduces a few subtle but significant enhancements to the interface of the Japanese Macintosh. The illustrations that accompany this article show some of the ways KanjiTalk has been improved.

New Input Method. From a users' standpoint, the most dramatic difference in how KanjiTalk 7 works is its enhanced input method, which is called Kotoeri. Typing Japanese ideograms is complex and time-consuming on any computer. As a result, the input method—the way that computer keystrokes are translated into the thousands of different characters and placed into a text window—is of crucial importance.

Two critical features distinguish the new input method. First, a new conversion engine more accurately translates Japanese phonetics—or *Kana*—into the characters—or *Kanji*—that make up the Japanese written language. Second, Kotoeri, which is fully compatible with the Text Services Manager (TSM), supplies "in-line" support for all TSM-aware applications (for an explanation, see below).

A sophisticated input method is of great value in the Japanese market, in part because so many Japanese have limited keyboard experience. With KanjiTalk 6.x, users had several alternatives for keyboard entry, including Apple's, called *2.1 Henkan,* and many third-party input methods.

2.1 Henkan requires the use of a "floating window," by which users of word processing applications create characters in a separate lower window, then press the Return key to place the composed character in the text. This method, while functional, is awkward to use: It's a little like using the Key Caps desk accessory to build words or phrases separately and only then inserting them into a document.

Developers could provide a better user experience by supporting one or more of the alternate third-party input methods. However, all of these systems required writing to proprietary application programming interfaces (APIs). Besides providing complete product offerings, developers needed to bundle their APIs with a third-party's input methods, thus incurring added expenses. For many, these complexities and expenses were barriers to success in the Japanese market, because they made it less likely for developers to include a good input method.

KanjiTalk 7 changes all that. With Kotoeri, users have an elegant in-line input method from Apple that supports both in-line and floating window input. See the illustration for an example of what the input methods look like. Kotoeri also includes a better engine that can convert longer and more complex phrases more accurately.

For developers, there is no need to license or to bundle an input method. And because in-line support is standardized by the TSM, one implementation will work not only for Apple's input method, but also for TSM-compatible input methods from third parties.

An additional benefit of Apple's new input method is that its API is not proprietary, but open. Input method developers can differentiate their products by providing additional services to users an applications. The API also means that developers are no longer dependent on others for their input method—they can substitute any new input method that has the same API. In this way, the typical problems with support and upgrades are reduced.

Finally, Apple's input-method API is the same for Japanese and Korean and will eventually support both traditional and simplified Chinese. This means lower development costs for developers who wish to enter all of these important

Asian markets. In fact, it provides an incentive for companies to create versions of products in all of the languages.

Over time, developers will create increasingly elegant and powerful input methods that will be superior for some users, and Apple is encouraging this. However, most application developers will now be able to rely on Apple to provide a great out-of-the-box experience.

For users of KanjiTalk 6.x, KanjiTalk 7 provides an InputBackSupport extension, which supplies backwards compatibility for KanjiTalk 6.x input methods and fonts.

In the past, only text-intensive applications, such as word processors, could justify the cost of an in-line input method. Now, many others—graphics, data bases, CAD applications—can use the Apple input method and API and enter markets in Japan, Korea, and China with far less cost. Kotoeri and the other enhancements to KanjiTalk 7 further Apple's goal of encouraging more developers to enter the strategic Japanese market.

Fonts. When Apple introduced the Laser Writer NTX-J in Japan in 1989, it was the first printer to handle Japanese PostScript font technology on a personal computer. Together with KanjiTalk, the NTX-J met a critical demand of the Japanese market for high-quality printing in the desktop publishing field. But because of the enormous size of Japanese fonts—containing as many as 8,000 characters—the development of bitmapped fonts for the screen and printer fonts for Postscript printers meant considerable expense and development time. And while the PostScript-only solution was powerful, it was expensive for users.

Apple introduced Kanji TrueType in February 1992. TrueType's outline font technology meant that fonts could be developed for both screen and printer more quickly, and that clear, sharp output could be generated on low-cost printers such as the Apple StyleWriter and LaserWriter LS

With KanjiTalk 7, TrueType is now built into the system, and seven TrueType fonts are included: Osaka (the system font), Honmincho, Heisei-Kaku Gothic, RyumiinLight-KL, ChuGothic-BBB, HeiseiMincho, and MaruGothic. For the Japanese market, the features built into this new system release provide significant value. Likewise, KanjiTalk 7 will open up a number of opportunities for software developers and font developers, and as the Japanese market matures, the demand for new and interesting fonts will grow.

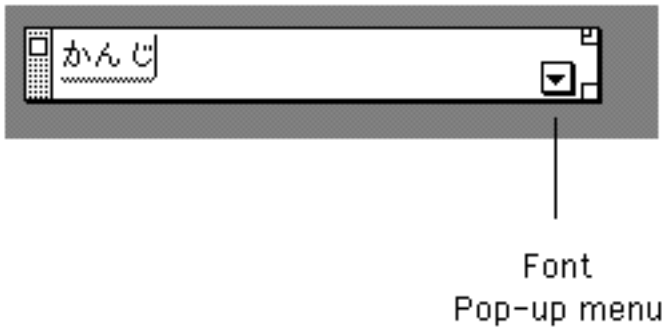
For the low-cost market, the enhanced text support of KanjiTalk 7 means that application developers will have a greater incentive to develop less-expensive applications. The addition of TrueType to the KanjiTalk 7 system software and the inclusion of seven TrueType fonts with the system now expand the range of applications and peripherals that can be competitive in the Japanese market.

Look and Feel. Apple's engineers have also enhanced the interface of KanjiTalk 7 in a number of ways. Previously, the metrics of the KanjiTalk system font, Osaka, required some interface elements, such as menus, to be taller than with other versions of the Macintosh system. Osaka has been refined for KanjiTalk 7 so that menus are the same height as those of U.S. System 7.1.

Additionally, the interfaces of previous versions of KanjiTalk used many so-called loan words—words of English origin made to sound Japanese. Interface terms for KanjiTalk 7 have, as much as possible, been translated into native Japanese words (although some borrowed terms, such as *Cut, Copy,* and *Paste,* remain in KanjiTalk 7).

KanjiTalk 7 requires a minimum of 4 megabytes of RAM. It is first being made available through retail outlets in Japan and will soon be available in other markets and through other channels.◆

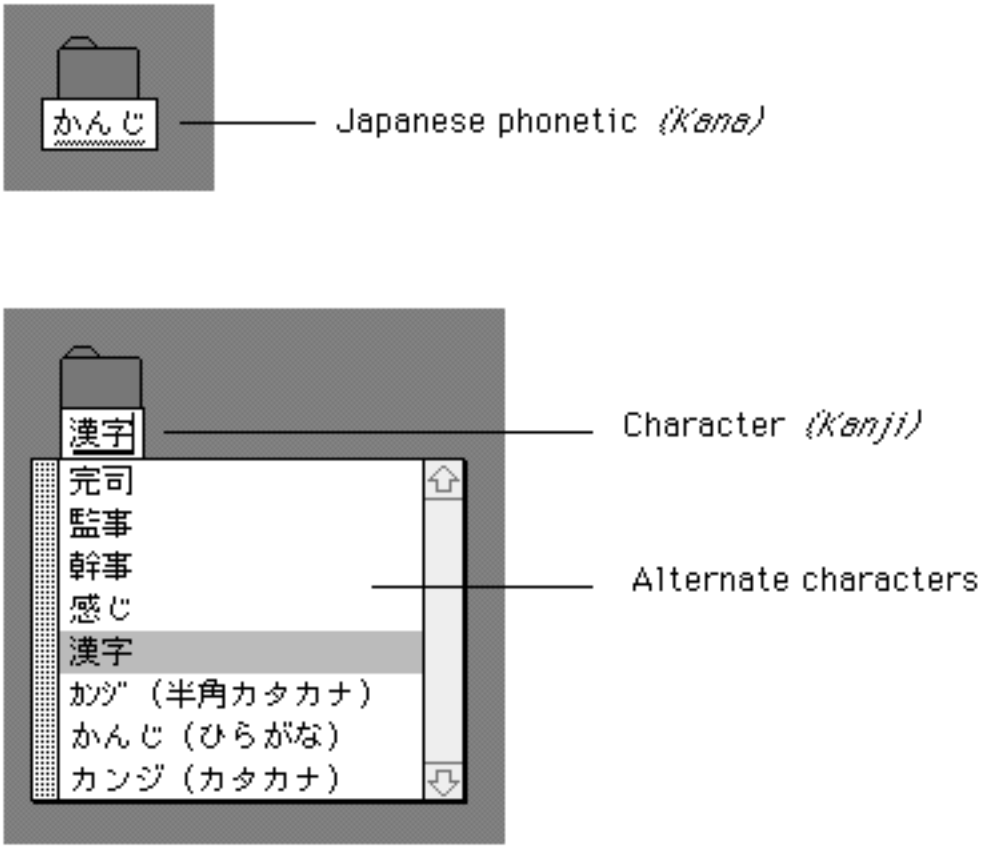
Floating Window (Non-TSM-Aware) Input



Floating window input is still available with KanjiTalk 7 for applications that don't yet support the Text Services Manager (TSM). Users type *Kana* in the

floating window, which is separate from the application window.

In-Line (TSM-Aware) Input


かんじ
Japanese phonetic (Kana)
漢字
Character (Kanji)
完司
監事
幹事
感じ
漢字
ｶﾝｼﾞ（半角カタカナ）
かんじ（ひらがな）
カンジ（カタカナ）
Alternate characters

For in-line input, users type phonetics (called *Kana* in Japanese), then press the Space bar to convert phonetics to characters (or *Kanji*). A scrolling window suggests alternate *Kanji.*

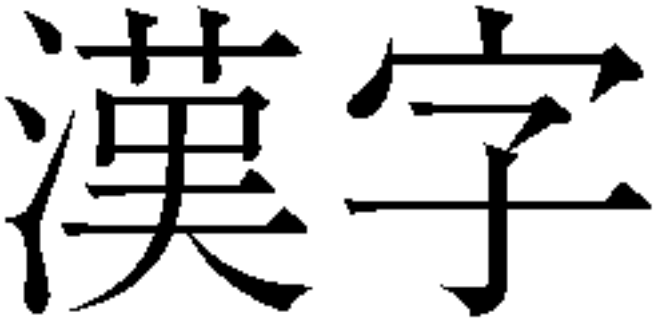
Five of the new Kanji TrueType fonts

Osaka

ChuGothic BBB

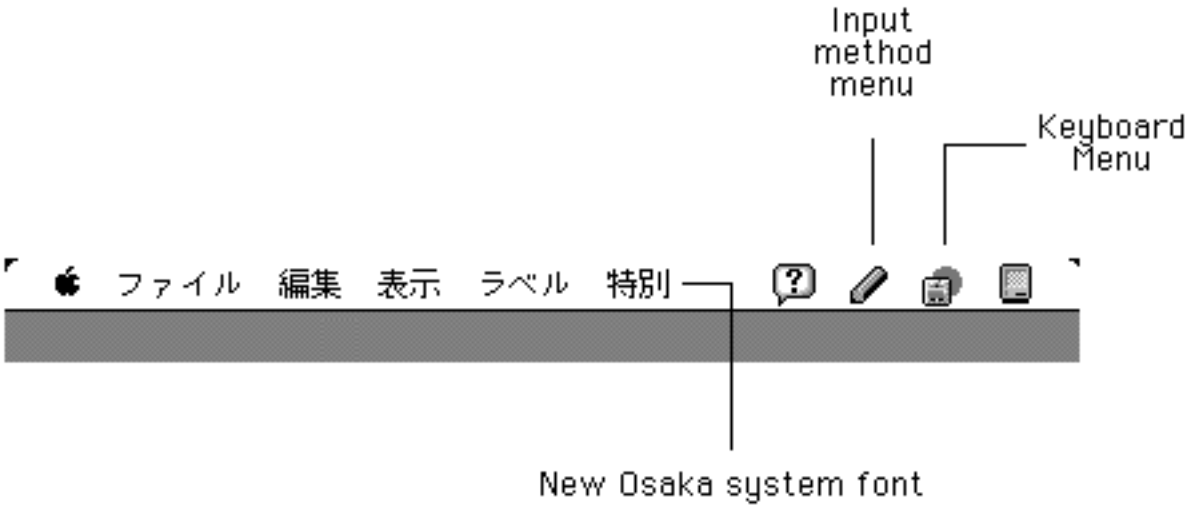
MaruGothic-M

Honmincho



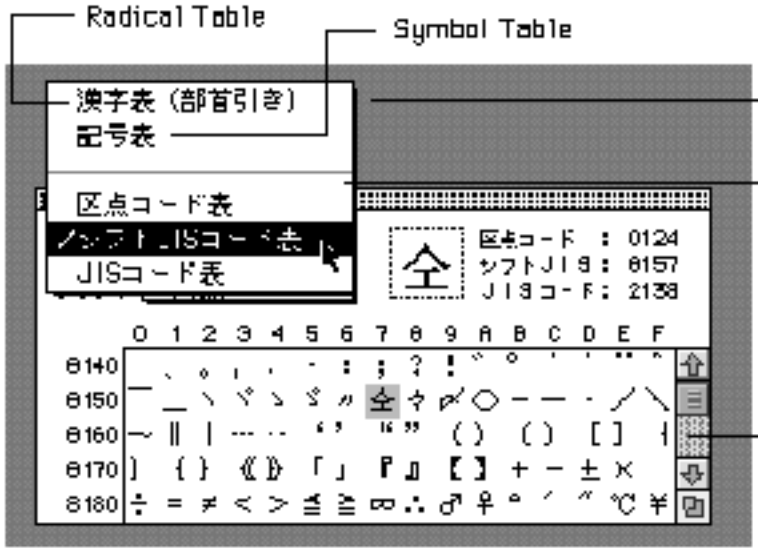
Ryumiin Light

KanjiTalk 7 Menu Bar



The new KanjiTalk menu bar, which uses a refined version of the Osaka system font, is the same height as the menu bar for U.S. System 7.1.

Character Tables

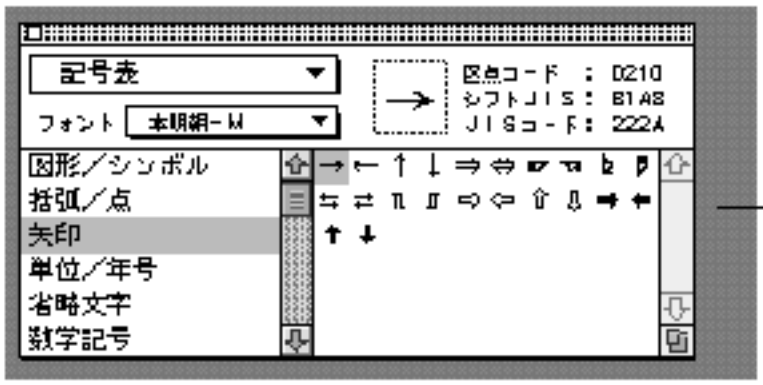


Pop-up menu to select different tables

Code tables

Shows Shift-JIS hex codes, which are used internally

Radical Table lists Kanji by radical, in this case the "lid" radical (highlighted)



Symbol Table lists symbols by category, in this case arrow symbols

These tables are used to enter characters when the user doesn't know how to describe them phonetically. To use them, the user selects the appropriate table and double-clicks to enter *Kanji.*

Now Available From Apple

The following list shows APDA products that have become available to developers within the last several weeks. To get a full listing of all APDA products, check the current *APDA Tools Catalog.* For new-product announcements and the most up-to-date price lists, check AppleLink (path—Developer Support:Developer Services:Apple Information Resources:APDA—Tools for Developers).

Apple Products

DAL 1.3.6 for VAX/VMS and A/UX

DAL Server 1.3.6 for VAX/VMS (9-Trk or TK-50)
B0576LL/B (9-Trk) / B0577LL/B (TK-50)
$5000.00

DAL Server 1.3.6 for A/UX
B0580LL/B
$995.00

DAL db adapters for VAX/VMS (9-Trk or TK-50)
C0195LL/C (9-Trk) / C0196LL/C (TK-50)
$1495.00

Supported dbms versions:

- Oracle 6.x
- RDB version 4.0
- Ingres 6.3
- Sybase 4.0

Books

AppleTalk Program-to-Program Communications (PPC) Programmer's Guide
R0281LL/A
$20.00

Third Party

NetBuild
(Calliope Enterprises, Inc.)
T1494LL/A
$995.00

SoftPolish
(Language Systems Corporation)
T1495LL/A
$295.00

TextPert Developer's Toolkit (CTA, Inc.)
T1497LL/A
$495.00

APDA Top-Ten Sellers

1. E.T.O. Starter Kit/Subscription
2. *New Inside Macintosh:* Files
3. *New Inside Macintosh:* Memory
4. *New Inside Macintosh:* Processces
5. MPW C v. 3.2 bundle (57 disk, 31 CD-ROM based)
6. Macintosh Programming Fundamentals v.1.0.1
7. Macintosh Common Lisp v. 2.0
8. QuickTime Developer's Kit v. 1.0
9. MacTCP v. 1.1 licenses
10. A/UX developer tools

Ordering Information

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

Spotlight On...

New tools for commercial developers from APDA.

SOFTPOLISH

Language Systems Corporation

This automated interface design tool helps ensure compliance with Apple Human Interface Guidelines by checking resources for screen/sizing compatibility, validity, spelling, and capitalization in menus, dialogs, alerts, PICTs, Balloon Help, and more. An invaluable tools for all projects from high-level languages to databases.

System Requirements: Any Macintosh with 2MB of RAM, System 6.0.5 or later (System 7 recommended) and Finder 6.1 or later.

Product contents: One Macintosh disk and one reference manual.

APDA Product number: T1495LL/A $295

TEXTPERT DEVELOPER'S TOOLKIT

CTA, Inc.

This toolkit lets you integrate OCR (Optical Character Recognition) capabilities into any application, from custom databases to forms to desktop publishing. You'll enjoy processing speeds of up to 10 kilocharacters/minute in less than 50k memory. The toolbox supports many popular scanners (including Apple Scanner and OneScanner) and recognizes single and multicolumn text. This product is compatible with MPW C and THINK C. Cross-platform libraries are available for MS/Windows and MS/DOS. Run-time and OEM licensing packages are available directly from CTA with externals for 4th Dimension and HyperCard.

System Requirements: Any Macintosh with 1MB of RAM, a hard drive with a least 2.5MB of free space and System 7.

Product contents: Two Macintosh disks and one reference manual.

APDA Product number: T1497LL/A $495

APDA Announces Address and Telephone Changes

Please note APDA's new address and phone number. APDA has moved its order processing center to Buffalo, New York. As a result, two phone numbers (domestic fax and international telephone) and our mail-order address have changed.

New phone numbers and mailing address:

- Fax number (716) 871-6511
- International phone number (716) 871-6555
- Mail-order address P.O. Box 319, Buffalo, NY 14207-0319

This information remains the same:

- U.S. 1-800-282-2732
- Canada 1-800-637-0029
- APDA hours of operation Monday-Friday, 7:00 A.M. to 5:00 P.M.Pacific Time

Developer Support Center To Phase Out Four AppleLink Addresses

Last May, the Apple Developer Group created a single gateway for support services for commercial software and hardware developers in the U.S. and Canada, called the Developer Support Center (DSC). The DSC was designed to make it easier for developers to access a wide variety of technical and business resources to help meet their development needs.

As part of this introduction, the DSC introduced two new AppleLink addresses, DEVSUPPORT and DEVFEEDBACK, for all electronic mail communication. To further simplify the process, on November 1, 1992, the DSC will phase out the following AppleLink addresses: MACDTS, AIIDTS, DEVHOTLINE, and DTS.FEEDBACK, all of which have been forwarded to the appropriate address since the DSC's introduction.

For developers, this means that all administrative-, product-, and development-related questions intended for MACDTS, AIIDTS, and DEVHOTLINE should now be addressed to DEVSUPPORT. All feedback on the quality of DSC service intended for DTS.FEEDBACK should now be addressed to DEVFEEDBACK. As of November 1, 1992, AppleLink will no longer allow you to send mail to the phased-out addresses.

Remember that the Developer Support Center offers a wide range of services, including:

- Answers to administrative questions about Apple's developer programs
- Answers to product-level technical questions related to development efforts
- Answers to programming-level questions
- Assistance with technical registration issues
- Direction to other resources within Apple for support

Here's how you can contact the Developer Support Center: Telephone: (408) 974-4897, Monday - Thursday from 8:00 a.m. to 5:00 p.m., Pacific Time; Fridays from 8:00 a.m. to 4:00 p.m., Pacific Time; closed daily 12:00 noon to 1 p.m.

AppleLink: DEVSUPPORT. Electronic mail messages can be sent any hour, day or night. The DSC will respond within 72 hours of the next business day.

Internet: DEVSUPPORT@ AppleLink.Apple.com.

Fax: (408) 862-8602.

U.S. Mail: Apple Computer Inc., Developer Support Center, 20525 Mariani Avenue, M/S 75-3T, Cupertino, CA 95014. ◆

“Details! Details!”

By Peter Bickford

You’re opening your mailbox when you receive an unexpected shock—an urgent, prize-award letter from the Sweepstakes Contest Clearinghouse. It’s marked as an express telegram notification, with special instructions to deliver it straight to you, MR. MYRON APPLEBY.

Of course, you know it’s a fake.

If you bother to open it, you know you’re not about to win a free car; you know that the dream home you’ve been looking for will remain a dream. Instead, you’ll probably be offered cheap jewelry or a bogus film offer if you call a 900 number “for award confirmation.” The whole thing’s a scam, and you know it before you open the envelope.

You know it because the bold letters say one thing, but all the details say another. The “hand-delivery” letter was in your mailbox. The telegram-style letter was in the wrong kind of envelope. And the urgent express notification bears a bulk-mail stamp. The con artist’s illusion missed too many of the details needed to make it work.

THE ILLUSION OF INTERFACE DESIGN

In creating human interfaces, we become like con artists, magicians, and film makers. We’re in the business of creating illusions—in our case, the illusion of simplicity. Like any con man, however, we need to get every detail of this illusion right, or it won’t work. Attention to detail is a crucial part of the human interface, and the fourth principle in designing for our complex world.

Interface designers tend to be perfectionists; they have that persnickety frame of mind that forces them to point out that your quotation marks should be curved, that your default button outline is a pixel too heavy, and that you forgot to capitalize the “K” in “Ok.”

I’m as guilty here as anyone. Heck, I can’t even watch commercials with computers in them without evaluating whether the dialog box button placement is correct. Like I said, we’re persnickety.

“We wory about all this because your users notice it to’. Note how one or two missed details in the previous sentence probably convinced you that the author

was a complete idiot and that the *Apple Direct* copy editors were asleep on the job. We could write the most important, provocative, and useful article in the world, but if it were filled with misspellings and incorrect punctuation, the author's credibility would be shot. More likely, you'd never finish the article.

It's the same story with the computer interface. It doesn't need to be the sudden appearance of an "ID=02" system bomb that alerts the user that something's fishy. Pop-up menus that don't have a drop shadow; buttons with the wrong curvature; modeless-looking dialog boxes that can't be switched to the background… All these things conspire to destroy the user's faith in your application. The user's illusion of consistency and simplicity is shattered. They get nervous around your products—and they start looking around for alternatives.

IF IT'S NOT ALL RIGHT, IT'S ALL WRONG

As a developer, there's an incredible burden on you to get every little thing right. To do this, you have to develop the eye of an editor and the attitude of the harshest critic and still manage to write the code of a master programmer. You have to keep at it until it's all right, because in the user illusion business, if it's not all right, it's all wrong. "Close enough" just isn't.

Start by using the Human Interface Checklist on the Developer CD (Path: Technical Documentation:Human Interface:Human Interface Checklist) as you evaluate your application. Does pressing Command-Period activate your Cancel button? How about the Escape key? Are you using modal and modeless dialog boxes appropriately? Run your program through the checklist and make sure everything's working appropriately.

Next, review the aesthetics of your program. Are you using 9-point type for some headings and 10-point for others? Do your dialog boxes have similar borders and white space? Do your dialog box items line up or are they a pixel or two off from each other? In the heat of development, it's easy to miss these things—so take a step back from your program and have another person give it a careful once-over before shipping time. Even if you didn't catch the little mistakes, you can be sure users will.

Many of the makers of development systems didn't take enough time to get their own details right. Their "modeless" windows are really modal; their floating

palettes don’t float; and the default button type looks like an over-sized, three-dimensional Tic-Tac mint. Worse, any applications you build with these systems inherit the same deficiencies.

As a result, you may have to do elaborate work-arounds to make standard interface elements work in the standard way. It’s a shame that because the developers of these tools didn’t pay enough attention to doing the details right, the burden falls on you. But if you don’t make things work right anyway, your users will blame you, not the folks who wrote the development system. This isn’t fair, but it’s the way life goes.

Users simply don’t care about the troubles that you go through as a developer. It doesn’t matter to them whether you had a tight shipping schedule or whether you were using a cross-platform code base that uses Motif-style windows in its Macintosh module. They want a program that looks and works exactly the way a Macintosh program should.

If you pay attention to the details, you’ll have created the sort of illusion for the user that our bulk-mailing con artist only aspired to. People will hand you their trust and their money as they buy your product, walk away smiling, and come back again.

And that, my friend, is the best kind of con game there is. ◆

Pete Bickford runs the Human Interface Lab at Apple’s IS&T (Information Systems and Technology) organization. You can send your human interface questions, or comments on his article, by AppleLink to THE.DOKTOR.

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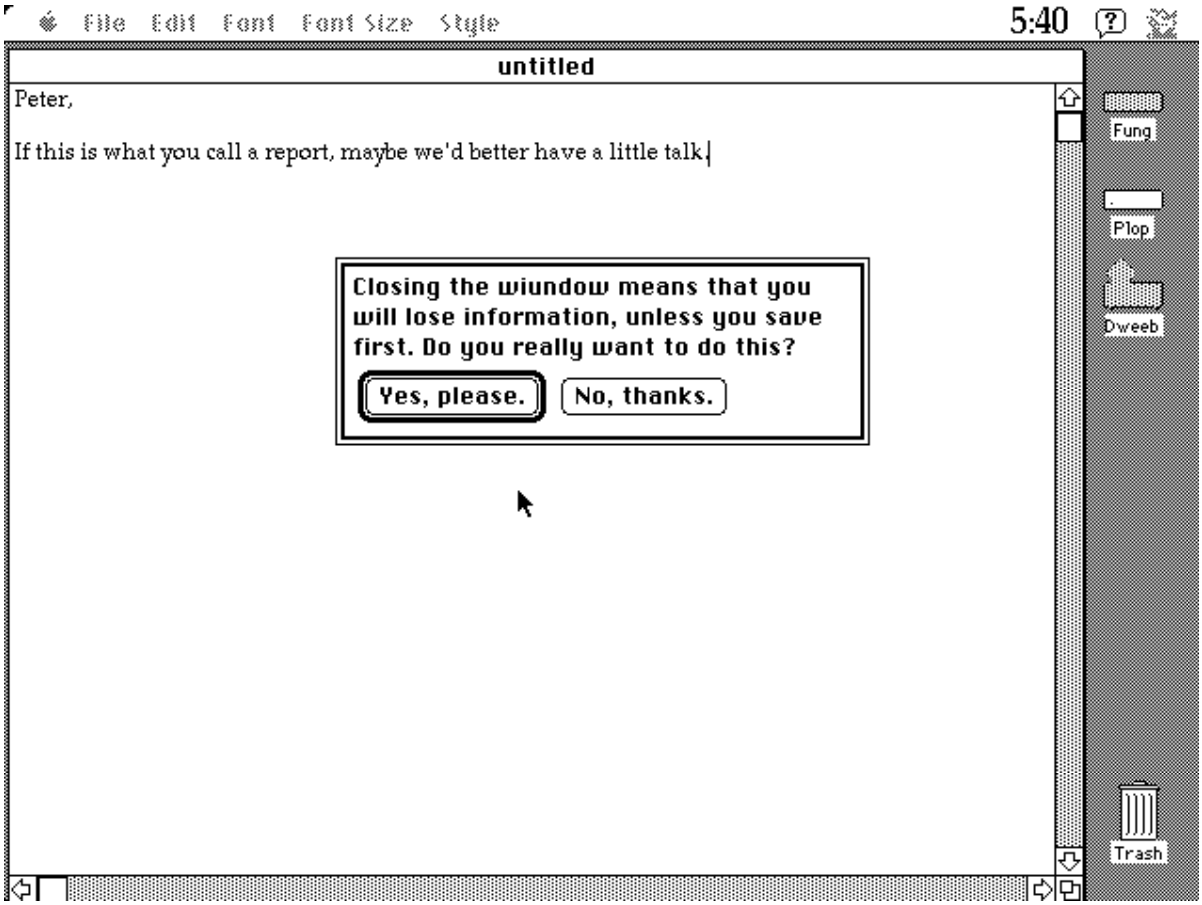

Would you buy a used car from this dialog box? Mistakes in your application's interface can make all the difference in obtaining the user's trust.

Announcing a Contest!

Tell us what's wrong with the dialog box in the accompanying illustration. Writer of the most entertaining response will have their entry reprinted in *Apple Direct* (space permitting) and receive a copy of *Processes* from *New Inside Macintosh.* Send your entry via AppleLink to APPLE. DIRECT or by U.S. mail to *Apple Direct,* 20525 Mariani Ave., MS 75-2B, Cupertino CA 95014, USA. Entries must be received by November 16, 1992.

GetNextEvent

The " " indicates the trade shows/events at which Apple Computer, Inc. is scheduled to exhibit as of press time. This list may be incomplete. If you have information about a show that you want listed here, contact Developer Technical Communications, 20525 Mariani Avenue, Mail Stop 75-3B, Cupertino, CA 95014. For further information check the Events folder on AppleLink (path—3rd Party Connection:Events).

October 28 through 31
Educom
Baltimore, MD
Contact: Paula McClain
(408) 974-8502

November 8 through 11
MacIS USA
New Orleans, LA
Contact: Jerry Starr
AppleLink: JERRY.STARR
(408) 974-3836

November 10 through 12
Autofact
Detroit, MI
Contact: Society of Manufacturing Engineers
(313) 271-1500

November 16 through 20
C++ World
Secaucus, NJ
Contact: G.G. Schafran
(212) 274-0640

November 16 through 20

Comdex

Las Vegas, NV

Contact: Interface Group

(617) 449-6600

November 18 through 23

NCTE

Nat'l Council of Teachers of English

Louisville, KY

Contact: NCTE

November 20 through 23

NCSS

Nat'l Council of Social Studies

Detroit, MI

Contact: (202) 966-8740

December 1 through 4

Cause

Dallas, TX

Contact: Cause

(303) 449-4430

December 8 through 10

FCC - Federal Computer Conference

Washington, D.C.

Contact: Information Development Corporation

(301) 961-6575

Apple #1 in U.S. Home Computer Sales

According to two independent market research firms, Macintosh is the best-selling computer in the United States for the home, and Apple has the largest installed base of personal computers in U.S. homes.

Research conducted by InfoCorp shows that in 1991, Apple sold 311,005 Macintosh computers into U.S. homes, while IBM sold 281,348 PS/1s and PS/2s. InfoCorp's forecast of U.S. homes unit sales for 1992 is 420,488 Macs versus 344,896 PS/1s and PS/2s.

Additionally, according to InfoCorp Apple is well positioned to gain market share in the home segment. In 1991 and including both Apple II and Macintosh computers, Apple had the greatest market share of personal computers in U.S. homes. InfoCorp shows Apple with an 11 percent share of the U.S. home market, IBM with 10 percent.

Research from LINK Resources Corp., New York, NY, shows Apple Computer as the vendor with the largest installed base in the U.S. home market with 18.6 percent share and IBM 16.6 percent.

Apple expects Performa sales to increase these numbers, and we'll let you know as much as we can about Apple's performance selling to home users. A future issue of *Apple Direct's* Market Research Quarterly will profile the U.S. home computing market. ◆

Understanding Distribution Realities

Timing Is A Key To Success

By Barry Evleth and Jeff Davis, Ingram Micro

Editor's note: While much of this information may apply to distributors overall, this article is a case history of Ingram Micro.

Understanding how a U.S. national distributor chooses which products to carry—and why —is sometimes confounding and frustrating. However, distributors really *do* want to carry your product. In our case, if we don't pick it up it isn't because we think the product doesn't have serious merit or that your company has a lack of vision.

Instead, it's often simply a matter of timing: Developers, whether based in the U.S. or elsewhere, often approach us too early in their product's life cycle. "Too early" means before products meet the criteria necessitated by the distributor's business needs.

The reality is that the noise level—the sheer number of products competing for distribution—is high. Distributors feasibly can carry only a finite, albeit large, number of products. For example, Ingram Micro carries more than 13,000 items from more than 650 vendors (300 of which have a Macintosh product). We receive more than 100 new submissions every month. Therefore, we must set criteria that will help us choose products that best fit our high-volume, mass-distribution model.

With this article we'd like to help you understand these criteria and how we evaluate products; give you a clearer idea of the right time to approach national distributors; and give you insight into a distributor's mindset to help set your expectations. We also hope to reduce the potential frustration when you first approach distribution and increase your chances to create a win/win relationship with a company like ours.

When to Seek a Distributor

The real key to successfully approaching a distributor is timing—where your product is in its life cycle. The best time to begin a relationship with a national U.S. distributor is when your product has already begun making solid inroads

into the market. Like most other businesses, distributors must carefully balance perceived risk with potential gains. To strike that balance, we usually seek products with proven track records, and companies who have established relationships with resellers and users.

Every distribution company has its own business model and the accompanying requirements for profit margins, sales run rates, and return-on-investment. The reality is that to meet our business objectives and succeed as a company, we must be able to move products out the door relatively quickly.

While there's no set-in-stone minimum required volume, on the average if we think we can sell a software product at a rate of $25,000 a month (wholesale) or more, we'll be more likely to carry it. The amount can be somewhat higher for hardware items, depending on support requirements, size, weight and other product handling issues.

The timing is right when you have:

- created a degree of market demand
- penetrated two or more reseller segments (such as computer specialty dealers, VARs, mail- order firms, aggregators/ chains, mass merchants/retailers)
- developed an ongoing relationship with dealers or resellers in more than one geographic region
- demonstrated that end users accept the product.

If your product has been newly introduced or if it's in the "chasm" between early market acceptance and adoption by the mainstream, it's probably too early for you to approach a distributor. (For a detailed description of what constitutes the chasm, see "Crossing the Chasm: Moving From Early Success to Mainstream Market Leadership" in the May 1992 issue of *Apple Direct.*)

There is, of course, an exception to the rule. Maintaining our competitive position depends somewhat on our ability to anticipate what *will be* hot in the reseller market. If you can show that your product is ahead of market demand, that it is part of a budding market, or that it takes advantage of a new or emerging Apple technology, then we may be more willing to take a risk on it. For example, we might be willing to consider a product that takes advantage of some hot new technology such as QuickTime, or is one of the first to incorporate O.C.E (Open Collaboration Environment).

The burden is on the developer to demonstrate that the product *is* part of an emerging trend and that it has market potential. Convincing a distributor that a

burgeoning demand is just around the corner reduces the perceived risk and makes your not-yet-established product more attractive to us.

WHAT WE ARE, WHAT WE AREN'T

An important part of working with a distributor is understanding exactly what its business is and isn't. The role of a distributor varies, depending on whether your products are for new or established markets. But overall, our role is to broaden and/or accelerate penetration into the reseller channel—not (usually) to create initial market demand.

In a new market (such as pen computing) the distributor's primary function is to broaden channel penetration by generating visibility with resellers, providing reseller education, doing promotions, and creating buying incentives. In established markets our role is primarily to provide product availability and quick delivery; assume credit risk; and give leverage to a developer in the form of our large reseller base, economies of scale, and targeted marketing and sales programs.

We call this the "leveraged model." In this model, the distributor acts as an extension of the developer; the developer gains additional marketing leverage by partnering with a company (the distributor) that has an established marketing and distribution infrastructure and the accompanying resources.

A caution here: It is important not to view the distributor as the final sale. Developers with this view tend to expect the distributor to generate channel and user demand; they structure their businesses without focusing on creating the necessary pull and product exposure needed to generate demand. This is a mistake, given what the distributor's role is. The key is to remember that the final sale is a transaction *between the reseller and the user,* and the developer must play a role at every level.

Historically, distributors outside the United States often have played a more extensive role, dictated by market conditions in their locales. They sometimes offer marketing programs, localization assistance, and other services beyond what is generally offered in the U.S.

This is particularly important to non-U.S. developers who wish to enter a national distribution relationship in the United States. Be aware that the role the typical national U.S. distributor plays—and the services it offers—can be

different than that played by distributors elsewhere. This means a developer must demonstrate that its product has a presence or track record in the U.S.

How to Submit a Product

We use a standard process for reviewing products. (For a general explanation of the process, see “Steps To Product Review” below.) Understanding this process can help you better prepare for what’s ahead and, we hope, save you time and spare some frustration.

What you submit and how you submit it is as important as the process itself. Of course, distributors want to see the whole product—disks, packaging, documentation, “the works.” (To help you avoid some of the potential pitfalls when submitting a product to a distributor, see “Tried-and-True Ways To Turn Off A Distributor” below.)

Another important part of your submission is a vendor profile (see Step 3 in “Steps To Product Review” below). This is a snapshot of your product and company that helps us gauge whether you present a “business case” that is consistent with our objectives. The profile gives us important information, such as what and how much product you sold last year and the year before, and competitive position, your competition, and immediate plans for producing and marketing the product. Its primary purpose is to give us a feeling about who you are and put your company in perspective with others like it.

The exercise of completing the vendor profile also can be useful to the developer. It can help you better understand what we’re looking for. It may also raise questions that you have not yet addressed in your business plan, possibly indicating that it’s still a little early to seek a national distributor.

Paint The Big Picture. In addition to submitting a complete product and vendor profile, it’s important that you send us a proposal that clearly paints the big picture for your product.

How is it positioned in the market? (You might try following the process outlined in “So What’s Your New Product All About? Position It Using the Elevator Test” in the February 1992 issue of *Apple Direct*.) How does it compare with the competition? What is your overall marketing strategy? What are you doing to create product awareness and visibility? Has your product been reviewed? What did reviewers and analysts say?

Send us reviews, copies of ads and information about response rates, articles about your products written by outside parties—anything that can help demonstrate that we can sell the needed volume of your product.

This picture will help us determine whether we can successfully distribute your product. It also helps identify potential opportunities for us to offer bundles that are complementary to your product, or to piggyback on existing advertising or promotional campaigns, road shows, and so forth.

ANTE UP: MEETING PRODUCT EVALUATION CRITERIA

Once you've submitted your product, the distributor's real work begins. The process of choosing which products to carry is one of convergence: We start with a very broad base of offerings and eventually narrow them to the few that we'll actually carry.

Most distributors have concrete criteria against which they evaluate submissions. Our new products committee reviews both the business aspects and the technical merits of a product. Table 1 on this page is a list of the various aspects we consider.

Based on what we learn, we can determine whether your product meets our business model criteria (see Figure 1 below). The more criteria you meet, the more appealing your product is to our company.

The criteria are sorted into three main categories. The bottom third of the pyramid represents what is needed to rise above the *noise level.* Products that meet criteria on the levels just above that have what we characterize as a *good chance* to be picked up by Ingram. Those that meet the criteria in the very narrow tip of the triangle are what we call the *slam dunks*—products that are the strongest candidates. These are often mainstream vendors with established products who do not currently use a national distributor (such as Apple Computer before 1992). We spend a great deal of time proactively pursuing them.

Rising Above the Noise. The bottom section of the pyramid represents the opening ante; products that don't meet these criteria basically don't make it beyond the initial reading of the vendor profile. The reason: Almost every product we receive fits the bottom two criteria—quality/reliability and competitive price. Likewise, most of these companies can demonstrate that they have

adequate financing or venture capital. However, innovative or enabling products (as we discussed earlier) are usually on the upper fringes of the noise level.

To rise above the noise level, products must exceed the expectations set by the criteria in the bottom tier of the pyramid. (For a discussion about how many products a distributor receives versus how many are accepted for distribution, see “Understanding the Noise Level” below.)

Good Chance. If the product is a “me-too” one, the ante is much higher; to even be considered, it must meet the criteria that are in the *good chance* section of the pyramid. Products that have a good chance of being accepted have a track record in the marketplace; they have a demand-creation marketing program and a healthy sales run rate (and therefore existing relationships with customers). These companies have also created strategic alliances with major resellers or dealers.

Because distributors generally don’t create user demand, developers must establish their own programs to generate it. Having a good sales run rate, something that is measurable, is important because it demonstrates that there is a market for the product and indicates that the distributor should be able to move the product adequately.

Having a strategic alliance with a major reseller, for example a regional distributor, is a plus but not a must. Quantifiable success stories about sales through any kind of resellers go a long way toward differentiating your company.

The Slam-Dunk. Products that meet the criteria in the pyramid’s upper tip are usually high-visibility ones. In fact, if you meet the top two criteria chances are that we will be calling you.

Companies that meet these criteria have already invested in the channel in some form or other and have a field sales force of some kind. They offer a good margin opportunity, have a high pull-through (have created a significant customer demand), and are highly visible, well-recognized players in the industry.

They also offer the distributor a “clean channel,” that is, a pricing model that clearly differentiates between two-tiered distribution (resellers and end users).

There are exceptions, such as when a product offers us a strategic opportunity; but as a rule of thumb, the higher up the pyramid you go, the more likely you are to be a fit for a company such as Ingram.

"NO" ISN'T A DEAD END

If a distributor must decline to carry your product, don't view the outcome as a dead end. Instead, use it as a learning experience. Ask the distributor to explain why your product isn't a match, and in that context ask for suggestions for improvement or change.

Remember, *timing is everything.* Even if you have a solid product, you may have approached the distributor when its resources were focused on other opportunities or when other products in your category were already a part of its marketing mix.

Understanding the distributor's role and taking the appropriate steps to implement a channel strategy before you approach national distribution is critical to your success in working with a distributor. Trying to establish national distribution too early in the product life cycle can be a costly and frustrating experience. There are tremendous opportunities to accelerate your penetration into the channel by using distribution to extend your reach into the market—at the appropriate time. ◆

Jeff Davis is the senior director of products and technology, and Barry Evleth is the Macintosh product manager for Ingram Micro, a computer products distributor located in Santa Ana, California.

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Understanding the Noise Level

As the market for Macintosh-related hardware and software grows, distributors are literally bombarded with products. To give you an idea of what the noise level is, consider these numbers, which generally apply to most national distributors:

• On the average, in a slow month we receive about 100 submissions. In a busy month, such as this past July, we get as many as 200 or more products. This means that in an average month we receive about three to four submissions per day. Generally speaking, two of those are Macintosh

products. Of those total submissions, 80 percent are unsolicited by the distributor, and the rest are products the distributor has actively pursued.

• About 20 to 25 percent of those products make it through the first cut, a process of eliminating those products that are obviously not a good fit. We generally can discern this from an initial letter, fax, piece of literature, or phone call. The kinds of products that are weeded out early are things such as as computer furniture, monitor shades, keyboard covers, or laminators. It may be tougher to get an initial reading on products in a crowded category, such as a monochrome monitor, a backup utility, or yet another canvas bag for a Macintosh PowerBook.

• Products surviving the first cut are then reviewed for technical merit and business proposition. Each month approximately 15 products pass that milestone and are then reviewed by the committee. (See step 7 in “Steps To Product Review” below.)

• Approximately 80 percent of those, or about 12 out of every 100 products we receive (12 percent, end up on our shelf. ◆

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Tried-and-True Ways to Turn Off a Distributor

Here are several sure-fire ways to turn off a distributor. Generally speaking, if you can avoid these you’re more likely to have a more satisfying distributor experience.

•**Submitting a me-too product before you’ve generated sufficient market demand.** Unless your product is on the cutting edge, the distributor is looking for an established sales record and existing relationships with customers. Without demand, it is difficult for the distributor to move a product off of its shelves, which does no one any good.

•**Sending a beta version.** Again, the distributor is looking for a proven track record. If you’re in beta, you’re not yet out in the market. The exception is if you have a technology/product that is especially innovative or that takes advantage of a new or emerging Apple technology. For example, if you have a product that truly takes advantage of O.C.E. or QuickTime, it’s likely (but not guaranteed) that the distributor will want to see the product in the beta stage.

•**Using a hard-sell approach.** Once you've made your submission, let the distributor do its job. Try to squelch the urge to phone the distributor every other day to "follow up" on your submission or to continue pitching the product. While that may be considered a good sales practice in other circumstances, in this case it's a proven way to turn off the distributor. Have faith that the distributor is giving your product its due. If you've done a good job preparing your submission, your product and company track record will speak for themselves.

Another way to look at this is: Don't view the distributor as the "final sale." The best possible way to look at a distributor in this context is as a partner or provider of services, a distribution mechanism, as opposed to being a customer. Save your final-sales tactics for the reseller or user—your true customer. Remember, a product is not actually sold through to an user just because it's on a shelf in the distributor's warehouse.

• **Sending a "brown-bagged" product.** Sending a product before its packaging is complete is an unmistakable sign that the product isn't already on the market. Also, the distributor is looking at your product's market appeal as a whole, not just its technical merits—and that includes how effective the packaging is.

• **Sending inadequate documentation.** A "whole" product includes the manuals. Your documentation should be complete and bound, if not shrink-wrapped.

• **Focusing on how big the distributor's opening order will be.** From the distributor's viewpoint, developers that dwell on how big the opening order will be betray their misunderstanding of what a distributor's role is. A better topic for discussion is what the product's long-term success will be.

The distributor's job is to ascertain what level of stock will be required to fill its customers needs; its buyers are expected to have the right amount of stock needed to fill the demand, and will work with the developer to create the proper flow of product. ◆

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Table 1:

Business and Technical Considerations

Business	***Technical***
Market size, need, demand, value	Features and perceived benefits
Current marketing budget	Ease of set-up, understanding, and use
Marketing fit w/Ingram Micro	Competitive products
Overall saleability, pull-through	Customer appeal
Industry positioning, developer reputation	Packaging quality
Support required	Documentation
Price vs. competition	Error handling
Gross margin, estimated monthly volume	Overall performance

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Steps to Product Review

While each distributor has its own process for accepting and evaluating submissions, here is a typical scenario for a distributor working for the first time with a developer:

1. Developer contacts distributor by telephone, fax, or mail.
2. Brief telephone conversation ensues; distributor receives overview of company and product(s).
3. Developer completes a vendor profile form and returnsit to appropriate distributor contact.
4. Distributor approves or rejects profile. If approved, it will request product for evaluation.
5. Developer mails or personally delivers product for presentation/evaluation.
6. Distributor evaluates product (see below for steps) and notifies the developers of the evaluation status. Evaluation process can take from two weeks to six months, or longer. The less suitable the product is, for any reason, the longer it will take to evaluate. A distributor with strong doubts about whether it can sell a product may nonetheless put the product through a lengthy evaluation to learn about the market and acquaint itself with product issues.

7. If the product passes the initial evaluation, it is presented to a committee within the distributor. This committee meets formally once or twice monthly at a predesignated date and time. It may include VPs from marketing, new products, sales, purchasing, and possibly director-level representatives from the same departments. At the meeting, the product reviewer makes a case for or against the product. The developer does not attend this meeting.

8. If the product reaches this step, the committee often makes its final decision during this meeting. However, one out of every ten products is held for a decision because the committee needs additional information about the technical or competitive environment.

If the product is rejected, the distributor will telephone or mail the notification to the developer.

9. If the product is accepted, the developer will receive a boilerplate contract within a short time, usually one week.

10. Contract negotiations begin. They can take two weeks to six months and are usually paced by the distributor.

11. Once the contract is approved by both parties, the developer will be handed off to its permanent contacts in marketing and purchasing. Then, a purchase order is sent to the developer. Depending on the complexity and type of product, the developer may be scheduled to conduct brief sales and technical training sessions. The marketing department then commences work on the product roll out.

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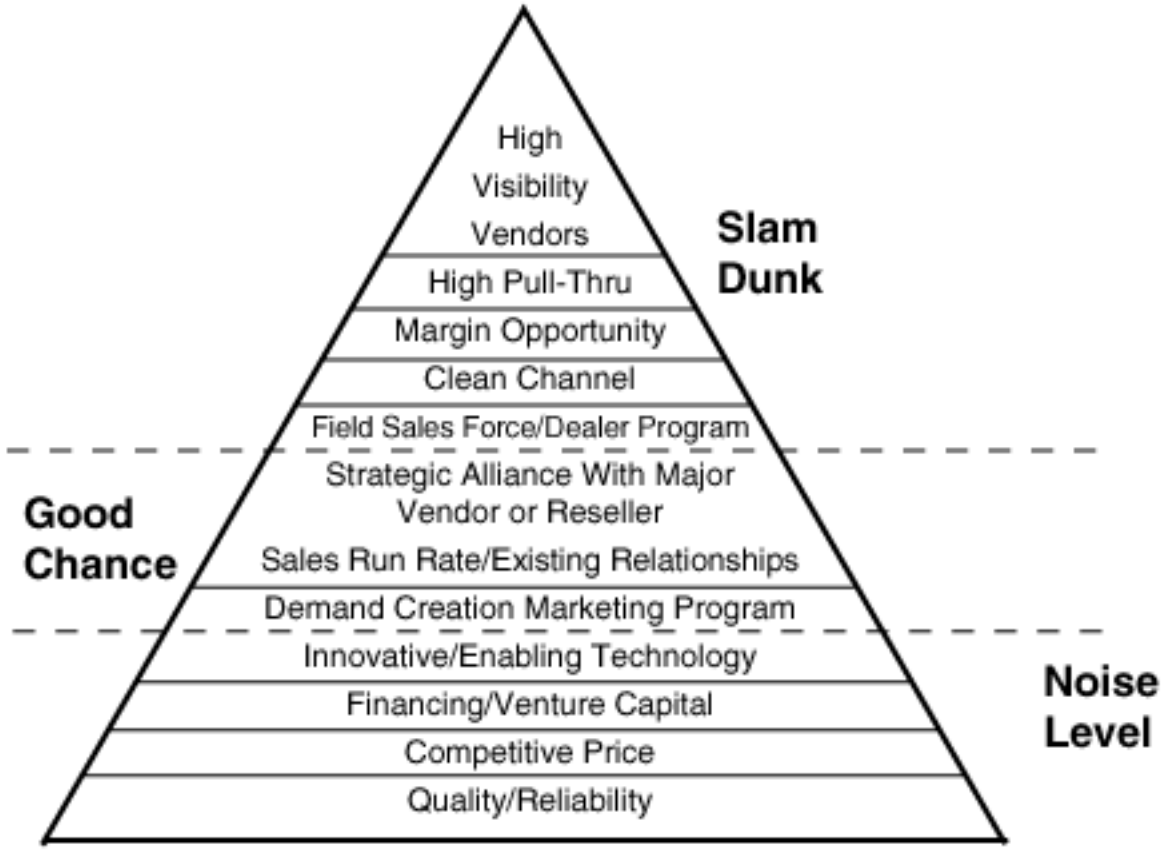

Figure 1: Product Selection Criteria

Apple Direct

Apple Direct is Apple's monthly developer newspaper, covering business and technical issues for decision-makers at development companies. It is published by the Developer Support Systems and Communications (DSSC) group.

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