

C

C

A very popular general-purpose programming language, C was developed by Brian Ritchie at Bell Labs in the 1970s. It is a successor to the nearly forgotten languages BCPL and B. It was first implemented on the UNIX operating system, and shortly thereafter, UNIX itself was rewritten in C. To this day, C and UNIX retain a very close association.

C is somewhat unique among high-level languages in that it's capable of performing some very low-level tasks. Using C, a programmer can directly manipulate bits, bytes, and memory addresses. Because of this position as a middle-level language, C frequently has been used to write operating systems and other low-level code that previously had to be written in **assembly language**.

C and its object-oriented offspring C++ are the languages of choice for most commercial software written for the Macintosh (and most other platforms).

Compared to most other languages, C is relatively lean. The ANSI C standard defines only 32 keywords, whereas other high-level languages have 100 or more keywords. It is possible for C to be this lean because many of the functions that are a core part of other languages, such as those for input and output or advanced mathematics, are implemented as libraries in C. The primary set of libraries are gathered together in the *Standard C Library*. This simple C program uses the library routine printf to display the words "Hello, World!" 10 times:

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```
#include <stdio.h>

main(void)
{
    for (i = 1; i < 10; i++)
    {
        printf("Hello, World!\n");
    }
}
```

It's very easy to write totally incomprehensible code in C. This has given C a somewhat bad reputation and has even spawned a contest to see who can create the most impenetrable C program[em]the obfuscated C contest. This, however, is really just a matter of style, and if you're careful in the way you write C code, it can be just as easy to understand as any other language. This entry, for example, in the obfuscated C contest, also prints the words "Hello, World!":

```
int i;main(){for(;i["<i;++i){--i;}"];read('-'-'-',i+++ "Hell\
o, World!\n",'/'/'/')));}read(j,i,p){write(j/p+p,i---j,i/i);}
```

Even a seasoned C programmer would have trouble puzzling this one out. If you keep readability and understandability in mind when you write in C, this shouldn't be a problem in your own C code.

Over the years, C has gone through several variations. The first, known as

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K&R C after the authors of *The C Programming Language*, Brian Kernighan and Dennis Ritchie, was similar to the initial version developed at Bell Labs. Although various implementations of K&R C were relatively compatible with one another, there were problems, so in the early 1980s, a committee was established to create a standard version of C. What emerged from the committee is now called ANSI C after the American National Standards Institute. Although the differences are relatively minor, be aware that most modern compilers get along best with the ANSI flavor of C.

C is traditionally a **compiled** language, although **interpreted** versions have popped up from time to time. On the Macintosh, you have more choices of C **compiler**s than compilers for any other language. C compilers are available from Metrowerks, Symantec, Apple, Motorola, Language Systems, and Microsoft, among others.

See Also

C++; CodeWarrior; Library; MrC; Visual C++; Symantec C++; Visual C++

C++

C++ is a high-level, **object-oriented programming** language that builds upon C. It was developed by Bjarne Stroustrup at AT&T Bell Labs.

In addition to its object-oriented features, C++ is in many ways an improvement on C. C++, for example, improves upon C's confusing input/output library with a much more logical and easy to learn I/O system.

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This program prints the words “Hello, World!” on-screen.

```
int main()
{
    for (i = 1; i < 10; i++)
    {
        cout << "Hello, World!\n";
    }
    return (0);
}
```

C++ also supports function overloading: the creation of multiple functions with the same name but different arguments. A programmer, for example, can create a “print” function that prints a value to the screen. In C, the name “print” can be used for one kind of value—integer, floating point, and so on—so each additional print function needs a new name. With many different data types, the number of different functions could quickly get out of hand: PrintInteger(), PrintDouble(), PrintComplex(), PrintString(), and so on.

In C++, each function can have the same name. The **compiler** determines which function to use based on the kind of data passed to it. So Print(4) calls the integer version, but Print(14.7) calls the floating point version.

Although the advantages of C++ has over C are numerous, most programmers consider the features that support object-oriented programming to be the

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most reliable. These features enable programmers to write code modules that are self-contained and reusable, as well as code that easily builds upon existing code.

Many C++ compilers are available for the Macintosh. Virtually all C **development environments** provide support for compiling C++ code. The Metrowerks **CodeWarrior** and Symantec C++ integrated development environments both include C++ compilers, as does Apple's **MPW**. In addition, Motorola offers a C++ compiler that is hosted by the MPW environment.

See Also

C; CodeWarrior; MPW; Object-Oriented Programming; Symantec C++; Visual C++

Cables and Adapters for Monitors

The port on the Mac into which you plug the monitor cable has several names, due to an unforeseen development in technology. These days, it is simply called the monitor port, or the display monitor port. However, for years, Apple happily referred to the port as the video port. When Mac acquired the capability to accept connections to VCRs and video cameras, Apple had to use the term video port for those connections. There is still some literature that calls the monitor port the “video port,” so be careful when you are buying cables.

To connect to a monitor, most Mac models use a standard DB-15 cable, which, as the name implies, uses 15 pins on the connector. Occasionally the cable is

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permanently connected to the monitor.

Some Macs have a special AV port, or high-density port, which combines the monitor port with sound and the **Apple Desktop Bus (ADB)** port, also called the keyboard port. You'll need a special cable to connect a monitor to this port.

PowerBooks with display monitor ports use a VID-14 monitor output connector (which Apple still calls a video connector). The VID-14 cable has a rectangular, 14-pin connector that plugs into the PowerBook, and a standard video connector that plugs into the monitor. You can buy an adapter cable that lets you use ordinary monitor cables. The Apple part number is M3927LL/A, although it is available from other vendors.

See Also

Monitors; PowerBooks; VGA Monitors, Using

Cache, Types of

See

Power Macs, Logic Boards

Cache Switch

This control panel is designed to turn on and off the onboard memory **cache**

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on **68040-based** models of Macintosh **and Performa** computers. With the cache turned on, functions of some applications run faster, but some programs are incompatible with the onboard cache, and turning this cache on might cause a system crash. In this case, you can use the Cache Switch Control Panel to disable the cache, enabling you to run the program.

See Also

68040 Models; Apple Menu; Cache

CA-Cricketdraw III

See

Charting And Graphing Applications, Other Drawing Applications

CAD Mover

Kandu Software's CAD Mover is absolutely essential for Mac users who wish to port their CAD files to other platforms or file formats. It contains many more import/export options than any stand-alone CAD package.

How it Works

Import a saved file that matches any of CAD Mover's import selections, and save it out as any file format that CAD Mover's export list supports (see "Export Formats"). Along the way, however, you may also have a need to

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utilize CAD Mover's other options. You can apply two-sided surfaces, very important if the object is to be rendered and viewed in many 3D programs that do not automatically apply this feature (your 3D object can suddenly disappear from view if two-sided surfaces are not present). A 2D view of the object can be displayed, with the background either gray or white. A special 3D dialog allows you to turn the preview of the object in 3D space via numeric inputs for each axis view angle. You might want to show the associated Log File, or choose the Text or PICT reader, all of which CAD Mover allows. You may choose from separate settings for Mac, MS/DOS, Unix and Mainframe Line Terminators, depending on which choice represents the platform that the object will be viewed and rendered on. Selected audible beeps can be set for your computer, associated with different file completion operations. Both the output units (from millimeters and inches to miles and kilometers) can be set, as well as a new sizing option for the exported object. The Fontmap can be set for imported text, and lastly, CAD Mover includes a thorough Preferences dialog that allows you to set input/output details, translation settings and display settings.

Import Formats

The following import formats are supported: 3DGF, Architrion II, CGM, Claris CAD, Ddes2, Dimensions, Dreams, DXF, DXF (Binary), Envisage 3D, EPSF, Focus, Focus Text, Gerber Plotter, HPGL, IGES, MacDraft, MacDraw II, MiniCAD+ Text, MacArchitrion Text, PICT, Presenter Pro, Sculpt 3D 1 and 2, Stereo Lithography, STL (Binary), Super 3D, Super 3D Text, WaveFront, Zoom and Zoom Text.

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Export Formats

The following Export formats are supported: 3DGF, Architrion II, Adobe Illustrator 1.1/3/5 and 88, CGM, Ddes2, Dimensions, Dreams, DXF, DXF (Binary), Envisage 3D, Focus, Focus Text, Gerber Plotter, HPGL, IGES, MacDraft, MiniCAD+ Text, MacArchitrion Text, PICT, Presenter Pro, PostScript, Sculpt 3D 1 and 2, Stereo Lithography, STL (Binary), Super 3D Text, WaveFront, Zoom and Zoom Text.

Because the input/options extend beyond CAD applications and cover so many standard graphics formats, this package is also of potential benefit to the general Mac artist and animator.

Caffeine

See

Java

Calculator D/A

This **Apple menu** Item gives you similar features to a regular hand held or traditional desktop calculator. You can input numbers from your keyboard or **numeric keypad**, or you can click the numbers with your mouse. The layout of the calculator matches the layout of the numeric keypad, as shown in the figure.

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To use the calculator D/A, follow these steps:

1. Choose Calculator from the Apple menu.
2. To clear the calculator, press the Clear key on your keypad or click the letter C on the calculator.
3. Enter the figures you want to calculate as you do on a regular calculator. The slash key is for dividing. The asterisk for multiplying. The Enter key acts as the equals key.
4. You can **copy** and **paste** any information that appears in the calculator window into any document you select by choosing Copy from the **Edit menu** , and then after you've chosen an insertion point in your document, choose Paste from the Edit menu.

See Also

Apple Menu; Copy; Edit Menu; Numeric Keypad; Paste

Calculator Keys

The **numeric keypad** on a Macintosh keyboard is set up to match the Apple **Calculator DA** keys. The **Clear key** in the upper-left corner of the numeric keypad resets the calculator for a new calculation. To the right is the Equals key (=), the slash key used for division (/), the asterisk key (*) used for multiplication, and the minus and plus signs. There is also a decimal point (a period) to the right of the zero key. The **Enter key** is used as an

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equals (=) key.

See Also

Calculator DA; Clear Key; Enter Key; Numeric Keypad

Calendar Server

See

Servers/Calendar

Cameras

See

Digital Still Cameras or Digital Video Cameras

Camera-Ready

See

Printing Terms

Cancel Keyboard Shortcut

Pressing ⌘-. (period) is equivalent to clicking the Cancel button. If, for

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example, you encounter an **alert box** or **dialog box** with a Cancel button, you can press ⌘-. to select Cancel. If you **launch** an application or document accidentally, some applications enable you to cancel that launch by pressing the ⌘-. keys several times in succession. This cancels the launch and returns you to the **Finder**. ⌘-. is also used to cancel a **print** command after you've clicked OK and a **status bar** appears. You may have to press ⌘-. several times to cancel the print job.

To select Cancel in a dialog or alert box, or to stop a print job in progress, use this keyboard shortcut:

1. Press ⌘-Period.
2. If the action is not canceled, you may have to press the ⌘-Period several times.

See Also

Alert Box; Click; Command; Desktop; Dialog Box; Finder; Keyboard Shortcuts; Launch; Print; Status Bar

Cannot Be Opened...Message

If you're running an application and get an **alert box** that reads, "There is not enough **memory** to open the application," the system's telling you that

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you don't have enough free memory (RAM) available to open the application. If you have a number of applications already open, you may be able to free up enough memory to launch the program by **quitting** one or more of the applications you have running. When you quit out of an application, it releases the memory it was using and makes it available for other applications to be opened.

See Also

Alert Box; Memory; Message Box; Quit

Canvas

The Canvas 5 upgrade was not available at the time of this writing, and will undoubtedly contain loads of revisions and add-ons. Canvas is a superlative high-end vector drawing program and has enough CAD oriented tools to make it a program that many CAD users can use to edit their higher-end CAD output. Experienced vector drawing users will need some time to get used to Canvas tool options (many of which are unique to the software) and also where more familiar items are placed on the Canvas interface.

A Preferences dialog allows you to set up Bezier polygon options (Curve drawing choices and freehand tool tolerance), left handed or right handed coordinate systems, double-mouse click options, object dragging options, duplication offsets, and general redraw and background updating choices. The program ships with the **Pantone** colorsets, and any one of four Pantone

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color options can be chosen as the default (ANPA, Coated, Process, and ProSim). Other windows that can be placed on the edit screen include the Text Ruler (used to measure text blocks being placed), and the Paint, Objects, and Effects Tools icon menus. Screen zooms are handled by a special pop-out window, which lists a series of possible zooms up and down, or by a positive and negative zooming button. This is much easier to use than a series of mouse clicks with the magnifying tool, and far more exacting. An example of the Canvas approach to expanding the uses of common tools is the “Multigon manager”. Here, the default polygon draw tool can be set as to polygon sides, and whether it is a spoked or outlined object, or both. Another option is the Alignment application. The standard alignment options in other programs allow you to left-right-center-top-bottom choices. Not Canvas. It greatly expands the creative possibilities by allowing you to apply different boundaries to the horizontal and vertical coordinates, and to choose amongst the selected objects, a drawn line, the grid, the page or the entire document as the ordering principle. Elements can then be aligned or distributed, and a visual schematic gives you a better idea of how each choice will alter the outcome of the graphics elements and their new placements. Both the Multigon and Align functions represent how Canvas, in these and other tools, widens the potential for creating unique vector drawings. A CD-ROM with 2000 fonts and 10,000 clipart images accompanies the software.

Basic Bezier Drawing

Canvas approaches beziers as intuitive drawing devices, not as creative challenges. Any object can be transformed into its bezier components, and

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these can then be easily edited. Standard control arms are selectable, resizable, and moveable. Selecting “Edit Curve” from the objects menu turns the selected objects into a bezier outline. When finished, a click away from the object re-applies any gradients or patterns connected to the original shape. A function that supports the bezier editing is the Smoothing function. It applies a series of smoother beziers automatically to the object design, turning spokes polygons into flowers as an example of its use. If you want to roughen the outlines a little, just add the Fractalize option from the Effects menu. Points on a bezier curve can be edited, added to, or deleted by accessing any of these three choices with the pen tool. The freeform line tool makes bezier curves, polygons, or smooth polygons (smooth enclosed freeform surfaces). All can be edited later as beziers. All objects can be skewed, distorted and stretched as well.

CAD Uses

Canvas has dimensioning capabilities that will make many dedicated CAD programs envious. These are extremely intuitive to apply, and include options far beyond the basic necessities. A Dimensioning manager allows for linear, radial and angular types, five varieties of text placement between dimensional lines, leader and symbol options, tolerance settings, precision to ten-thousandths of a unit, measurement units (inch, pixel, centimeter and pica), and scaling from inch equals inches and pixels to inch equals miles and kilometers. A full dimensioning standards sub-menu includes the settings for dimensioning standards options (ANSI, BS-380, DIN, ISO and JIS). As if to emphasize its CAD uses, a 3D rectangular box can be placed in a

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drawing, and 2D DXF files (the CAD format of choice) can be both written and read.

Other Drawing Tools

Canvas' Object Tools menu can be left open on the screen. It has drawing tool options far beyond what is expected from a vector drawing program. Among these are the following:

- **Concentric Circles-** The user can set the number of circles and how far apart they will be from each other (choosing "0" causes them to be rendered equidistant).
- **3D Rectangle-** Depth and direction are dependent on real-time mouse placement.
- **Dimensioning Options-** Direction, size and measurement end points are controlled by the mouse.
- **Multigon Manager-** sides, spokes and outlines controlled by numeric input.
- **Star Manager-** Sides and outlines controlled in the dialog.
- **Parallel Lines Manager-** a full featured dialog is used to set the defaults, among which are dash patterns, pen pattern/size/color, number of lines, distances and spacing from one line to the next.
- **Pressure Pen Manager-** for graphics tablet users

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-
- **QuickTime Specifications-** See the animation listing in this reference.
 - **Registration Mark-** Placement
 - **Line Type Selector-** Five types
 - **Spiral Manager-** Spirals are placed with the mouse, but the number of spirals are set in this dialog.

Canvas allows you to place all of the most used tools on the work screen, making it unnecessary in most cases to access them through the menu. A full list of macro keys can also be set to trigger the tools.

Tracing Images

Tracing can either be handled manually by tracing over the bitmap on another layer, or automatically. If automatically, Canvas has a dedicated Trace Manager that allows you to set various tracing tolerances. The best images to auto-trace are high contrast images, with black and white being a better choice than grayscale or color. Traces may be bezier curves, polygons or smoothed polygons.

Typography

This is another area where Canvas extends tool use. In addition to being able to write the text block in any typeface and size, Canvas also contains the following tools (usually associated with word processing and desktop publishing): Justification, leading, kerning, style sets, search and replace,

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and spell checking. Once the type is on screen, it can be translated to beziers for further manipulation.

Blends and Gradients

Like Freehand, Canvas accepts only two colors in its gradient blends, and also like Freehand, user designed blended gradients may be customized and saved to a visual library for selected applications.

Graphs

Canvas has no native graphing capability, but by using the 3D rectangular shapes and color, pattern or gradient fills, bar graphs are easy to design.

Animation

QuickTime movies can be placed in Canvas documents with the Movie icon. A dialog allows you to set the audio and playback rate levels. QuickTime movies can also be generated by Canvas itself, another unique feature not associated with vector drawing software. Master layers can print as backdrops to each frame of the movie, and the movie can be saved as either self contained (along with all of the elements in one file) or linked to those elements by data paths.

Layers

New layers can be added in the Layer manager, and any layer can be hidden or shown as well as exchanging its place with another in the list. A layer listing is accessible at the bottom of the screen, allowing you to jump to other

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layers quickly.

File Load / Save Conventions

Canvas addresses more than the usual number of file formats for both loading and saving. Save formats include: BMP, Canvas Prefs, Canvas drawings, CGM, DCX, DXF, EPSF, GIF, IGES, Illustrator (1.1 and 88), JPEG, MacPaint, PCX, PICT and PICT 1, QuickTime movie, Separations, StartupScreen, TIFF, WMF, WPG, and UltraPaint. Loaded files include all of the previous plus External Tool and MacDraw I and II.

Deneba ArtWorks

In general, Deneba ArtWorks is a product that may be described as Canvas Jr., with the exception that it contains some tools (most notable texturing options) that its parent does not possess.

Cap Height

See

Typesetting Terms

Caps Lock Extension

This extension for **PowerBook** users was created because PowerBooks don't have a locking **Caps Lock** key. When this extension is used, an outline of an

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arrow appears in the far right corner of the **menu bar** , letting the user know that the Caps Lock key is engaged.

See Also

Caps Lock; Menu Bar; PowerBook

Caps Lock Key

The Caps Lock key, located between the Tab and Shift keys, enables you to type in CAPITAL letters. The Caps Lock effects only letters, it does not effect symbols or numbers.

See Also

Keyboard; Shift Key

Card Games

Computer Card games on the computer give you the chance to pass the time and to bone up on your skills. The one advantage that computer card games have over a regular deck is that you can learn by yourself, without fumbling through a manual. Let's face it, who wants to join in a poker or pinochle game and be the only one who keeps saying "So, what should I do now?" The main thing to remember when checking out card games for your computer is that, with a few exceptions, they are not apt to be too elaborate in the multimedia department.

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The forthcoming Perfect Partner series of games from Positronic use 3D rendering to give background to your opponents and will be an interesting twist on the genre. Anyone For Cards? from Capstone, has annoying animated characters, and its futile attempts at humor take away from the already sluggish game play.

Although we have yet to find out if gambling on the Internet is as much of a financial gain as going to Vegas (and who knows what the inevitable legal mess will be if it is), card sharking is alive and well on CD-ROM.

Although the best thing about card games is playing them with other people, sometimes that is not necessarily an option and you just don't feel like playing solitaire (although solitaire is still a viable computer game). When money gets involved with the cards, even cybermoney, the stakes get a little higher in what you expect from a game. Therefore, most gambling titles don't fare too well under close scrutiny in comparison to the more tutorial intensive card games like Blackjack Trainer from ConJelCo and Micro Bridge Companion from Great Game Products. Casino Game Pack from MacSoft Casino and Master Gold from Centron Software are mediocre, but still worthwhile for enthusiasts, but Virtual Vegas' Blackjack falls completely flat with its attempts at sexist humor and slow effects.

See Also

Traditional Games

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Careers

See

Desktop Publishing Careers

Carpetbag

See

Font Utilities

Cartoon-Style Animation

See

Full Throttle

Casady & Greene

See

Crystal Crazy

Castoff

See

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Printing Terms

CCITT

See

Modem Standards and Speeds

CD

The specifications for CD data have been defined primarily by the original developers of CDs, Philips and Sony. The original audio CD specification was named Red Book after the color of the specification. There have since been other formats adopted, but these products are more commonly known by other names.

Red Book: standard audio CD.

Yellow Book: A standard **CD-ROM**. A disc written in this format usually has the "disc" logo with the words "data storage" underneath it. An extension to the Yellow Book format is **CD-ROM/XA**, a disc that can contain data as well as audio and video tracks.

Orange Book: A standard for writeable CDs developed by Philips, Sony, and Kodak. They are usually referred to as **multisession** discs. Like **Red Book** audio, this name comes from the color of the book containing the

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specification.

Green Book: The standard for **CD-I** (compact disc interactive).

See Also

CD-ROM; CD-ROM/XA; Multisession CD; CD-I; Mixed-Mode CD; Red Book Audio

CD Audio, Converting to QuickTime

A standard audio CD track can be imported into a **QuickTime** movie and played on the computer, provided you have **QuickTime 2.0**, **Foreign File Access**, and the **Audio CD Access** Extension. Converting CD Audio files to QuickTime or AIFF format can be useful in multimedia authoring. Most applications, such as Director and HyperCard, cannot play CD audio from the CD disc. If you just want to listen to a CD disc, read the entry for the *CDAudio Player*.

When the disc is inserted into the CD-ROM drive, it appears on the Macintosh desktop with an Audio Disc icon. Any application that can open a QuickTime movie, such as **Adobe Premiere** or **MoviePlayer**, can be used to perform the conversion. Simply choose File Open and select the audio disc. The File Open dialog displays the tracks on the CD and enables you to choose a track and open it. After choosing to open the file, a second dialog asks you to name and save the file. QuickTime cannot play the CD audio track directly; it must first convert it to the QuickTime file format. Depending on the speed of the computer and the length of the selection, this conversion process can take a

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few minutes.

Before saving the file, click the Options button in the Save File dialog. This brings up a second dialog box in which you can choose the **bit depth** and **sampling rate** for the converted file. You can also select the beginning and ending point of the sample to convert.

Click OK and then click Convert. The audio file is converted to a QuickTime movie file that can then be played in any application that supports QuickTime movies.

See Also

Playthrough; QuickTime

CD Plus

CD-Plus was developed to overcome the problems of **Mixed-Mode CD s**, the original format for a **CD-ROM** that contains both audio and data. Mixed-mode CDs store the data as track one on the CD. Unfortunately, many audio players would attempt to play track one, resulting in unexpected and unwanted results.

CD Plus takes advantage of the multisession format for CDs, and the fact that most CD-ROM players can read a multisession disc.

A CD Plus disc is actually a two-session CD. The first session contains any audio tracks written in standard **Red Book audio** format. A second session is

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then added that contains the data track.

Consumer audio players play the audio tracks and stop at the end of that session. They do not support multisession discs, because audio CDs are usually pressed.

When the disc is inserted into a multisession CD-ROM drive, the two sessions are recognized, and the audio and the data can be accessed by the computer.

See Also

CD-ROM; Mixed-Mode CD; Multisession CD

CDEF Virus

Similar in symptoms to **WDEF**, this virus only infects the invisible Desktop file used by the Finder. System 7 cannot be infected by the CDEF virus.

See Also

Virus; WDEF

CD-I

Compact Disc Interactive. A **CD-ROM** disc format and a computer platform developed by **Philips** for the home entertainment market. The CDs hold CD-quality audio (as well as other levels of compressed audio that lengthen the amount of sound but degrade the sound quality), interactive programs, and

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MPEG video. The player contained a computer with RAM and operating system, as well as an MPEG decoder.

Intended primarily for entertainment, education, and games, the original players cost around \$700. While they were generally regarded as capable machines, they did not offer any typical computer applications, so they were limited in use (primarily because the CD-I machine lacked a floppy drive, a hard drive, or even a keyboard.) Whether it was this limitation, or their expense compared to other platforms, such as Nintendo or Sega, CD-I did not sell well in the consumer market.

CD-I hardware is no longer being sold in the U.S. consumer market, but CD-I discs are still being used to deliver some multimedia products. There is an MPEG player available that works with CD-I discs, and QuickTime may soon support CD-I playback on Power Macs.

See Also

CD-ROM

CD-ROM

CD-ROM technology is a result of the Philips and Sony corporations' research. In 1978, these companies raced to finalize development and create standards for CDs. Sony initially intended to use a 12-inch format for the discs, but when they realized that a full 12 hours of music would fit on one 12-inch disc, they considered other, smaller options (see the following

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figure).

Sony and Philips announced the standard 5-inch disc in 1982. Some report that this size became the standard, because it was just large enough to contain Beethoven's famous Ninth Symphony. Throughout the 1980's, Philips and Sony continued to work together to develop CD-ROM standards.

Although CD-ROMs appear almost identical to Audio CDs, the distinction is that CD-ROMs can store both audio and data. An aluminum alloy is sealed within the protective plastic coating. Information is burned or pressed, in one long spiral not unlike the groove on a vinyl record album, onto this alloy, resulting in pits called data bits. The pits are read by a low-powered laser beam in the CD-ROM player. The pits absorb the laser light, resulting in little or no reflection, and areas without pits produce strong reflections. These reflective areas are referred to as lands. The patterns that develop from these reflections, and lack thereof, are transmitted to the microprocessor to be translated into sound or data.

Although CDs are a standard physical size, the amount of information that can be stored on a disc depends upon a number of factors. The most common size is 620MB, but it is possible to get up to 700MB of data on a disc. This, however, can come at the expense of error correction and readability on older drives. Also, note that multisession discs (discs that have information added to them at different times) use a significant amount of space to hold the additional indexes built when the additional data is added.

The length of time a CD-ROM will last depends on the way it was

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manufactured. It is possible for manufactured discs to last hundreds of years if they are manufactured correctly. Of course, it is somewhat difficult to predict given that CDs have been in existence for only a little over ten years. Conservatively, discs manufactured at a pressing plant should last at least 100 years. If the disc is not manufactured correctly (for example, if the edge is not properly sealed), the metal surface inside can corrode, damaging or destroying the disc in only a few years.

Writeable CDs (those created using a CD-ROM recorder) are estimated to have a shorter life span: from 70 to 100 years depending upon the materials used in the disc. Writeable discs come in several colors; in general, the gold discs are believed to have a longer shelf life than the green discs. This life span may be shorter if the disc is not handled correctly, exposed to high temperatures or UV light, or otherwise mishandled. The laser used to "read" the CD is of very low power and cannot harm the data on the disc, even after thousands of reads. CDs should last at least until it's time to replace them with a storage medium of even greater size. Already, **DVD (digital video disc)** technology promises storage capacities much higher than standard CDs.

Which side is up? It's obvious which side contains the data (it's the side without the label). Actually, it's a trick question, because writeable discs are often unlabeled, making it difficult to determine which side contains the data. Usually you can tell by looking for tracks in the surface of the disc. If the top coating contains no visible circular patterns, then it's probably the non-data side. You don't have to worry too much even if you can't work it out. Insert the CD into the player or the recorder and the drive will tell you

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whether it likes the disc or not!

But which way up should the disc be inserted into the player? Most CD players require that you insert the CD with the label facing upwards, but there are a few that work the reverse. Again, if you can't figure it out, insert the disc and see what happens.

CDs are a surprisingly rugged medium. In a protective case (jewel cases), a CD is probably better able to survive mishandling than floppy disks, hard disks, or removable cartridges. It is, however, wise to take reasonable precautions to ensure the long life of your discs.

CDs are resistant to minor scratches. Error correction is used to detect and hopefully fix errors that occur during reading. The most damaging scratches are those that are circular. A circular scratch can destroy a sequence of information in a track (data is written in a long spiral track on the disc), making it impossible to correct for the error. While audio CDs include algorithms to compensate for massive errors (they simply make an approximation of what the information for the audio signal should be, i.e. continue the current tone until it gets new data), it's impossible to guess at data and not cause problems.

Always handle a disc by the edges or by the center, and avoid touching the reflective surface of the disc. If you have to touch either side of the disc, touch the label side.

For convenience and cost savings, most CD players sold today don't use caddies

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(plastic trays that resemble CD jewel cases and are inserted into the drive). One advantage of caddies is that if you purchase several of them, you can leave the CD in the caddy, thus avoiding handling the CD at all.

If a disc is dirty, use a soft, dry, lint-free cloth and wipe in a radial motion either from the center out or from the side into the center of the disc. Do not wipe in a circular motion—just in case you accidentally scratch the disc during cleaning. Do not use any cleaner or solvent; many of these can damage the disc permanently. Do not use water either. Even cleaning agents sold for CDs should be used only when a disc needs serious cleaning. Try to minimize use of these chemicals. Avoid exposure to temperature extremes, humidity, and UV light.

See Also

Burning or Pressing a CD-ROM; DVD; Photo CD

CD-ROM Burning

See

Burning or Pressing a CD-ROM

CD-ROM Movie Maker

This is a **plug-in** for Adobe **Premiere 4.2** and is designed primarily for those who are authoring **QuickTime** movies for playback on **CD-ROM**.

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Because of the comparatively low transfer rate of a CD-ROM, it is important that a QuickTime movie pressed on a CD should not require a transfer rate higher than is possible on the CD-ROM player. For the largest audience, most movies are digitized to play on double-speed drives. While the **Cinepak compressor** enables the user to define the maximum transfer rate for the movie, the CD-ROM Movie Maker provides several other options which can improve the performance of the final movie.

A blur option softens edges and removes some video noise present in the original video. You can specify the data rate for the movie as well as crop and scale parameters. A noise filter removes small random changes that happen from frame to frame in digitized video, which can improve the performance of the compressor. As well as defining the frequency of **key frames** (specify a key frame every x frames), you can also force key frames by adding markers in Premiere's Construction Window. Key frames serve two purposes: they make it possible for the software to drop frames—this is necessary if the CD player cannot read the disc fast enough to play back the movie—and key frames are necessary if the user will be interacting with the movie. Specifying key frames makes it possible to improve interactivity at specific points, while improving compression (the fewer number of key frames, the smaller the resulting movie).

CD-ROM Movie Maker also enables you to specify an 8-bit palette, or create a palette, and attach it to the movie. This is useful if the movie will be played back on 8-bit monitors, because it improves both playback performance, as well as the appearance of the movie. Another nice feature is that CD-ROM

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Movie Maker batch processes files (apply the same parameters to several movies automatically).

See Also

Compression; CODECs; Key Frames; Movie Cleaner Pro; Premiere; QuickTime

CD-ROMs, Object and Image

See

Object and Image CD-ROMs

CD-ROM/XA

CD-ROM/XA is an extension to the original **Yellow Book** or CD-ROM standard (see **CD** for a discussion of CD formats). While the original CD-ROM format supported data only, the XA standard adds many of the features that were added to the **CD-I** format: compressed audio data and video and picture data. Many CD-ROM drives do not support CD-ROM/XA. There is currently no system software support for CD-ROM/XA, but this could change in the near future.

See Also

CD-ROM

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Cell in Databases

A cell is an individual **field** of data arranged in a grid across a **spreadsheet** . Cells can hold numbers or text, or they can hold **formulas** telling them how to calculate the information in other cells. If a cell holds a formula, it displays the result of that calculation—and can be used as the input to a formula in another cell.

For example, if cell A1 holds the number 5 and cell B1 holds the formula “= A1 + 1,” cell B1 will display the number 6. If cell C1 holds the formula “= B1 / 2,” it will display the number 3.

See Also

Absolute/Relative Referencing; Circular Reference; Spreadsheet Notation

Centipede

See

Arcade-Style Games

CEPS

See

Desktop Publishing Color Electronic Prepress Systems

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CGI

A common gateway interface (CGI) is a standard way for applications to interact with **World Wide Web** servers on the **Internet**. The term CGI is used for both the standard interface and the applications themselves.

World Wide Web servers, such as WebSTAR, generally provide basic functionality needed by a Web site. These servers send files at the request of a **Web browser**. To add functionality to a Web site—such as forms, searching, database access, and so on—a CGI application is required. Using CGIs, Webmasters can vastly expand the services they provide to their users.

On the Macintosh, Web servers communicate with CGIs using **Apple events**. When a browser requests a URL that corresponds to a CGI application, the server bundles up all the relevant information about the request into an Apple event and sends it to the CGI. The CGI then does its magic (for example, processing and logging the input from a form) and returns information to the server that it can then pass on to the browser. This use of Apple events differs from Web servers on other platforms, such as UNIX, in which information is passed to CGIs as command line arguments.

Virtually any **programming language** can be used to create CGI applications. For many kinds of tasks, it is easiest to use a scripting language such as **AppleScript** or **Frontier**. Jon Wiederspan has written an excellent tutorial on writing CGIs in AppleScript. The tutorial is available at <http://www.comvista.com/net/www/cgilesson.html>. Jon S. Stevens revised

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these tutorials for learning how to create Frontier CGIs. The Frontier CGI tutorial is located at http://www.clearink.com/fun_stuff/frontier/. Though not as popular on Mac servers as on UNIX, **Perl** is also a frequent choice for creating CGI applications.

Although script-based CGIs offer tremendous advantages in development time and maintainability, they are not be able to offer the same speed as those written in a compiled programming language such as C or Pascal. A number of frameworks have been written to help programmers create CGI applications. The most widely used of these is Grant Neufeld's CGI framework, written in C.

In many instances, it may not be necessary to resort to writing your own CGI at all. There are a wide variety of CGIs available that perform the most common tasks needed of CGIs. There are pre-built CGIs for handling image maps, for example, redirecting a client to another page, processing forms, and so on. Jon Wiederspan maintains a reference of available CGIs at <http://www.comvista.com/net/www/cgi.html>.

See Also

Apple Events; AppleScript; Frontier; Internet; Perl; Programming Language; Web Browser; World Wide Web

Chameleon

This program accompanies the CorelDraw 6 package for the Mac.

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Chameleon's interface resembles that of Adobe's TextureMaker, but its operations and options are different. Like TextureMaker, it operates on a stack of planes, each of which is sandwiched together to form the final graphic. Also like TextureMaker there is a background layer (beveled or picture frame backdrop), a Lights layer (where lights can be positioned and adjusted) and a one or a series of graphics layers (with variable opacity so you can see through them as a sandwiched graphic). Unlike TextureMaker the Light plane acts more like an Alpha channel overlay and bump map, with three movable lights, ambiance, and shading and Hilite sliders. The layering effects possible in Chameleon function much like Photoshop's layering options.

Algorithmic PreSets

Oasis applies a selection of algorithmic textures to a plane between the background and the lights layer. These textures are represented in a list, and include: Solid Color, Clouds, marble, Wood, Checkers, Spots, Agate, Gradient, and Picture. The last selection, Picture, allows you to add your own graphic as a layer (PICT). Except for the Picture option, the rest of the textures can be altered as to magnification and rotation, and in some cases, variance and turbulence. Each of the layers has a variable opacity and combine feature. Opacities range from Opaque to 25% opaque in 25% increments, and the combine features (which affect how the selected plane will be combined with its neighbors in the final rendering) include: Additive, Subtractive, Lighten, Darken, Shade, Hue Shift and Multiply. By combining all of these variables, thousands of unique textures can be created. It's also possible to use

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Chameleon as a compositing platform for larger graphic backgrounds.

A preview area shows a reduced version of either one selected plane, that plane plus others below it in the stack, or all planes combined. The bottom plane acts as the final background, and it can be set to a variable beveled frame. This makes Chameleon an excellent choice for creating multimedia interactive buttons. Graphics can either be tiled or made to fill the entire area. A special “Render to Window” option allows you to see a finished rendering before saving it to disk. The Image Setup dialog allows you to set the final size for the renderings, in Pixels, Inches or Centimeters. DPI can be set to 72 (standard for video work), 150 or 300 (the lowest setting desirable for printed output). A Render to File option writes directly to the chosen disk path. You can operate Chameleon from a new blank page, a Texture Preset mode, or in compliance with its walkthrough wizards. The Wizard mode is great for beginners.

See Also

CorelDraw 6

Change Icon Name

To rename a file **icon**, **select** the icon and press **Return**. This **highlights** the file's name below the icon, allowing you to type in a new name. You can also use the **arrow pointer** to highlight the icon name by **clicking** it. You can edit individual letters by clicking at the insertion point where you want

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to edit. The arrow pointer changes to the **I-Beam cursor** , allowing you to edit the text as you would in a text editing program.

See Also

Arrow Pointer; Click; Highlight; Icon; I-Beam Cursor; Return Key; Selection

Changing Type and Creator

Imbedded in each Macintosh file is the file's type code and creator code. These codes tell the Mac what the file is and how it should be handled. The four-letter creator code tells the Mac which application created the file. If, for example, you created a database in ClarisWorks, the creator code is BOBO. If you **double-click** that file, the Mac looks at the creator code, sees that the document was created in ClarisWorks, **launches ClarisWorks** , and opens the document in ClarisWorks. All files created in ClarisWorks have the creator code BOBO, regardless if they were created using ClarisWorks's spreadsheet, word processor, or database.

The type code tells the Macintosh what kind of file it is (database, graphic file, text file, spreadsheet, and so on). A type code of CWDB, for example, tells the Mac that the file is a database document (created in ClarisWorks). Each type of file has a separate type code.

You can change these type and creator codes by using Apple's **ResEdit** or Norton Utilities's **Disk Editor** (part of the Norton Utilities package), plus there are dozens of freeware and shareware utilities that enable you to do the

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same thing quickly and easily.

Why would you want to change a type or creator code? If you have a text file that was created in WordPerfect on a PC, and you want to be able to open it in Microsoft Word on the Macintosh, you can open the WordPerfect file and change its type code to WDBN (The type code for Microsoft Word) and its creator code to MSWD (the code for a Microsoft Word text document). The next time this file is opened, Macintosh will treat the file as if it was a Macintosh Microsoft Word document, and if you double-click the file, Microsoft Word will launch and the document will open.

Some of the more popular type and creator code freeware and shareware utilities (for System 7 and higher) are

- Creator Changer
- Type Resolve (which automatically takes PC file-type codes and matches them with Mac codes)
- TC Changer

You can also change type and creator codes with the popular shareware utility DiskTop. These all are available from online services or via the Internet.

See Also

Double-Click; The Internet; Launch; Norton Utilities; Online Services; ResEdit

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Chameleon

Chameleon is a desktop background **utility** program that is part of the Seventh Heaven Utilities suite of system enhancements from Logical Solutions, Inc. Chameleon is a stand-alone commercial utility that was originally distributed as **BeforeDark** . Chameleon enables you to choose from a variety of tiled background images to use as your **desktop pattern** , and you can create your own patterns, edit existing patterns, or import patterns. There are a wide variety of Chameleon patterns available from the online services or the Internet.

See Also

BeforeDark; Desktop Pattern; Utility

Chaos Overlords

Although **Chaos Overlords** isn't as in-depth as **Spaceward Ho!** , the unique twist on the **strategy game** theme should appeal to gamers with more urban interests. The future world of Chaos Overlords ushers us into a society ruled by corporate bigwigs and pure capitalists. A few former crime lords, dubbed the Chaos Overlords, have decided to take the power back from the leaders and get a little something out of it themselves in the bargain.

You play an overlord on a mission to kick the suits off the street and reclaim your territory. Using gangs that you conquer and then employ, you establish

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a hold on your 8x8 grid. Then, as you progress, you move into enemy territory and take on rival gangs. Over a modem or the Internet, you can start global warfare with other players making Chaos a welcome addition to the strategy world. To add to the strategy depth, not all gang members are fighters. Because not all grids can be taken by force alone, some are going to need to research new technology and handle the bribes of certain prominent government officials.

See Also

Allied General; Empire Deluxe; Pax Imperia; Sid Meier's Worlds; Spaceward Ho!; Strategy Games; Warcraft; V for Victory

Character Spacing

See

Tracking

Character Styles

See

Styles in Word Processors

Charting

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Any computer can crunch numbers. What made the Macintosh so popular is its ability to crunch pictures, and **spreadsheet** programmers have taken advantage of this. Every spreadsheet lets you **select** a range of **cells** and, through a menu command or palette selection, quickly turn it into an accurate chart. The result can be kept in the spreadsheet or **copied** to another program for a reports or a presentation. A few of the newer programs have **assistants** or **wizards**: when you ask for a chart, they present dialog boxes that guide you through appropriate choices to set how the chart will look.

Charts also make it easier to spot trends that might be hidden in rows of numbers. In the figure from **Excel**, it's difficult to quickly tell how the regions are doing by just looking at the numbers. But the three-dimensional graph, which took only a few seconds to construct, makes it immediately obvious that South is a consistent performer and North has been having some problems.

See Also

What-If Calculations

Charting and Graphing Applications

Actually drawing charts and graphs can be much more time-consuming than designing them. A number of applications exist to deal with this problem, most requiring only that the user enter the data and choose a style of chart

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or graph to produce a finished piece of artwork. They combine features from spreadsheet and presentation applications and throw in a few extras specifically for graphing.

DeltaGraph Pro provides more than 60 chart types, including business, financial, statistical, and scientific charts, pictographs, quality control charts, XYZ contour, and scatter plots. Graphs can be linked to existing data from Excel and other programs, and a Chart Advisor helps users determine what type of chart or graph is appropriate for the data in question. Once the graph is created, users can customize its format by changing fonts, colors, rotation, dimensions, and adding imported artwork.

A slide show feature allows users to display a series of graphs in a designated order, with artistic transitions between images. Graphs can be exported as EPS files (for importing into page layout packages) or as Illustrator files that can be edited in **Illustrator** or **Freehand**.

For more sophisticated data analysis, KaleidaGraph offers 16 graph structures that can plot large amounts of data and mathematical functions useful to scientists, engineers, and financial analysts.

Spyglass Plot is also scientific charting software that can handle huge data sets; it supports HDF (Hierarchical Data Format) files, a standard format for supercomputers. It's part of a trio of programs that work together; the other two are Spyglass Dicer, which displays volumetric data (used in fluid dynamics, meteorology, and astrophysics) in false color, and Spyglass Transform, which generates surface and vector plots from data tables.

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A third option for scientists is Igor Pro, another complex charting program that offers a large choice of data-analysis functions. Its charting capabilities are admirable (from a design standpoint) with the capability to fine-tune any element. It has a built-in Igor language that allows users to run several kinds of analyses on a data set and then save the procedure to run on other sets.

Business users, on the other hand, will find Claris Impact suited to their needs. This easy-to-learn program creates organizational, flow, and data charts; network diagrams; project time lines; and calendars. With a colorful library of styles and a large selection of clip art, Impact can produce charts and graphs with professional flair. The DataDraw feature allows charts and graphs to be linked to data from spreadsheets and databases.

In addition to charts and graphs, Impact can create multi-page documents, drawings, and presentations. Claris Impact's graphs come in several simple styles and can be customized with colors, fonts, and 3D effects of the user's choice.

For basic graphs, CA-CricketGraph III offers ten different types of graphs. While it doesn't have the advanced features of other programs, it uses less RAM and it's easy to use. Charts are limited to two dimensions but can be produced in color or black and white.

See Also

Freehand; Illustrator

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Checkbox

Many **dialog boxes** enable you to choose from a set of options. To choose more than one option, a dialog box provides checkboxes. A checkbox is a small square box you click to select (or deselect) an option. When you select a checkbox, an "X" appears to let you know it's been selected, similar to the way you mark an "X" on a ballot.

If you were to open the **General Controls control panel** , you'd see a list of options on the left with checkboxes and a list of options on the right with **radio buttons** , as shown in the figure.

Radio buttons differ from checkboxes in that radio buttons allow only one choice. In the General Controls control panel, for example, you can have the **insertion point** blink either slow, medium, or fast, but you can only choose one. You can't have the insertion point blink medium and fast at the same time, so when you click your choice of speed with a radio button, any other choice is automatically deselected. Checkboxes, however, act independently of each other. For example, look in the General Controls Control Panel again. You can click a checkbox to protect the **System Folder** , and then click a checkbox to protect the Applications folder. Your choice to protect the System Folder is not deselected. For this reason, checkboxes are ideal for choosing multiple items from a list of options and radio buttons are ideal when an either/or selection is required.

See Also

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Dialog Boxes; General Controls Control Panel; Radio Buttons; System Folder

Checking Account Software

Of the personal finance programs on the market, Intuit's **Quicken** is by far the most popular, and the easiest to use. It uses the visual metaphor of a checkbook, with a register to keep the balance and check forms to fill out. For a small fee, Intuit can supply standardized checks for your laser or pinfeed printer, which you can print from the program. You can also use CheckFree payment services with Quicken. CheckFree eliminates stamps, envelopes, checks, and paperwork because it transmits your payment advice by modem. When you enter a list of checks to be paid and log into CheckFree, the amounts will be subtracted from your bank balance and forwarded to the accounts of your creditors. Your monthly bank statement lists your CheckFree transactions, along with any paper transactions or ATM withdrawals you've made.

Monthly payments, such as rent or car payments, need only be entered once in Quicken. Its QuickFill feature (see figure) simplifies data entry. Checks you write can be listed in the QuickFill window. Next time you need to write a check to the same person, just click on the last one and the new check is automatically filled out. If you need to change an amount, go ahead. The change will be entered in the QuickFill list, too. Even without using QuickFill, Quicken does its best to automate the check writing process. Whenever you start to enter a transaction, the program scans its records of previous ones

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looking for a match. If it is found, Quicken will automatically enter the address and other data for you. You can specify payment dates for monthly bills and Quicken will remind you when one is due.

See Also

Quicken

Checkmark in Menu

If a checkmark appears to the left of a command in a **menu**, it is indicating that the checked command, preferences, or option is active, as shown in the figure. If, for example, you're typing all bold text and you look on the **Font** menu, a checkmark appears beside the Bold command. If you select Bold again, the Bold setting is deactivated, your text no longer appears in bold face, and the checkmark disappears. The checkmark is the Mac's way of telling you which commands are selected.

You can also set some preferences by activating a menu option or command. If, for example, you're using a word processor and you select a word and choose the Bold option, the application will bold the word, and anytime you select that word, the Bold option will be checked in the menu. However, if you go and select the Bold option without any word or letters being selected, you are setting Bold as a temporary preference. The next words you type will now appear in bold, and all words thereafter until you change the option in the menu bar to another setting, such as Plain Text. This change is only

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temporary, and if you quit or open a new document, the applications pre-set preferences will again be in place.

See Also

Fonts; Menu Commands; Menus

Chess

As far as high strategy goes, nothing created for the Mac is ever going to diminish the status of the grand-master of all games: Chess. Although the computer Chinook has mastered checkers by beating all but one master (Marion Tinsley forfeited) in August 1994, even the IBM whiz Deep Blue still couldn't defeat world champion Kasparov during their seven day face off in February 1996. But Deep Blue came closer than Kasparov expected. In Popular Science, before the match, Kasparov revoked his prior boast that he would not be beaten by a computer in the 20th century saying: "I'm amazed at the amount of progress the machines have made."

On the Mac side, the leader is Mindscape's Chessmaster 3000. Although not a beginner's program (it does have an extensive tutorial, but is tough to beat) Chessmaster 3000 offers multiple options as in-depth as deciding whether the computer values pawns more than other pieces and whether its strategy will be defensive or offensive.

One thing missing from the game is network play. For this, Battle Chess from MacPlay is your best bet with great graphics and animation. Every time you

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make a move, the pieces animate accordingly, engaging in combat when they come into contact with the other side. You can turn the options for walking and music off if you want to get serious (it does slow things down), but the enhancement reminds you that you are not necessarily sitting across from your opponent at a table and that they may be on the other side of the world.

See Also

Traditional Games

Chessmaster 3000

See

Chess

Chiat/Day

See

1984

Children's Software

See

Software, Educational, Grades 7-12, Grades K-6, Pre-School

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Chimes of Death

The chimes of death, four tones the computer sounds as a warning, sound when a problem is found during the diagnostic check the Macintosh runs every time you **start up** the computer. These "chimes of death" are usually accompanied by a **Sad Mac icon**. Like the Sad Mac hexadecimal codes used to aid the repair technician, the chimes of death are used to tell the Apple repair technician that the problem was found during the diagnostic check.

See Also

Icon, Sad Mac, Startup

Chinon ES-3000

This camera, also marketed by Kodak and Dycam, provides several features not found in other still video cameras. Most noticeably, it has a built in 3x zoom lens, and accepts **PCMCIA** RAM cards for storing additional images. The camera is not an **SLR** camera (i.e. you aren't looking through the camera lens when using the viewfinder), but the viewfinder zooms along with the zoom lens, providing a reasonably accurate indication of what you are shooting.

The camera contains 1MB of built-in memory, which is enough to hold 10 640 x 480 images. A 4MB PCMCIA can hold just over 40 images. Additional cards cost several hundred dollars, but provide an almost unlimited opportunity for

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picture taking without having to download the images to a computer.

The camera's shutter and zoom buttons are on the top, and an LCD panel at the back that displays the number of images available, the resolution, the flash, exposure, and auto-focus mode. Two buttons enable you to switch between features and change the selection, while a third button erases all of the images in the camera or card. The PCMCIA card is inserted into a slot on the lower edge of the back of the camera. If the card is inserted, pictures are stored on it. To use the internal memory, you must eject the card by pressing the large eject button next to the card.

The image quality is similar to that found in the other cameras, and the camera's exposure metering does a very good job in most situations. One feature that is a bit annoying is that you must hold down the shutter release for a second or two before the camera will take the picture. It also takes several seconds to save an image, making it difficult to take spontaneous pictures.

Like most other still video cameras, the ES-3000 supports 1/4 screen (320 x 240) and full screen (640 x 480) mode pictures. A third resolution, called SuperFine, produces an image of 640 x 480, but results in a larger file. It also reduces the number of pictures you can take. The quality of these images in some situations may be better than the standard 640 x 480, but often they look as though they have been over sharpened.

The software for the Chinon ES-3000. The control panel (at right) can be used to control the camera remotely.

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See Also

Digital Still Camera; Still Video Camera

Chokes

See

Color Trapping

Chooser DA

This desk accessory, which appears on the **Apple menu**, lets you choose which printer you'd like to print to, or which network or server you want to connect to. The Chooser displays your choices as icons that appear in a window on the left side of the Chooser dialog, as shown in the figure. To make your selection, simply click the **icon** of your choice.

If you need to **print** a document, you'll need to choose which printer you'd like to print from. When you choose which type of printer you'd like to use (laser printers, color printers, and so on), the Chooser lists all of the types of printers that you have access to. If you only have one printer, and will be printing only to that printer, you may have to access the Chooser only when you first install your printer. However, if you have multiple printers, or if you're on a network sharing one printer or a number of printers, the Chooser will need to be accessed more frequently.

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The Chooser will remember the last printer you've selected, so you don't have to access the Chooser every time you want to print a document. You can just select Print and your document will print to the last printer you selected in the Chooser. However, if you want to switch printing devices, you'll need to access the Chooser to let your Mac know which printer you want to print to.

For example, if you've been printing to an Apple LaserWriter 360 for the past week, and then decide you want a color print out of a page from your Apple Color StyleWriter, you'll have to access the Chooser to switch from the LaserWriter 360 to the Color StyleWriter. After you've selected the Color StyleWriter, all subsequent print requests from your Mac will go to the Color StyleWriter until you access the Chooser again, and switch back to the LaserWriter 360.

If you are connected to a **network**, when you access the Chooser, you may see a list of **AppleTalk zones**. To access a particular zone, select it from the alphabetical listing. Also, if you're on a network and you want to connect to a server, first click the icon for your network.

To lock in the changes you've made in the Chooser, simply click the **close box** and your changes will be in effect.

There are two other options the Chooser provides: The capability to request **background printing** and the capability to make **AppleTalk** active or inactive.

To use the Chooser DA, follow these steps:

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1. Choose Chooser from the Apple menu.
2. Click the icon for the type of Printer you want and a list of available printers will appear in the window to the right of the icons. If you want to connect to a server, click the appropriate icon and a list of available servers will appear in the window to the right of the icons.
3. If you want your documents to print in the background, you can activate background printing here as well. You can also make AppleTalk active or inactive by choosing from radio buttons in the Chooser.
4. To lock in your choices, close the Chooser.

See Also

AppleTalk, AppleTalk Zones, Apple Menu, Network, Background Printing, Close Box, Icons, Print

Chording Keyboard

See

Keyboards

Chromapress

Agfa's short-run digital press is actually a color printer that uses toner, just

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like a laser printer. It's one of several models based on the Xeikon DCP-1 engine, including IBM'S 3170 and Barco's DigiPress. Like the other Xeikon models, the Chromapress can output 4,080 letter-size pages per hour (or 2,040 double-sided pages).

See Also

E-Print; Short-Run Printing

CIE

CIE is the acronym of the Commission Internationale de l'Eclairage, an international commission formed in the early 1930s for the purpose of devising a universal color standard for the graphics industry.

See Also

CIELAB; Color Gamut

CIELAB

Developed by the **Commission Internationale de l'Eclairage (CIE)** in the mid-1970s, CIELAB is a standard theoretical color space (gamut) which contains all visible color. CIELAB and a similar color space, CIELUV, were derived from, and meant to replace, an original model developed by CIE in 1931. The original model was called CIEXYZ because it defined color mathematically using the three axes—x, y, and z. In CIELAB, "L" refers to

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Luminance (light) and "A" and "B" refer to chrominance (color perception). The CIELAB colors are closer to human perceptions than the other models and is more widely used in color printing. In CIELUV, the letters "L," "U," and "V" have the same meaning as in CIELAB, but this model is used in color display on monitors rather than printed color. The purpose of these color standards is to establish a device-independent **color gamut** to aid in translating color accurately from one device to another.

See Also

CIE; Color Gamut

CIM

See

CompuServe

Cinepak

Developed by SuperMac, which then merged with Radius, the Cinepak compressor is a QuickTime compressor. A movie segment compressed in Cinepak is half the size (data wise) of the same movie compressed using the **Apple Video Compressor** with similar parameters.

The compressor also has a data rate limit, which enables you to define the maximum data rate for the movie during compression. The compressor

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reduces the compression parameters to maintain the specified data rate. This makes Cinepak the best choice for **CD-ROM** distribution.

Cinepak is **asymmetrical**. Compressing files with Cinepak takes much longer than with the Apple Video Compressor. This is not as noticeable, however, if you are using a PowerPC, which noticeably reduces the time it takes to compress a movie with Cinepak.

See Also

Asymmetrical Compressors; Compressor; Drop Frames; Spatial Compression; Symmetrical Compressors; Temporal Compression

Circuits, Parts of the Macintosh

The Macintosh is composed of various printed circuit boards that contain integrated circuits, called chips. These chips are arranged on the boards to serve different functions.

- **CPU**—the central processing unit in Apple terminology—is the total conglomeration of chips and boards that make up the intelligence of the Macintosh. But, the CPU is also the printed circuits and their associated electronics that perform the computing work for the Macintosh. The CPU printed circuit board (and other connected boards) contain the following types of semiconductors and communications connections.
- **Microprocessor** —this is the chip that executes the instructions from the Macintosh applications and operating system. You may also have a

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math coprocessor to speed up mathematical computations.

- **RAM**—the random-access memory or the **dynamic RAM** (DRAM) chips which temporarily hold data and instructions for use by the microprocessor. The Macintosh dynamically updates the RAM by swapping in and out information on a “least-used” or “first-in, first-out” basis. In System 7, virtual memory can be assigned the role of RAM to augment your built-in memory.
- **PRAM**—the **parameter RAM** is a small reserved portion of RAM that is protected by the batteries soldered on to the printed circuit board. PRAM is used to retain time and date information, and the name of your designated startup device, as well as other dynamic information. Because PRAM is protected by battery power, its data is not lost when the Macintosh is turned off.
- **ROM**—the **read-only memory** is “firmware” that has been permanently encoded on to the chips. ROM holds the most basic portions of the Macintosh operating system that are used in startup, as well as much of the instruction used to draw the Macintosh screens.
- **Communications Ports** —the Macintosh also uses several types of *ports* associated with the CPU and located on the back of the computer case, including a printer port, sound port (used to connect external sound devices such as MIDI processors), telephone port (used for connecting your modem to the computer), SCSI port (used for connecting SCSI devices such as external hard disks, CD-ROM units,

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scanners, etc.), external floppy disk drive port, and an **Apple desktop bus** (ADB) port for attaching your keyboard, mouse, graphics tablet, and so on. (The early Macs, up through the Plus, had a non-ADB mouse.)

- **Expansion Slots** —in addition to the processor and ports, The Power Macs, Quadras, LCs, and PowerBook series contain one or more internal slots used for the installing of printed circuit boards to enhance the performance of your Macintosh. Macs currently use three types of slots: NuBus, Processor Direct Slots (PDS or LC), and PCI slots, depending upon the Mac model. Such cards may include a 24-bit color card, an internal modem card, a card to connect your Macintosh to an Ethernet or Token-Ring network, a card to attach your Macintosh to a mainframe computer, and a video card.

In order for the Macintosh to function properly, its components need to be plugged together in a logical fashion, using the correct ports and slots to connect the correct type of peripheral device. If you do not use the proper port, the Macintosh will not recognize the plugged-in component. In addition, SCSI devices attached to the SCSI port must be linked with a termination resistor on both ends of the chain.

If your Macintosh does not turn on, be sure the components are plugged in correctly. Read the installation instructions for each peripheral to ensure that you have hooked it to the correct port, and that you have terminated any SCSI devices.

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See Also

GeoPort; NuBus Slot; PCI Slot; PDS Slot; PowerPC; PRAM; Processors; RAM; ROM; SCSI Port

Circular Reference

A circular reference is a **user error** in a **spreadsheet**. It happens when you ask it to calculate a **formula** that depends on the results of itself, sort of like the image of a mirror reflected in another mirror, reflected in itself, and on to infinity. For example, if cell A1 contains the formula “= B1 + 1” and cell B2 contains “= A1 + 1,” the program could go back and forth between the two cells forever and never reach an answer. Rather than crash, it reports the error, usually with a **dialog box** or a question mark in the cell.

Most circular reference errors aren’t as obvious as our example, and a dozen cells or more may be found in one huge chain. The cure is to replace one of the formulas with real data.

Civilization

See

Sid Meier’s Worlds

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ClarisDraw

ClarisDraw approaches the entire concept of what a drawing program should do and how it should go about doing it very differently from its competitors. Users that come to ClarisDraw from Illustrator or Freehand will have to acclimate themselves to a very different environment in terms of tool placement, usage and options. In many ways, ClarisDraw is a vector drawing program that masquerades as a bitmap paint program, making user interaction less daunting. The way that it allows objects to be bezier edited is a good example. If an object in ClarisDraw is constructed from straight lines, editing a corner of the object will not produce bezier curves, but instead just resized straight lines. The only users who will have problems with this approach are those with experience in Illustrator or Freehand, who are used to having curve control over all line segments. New users, or those with little invested memory of other software, might find this convention more intuitive and comfortable.

Basic Bezier Drawing

ClarisDraw reinvents the wheel with regard to bezier curve editing. Polygons with straight segments cannot have those segments transformed to bezier curves in the normal manner. Transforming a straight sided polygon will result only in the capacity to resize it interactively with the mouse. An intermediate step has to be performed first before the straight sides can be adjusted as bezier curves. ClarisDraw expects that you first translate the polygon to a “bezigon”. After doing this and grabbing one of the poly’s

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anchor points, the standard bezier curve control levers appear and allow for the readjustment of the curvature of the linear segments. No other drawing software allows you to manipulate straight line segments as non-beziers, and no other drawing software uses nomenclature like “bezigon”. The advantage of the way that Claris addresses the bezier modes is that it results in far more intuitive shape creation for artists not used to normative bezier conventions. The same tool that is used to readjust a bezier adds anchor points to any line segment by a simple mouse click. No special tool need be chosen from the toolbox for this task. In ClarisDraw, bezier modeling becomes the domain of artists without the restrictive complications usually placed upon bezier creations by many software engineers. ClarisDraw tries very hard to be as accessible as a standard raster paint program while offering all of the features of a vector drawing program.

Other Drawing Tools

Most notable in ClarisDraw is the addition of raster-based painting tools, accessed by choosing the paintbrush icon from the toolbox. This brings up another column of tools, this time related to raster painting rather than vector drawing. Paint images are handled on a special paint frame overlay. Standard bitmapped images can be modified with ClarisDraw’s painting tools, unusual in a vector drawing program. Once created, a brush painting is incorporated in ClarisDraw as a standard bitmapped element.

ClarisDraw has twelve drag-and-drop symbol libraries, including trees and shrubs, computers, and flags, as well as standard universal symbolic signage

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(no smoking signs, and so on). These symbols come in handy for developing symbol related posters and peripheral publications (newsletters, architectural renderings, maps, and so forth). ClarisDraw's symbol libraries hold many of the symbols needed to craft a good many of the graphics you might be faced with. All of the symbols are drag-and-drop ready.

The software also features a listing of sixteen object primitives such as stars, various shaped polygons, arrows and more. This shape library can be torn off of the toolbox and placed on the editing screen. Applying a smoothing factor to these straight lined poly segments changes them to curved surfaces ready for bezier editing. 3D effects, editable drop shadows and embosses, can also be added to objects.

Typography

ClarisDraw allows you to wrap text inside or outside of an object, but the non-intuitive numeric controls are difficult to understand compared to other software that accomplishes the same results. There is also no way to interact with the text (add spaces, make bolder, and so on) once the text has been attached to an object. Text, either by selected letters or whole blocks, can be translated to bezigons. At that point, gradients, colors and patterns can be added to the selected text objects, and bezier manipulations can be performed. ClarisDraw allows the addition of user selected style tags for all text entries (headings, body copy, and so on). ClarisDraw's text options also lend a certain desktop publishing character to the program, adding to its versatility.

Blends and Gradients

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Instead of presenting the user with an on-screen dialog for creating and manipulating color gradients and blends, ClarisDraw contains three menu bar groups at the top of the screen. One is for text variants, and the other two are devoted to colorizing the internal space (paint bucket) and outlined borders (pen icon) of a selected object. A color palette with either 81,168 or 256 color swatches responds to user controls. Claris also has a pattern fill menu (in deference to MacPaint) and a grouping of sixty-four pre-designed gradient fills. Any of the patterns or gradient fills can be edited and placed in the list, but the total number of each remains the same. New edits simply replace defaulted selections. Gradient edits allow for directional, circular or shape bursts in either 2, 3 or 4 colors. Gradients are then added between color choices. This makes ClarisDraw gradients richer than FreeHand's, but poorer than Illustrator's. Focused light angles can also be altered in gradient edits. The figure shows how ClarisDraw's default gradient fills can be edited and saved in the pop-up library.

Graphs

ClarisDraw has no internal support for developing charts or graphs directly. Instead, interested users are directed to another Claris product, **Claris Impact**.

Layers

ClarisDraw supports the creation and manipulation of separate layers for separating page elements. A basic layer manager allows for layer creation and deletion, as well as locking layers in place. There are no extended layer

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options, nor is the layer manager visible on the edit screen (It must be accessed from the menu bar.). You cannot reposition layers in the stack as is possible with other vector drawing software.

File Save Conventions

The saved output from ClarisDraw is not as user editable as in Illustrator (For instance, there is no way to save a drawing in user selected dpi output). This creates less anti-aliased images when saving in the PICT format, and even the EPSF files look a bit jagged. ClarisDraw saves in Claris options, PICT, CGM (Computer Graphics Metafile), MacDraw and MacDraw Pro, and can import/export the following formats invisibly: ASCII, DIF, EPSF, GIF, AIFF, BMP, Freehand 3.11, JPEG, Kodak, PCX, Photoshop and 2.5, PICS, Quark, QuickTime Movie, RIFF, Scitex, sfil, snd, Soundedit, Targa, TIFF (Mac and PC), MacPaint 2.0, MacWrite, Excel, MsWord, Movie, RTF, Stuffit Deluxe, SYLK, Text, Illustrator XTND.

Claris Draw

See

Other Drawing Applications

Claris Impact

Claris Impact is not so much a **presentation** program as it is a complete

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business graphics program. It can, indeed, create slide presentations, both on the Mac and as 35mm slides or overhead transparencies. It can also create reports, drawings, and outlines, and easily can incorporate timelines, tables, calendars, data charts, organization charts, and flow charts into any of these.

Impact can handle most, if not all of your **desktop publishing** chores, with some help from a good **word processor** . You can type directly into an Impact document, of course, and the program contains a spelling dictionary and Thesaurus, but serious writers might prefer to create large blocks of text elsewhere and then import them into Impact text frames. The drawing tools are essentially the same ones provided with **Claris MacDraw Pro** or **ClarisWorks** , and are easy to use and intuitive. They enable you to use special effects, such as drop shadows, proportional re-sizing, and more.

Claris Impact's style selections, although limited, are an especially good feature of the application. They're shared by all of the business graphics tools, so that your presentations and other printed matter prepared with Claris Impact will have the same look. The calendar will have the same color scheme, fonts, and design elements as the brochure and desktop presentation slides. It gives your work that professional touch.

Charting is a much-used feature of Claris Impact. Organization charts are used in business to show the corporate structure, or any sort of hierarchy. If your business is more than a one- or two-person shop, you can chart the relationship of employees to each other. (You could, of course, do an organization chart for a sole proprietorship, but it would have just one

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square in the middle.) To create one, click the organization chart icon.

Flowcharts show relationships between processes rather than between people. Flowcharts can be done quickly using the flowchart icon.

Tables are just as easy. Click the table icon and enter the data in spreadsheet format, or import data from an existing spreadsheet.

Data charts are what we might more often think of as graphs. They include bar, pie, column, line, and area charts. Again, these can be created from a spreadsheet, with data either entered directly into Claris Impact or imported from ClarisWorks, Excel, or other spreadsheet program. Click the data chart icon, and select from a variety of chart and graph formats. After you've chosen a type of graph, you can adjust the colors, shading, drop shadows, and so on.

Timelines, also called Gantt charts, show events that occur over time. Events or tasks are indicated as bars on a scale that represent seconds, hours, days, or months depending on the kind of event. Many multimedia programs use timelines to indicate how long an image stays on-screen or how long a sound should be played. Claris Impact can also create the more familiar type of calendar with a square for each day.

Presentations in Claris Impact can take the form of any or all of the previously mentioned documents. Use the outline format to create title slides and to outline main points in your presentation. Add graphs and charts to show allocation of resources, percentages of people involved, or whatever

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data is relevant. Use a master slide to maintain consistency throughout the presentation. The master slide determines the type fonts, colors, and graphic elements on each slide. Create a custom background by importing an appropriate graphic from a **photoCD** or **clip art** collection, or design your own. Keep it simple, so that it doesn't interfere with the type. To rearrange your slides, go to the Slide Sorter view and drag them into the correct order. Select Run Show to view the presentation.

See Also

ClarisWorks; Charting and Graphing Applications; Desktop Publishing; Graphics; Presentation Software

Claris Organizer

One of a growing number of Personal Information Managers, Claris Organizer combines calendar, address book, and to-do list functions into one easy-to-learn program with an extremely simple interface. Organizer has only four icons on its toolbar, one each for your agenda, task list, contacts, and note list. Clicking repeatedly on an icon cycles through the different ways of viewing the information. For example, the first time you click the agenda icon, you'll see the daily schedule. The second time, you'll see a week-at-a-glance version. The third click takes you to the monthly calendar page.

A database is only as good as the information you put into it. By making it easier to put data in, Claris Organizer just may have positioned itself as the

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best of the PIMs. Entering data in Claris Organizer is made simple by pop-up menus, which already contain much of what you'd have to type and can be customized to handle even more of it. Are there a lot of doctors or editors or CEOs in your contact file? Add a category for them. The figure shows how simple it is.

Retrieving information in Organizer is equally simple. The list mode provides quick access: start typing what you're looking for, and Organizer will scroll to the first entry that matches those letters. The Find dialog box allows for searches on any one field or multiple fields. Organizer's "smart find" feature helps locate people even when you can't remember their names. Suppose that you have several clients named Steve. You're trying to call Steve who works at Custom Productions, but you don't remember his last name. In the Find box, type "Steve at C," and there he is. Or suppose that you have an appointment with your doctor, but you've forgotten when. Using the Find box, search the agenda for his name. The program will jump you ahead to the day and time. If there's more than one, Find Again will keep on taking you through all the entries with that name until you find what you're looking for.

Like other good PIMs, Claris Organizer can print nicely formatted pages in your choice of styles. There are label masters, fax covers, calendar and address book pages, and even more. One especially handy feature enables you to specify a starting label on your Avery label templates. You can use up all those partial sheets of labels you've carefully set aside. Print Preview lets you see what you're getting before you print it. The only drawbacks to this

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program are that, unlike many of the other PIMs, it can't be opened and shared by multiple simultaneous users, and it lacks the easy menubar access that **Now UptoDate/Now Contact** and **Expresso** provide.

ClarisWorks 4.0

ClarisWorks has come a long way since its earliest incarnation. What was originally a somewhat awkward and limited works program can now handle most of the tasks of the much beefier programs. In addition to the usual set of modules, it includes a painting module that's capable of some nifty tricks, such as gradient fills. Its word processor can handle outlines and apply style sheets to text. It also enables you to create your own styles and provides some pre-formatted ones to get you started. The word processor also can create Web pages using **HTML**. The spreadsheet and database functions are adequate for home or small business use, and the telecom program, while it won't get you into the Web or on **America Online**, is adequate for accessing a text based service, such as **Delphi** or a local bulletin board.

The word processor module is probably the most critical, because it's the one most people use most often. ClarisWorks comes with all kinds of goodies and gimmicks, including a library of inline graphics to brighten up your memos and newsletters. You can add your own favorite bits of art, your scanned signature, your logo, your letterhead, or whatever you like to use to perk up your pages. It has a spelling checker, a dictionary, and a thesaurus. The figure below shows the Style Sheet palette, the Library palette, and the

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Shortcuts palette.

ClarisWorks provides a set of assistants to guide you through the creation of certain kinds of documents, including certificates, calendars, newsletters, and presentations. The certificate assistant, shown in the preceding figure, begins by asking about the occasion for the certificate. Is it a diploma, a certificate of appreciation or membership, or something else? Then, it asks for the name of the recipient and suggests wording for the text. It also asks who, and how many people, will be signing it. Finally, you choose a border and a seal, and it's done and ready to print. The newsletter assistant is equally simple. Choose a layout, enter a title and a number of pages, and you're all ready to paste in the text. Working from scratch is almost as easy. The palettes can be customized to give you access to the commands you use most frequently.

Databases and spreadsheets can be a pain in the posterior. FileMakerPro by Claris, however, is one of the less complicated ones, and ClarisWorks has retained its best features in the database module. There's stationery to maintain a checkbook and ledger, a recipe file, customer lists, and more. The spreadsheet function is equally simple to master. Auto-fill commands make data insertion easy.

Conversation with Dan Muse

As editor of *Family PC* magazine, Dan has reported on personal computers since the days of the Apple II.

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Maclopedia: How did you first come in contact with a Mac?

Dan: I was working at *MicroComputing* and the publisher decided to start an Apple II publication, *InCider*, with program listings and projects articles. I helped pick some of the early programs for the Apple II+. The magazine started to evolve and began to be a business publication; when the first Macs came out, I had one of the first—the unit we were to review. I was just amazed. Most people were using WordStar and CPM at the time. I was managing editor and I did the table of contents on the Mac and played around making the fonts bigger and smaller, things you couldn't do before. I was terribly excited about it—the whole idea that you could see what you could get and play with fonts and sizes, it was a whole new world. Instead of saying to a designer, "I want it to be this size or that," I could say, "I want it to be like this" and give him an example—this was before desktop publishing.

I was with *InCider* until 1992. Most of my tenure there I was covering the Apple II, and people felt Apple was abandoning the Apple II for the Mac, which it was. We bought A+ and merged the two, and we were the best-read among educators because we covered AppleWorks and PrintShop, and we had spreadsheet and database projects you could do with AppleWorks, a huge program that never got the credit it deserved.

Maclopedia: Yes, and AppleWorks led directly to both Microsoft Works and ClarisWorks. So how did you move over to the Mac side?

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Dan: I went to *Byte* in 1992 and was there for a year, and then I went to *MacWorld*. I was the senior features editor and covered a lot of Mac products. I did the PowerBook and Newton beat. I was there for the tenth anniversary of MacWorld, which was also the tenth anniversary for the Mac. Everyone there was totally committed to Macintosh, but people were beginning to realize the Windows world would not go away, and we had to deal with Mac-Windows connectivity.

Maclopedia: How did you like the trackpad?

Dan: The trackpad was typical Apple. Other companies had fooled around with it, but Apple made using the trackpad in the notebook a standard; now you get it with Gateways.

Maclopedia: How about the Newton?

Dan: I thought the Newton was a bad idea at first. You couldn't really think of anything to do with it. But I did cover the Message Pad 110 and played around with that for a few months, and I found I was using it a lot. I did my scheduling on the Newton because I commuted by train to the city, and then I'd download to the Mac. I was using Now Contact on the Mac, and you could take your address book and contact list and sync it with the Newton using the Desktop Connection Kit, connecting a cable from the Newton to the Mac.

Maclopedia: Do you blame some of the Newton's early problems on its weakness in handwriting recognition when it first came out?

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Dan: Yes, people expected handwriting recognition to be something it can't be. Most people can't even recognize their own handwriting all the time; how can you expect software to do that? But as far as taking notes, it is very effective. On the first Message Pad, you had to recognize at the time you wrote or not at all, where with the 110 you could do the handwriting first and run the recognition later.

Maclopedia: Is the Newton going anywhere now?

Dan: I don't see much growth in the marketplace. It's not a family product. I see a lot of people running around with them, but I still think it's an idea waiting for applications. People have to have a compelling reason to get one. And competition from notebooks is tougher, now that they have gotten smaller and more powerful.

Maclopedia: From your perspective at *Family PC*, how is the Mac as a home machine?

Dan: It defines what families want. It is easy to set up, it is consistent, it is self contained. You don't have to add things to it, and if you do add, it is true plug and play—what Windows is still trying to emulate. The top choices for games and hobbies and niche software just aren't out for the Mac, but for early learning and reference, there is everything out for the Mac.

Maclopedia: How do you envision the future of the Mac?

Dan: The Mac will be around as long as Apple keeps its pricing competitive.

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Among our readership, Mac users are very vocal—they watch us very closely to make sure we cover it. It doesn't matter if you are talking about engineers, business people, or home, they become zealots, part of the religion. So the Mac's place in the home and education is secure.

Also, if you look at market share, you see 90-10, Windows to Mac, but if you look at individual companies, Apple is right up there with Compaq and IBM; it has a big percentage of the marketplace.

Apple's more healthy than people think. They just need to be aggressive with pricing, and they need to make sure they are evangelizing with software developers to make sure people aren't driven away. If there is a downfall, that would be it: developers not feeling it's worth their time.

And Apple needs to continue to innovate, and make the Mac different after Windows 95, which was a step closer to the Mac in ease of use. People are watching to see what the next step for the Mac will be. Apple must distinguish itself as the premium in ease of use and consistency; that way people will continue to be religious about it.

As soon as people buy a Mac they identify with the machine. They don't do that with a PC; they may identify with what they can do with it, but not the machine. I don't know anyone who has a PC that has that connection that Mac people do. Maybe that goes back to the smiley face.

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The draw and paint modules are somewhat limited, but more than adequate for drawing a diagram or cleaning up an imported graphic. ClarisWorks can import both TIFF and PICT images, but can't deal with EPS. It enables you to edit the gradient fills and to save in resolutions up through 360 dpi and in bit depth sufficient for millions of colors.

Telecommunications is generally the weak link in a Works program and ClarisWorks, unfortunately, is no exception. The program does support Z-modem file transfers and will enable you to chat via modem with a friend or transfer files back and forth. It won't get you into the **World Wide Web** or onto **Prodigy** or American Online. It *can*, as of this writing, give you text-only access to **GENie**, Delphi, and **CompuServe**. How long these services are going to continue their text-based access is anybody's guess.

If you're not self-publishing the Great American Novel, running a business with more than a couple of employees, or trying to create the digital Mona Lisa, a Works program might be all you need for basic software. ClarisWorks is preferred over Microsoft Works by most users for its speed, ease of use, and word processing capability.

See Also

Word Processors; Works Programs

Clarus

See

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Dogcow

Class

See

Object-Oriented Programming

Class Browser

See

Browser

Class Library

See

Framework

Classic Collection: Three Classic Board Games for your Mac

MacPlay 's triple offering features three board games translated to the Mac: Risk, Scrabble and Monopoly—which is the best of the pack. Parker Brothers

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has already release a networkable, 3D enhanced version of the best-selling board game of all time for the PC but is still working on the Mac, but MacPlay's version takes less memory and should fill the space between release dates. The small board is a bit of a sacrifice, but the game is still addictive. Plus, you can option for all those crazy rules you thought you made up when you were a kid, like putting money on free parking or having insider trading between partners. Be warned: the computer has no qualms about activity that comes suspiciously close to cheating. It will trade with itself if you have it in charge of more than one opponent. On the up side, the game is challenging and, for some reason, it is a lot easier to finish a game than on the board.

Scrabble also fares well, despite the comparatively diminutive playing area, whereas Risk works the least well of the three. MacPlay's computerized version of the popular board game is fun and is faithful to the original but is considered by some Mac lovers to be a little too DOS-like.

Another, more exotic collection of traditional games comes from Edmark. Strategy Games of the World includes Go-Moku from Japan; Mancala, an African game; and the English classic Nine Men's Morris. Play against Game Masters, with the help of your own personal strategy coach, or play against a friend. These games depend on thought, rather than random rolls of dice. As your strategy improves, so will your problem-solving skills.

See Also

Card Games; Chess; Traditional Games; You Don't Know Jack

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"Clean" Reinstall

If you have a **system crash** and determine you need to reinstall the system software, if you run Apple's **installer** to reinstall a new system, you may still be faced with the same problem that caused the crash in the first place. Apple's installer replaces only parts of the system that it deems necessary to update, so if you have a damaged **system file** or **Finder file**, a standard reinstall may install right around those damaged files, leaving them damaged. For this reason, many people choose to do what's called a "clean" re-install that installs a new and fresh copy of the Macintosh operating system for your machine in a separate folder from your old, possibly damaged, **system folder**.

To make certain this new reinstall is a clean reinstall, you have to make sure the installer doesn't see an active system folder when it begins its installation process. If the installer sees an active folder, it updates that system. Because you don't want that (you want a clean reinstall), you need to fool the installer by **dragging** your system file into another **folder** within your system folder (such as the Preferences folder) and then renaming your old system folder with a different name, such as "Bad System Stuff." When the installer looks on your **startup disk**, it doesn't see a folder named "System Folder" and it creates a new clean copy of the system in a new folder called System Folder.

After the clean reinstall is complete, you still have access to your old system folder under its new name "Bad System Stuff." You can drag any special

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control panels or **extensions** that you've added to the system into your new system. It's helpful to add these extra control panels and extensions one at a time and **restart** the computer to see whether it restarts correctly. If you add them one-by-one and after you add one you have a problem during the restart, you've tracked down a conflict within your system that may have caused your problems in the first place. You should also trash your old System file and Finder file.

In System 7.5 and higher, you can have the Installer do a clean install for you. Just insert the Installer Disk (or the System 7.5 or higher CD-ROM disc) and launch the installer. When the installer screen comes up, hold down Shift-⌘-K, and you'll have the choice of installing a brand new (clean) System Folder or updating the existing folder. Choose the clean install.

To do a clean re-install of your system, using System 7.5 or higher, follow these steps:

1. Insert the Install Disk 1 from your set of Apple installer disks you receive when you buy your Macintosh. (If you received a CD-ROM disc instead, insert the CD-ROM disc that contains your System 7.5 software.)
2. Double-click the Installer Icon to bring up the Installer window.
3. Hold down the Shift-⌘-K keys to start the clean installation.
4. You get a dialog box with two radio buttons enabling you to choose

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which kind of installation you want; Update Existing System Folder (the default choice), or Install New System Folder. Select "Install New System Folder" and click OK (see following figure).

5. The Installer window appears, but this time the button that used to be labeled "Install" now reads "Clean Install." Click Clean Install. This creates a new system and system folder, and your old system folder is not deleted, but is automatically renamed "Previous System Folder."

See Also

Control Panels; Dragging Folder; Extensions; Finder; Installer; Restart; Startup Disk; System Crash; System Folder; Troubleshooting

Clean Up All Command

The Clean Up All command helps you organize your **desktop** by automatically aligning all **icons** on your desktop along the far right edge of your screen. The Clean Up All command is only available when no windows are open. If no windows currently are open, you can press the **Option** key and choose Clean Up All from the **Special menu**, which snaps any items on the desktop to an invisible alignment grid on the far right side of your desktop. You might want to choose this function if you have icons cluttered all over your desktop and want a quick, orderly accounting of them.

See Also

Command; Desktop; Icons; Option Key; Special Menu

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Clean Up Desktop Command

You can use the Clean Up Desktop **command** when no windows are open to help you organize **icons** on your **desktop**. If you look on the **Special menu** when no windows are open, you'll see that the Clean Up Desktop command is available. By choosing the Clean Up Desktop command, items on the desktop will snap to the nearest alignment point on the invisible alignment grid on the desktop. If a window is active, you get the Clean Up Window command from the Special menu.

See Also

Command; Desktop; Icons; Option Key; Special Menu

Clean Up Command

Found on the **Special menu** on the **Desktop**, the Clean Up command is designed to help keep **icons** in windows organized by straightening them out visually. Each window has an invisible alignment grid. As you move files and folders around within a window, after a while they can become disorderly looking and scattered since they're not aligned with each other. The Clean Up command takes these scattered icons and snaps them to the invisible grid, straightening them into orderly rows. (see the following figures). This particular command is available only when the window's view option is set to **View by Icon** or **View by Small Icon**. If you want to clean up just a few items, select only them items you want cleaned up and choose

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Clean Up from the Special menu.

The Clean Up command also has a number of different forms it can take to help you with your housekeeping. If you select Clean Up while holding down the **Option** key, you'll notice that Clean Up Window has changed to Clean Up by Name, which not only aligns your icons into neat columns along an invisible grid, but it also arranges them alphabetically as well.

You can also use the Clean Up command when no windows are open to help you straighten out your desktop. If you look under the Special menu when no windows are open, you'll see that the Clean Up command has again taken a different form and is now called Clean Up Desktop which snaps any items on the desktop to the invisible alignment grid on the desktop. If you were to hold the Option key while choosing Clean Up Desktop, it changes to the Clean Up All form, and this time it Cleans Up by aligning all your icons on the far right edge of your desktop.

To clean up the icons in the active window, follow these steps:

1. Choose the Clean Up command from the Special menu (This works only when your windows view is set to View by Icon or View by Small Icon.)
2. The icons in the windows snap to an invisible alignment grid in the window. You can choose to align them on a straight grid where the icons are side-by-side, or a staggered grid that staggers the icons between lines. (The staggered method works great if you have long file names that might bump into one another on a straight grid.) You

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select which style of grid, straight or staggered, in the Views Control Panel, found under the Apple menu.

3. If you want these icons arranged alphabetically by name, hold the Option key as you choose Clean Up from the Special menu.
4. If you want to clean up the icons on your desktop, close all windows and choose Clean Up Desktop from the Special menu.
5. If you want to align all the icons on your desktop along the right edge of your desktop, hold the Option key as you choose Clean Up All from the Special menu.

See Also

Desktop; Icons; Option Key; Special Menu; View by Icon; View by Small Icon; Views Control Panel

Clean Up by Name

See

Alphabetizing Filenames

Clear Command

This command erases an item from your document without making a copy to the **Clipboard** and basically has the same effect as the Delete key. In certain

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instances, you may want to delete an item without erasing the contents of the Clipboard. The Clear command is ideal for this purpose.

To clear an item, follow these steps:

1. Highlight or select the item you'd like to clear.
2. Select Clear from the Edit menu.
3. The selected item disappears *without* a copy being stored in memory.

See Also

Clipboard; Copy; Cut; Delete; Edit Menu

Clear Key

The Clear key, located in the upper-left corner of the **numeric key pad** , operates the same way the **Delete key** does, by erasing selected items without saving a copy to the **Clipboard** . Depending on your type of keyboard, it might delete from the right instead of from the left. It also acts the same way the Clear key does on a standard calculator. If you use Apple's **Calculator DA** , use this key to clear the calculator's display for a new calculation.

See Also

Calculator DA; Clear; Clipboard; Delete Key; Numeric Keypad

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Clear Keyboard Shortcut

The **Clear** command doesn't have a keyboard shortcut assigned, but the **Delete key** performs the same function. If, for example, you want to change a filename, you can **click** the filename and select **Clear** from the **Edit menu** , or you can use the **Delete key**.

See Also

Click; Delete Key; Edit Menu; Keyboard Shortcuts

Click

To make a selection with your mouse, press the mouse button and release it. The mouse clicks to let you know that you've pressed the mouse button, or “clicked the mouse” as it's known. If you see an instruction that reads, “point and click the folder,” for example, point the cursor at a folder (using the mouse), and click the mouse button. Double-click refers to pressing the mouse button quickly two times. A single click selects an item. A double-click performs a task. If you click the mouse button once on an application icon, it will select the icon, and you can drag the icon to another location. If, however, you double-click the mouse button on an application icon, it launches the application. One click tells the Mac you're selecting an item, two clicks tells the Mac to perform a task.

See Also

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Application; Double-Click; Folder; Icon; Mouse; Mouse Button

Click and Drag

To access items on a **menu**, click and hold the mouse button with the arrow pointer on the menu title and the menu pops down, enabling you to drag the **arrow pointer** to the menu item of your choice. When you reach the menu item you want, release the **mouse button** to select it. You can also click **icons** in active windows and move them while continuing to hold the mouse button. When you've moved the icon to the desired new position, release the mouse button. This is also referred to as **pressing and dragging** .

Clicking and dragging is also used in System 7.5 and above as a text editing tool in many word processing applications. You can highlight a word or phrase and drag that highlighted selection to another area in your document. This is a way to quickly edit a text document without having to use the Cut and Paste commands, which would take longer and would replace any items in the Clipboard.

Click and drag is also used to move items in and out of the Scrapbook, NotePad, Stickies, and other applications that support click and drag capabilities.

See Also

Arrow Pointer; Desktop Level; Icons; Menus; Mouse; Pop-Down Menu; Selections

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Clickable Map

See

Imagemaps, Creating

Client

See

Server

Client-Side Imagemap

See

Imagemaps, Server-Side versus Client-Side

Clip Art

Very few designers create all the artwork they use from scratch. For many purposes, clip art (which is sold in books and now in electronic format on floppy disks or CDs) will work just fine, either on its own or as a starting point for a design.

Sold by a variety of companies and as **shareware** , the available styles of clip art are countless, from simple line drawings to cartoons to woodcuts to

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detailed perspective images in color. Formats vary as well, with black and white art generally available for the Mac as either **TIFF** or **EPS** files that can be imported into page layout or other graphics programs. Some companies remarket clip art originally sold in books by scanning it. For example, Zedcor sells a set of CDs containing tens of thousands of images, including much of the high-quality clip art created by Dover Publications.

In addition to clip art, the proliferation of multimedia and online projects has created a market for other clip media, including sounds and movies, as well as stock photography, backgrounds, and borders.

Many clip art companies are delivering “edited” or “editable” files. Many illustrations come in **Illustrator** or **Freehand** EPS format with layers so that parts of the drawing can be used independently. Clip photography disks have images pre-silhouetted, with separate drop shadows.

In clip media, especially stock photography, it's very important to examine and understand the license agreement. Some manufacturers demand royalties or additional payments for images used for commercial distribution.

See Also

EPS; Page Layout Programs; TIFF

Clipboard

The Clipboard is the Mac's temporary holding area that enables you to **Copy**

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or **Cut** elements from one document, and **Paste** those elements into another location or document. After you've Cut or Copied an item into the Clipboard, you can view that item by using the command Show Clipboard from the **Edit menu**. The clipboard is designed to hold one item or one group of items at a time. If a new item enters the clipboard (by copying or cutting an item), the previous item is deleted.

The Clipboard is often used as a way to move information between applications. If, for example, you're working on a spreadsheet, and have created a Pie Chart that you'd like to import into a word processing document, you can Copy the Pie Chart Graphic into the Clipboard by selecting it and using the command Copy under the Edit menu and then you can switch to the word processing program. The pie chart graphic will be held in the invisible clipboard until you select Paste from the Edit menu and then the pie chart would be inserted into your word processing document. Holding that graphic, as you switch between programs, is a key function of the Clipboard.

See Also

Copy; Cut; Edit Menu; Paste

Clipping Extension

This System 7.5 and higher **extension** enables you to **drag and drop** text or graphics directly onto your desktop where they appear with icons as clipping files. These files can remain on your desktop and be dragged from

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the desktop into other documents as needed. This way you can leave frequently used items, such as logos or your address, on your **desktop** and drag them into documents as you need them.

See Also

Desktop; Drag and Drop; Extensions

Clock

See

Internal Clock of the Macintosh

Clock, Setting

To set the time for the Macintosh's internal clock, choose the **Date and Time Control Panel** from the **Control Panels** folder. You can use the Date and Time Control panel to set the time by clicking the currently displayed time and entering the correct time by typing it from the keyboard or clicking the edit arrows to move the numbers in the proper direction.

To set the time for the clock using the Date and Time control panel, follow these steps:

1. Choose the Date and Time Control Panel from the Control Panels submenu of your Apple menu.

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2. To set the time, click the number (hour, minutes, or seconds) and the up/down **edit arrows** will appear to the right. You can type the correct number or click the up arrow to move the number higher and click the down arrow to move the numbers lower. To make the time change complete, click the words, "Current Time". The edit arrows will disappear.
3. To turn the menu clock on, click the On button. You can set the preferences for the menu clock by clicking the clock options button. When your preferences are complete, click OK and close the Time and Date control panel.

See Also

Control Panels; Date and Time Control Panel; Edit Arrows

Clones, Desktop Models

Power Computing Corporation concentrates its Macintosh clone business on the middle-level desktop publishing and business users. This company offers the most variety of features and standard components. There are three levels of PowerComputing clones: The Power 120, which is a first-generation clone (and has been discontinued), the PowerWave which is a high-level Macintosh, and the PowerCurve which serves the middle-level users.

Each model has the following features in common:

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- **Use of Apple 601 or 604e PowerPC processors.** These computers use faster chip sets than Apple's comparable models with performance at 120, 132, and 150 MHz. Each processor has an integrated floating-point processor and 32K internal cache.
- **CD-quality 16-bit stereo sound.** The PowerComputing Macintosh clones provide the same high-level of fidelity as Apple Macs.
- **Good color display support.** The PowerCurve provides 1MB VRAM upgradable to 4MB in 3 sockets; the PowerWave provides an accelerated 64-bit PCI video card with 2MB VRAM upgradable to 4MB. The Power 120 provides an optional video card with additional Macintosh standard and VGA monitor port along with 2MB of VRAM upgradable to 4MB.
- **Extensive expansion bays.** The Power 120 provides four expansion bays supporting either two 3.5 inch drives and one 5.25 inch drive or four 3.5 inch disk drives. The PowerWave models support three front-accessible 5.25 inch bays; one internal 3.5 inch bay for one full-size or two half-size internal disk drives.
- **Network compatibility.** The PowerComputing clones come with standard Ethernet (AAUI) and ThinNet (10Base-T) ports, as well as support for Apple's LocalTalk.
- **Internal expandability.** The PowerWave and PowerCurve models provide 2 to 3 PCI and NuBus expansion slots, depending upon the

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model. The Power 120 provides three internal NuBus slots.

- **Bundled business software.** PowerComputing clones provide an extensive array of business software including: ClarisWorks 4.0, Intuit's Quicken 5.0, Insignia's SoftWindows 2.0 on a 60-day trial, Now Up-to-Date 3.5 and Now Contact 3.5, Now Utilities 5.0, Nisus Writer 4.1, Grolier Multimedia Encyclopedia, The Animals!, U.S. Atlas 5.0, World Atlas 5.0, Launch interactive media CD-ROM, FWB Hard Disk Toolkit and CD-ROM toolkit, America Online, and 250 Bitstream Type 1 and 2 Fonts.
- **CD-ROM support.** Most PowerComputing models come standard with a four-speed, tray-loading CD-ROM Drive.
- **Choice of configuration.** Each Power Computing clone comes in a tower or box-chassis model.

See Also

Clones, High-End Graphics Models; Macintosh Family; Clones, Macintosh General; NuBus Slot; PCI Slot; PowerPC

Clones, High-End Graphics Models

Two vendors in the Macintosh clone business have decided to sell Macs in niche markets: Radius Computer and DayStar Digital. In January 1996, Umax Data Systems acquired Radius' clone business. Radius transferred its operating system license and systems designs to Umax Computer, a new

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division of Umax Data Systems. All of Radius' clone-engineering staff joined Umax and Radius retained a 20 percent ownership in the venture. Umax Computer will sell PCI-based Macintosh clones under the Radius SuperMac brand. Radius will continue to support its NuBus-based Mac clones, but will no longer develop new clones.

Umax, like Radius has targeted its clones to digital-video and color publishing organizations. DayStar has targeted its clones to the electronic publishing market.

Umax is introducing a Macintosh clone in the Spring, 1996 featuring the 150 Mhz PowerPC 604e processor. This will eventually be a multiprocessor Macintosh with slots for two CPUs, but the second CPU and multiprocessing software will not be shipping until after the base model ships. According to the May 1996 issue of *MacWorld* in an article by Charles Piller "MacWorld Exclusive: Umax Clone Speeds to Top of Mac Pack, First Look at SuperMac Prototype," the SuperMac clone will be configured with 16MB of RAM (upgradable to 1G), a 512K Level-2 cache, a quad-speed, tray-loading CD-ROM drive, six PCI-slots, six expansion bays, and an optional 100-Mbps Ethernet with Ultra SCSI card. Umax is also planning to market a general-purpose business Macintosh clone to compete with the PowerCurve models by Power Computing, as well as a consumer model that would be competitive with Apple's Performas in price and performance.

Radius formerly manufactured an image-editing Macintosh called the Radius System 100 (Existing machines are still supported by Radius, but the

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computer has been discontinued). This is a Macintosh whose performance has been tuned for image management. It has the following qualities:

- The System 100 is based upon a Power Mac 8100/110 motherboard. The “110” in the name indicates that the PowerPC 601 chip performs at 110 MHz.
- A Fast-Wide Bus JackHammer SCSI accelerator card has been added to increase the performance of the Mac’s input and output.
- Two hard drives: a 2G and a 500MB for extensive storage.
- The standard Apple video card is replaced by a Radius Thunder IV GX-1600 video card that increase the VRAM and increases the monitor’s capability to display true 24-bit color.
- At least 40MB RAM for added performance.
- A double-speed, tray-loading CD-ROM drive.
- Bundled image-editing software including Adobe PhotoShop and Radius Color Composer.

DayStar Digital’s specialization is accelerator cards. This company takes a different tactic to sell to the publishing market: multiprocessing Macintoshes. The Genesis MP tower system began with a dual-processor Mac and has now produced a four-processor version. This means that the Genesis couples together two or four PowerPC 604 processors, each on its own daughterboard which can be exchanged for a board with faster chips when

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these become available. DayStar has designed a program interface that establishes a primary processor that runs the Macintosh operating system's toolbox operations. Applications, such as Adobe **PhotoShop** or **Illustrator** or **3-D graphics programs** that have been rewritten to support multiprocessing, split up their computer-intensive tasks such as vector rendering or photo-retouching, between the remaining processors. Because each processor is located on a daughterboard on the system bus, each has the same access to the motherboard's memory, and does not take up overhead competing for toolbox resources.

The DayStar Genesis MP has the following features:

- At least 32MB of RAM (the four-processor model comes equipped with 72MB of RAM) upgradable to 512MB or more.
- Three or six PCI slots compatible with Intel-standard accelerator cards and other performance add-ons.
- Eight or nine internal expansion bays that include those pre-configured with a quad-speed, tray-loading CD-ROM drive, 1G hard drive, and floppy drive(s).
- Bundled image-processing software, including DayStar's Colorimeter 24 and ColorMatch software.

See Also

Clones, Desktop Models; Macintosh Family; Clones, Macintosh General; NuBus Slot; PCI Slot; PowerPC

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Clones, Macintosh General

In 1994, Apple Computer transformed its corporate culture through one small act—it licensed the Macintosh operating system and ROMs to a select number of computer manufacturers. In so doing, Apple opened its formerly proprietary hardware/software symbiosis to outside players. In the spring of 1995, Power Computing introduced the first Macintosh-compatible machine not made by Apple. There are currently only a handful of Macintosh “clone” makers, but the list is growing.

The Macintosh computer is software and hardware. The software consists of an operating system and firmware (instructions hard-wired into the Read Only Memory (ROM) chips. The current clone manufacturers have gained permission to use Apple Mac_ROMs and other Apple chips in their computers so as to maintain the 100 percent compatibility and “plug and play” of true Macintoshes. Apple provides engineering assistance and compatibility certification for clone manufacturers to ensure that every clone will be Macs in everything but brand. Apple is building the same type of brand recognition for its operating system as Microsoft has built for Windows. Every Macintosh starts up by displaying the Macintosh OS logo. Clone machines also display this logo so that you know that your clone is a pure Mac.

IBM and Macintosh Clones

In 1994, around the same time as Apple announced the licensing of the Mac,

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it also formed an alliance with IBM and Motorola to create a framework of technical concepts and specifications that can be used by any hardware manufacturer to permit their machines to run a variety of operating systems, including Macintosh OS, IBM OS/2, AIX (IBM's UNIX), Sun's Solaris UNIX, and Microsoft Windows NT. This design was called the **common hardware reference platform (CHRP)**, and in 1996, Apple demonstrated the first CHRP machine, now called the **PowerPC platform**, running of the Macintosh OS. Since then, IBM has abandoned the idea of running OS/2 on the platform and there are rumors of a Macintosh license.

There are currently three active clone manufacturers: Power Computing, Umax Data Systems (who acquired Radius' clone business in January 1996 but will use Radius' SuperMac branding on their PCI-based Mac clones), and DayStar Digital. The following table outlines the computer offerings of these manufacturers.

Macintosh Clones

Power Computing

Power 120, PowerCurve 601/120, PowerWave 604/120, 604/132, and 604/150 PPC 601 or 604 at 120, 132, or 150 MHz, 256K level-2 cache 64-bit PCI video card with 2M VRAM, 3 or 4 expansion bays for two 3.5" drives and one 5.25" full-height drive, 2 serial ports, built-in Ethernet and 10Base-T port, 3 PCI slots or 2 PCI and 2 NuBus slots with Stargate Riser Card, 8 or 16MB RAM, 540 or 850MB, 1 or 2G

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	hard drive, 4X speed CD-ROM drive, bundled business software
Radius	Radius System 100 PPC 110 MHz 601, 32K internal cache, 256K level-2 cache 72MB RAM, 2G fast and wide SCSI hard drive with fast and wide controller, 24-bit color, 3 custom-designed graphics accelerator cards, 4 AT&T 32-bit digital signal processors, 2X CD-ROM, bundled Radius Dynamic Desktop, PhotoEngine software, and Radius ColorComposer software
DayStar Digital	Genesis MP Two or 4 PPC 604 processors at 120 or 132 MHz each 3 or 6-slot PCI motherboard and 9 drive bays, 16MB RAM, 1G hard drive, 4X CD-ROM drive
Umax	SuperMac brand 150 Mhz PPC 604e processor UltraSCSI bus, 6-slot PCI, 4X CD-ROM, 6 expansion bays, multiprocessor slot (2 cpus), 16MB RAM, 512K L-2 cache, options of 100-Mbps Ethernet and Ultra SCSI I/O card

As can be seen in the table, each vendor has approach a different segment of the Macintosh market. Power Computing is selling clones on the general market to—consumers and business users who wants a general-purpose computer, whereas Umax (formerly Radius) and DayStar Digital are

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concentrating on the high-end graphics, video, multimedia, and pre-press businesses.

Each vendor also takes a different tactic in the manufacture and sales of its computers. Power Computing uses Apple Mac ROMs and chips and packages them in PC cases (either mini-tower or flat box) and sells them through mail order and some retail outlets. Radius sold-its Macintosh clones directly and through some mail order catalogs. Umax is targetting high-end graphics machine users as well as the consumer and education markets, and should retain the mail order method, as well as sell through stores (although it is unknown as of the writing of this book). DayStar Digital sells only directly.

See Also

Clones, Desktop Models; Clones, High-End Graphics Models; Fast and Wide SCSI; JackHammer Accelerator Cards

Close Command

When you are in an application and want to close the current document, you can select the Close command (⌘-W) from the File menu to close that document. You can also click the **Close Box** in the upper left hand corner of the title bar. If the document has not been saved yet, and you select the Close Command, you'll get a **dialog box** asking you, "Save Changes Before Closing?," and shown in the figure. If you want to save your current changes, click OK, and you'll get the standard **Save dialog box** and be

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prompted to name your file and choose the location you'd like to save your document.

If your file has already been named and you're working on an existing document, when you select the Close Command, you'll get a dialog box asking you, "Save Changes Before Closing?" If you want to save your the changes you made since the last time you saved, click OK, and the document is saved and then closed.

To use the Close Command to close an open document, follow these steps:

1. Select Close (⌘-W) from the File menu or click the Close Box in the upper left hand corner of the title bar.
2. You'll get a dialog asking you if you want to save your changes. If you click OK, and you've previously named this document, the document closes. If you click OK and you haven't previously named this document, it takes you to the standard Save dialog (ref. here), which enables you to name the document and choose the location where you'd like it saved.

See Also

Close; Dialog Box; Save; Save As

Close All Keyboard Shortcut

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If you have a number of windows open on your **desktop** and want to close them all, press the **Option key** and **click** the **active window's close box** . This closes all windows. If you look on the **File menu** , you see the **Close Window** command. When you press the Option key, this changes to the **Close All** command. Option-⌘-W closes all windows, too.

To close all open windows, hold the Option key and click the active window's Close box. This will invoke the Close All command and it will close all open windows.

See Also

Active Window; Click; Close Box; Close Window; Desktop; File Me; Keyboard Shortcuts; Option Key

Close to Previous Window (Keyboard Shortcut)

If you want to close the **active window** , use the keyboard shortcut Option-⌘-Up Arrow. This keyboard shortcut also works if you want to see **icons** that may be hidden by the active window. You then use Option-⌘-Down Arrow to reopen the window.

See Also

Active Window; Desktop; Icons; Keyboard Shortcuts

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Close View

This **control panel** enables you to magnify the screen to a preset magnification. Perfect for users with impaired vision, this magnification tool enlarges items on your screen up to sixteen times the normal size. The Close View Control Panel enables you to change your magnification power, toggle on or off the ability to enable Close View with a keyboard shortcut, and to invert the screen image.

To use the Close View Control Panel, follow these steps:

1. Choose the Close View Control Panel on the Control Panels submenu on the Apple menu. Note: The Close View Control Panel is not automatically installed with your system; you may have to drag a copy off your system disk, or in more recent version of the system, you may have to access Close View by using the Apple Installer and choosing to custom install CloseView.
2. You can now turn Close View on or off, set the magnification by clicking the up and down **edit arrows** , turn **shortcuts** on or off, and invert the screen image.

See Also

Control Panel; Edit Arrows; Shortcuts; System Folder

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Close View (Keyboard Shortcut)

If you have the **Close View Control Panel** installed, you can use a keyboard shortcut for Close View. Option-⌘-O turns close view on or off turns Close View's magnification on or off. To increase the magnification of Close View, press Option-⌘-H, and then press Option-⌘-Up Arrow. To decrease the magnification, press Option-⌘-Down Arrow. To enable the keyboard shortcuts for Close View, you must turn on the Keyboard Shortcuts feature within the Close View Control Panel.

See Also

Close View; Control Panel; Keyboard Shortcuts

Close Window Command

If you have a window open at the **Desktop** Level, you can Select Close Window (⌘-W) from the **File** menu to close the **active window**. The Close Window command is only available when a window is active. You can also invoke the Close Window command by clicking the **close box** of any active window, which is located in the upper-left corner of the title bar, as shown in the figure. When you close a window, the window directly behind the closed window becomes the active window. If there are no other windows open, no windows are active.

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At the desktop level, if you have multiple windows open and you want to close them all , you can hold down the **Option key**, which changes the Close Window command to the Close All command. By selecting the Close All command, it closes all open windows. This also works if you hold the Option key while clicking the active window's Close box.

To use the Close Window Command, follow these steps:

1. Make active (by clicking it) the window you want to close.
2. Select Close Window (⌘-W) from the File menu or click the Close Box in the upper left hand corner of the title bar.
3. This closes the currently active window.
4. To close all open windows , hold the Option key before you select Close or click the Close box.

See Also

Active Window; Close Box; Desktop; File Menu

CloseFlash

See

Kaidan

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CloseTake

See
Kaidan

CMS (Color Management System)

See
Color Gamut

CMYK

Most desktop color printers use four colors—cyan (light blue), magenta, yellow, and black—in various combinations to reproduce color images. This color definition is taken from the commercial printing industry, in which color images are often reproduced on press using these four colors. Cyan, magenta, yellow, and black are known as the subtractive primary colors.

Color images stored in digital form can be defined in terms of these colors, or in other terms (such as **RGB**, which is used by video monitors). Graphics software (such as Photoshop) can convert images from one color definition to another, but there are colors in each definition that aren't achievable using other definitions.

See Also

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Color Management; Process Color; RGB

Cobweb Site

Colloquial term for a **World Wide Web** site that has not been updated for a substantial length of time and whose contents are obviously out of date. It is considered bad form to let your site become a cobweb site.

See Also

Web Site, Creating

CODE 1 Virus

This virus infects applications and the System file under System 6 and System 7. CODE 1 renames your hard drive to “Trent Saburo” when an infected Mac is started on any October 31. The virus can cause system crashes.

See Also

ANTI Virus; CDEF Virus; CODE 1 Virus; CODE 352 Virus; Frankie Virus; INIT 17 Virus; INIT 1984 Virus; INIT 29 Virus; INIT 9403 Virus; INIT-M Virus; MacMag Virus; MBDF Virus; MDEF Virus; nVIR Virus; Scores Virus; T4 Virus; WDEF Virus; ZUC Virus

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CODE 252 Virus

This virus displays the following message if triggered between June 6 and December 31 of any year:

You have a virus. Ha Ha Ha Ha Ha Ha Ha Now erasing all disks.

However, no files are deleted. Code 252 infects the System, Finder, and applications, and may cause system crashes.

See Also

ANTI Virus; CDEF Virus; CODE 1 Virus; CODE 352 Virus; Frankie Virus; INIT 17 Virus; INIT 1984 Virus; INIT 29 Virus; INIT 9403 Virus; INIT-M Virus; MacMag Virus; MBDF Virus; MDEF Virus; nVIR Virus; Scores Virus; T4 Virus; WDEF Virus; ZUC Virus

Code Browser

See

Browser

Code Names

Apple has a long history of using code names to refer to unreleased products. The purpose of these names varies from project to project. For some projects,

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the code name is a placeholder for a name that marketing hasn't invented yet. In other cases, the code names are used to help keep projects secret. Projects are generally named by the lead engineer or manager responsible for the project.

Some projects have more than one code name. The names may be used for different parts of a project (one for the software, another for the hardware, and so on), or they may be used to deliberately confuse outsiders. In fact, different names are sometimes used when talking to different people so that press leaks can be tracked back to their source.

Past and Present Code Names

Product	Code Name
At Ease	Tiny Toons
Claris Works	Terminator
Apple III	Sara
Macintosh 512K	FatMac
Classic	XO
Color Classic	Slice
IIvx	Brazil
LC	Pinball, Elsie, Prism

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LC II	Foster Farms
Mac Plus	Mr. T
OpenDoc	Amber
Power Macintosh Project	Cognac
Power Mac 6100	PDM (Piltdown Man)
Power Mac 7100	Carl Sagan, BHA, LAW
Power Mac 8100	Cold Fusion
PowerBook 100	Derringer, Rosebud, Classic
PowerBook 140	Tim LC, Tim Lite, Leary, Replacements
PowerBook 170	Tim, RoadWarrior
Duo 210/230	BOB/W (“Best of Both Worlds”)
MultiFinder	Juggler, Oggler, Twitcher
PlainTalk Speech Recognition	Casper
Color QuickDraw	Pollock
QuickTime	Warhol
QuickDraw GX	Serrano
System 7	Blue, Big Bang, Pleiades, M80

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System 7.5	Mozart, Capone
QuickDraw 3D	Escher
“Copland” (System 8)	Copland

It's not unusual for Apple's code names to survive the development process and become the product's real name. “Macintosh” and “Lisa” were both code names before they became the real names of the products to which they refer.

In Apple's early days, many codenames were female names; the names of the children, wives, or girlfriends of the engineers working on the project. A classic example is Lisa, rumored to be named after **Steve Jobs** ' daughter. The names of apple varieties are also frequent candidates for use as code names. Macintosh, Pippen, and Jonathan all fall into this category.

See Also

Jobs, Steve; Lisa

Code Resource

Code Resources are small, self-contained bits of executable code stored in the **resource** fork of a Macintosh file. There are actually two very different kinds of code known as code resources. The first are “CODE”-type resources. Non-native software contains most of its program code in this type of resource. The second kind are snippets of code called by the system or

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another application to perform a specific task.

The Macintosh uses special code resources to draw windows, controls, and menus, and to handle events in these interface elements. These resources are often called *def procs*, short for definition procedures. The MacOS includes the standard procedures for drawing windows, menus, and controls. Programmers can create their own *def procs* to extend or change the default behavior.

Window definitions are stored in resources of type WDEF. To create a new window style, a programmer can create a new WDEF that draws the window in a new or different way. Similarly, menu definitions are stored in MDEF-type resources. An excellent example of each of these can be found in HyperCard's Tools menu and tools palette. The menu uses a custom MDEF to draw the menu as a set of tools; when the Tools menu is "torn off" the menu bar, it forms a floating tools palette that uses a custom WDEF.

Although these definition procedures can be used to great effect, they have two disadvantages compared the standard definitions. First, any windows, menus, or controls that use custom definition procedures do not benefit from any changes or improvements that Apple might make to the standard definitions. Second, they might not work at all under future versions of the operating system.

Definition procedures are not the only kinds of code resources. Any code that extensions or Control Panels execute at startup is stored in code resources of type "INIT." In fact, the main code for Control Panels themselves is stored in

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resources of type “CDEV.” Other applications also make use of code resources. Many **plug-ins** (such as Photoshop plug-ins or **AfterDark** modules), for example, are implemented as code resources.

See Also

Programming; Resource

Codec

See

Compressor

CodeWarrior

CodeWarrior is an **Integrated Development Environment** (IDE) from Metrowerks that includes a full suite of programming tools.

Many analysts have credited CodeWarrior with the smooth transition to the Power Macintosh and the quick availability of native Power Mac applications. When Metrowerks introduced CodeWarrior several months before the introduction of the first Power Macs, it was the only IDE to generate native Power Mac applications. Since then, Metrowerks has continued to update and improve CodeWarrior, and it is now a major force in the Mac development community.

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As an IDE, CodeWarrior includes in one package all of the tools you need to create Macintosh programs (see following figure): a source code **editor**, **compiler s** **linker s**, a **debugger**, a programming **framework**, and an **interface builder**.

CodeWarrior uses a plug-in architecture to support multiple **programming language s** and multiple development targets from the same IDE. It currently supports C/C++, **Pascal**, **Java**, and can target the following platforms:

- 68K Macintosh
- PowerPC Macintosh
- x86 **Win32** (Windows95 and Windows NT)
- PowerPC BeOS for the BeBox
- 68K Magic Cap

Code Warrior's cross-platform support is unique among Macintosh IDEs. The Win32 tools are especially interesting. They enable you to do all of your Mac and Windows development on the Mac and then transfer your finished Windows programs to a PC for debugging. CodeWarrior even includes a remote debugger that enables you to do most of the debugging from the comfort of your own Macintosh.

Along with the compilers included with CodeWarrior, Metrowerks has published the **API** for creating plug-in **compiler s** and **linkers**, so third-party tools are beginning to appear for the CodeWarrior environment.

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Besides the IDE itself, CodeWarrior includes a slew of other helpful tools. **ZoneRanger** is an excellent tool for delving into your application's memory heap. The MPW shell and MPW-hosted version of the Metrowerks compilers and linkers are also included.

Metrowerks' C++ application framework and interface builder, **PowerPlant** and **Constructor**, make producing complete applications relatively pain-free.

Metrowerks produces four versions of CodeWarrior: Gold, Academic, Bronze, and Starter Kit. The Gold and Academic versions include all of the compilers previously mentioned, while the Bronze and Starter Kit versions only generate 68K code. The Academic version is available to full time students and faculty, and all versions, other than the Starter Kit, include two free updates in addition to the initial version. CodeWarrior is available on CD-ROM only (the Gold and Academic versions nearly fill two CDs!).

Metrowerks maintains an excellent Web site (<http://www.metrowerks.com>) with product datasheets, updates, and other information, including an archive of the **comp.sys.mac.programmer.codewarrior** newsgroup.

See Also

API; C; C++; Compiler; Constructor; Debugger; Editor; Framework; Heap; Integrated Development Environment; Interface Builder; Java; Linker; MPW; Pascal; PowerPlant; Win32; ZoneRanger

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Collage

Marketed as a page layout program for images and a companion to **Photoshop**, Collage is designed specifically for putting multiple images together to create a composite image. To that end, it offers layering and a set of tools that are very similar to those found in **page layout applications**.

Images created in Collage can be up to 53 inches square, and they're placed on a **pasteboard** that extends off to the sides for storing elements that don't yet have a definite place in the composition. Other page layout tools include **rulers**, **guides**, grouping and alignment controls, and numerical controls for moving elements.

Images are imported into Collage at screen resolution—72 dots per inch. All edits are displayed on these low-resolution “screen proxies,” so changes take much less time than they would if applied to the full-resolution image. Once a composition is complete, the user “renders” it to a high-resolution disk file.

A disadvantage to using Collage is that the low resolution becomes apparent when a user zooms in on an image. That's a trade-off for the speed gains and the less demanding hardware requirements of Collage.

Multiple layers allow users to treat individual elements of a composition in Collage as objects, moving, resizing, and editing them without affecting the other objects in the file. Drop shadows, feathering, transparency, and haloes can be applied to objects as easily as an italic style can be applied to text in a page layout package, and once created these additions move with the object to

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which they've been applied.

As **filters** are applied to an image, Collage keeps a list of each filter, so the effects of any change can be undone regardless of what's been done to the image since then. Photoshop plug-ins are supported by Collage.

While Collage supports both **CMYK** and **RGB** color definitions, the program can't convert one to the other. **PICT**, **TIFF**, and Photoshop's native format are supported, but the program can't read or write TIFF LZW (a common compression scheme used with TIFF images). If images are saved in Photoshop format, layers can be maintained and manipulated in Photoshop, furthering Collage's ambition to be the Photoshop companion.

As a proxy system, Collage works with representations of your real graphic elements, not with the actual files. Make sure that you save the mask with the graphic.

In **Photoshop**, this is done as follows.

1. After designing your image, use the Magic Wand to mask it out of the background (make sure it is masked and not the background).
2. Save the image with a unique name to a storage folder.
3. Go to the Select menu and choose Save Selection. Save it as a new channel with the same name as the present saved file.
4. Click the graphic off. When Photoshop asks if you want to save the changes first, reply Yes.

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5. Open Collage and import the image that you saved. Import it again so that you can layer one on the other. You should observe that the top layered image has an opaque background. To get rid of the background (the selection channel saved with the image), go to the Element menu in Collage and down to the Mask item. Select Yes and the background will disappear. This is how you layer elements in Collage when you want their backgrounds to drop out.

If you go to Element menu/Mask option, choose Yes, and the image disappears, that means there was no mask saved as a part of the image file. At that point, you have to go back, create a mask for the image, and save it again.

See Also

CMYK; Filters; Guides; Page Layout Applications; Pasteboard ; Photoshop; PICT; RGB; Rulers, TIFF

Collapse Folder (Keyboard Shortcut)

To collapse an expanded **folder**, press ⌘-Option-Left Arrow. This keyboard shortcut works only when a window is displayed in a **list view** . You can also used this keyboard shortcut to collapse a nested **folder** , (a folder within a folder that has been expanded) The folder will collapse leaving any other expanded nested folders still open. This keyboard shortcut is available only when a window is displayed in list view and a folder within that window has

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been expanded.

To collapse a folder in a list view, follow these steps:

1. Click the icon for the expanded folder.
2. Press ⌘-Option-Left Arrow to collapse the folder.

To collapse a nested folder within a list view, follow these steps:

1. Click the **icon** of the nested folder.
2. Press ⌘-Option-Left Arrow to collapse just that folder.

See Also

Click; Copy (Keyboard Shortcut); Folder; Icon; Keyboard Shortcuts; List View; Nested Folder

Colonization

See

Sid Meier's Worlds

ColorBlind

One of a wave of **color management** systems compatible with Apple's **ColorSync 2.0** system software, ColorBlind offers users a way to create

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device profiles for their input and output devices and use the resulting ICC-compatible profiles to adjust their color images for optimum results with their hardware.

The ColorBlind package sells for several thousand dollars as a unit, but its components can be purchased separately. The software that makes up ColorBlind includes ICC Print (the device profiler), ColorBlind Edit (for making sophisticated adjustments to the color in images), and ColorBlind Parachute (a utility that applies device profiles to previously generated color PostScript files). The package also includes an X-Rite DTP51 colorimeter (for **measuring color** output) and a set of reflective and transmissive ANSI IT8 targets (the industry standards) for scanner profiling.

Monitor profiles can be created by using the X-Rite's DTP92 Monitor Optimizer, another device (not included) that attaches to the front of a monitor and reads its color output, or by entering information provided by the monitor's manufacturer. Scanner profiles are created by scanning the supplied targets, then having ColorBlind compare the results with the supplied reference values. Creating printer profiles requires printing a supplied target file, then scanning the printout with the DTP51 colorimeter; ColorBlind compares the colors in the printout with its stored record of the colors in the original file.

See Also

Color Management; ColorSync; Device Profiles; Measuring Color

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Color Control Panel

The Color Control Panel enables you to choose the color that indicates an item is selected and choose the accent color for window title bars. Colors are selected from a pull-down menu. After selecting a color, close the control. Your changes are now in effect, as shown in the figure.

To use the Color Control Panel, follow these steps:

1. Choose the Color Control Panel from the Control Panels submenu on the Apple menu (or System Folder).
2. To set the highlight color, select the color of your choice from the highlight pull-down menu. To select an accent color for your window title bars, select a color from the accent pull-down menu. Close the window to make the changes take effect.

See Also

Apple Menu; Close Box; Control Panels; Title Bar

ColorDrive

Acting as a front end to **ColorSync**, ColorDrive uses ICC profiles from any **color management** system and helps out with color management for photographic images in applications that don't support ColorSync. But its primary purpose is to ensure accurate reproduction of Pantone colors from

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the Pantone Matching System, Pantone Pastel Color System, Pantone Metallics Color System, Pantone Textile Color System, Pantone Plastics Color System, and Pantone Hexachrome (for six-color printing). When outputting Pantone colors, ColorDrive first looks for a Pantone-licensed printer (for which it includes **device profiles**), then passes the image to ColorSync if it can't find a profile.

See Also

Color Management; ColorSync; Device Profiles

Color Gamut

Color gamut describes the range of colors that a device can reproduce or process.

The term *color space* is also used to mean the same thing. Color gamut is an important consideration in printing, especially in desktop publishing. Because each electronic device or printing press may have different color capabilities, color is a difficult element to control. Much of the focus of the printing industry has always been on color reproduction, and the development of digital color has greatly complicated the issue. **Color printing** is more complicated now because of the device-dependency of color. Device-dependency implies that a color will not display or reproduce the same way in different devices.

In 1931 and 1978, the **Commission Internationale de l'Eclairage (CIE)**

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established color standards to aid in the mechanical description of color. These color standards are known as CIEXYZ, CIELAB, and CIELUV. These models define color mathematically and are considered device independent. However, they are purely theoretical and of not much use when color must be displayed on a monitor or printed on a printing press. The CIE color models are useful when mathematical color values must be transferred from system to system.

The ostensible goal of color printing is to reproduce the colors of the natural world, but this really cannot be done. The physical differences between the human perception of color and the capability of a mechanical device to reproduce color are impossible to overcome. Even though the differences cannot be overcome, they can be compensated for by controlling color through the use of color models, **color matching systems**, and color management systems.

Color models, such as RGB, HSB, and CMYK, represent the actual colors that an individual device can reproduce or display.

The reproduction of color can be made more predictable with a color matching system, such as PANTONE, TRUMATCH, or FOCOLTONE. The color space of any device can be described and controlled with a color management system (CMS), such as EFIcolor, ColorSync, or Kodak Precision. The color management systems are a relatively recent development in the effort to control and predict digital color. An organization of hardware and software companies, the International Color Consortium (ICC), has set standards for

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developing color profiles for electronic devices.

The essential difficulty in printing color is to satisfy human perceptual needs. The emotional context of color plays a role in this, and it is extremely difficult to satisfy everyone all the time. Because color is variable, elusive, and symbolic, much effort is made in the graphic arts to qualify it. Graphic designers and artists attempt to specify appropriate colors by considering their psychological effects or aesthetic value. The full effect of color in nature cannot be reproduced on a computer or printed on a page, but we make quality judgments nonetheless. “That sky is too blue.” or “Can we cut back on the pink in the skin tones?” are phrases that might be overheard in connection with any color display or printing job.

The most important consideration in working with color gamuts, therefore, is to understand and be prepared for the inevitable differences in the way colors will look from one device to another. One of the most dramatic color shifts occurs when an image is converted from the RGB (Red, Green, Blue) color gamut of a monitor display to the CMYK (Cyan, Magenta, Yellow, Black) color gamut of the printed page. The CMYK **process color** model simply cannot reproduce all the colors that are possible in the RGB model.

See Also

CIE; CIELAB; Color Printing; Color Separations; Desktop Publishing Color Models; High-Fidelity Color; Image Manipulation for Printing; Process Color

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Color Halftoning

See

PostScript Level 2

Color Icons

You add color to an **icon** by using the **Labels menu** at the **desktop**. For example, to give a **folder** color, you **select the** folder and choose a color from the Labels menu. If the color you want doesn't appear in the Labels menu, you can create a custom label color using the **Labels Control Panel**.

See Also

Click; Control Panel; Desktop; Folder; Icon; Labels; Labels Menu

Color Inkjet Printing

See

Printing_Technology, Color

Colorimeter

See

Measuring Color

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ColorIt!

ColorIt!, from MicroFrontier, is extensive in its image creation and editing potential, and has a wealth of tools to do the tasks. It is the most competitive image editing and photo retouching competitor that Photoshop has on the Mac. There are some areas in which it is lacking, however, when we use Photoshop as the comparative model. It does contain vector drawing tools, more specifically a bezier pen, but that tool has little variability compared to the bezier operations found in Photoshop's Path routines. It also is more limited when it comes to load/save formats, and does not work as well with super large images. For 99% of the tasks expected of it however, it is a superlative image editing program. Some of its features far exceed those found in Photoshop. It also features multiple Undos, a capacity not found in Photoshop.

The ToolBox

ColorIt! takes a very different approach to the ToolBox from any other software. Its tools are contained in a four part group that is separated into Default, Painting, Retouching and Selection alternatives. To make matters more interesting, you can create your own set of tools at any time and save them as a custom tool set in the list of selections. Photoshop allows no customization of the ToolBox. In ColorIt!, many of the tools can be customized according to the shape and size of the drawing medium, with an interactive pop-out series of choices. A constant list of eight available tools exists in a side menu, and can be dragged and dropped in place on your toolset,

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exchanging places with the tool that's already there. ColorIt!'s painting options and tools make it a better choice for pure electronic painting than Photoshop, though its lack of stability for large images may be a limiting factor.

Selection Menu and Tools

ColorIt! has far more selection options than Photoshop, and each is customizable from a pop-out list of interactive choices. For one, there are eleven shape choices, and an additional "custom" choice that allows you to insert your own shape. Add to this a unique lasso option that can be set to draw a freeform shape as normal, or only around either dark or light colors. This gives the user a wealth of options when drawing or surrounding a selected area. The selection menu contains all of the standard choices, with two additional features worth mentioning: Extrudes and Shadows. Each allows you to add depth to the selection, using the foreground color as the shadow or extrusion. An extrusion can either be filled with the set color, or it can be created as a path, ready for texture fills or customized painting (shading, airbrushing, and so on).

Layers

ColorIt! does not support layers, and has no Layering menus. You cannot drag a selection from one page to another, although you can copy and paste it. Once positioned, it's easy to make the new selection transparent to any degree necessary, thereby fostering the creation of collages and composites.

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Native Effects Filters

Except for a few standard filters, ColorIt! depends mostly on plug-ins for its effects operations. Photoshop, as a comparison, has a number of its own built-in filters. The exception is the Convolution Filter, which applies a convolution matrix to the selected graphic either from a list of over thirty members or as a customizable choice. The convolution matrix has an updated preview screen so that you can explore creating your own convolutions and watch them being applied in real time. ColorIt! accepts most of the Photoshop compatible filters.

Work Modes

ColorIt! can work with RGB, Grayscale (16 and 256), Black & White, CMYK, HSV and HSL images. You can also target the R, G, and B color channels separately.

Other Considerations

One of the nicest features of ColorIt! is its ability to allow you to paint with textures. Textures are selectable from several included libraries, and are available at the MicroFrontier site on-line for free every once in a while. The feathering and opacity of texture brushes can be adjusted, inviting very exploratory use of the medium. Any selected image area can be grabbed from the screen and saved as a new texture in the selected library. This feature emphasizes ColorIt!'s use as a professional digital painting tool. ColorIt! is not a PowerMac native application.

File Save/Load Conventions

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ColorIt! can load TIFF, Mac PICT, PostScript, Paint, GIF, Photoshop 2 and 2.5, Startup Screen, Photone Prepress, and Scitex CT. It can save out all of the above (with the exception of Scitex CT) and in addition, Quicktime PICTs.

See Also

Paint Applications, Other

Colorize 2

Colorize, from DS Design, adds color to black and white line art. This is not a simple task. The line art is often adversely effected by skips in color and other glaring results that make the art useless. Comic book artists and technical illustrators, for example, are often faced with this challenge. Colorize only accepts black and white 1-bit TIFF images. Images that do not fit this format must be converted before they can be imported into Colorize. Color trapping, having colors fill in to the edge of another color, is emphasized in Colorize. Colorize 2 is an extremely intelligent paint system.

The ToolBox

Colorize is different than either a bitmap painting program or a vector drawing program,so its ToolBox contains tool options unique to its tasks. A brief description of the tools includes:

1. Paint and Paint To Edge—Paint To Edge is unique in that you cannot paint in any area that is not bounded by the lines that encircle the area in which you

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begin painting. Holding down the ⌘ key resizes the brush.

2. The Erase Tool, Erase Edge, and Erase Fragment—The Erase Tool erases only the color selected, without touching other colors. Erase to Edge erases the current color to the encircling hard edge, and Erase Fragment erases only what is under the present brush size, one step at a time.

3. Transfer/Transfer Fragment—The Transfer Tools exchange a selected color with another from the Shades dialog.

4. Line Tool—Draws a line in the current color.

5. Crop Tool—Standard tool for cropping image area. Unlike some paint programs, cropping *cannot* be undone in Colorize.

6. Outline Tool—Draws an outline around the selected area.

7. Despeckle—Used to clean up stray pixels from the image.

8. The Blend Tool—This tool paints blends and gradients of one or two colors in a selected area. It works only on a CMYK layer. A CMYK Layer is always at the bottom of the Shades stack.

9. Airbrush—Three variants are possible: smooth, pixelated, and a blend of the two. The airbrush also is consigned to the CMYK layer.

Selection Menu and Tools

Selections are constrained automatically within the boundaries of the

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outlines contained in the image.

Layers

Colorize treats separate colors as separate Layers. Where layers overlap, the colors blend. Color palettes are organized by choosing colors from a swatch list and dragging them to a shades list, and dropping them on a new color item. This process creates the desired palette. The color Layer at the top of the Shades palette paints over colors below it, but not above it.

Native Effects Filters

The Blend and Gradient operations can be considered as effects filters in Colorize2.

Work Modes

Colorize works in RGB and CMYK.

Other Considerations

There is no other software on the market like this. You might find Ray Dream's JAG II software to be a perfect companion to this package as a post production tool.

File Save/Load Conventions

Colorize accepts only 1-bit black and white TIFF files as input, but can output either TIFF (LZW compression included) or EPS formats. Flat color images saved to EPS can have automatic masking, with no need for creating clipping

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paths.

Color Laser Printing

See

Printing Technology, Color

Color Management

Anyone who's ever scanned a color photo, viewed the scan on a computer monitor, and then printed it on a color printer could explain why color management software is needed. Although it's still in an adolescent stage, color management software provides a way to make sure that those three color images (the one that's scanned, the one that's viewed onscreen, and the one that's printed) look the same.

In this scenario, it would be nice to know what you're going to get when the paper comes out of the printer. But in professional printing, where the final product is produced by a printing press that costs hundreds of dollars per hour to operate, it's not just nice, it's vital—mistakes in this field are *really* expensive.

The root of the problem lies in the fact that input, output, and display devices don't use the same methods of defining color. Monitors and some scanners use **RGB** color (with red, green, and blue combining to form a range of

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available colors), while printers and other scanners use **CMYK** color (cyan, magenta, yellow, and black are combined to form colors). Commercial color printing uses CMYK, as well.

But the range of colors that can be created using red, green, and blue light, as on a computer monitor, isn't the same as the range of colors that can be created using cyan, magenta, yellow, and black inks. And images that start out in one color definition (or color space)—say, in RGB on a user's monitor—often need to be converted to another color space to be used—in this case, to CMYK to be printed. The end result? The colors don't match.

Software and hardware developers have chosen to tackle this problem in a number of ways, but only lately has there been any sign of consensus.

Closed-loop color management systems only work with a specific hardware/software configuration. For example, Hewlett-Packard has produced ColorSmart software that improves color reproduction in documents printed on its own color inkjet and laser printers, and QMS offers a similar product called QColor for its color laser printers.

Some graphics applications, such as **Photoshop**, have primitive but effective color-matching systems that consist of a reference image packaged with the software in both printed and digital form. The user compares the printed image with the digital image onscreen and adjusts the monitor until the two match. A scanner can be put into the loop as well.

Dedicated software to handle color management isn't perfect, by a long shot,

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but it's much improved from its early days. A big leap forward came in 1995, with the introduction of Apple's **ColorSync** 2.0, system-level software that allows the use and creation of "device profiles." These descriptions of individual input and output devices document the particular color changes that the devices will make to images in the printing, scanning, and viewing processes and allow graphics applications to compensate for those changes.

The result, assuming the profiles are used properly and supported by all software used in the design process, will be printouts that match what's on the monitor and scans that match their originals.

But developers disagree on the best way to create and implement profiles. Some color management systems come with a library of profiles supplied by hardware manufacturers for use with their printers, scanners, and monitors. Others, claiming that this information won't be valid over the lifetime of a device, promote the use of spectrophotometers and colorimeters (**color measuring** devices) to create profiles customized to individual devices.

Another problem encountered with color management is how to define color in a neutral way that can be converted into measurements in any color space, including RGB, CMYK, HSB (hue, saturation, and brightness). The standard used by most color management software today is the CIE color space, which was developed in the 1930s by the Commission Internationale de l'Eclairage (International Commission on Illumination). CIE color definitions cover the entire visible spectrum and so can be used to define any color achievable in other color spaces.

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Software to help control color has been around for a few years, but it's still in flux; as recently as early 1995 there were several competing systems with incompatible device profiles (**FotoTune** , **EfiColor** , **Kodak Precision Color Management System** , **Pantone ColorDrive**). But the release of ColorSync 2.0 spurred many software developers to base their color management systems on this new system software from Apple—and the newly revised systems can read each other's profiles, because they all use the ICC (International Color Consortium) standard for device profiles.

Profiling software that supports ColorSync 2.0 includes Linotype's **PrintOpen** , Candela's **ColorSynergy** , and Color Solutions' **ColorBlind** .

With today's technology, there are several ways to control color matching on the desktop, ranging from system-level software that users can completely ignore all the way up to dedicated application suites that allow sophisticated manipulation of color as well as adjustments to compensate for the limitations of different devices. With the advent of new printing technologies such as Pantone's Hexachrome (a six-color printing process), color management can only get more complex.

See Also

CMYK; ColorBlind; ColorSync; ColorSynergy; Desktop Publishing and Color Management Systems (CMS); EfiColor; FotoTune; Kodak CMS; Measuring Color; ColorDrive; Photoshop; PrintOpen; RGB

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Color Matching Systems

Color matching systems are used to standardize ink colors and aid in the specification of color for printing presses. Desktop publishing software applications provide access to several matching systems in their color dialog boxes, but the most widely used is the **PANTONE Matching System**. Commercial printers obtain licenses to use a particular matching system. To use a color matching system properly, a color swatch book for that system should be obtained. Other color matching systems are: DIC (DaiNippon), FOCOLTONE, MUNSELL, TOYO, and TRUMATCH.

DIC is used for spot colors and organizes color into categories such as bright and dark. FOCOLTONE displays colors by how they share a common percentage of each of the process colors. The MUNSELL color system organizes colors by hue, value, and chroma. TOYO is a system of spot colors organized by hue and saturation. The TRUMATCH system displays process colors by hue, tint, and brightness.

See Also

Color Management; Color Printing; Desktop Publishing Color Models; FocolTone; Pantone; Process Color; Toyo; TruMatch

Color, Measuring

To get accurate color results, desktop publishers need to calibrate scanners,

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printers, monitors, and other devices, measuring the colors these devices are generating in order to make them match. The most commonly used instruments for measuring color are spectrophotometers, colorimeters, and densitometers. These three instruments measure light to determine the color of objects or images.

Spectrophotometers measure wavelengths of light at various points along the visible spectrum to generate a curve that represents a color.

Colorimeters measure light in the same way that the human eye does, using red, green, and blue receptors. Each color component is assigned a number representing its intensity; the combination of three values are called tristimulus values.

Densitometers are similar to colorimeters, but they're designed for measuring specific materials such as printing inks. They can measure the strength of a color, but they can't accurately measure its hue.

Color measurement devices for the Mac have recently become both affordable and reasonably accurate. They include X-Rite's Digital Swatchbook, Light Source's Colortron II, and Color Savvy's ColorMouse.

See Also

Color Management

Color Model

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See
Color Gamut, Color Matching Systems, Desktop Publishing Color Models

Colormouse

See
Measuring Color

Color Output, Buying

Although color **printers** are coming down in price faster than almost any other type of hardware in the Mac world, service bureaus and many quick print shops still make good money offering their customers color copies and color printing of supplied files. There are a couple reasons for this.

First, it's expensive and time-consuming to print more than a few color pages at a time, so if you need quite a few copies of a color document, it may be worth it to have the output done at a service bureau. Second, most people can afford only color inkjet printers, or, at best, color laser printers, and these don't offer the most accurate color. Other technologies, like dye sublimation and wax transfer, are better suited for use when accurate color proofing is a concern.

When buying color output, check to make sure the vendor uses a **color management** system and that color output devices are serviced and

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calibrated regularly. Calibration needs to be done daily to make sure color is accurate. When buying color copies, make sure vendors check each copy against the original to ensure that colors have translated accurately.

See Also

Color Management; Printers

Color Printing

If your documents contain color, you can **print** in full color using a color printer. There are different levels of color printers in every style and price range. The most popular are the inexpensive color inkjet printers that use Apple's **QuickDraw** technology. Color inkjet printers have become very affordable, and companies such as Hewlett-Packard even have black-and-white inkjet printers that can be converted to color printers by adding colored ink cartridges. Most color inkjet printers use either three or four color ink cartridges, and the quality of color inkjet printers ranges from acceptable to outstanding. Some color inkjet printers are capable of producing photographic-style quality on specially designed, coated paper. The drawback of producing this photographic quality on an inkjet printer is the printing time, which can be as long as 45 minutes for a standard 8 1/2-inch by 11-inch color page.

Among your printing options are third-party software packages that add **PostScript** compatibility to QuickDraw color inkjet printers. On the high-

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end, there are color **Laser Printers** , including one from Apple, and dye sublimation or thermal wax printers, which produce PostScript photographic-quality images quickly, which are popular with graphic designers for proofing their color work. PostScript dye sublimation and thermal wax printers are becoming more affordable as more and more printer companies enter this expanding market.

At one time, color printing could be achieved only on a traditional printing press, but now much color printing is done on digital presses. Therefore, a discussion of color printing in general must encompass both technologies. Color printing falls into two categories: **spot color** and **process color**.

- **Spot Color Printing.** In spot color printing, images appear as separate solid areas or tint screens of a single color usually specified from the PANTONE Matching System (PMS). One, two, or three spot colors are the norm in most commercial printing jobs. Spot color printing is very common in traditional printing operations, and it is often used in business stationery and low-budget printing. Digital printing devices cannot use PANTONE colors, but some copiers can apply a limited range of spot colors.
- **Process Color Printing.** Process color printing accounts for the majority of both traditional and digital printing. In process color printing, four colors (cyan, magenta, yellow, and black) are laid down by the printing device in various tint screen combinations to achieve the effect of “full” color. For this reason, process color is always used

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to reproduce color photographs; but, in fact, the range of colors reproduced in this way falls far short of the full spectrum of colors produced by visible light. Process color printing is also known as “four-color printing” and “full-color printing.” The four colors are often referred to as CMYK.

In both spot color and process color, the colors themselves must be printed one at a time. On traditional printing presses in general, ink is applied to paper or other material from a printing plate. A separate plate is required for each color. If the press is capable of handling only one plate at a time, multicolor printing is impractical though not impossible.

In the early days of printing, additional colors were added by passing the sheet through the press more than once. Modern large presses may incorporate two, four, six, or eight color units and are able to print all the colors on both sides of the sheet in a single pass. Sometimes process colors and spot colors are used in the same printing job. This requires a six or eight color press. Varnishes may also be added instead of color. A special form of process color printing, high-fidelity printing, utilizes more than four colors with special inks and papers to achieve premium results. Even digital printing devices must apply the four process colors one at a time, and in most cases, the sheet of paper can be observed moving back and forth or up and down through the printer as each of the four colors is applied.

See Also

Color Gamut; Color Separations; High-Fidelity Color; Printing; Printing

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Methods, Digital; Printing Methods, Traditional; Printing Presses, Offset;
Process Color; Spot Color

Color Printers

See
Desktop Printers

Color Resolution

Color Resolution, or bit depth, refers to the amount of color information contained in a single pixel of a digital image. All modern computers use the binary system where data is processed as either a 1 (one) or a 0 (zero). Therefore, in this binary system, the most basic color choices for a pixel are black or white (1 or 0, yes or no, on or off). This black or white pixel has a color resolution, or bit depth, of one bit (2^1). In a color computer system, the color resolution of pixels increases exponentially. In a two-bit system, each pixel may have four potential colors (2^2). In a three-bit system, each pixel may have eight potential colors (2^3) and so on. In Macintosh **desktop publishing** systems, 24-bit color is common and results in 16.7 million color choices. The following figure charts this exponential increase. The total number of possible colors increases exponentially as the number of bits in a color system increases.

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See Also

Digital Halftones; Image Scanning

Color Separations

Color separations are necessary in **spot color** and **process color** printing on traditional printing presses because each color must be printed from a separate printing plate. In the traditional mechanical method, spot color separations are made either by photographing physically separated elements of a paste-up with overlays or by photographing the same paste-up once for each color and then blocking out irrelevant areas on each piece of film. The separate pieces of film are then used to make the printing plates.

This method is also used to produce **process color separations**, but in this case, a full-color image is photographed four times through special filters. Each filter allows only a specific color to be recorded on the film as a tint screen of cyan, magenta, yellow, or black. These procedures have been almost entirely supplanted by digital methods in the United States and many other countries.

In digital color separating, spot colors are easily output to different pieces of film from a page layout software application such as **QuarkXPress** or **Adobe PageMaker**. It is even possible to output directly to separate printing plates. Process color separations are similarly easy to create with a page layout software application or an image manipulation program such as **Adobe**

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Photoshop. Digital technology has greatly simplified the color separation process.

Most graphics applications enable you to create spot color and process color separations for use in offset printing. You can have these separations output for you by a service bureau or print shop that offers digital imaging.

Most graphics programs give you the option of printing the name of the each spot color on the bottom of each page (or plate), so the red "plate" has the word "Red" in the bottom corner. This lets the print shop know to apply red ink when that plate runs through the press. It's a good practice to print a test spot color separation on your own laser printer to make sure the items you want in a particular color come out on the right plate. Ask your print shop what kind of artwork (film or paper) you need to supply for them to properly print your job. They may need high-resolution film negatives or RC paper output from an imagesetter, or they may be able to use regular paper from your laser printer. Always check with your printer before you output your final artwork.

Process color is used for reproducing color photographs. It uses a PostScript imagesetter to separate your color photo into four separate film negatives, each representing a color (which is why it's often referred to as four-color printing). These four process colors are: Cyan, magenta, yellow, and black (CMYK). When you ask for a process color separation from a digital file, you get four film negatives back, with one representing the cyan plate, one the magenta plate, one the yellow plate, and one the black plate. Modern color

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printing presses use these four colors to recreate full color photographs.

When printing film negatives, you should also get a color key or Matchprint type proof (which is a color proof made from your new negatives) to see whether the file separated correctly, and to help the printer match the colors displayed in the proof to ink on the press. It's an amazing technology, but requires significant knowledge, equipment, and experience to make it work properly.

If you're thinking about creating your own color separations from a graphics application, ask your service bureau, print shop, or other pre-press professional for guidance.

See Also

Color Printing; Graphic Design; Prepress; Printing Methods, Digital; Printing Methods, Traditional; Process Color; Spot Color

Color Shop

See

Service Bureaus, Trade Shops, Desktop Publishing

Colormart

See

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Color Management

Color Space

See

Color Gamut

Color Standards, *See* Color Gamut, Desktop Publishing Color Standards

ColorSync

Developed jointly by Apple and Linotype-Hell, a major player in the prepress industry for decades, ColorSync 2.0 is a big improvement over the original version of this **color management** technology.

Designed to compensate for the differences between the color technologies and media used by input devices (digital cameras, scanners), video monitors, and output devices (printers, printing presses), ColorSync allows the creation of “device profiles” that tell the hardware how an image should be modified when it’s scanned, viewed, or printed to make sure colors always appear the same.

The original version of ColorSync, which came out with System 7.5, required profile information to be stored in separate files that had to accompany graphics files. Because of this limitation, the software was not supported by

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most software developers in the publishing industry. ColorSync 2.0, on the other hand, allows profiles to be stored within an image file so that the color management process is more transparent to the user. The ColorSync control panel shown here allows users to specify device profiles for their systems.

The profiles created using ColorSync are compatible with the International Color Consortium (ICC) profile specification, which is an industry standard for device profiles that are compatible across multiple platforms. Another improvement over profiles created using ColorSync 1.0 is greater detail in device profiles, leading to better color-matching results.

ColorSync 2.0 also supports devices that use more than four colors to produce an image, like **Pantone's** Hexachrome color printing process, which uses six colors. And it runs native on Power Macs, working (Apple says) more than five times as fast as ColorSync 1.0.

Because it's system-level software, ColorSync needs to be supported by other software to work. **Add-on software** (such as **Photoshop** plug-ins and **QuarkXTensions**) can be used to activate the features of ColorSync from within major applications; software vendors are also selling separate programs that create corrected color palettes that can be imported into graphics applications.

With its improved capabilities, ColorSync has been adopted by the major graphics software developers as a standard—which means users can stop guessing which color management system to use and start looking for better results.

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See Also

Add-On Software; Color Management; Pantone; Photoshop; Plug-Ins; QuarkXPress; XTensions

ColorSync Extension

ColorSync, added as a separate extension in **System 7.1** , adds color-matching technology to your system to help you match the color you see on your **monitor** to a variety of color output devices (such as color **printers**) to help your color work be more consistent. ColorSync is part of **System 7.5** and is installed when you choose to install **QuickDraw GX** .

There's a **pop-down menu** in the ColorSync extension that enables you to select a profile of your current monitor. For example, if you're using an Apple 17-inch color monitor, you would choose the Apple 17-inch RGB Monitor profile from the pop-up menu. By choosing a monitor profile, you're telling ColorSync the characteristics of your particular monitor so it can help match the color your monitor display to the profile of your output device. Apple creates ColorSync profiles for its monitors, color printers, and scanners.

After you've selected a profile for your monitor, you must select a profile for your output device. These profiles are supplied by the peripheral manufacturers themselves, but, unfortunately, not all peripheral devices have a ColorSync profile—check with your peripheral manufacturer to see

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whether your printer or peripheral has a ColorSync profile available. You can also create your own custom profiles by using the Set System Profile command from the pop-up menu in the ColorSync dialog box.

When ColorSync has both of the these profiles, it adjusts your monitor's color to accurately show how on-screen objects appear when printed.

See Also

Monitor; Pop-Up Menu; PostScript Level 2; Printer; QuickDraw GX; System 7.1; System 7.5

ColorSync System Profile

The ColorSync **technology** was introduced in System 7.1 as a separate extension to help Macintosh users better calibrate their monitors to their output devices, so the color they see on their screen more closely matches the color that appears on the printed page. ColorSync is now part of System 7.5 as part of the QuickDraw GX installation.

Accessing the ColorSync Control Panel enables you to tell the computer what kind of monitor or input device you are using by selecting it from a **pull-down menu**. If you're not using an Apple-brand monitor or input device, and your output device does not appear on the list, ask the manufacturer for an Apple ColorSync profile for your device. A number of manufacturers are now including these Color Sync profile files with their peripherals, including scanners and color printers.

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To set a ColorSync profile for your device, follow these steps:

1. Choose the ColorSync Control Panel from the Control Panels submenu on the Apple Menu (or in the System Folder).
2. Choose the pull-down menu and select the model of monitor or other color input device from the list.

See Also

Extensions; Pull-Down Menu

ColorSynergy

Adopting Apple's **ColorSync** software as their native format, software developers are releasing **color management** software that finally promises to be effective. ColorSynergy is a package that enables users to create and use ICC-compliant **device profiles** to ensure accurate color from scanner to monitor to printer.

ColorSynergy supports a wide range of instruments for **measuring color** output of printers and video monitors, including the popular ColorTron II. The software comes with a reflective IT8 target image to scan for calibration, and users can order transmissive (transparency) targets.

Those who don't have a device that measures monitor output can "eyeball" a monitor profile by matching a series of gray swatches and manually entering white-point and phosphor values (information obtained from the

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monitor's manufacturer).

To create profiles for printers, users print a supplied file containing 504 color swatches. Then they either use a calibrated scanner to scan the image back in, or read the colors on the output with a spectrophotometer. The software compares the colors in the printed file with the original color values.

See Also

Color Management; ColorSync; Device Profiles; Measuring Color

Color Trapping

Color trapping is the process of compensating for the slight misregistration of abutting colors that sometimes occurs on a printing press. Misregistration does not always happen, but the potential causes of it are many. The type of press, the number of years it has been in service, the speed at which it runs, the skill of the operator, paper characteristics, and other factors can affect registration. In perfect registration, the press is able to place an image in exactly the same spot on the paper on every copy made. If abutting color images misregister, a sliver of the paper color may show. This is generally considered undesirable, and if even a slight chance for misregistration is present, most commercial printers will want to trap. The following figure shows an illustration of misregistered colors.

Trapping is not necessary when colors overprint one another. Usually,

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however, only black is overprinted. **Overprinting** black actually enhances its blackness. Ink colors are transparent and overprinting any color other than black results in a third color being created by the combination of the two colors. Conceivably, this can be a way to make a two-color printing job appear to have three colors, but most people would rather keep the colors pure.

To keep the colors pure, a **knockout** is required. In a knockout, the background color is dropped or “knocked out” in an area exactly corresponding to the size and shape of the foreground image. See the following figure. Therefore, if the foreground image does not exactly fit the knocked out area due to misregistration, trapping is necessary to cover the sliver of paper color that results.

The goal of trapping is to make the two images overlap very slightly at their edges. If this is done properly, the trap (the area of overlap) is not noticeable. Too much trap can create a dark line around the edges of the foreground image.

Two methods are used to create traps: choking and spreading.

- In *choking*, the knockout is made smaller.
- In *spreading*, the foreground object is made larger.

The amount of choking and spreading is very slight—0.25 points (0.003 inch) more or less, depending on the type of paper and other factors. This is known as the trapping value. Whether to choke or spread depends on the color

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content of the images in question, and no trapping may be necessary if the two images contain at least 20 percent of the same color.

Trapping is a complex issue and not one to be taken lightly. The two popular page layout software applications, **Adobe PageMaker** and **QuarkXPress**, both make provisions for automatic and manual trapping of objects created in the program. Neither can trap imported graphics. The issue of trapping should be discussed with a **service bureau, trade shop**, or commercial printing firm before making any final decisions. Two dedicated trapping programs, Adobe TrapWise and Island Trapper, are often used at service bureaus and trade shops to perform automatic, and complete, trapping procedures.

See Also

Adobe PageMaker; Prepress; QuarkXPress

Colortron II

See

Measuring Color

Column in Databases

A vertical stack of **cells** in a **spreadsheet**. All Macintosh spreadsheets designate columns alphabetically, starting at the left margin. If there are

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more than 26 columns, double or triple letters may be used. The first column is typically used for text to describe the data in each **row**.

See Also

Absolute/Relative Referencing; Circular Reference; Spreadsheet Notation

Comma-Delimited Text

See

Tab-Delimited Text

Command Key

This is a **modifier key** unique to the Macintosh that is used in combination with other keys to add additional functionality to the keyboard. The Command key has two symbols on the key: the Apple logo ([a])(which is why it's sometimes called the "Apple" key) and the unique Command key symbol (⌘). The Command key is used with other keys to create keyboard shortcuts for menu **commands** and **mouse** actions.

Command Key Actions

If you want to do this...

Quit an application

Use this key command...

⌘-Q

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Find a file	⌘-F
Copy an item	⌘-C
Paste an item	⌘-V
Create new folder or document	⌘-N
Eject a disk	⌘-E
Get Info on a file	⌘-I
Undo the last action	⌘-Z
Cut an item	⌘-X
Undo the last action	⌘-Z
Print a document	⌘-P
Cancel an action	⌘-. (period)
Open an item	⌘-O
Duplicate a file	⌘-D
Save a document	⌘-S

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Close a window/document	⌘-W
Make an Alias	⌘-M
Select all items in a window	⌘-A
Put an item away/Eject a disk	⌘-Y

See Also

Commands; Menu Bar; Modifier Keys; Mouse

Comments, in Get Info Box

You can attach a written comment to any file by entering your comments in the file's **Comments box**, located in the file's **Get Info** window. This area is for your convenience and enables you to attach a personal message or note to a particular document. These comments will not appear in your document; they will appear only in the Comments box. To access a document's Get Info window, **click** the document's icon and select Get Info (Command-I) from the File menu. The Comment box appears at the bottom of the Get Info window, enabling you to type any message in that window. Comments that you enter in the Comments box are searchable by using the **Find File** command.

See Also

Click; Comments Box; Find File; Get Info

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Commercial Online Services

Commercial Online Services are companies that provide their own fee-based online connection services, such as **email**, computer and non-computer related discussions, file libraries, and databases of information.

You can access some of the commercial services over the **Internet** instead of over a **modem**, but this still requires you to have a connection to the Internet, whether through your employer or through an account with an Internet Service provider.

Commercial services offer two main advantages over finding a “real” Internet connection:

1. Commercial services have deals with international commercial network carriers such as SprintNet and Tymnet, so finding a local phone number is usually easier. You pay for that easier access, usually with the connect-time fee for the commercial service.
2. Commercial services find it easier to offer commercial-quality information because they can charge users to access that information and then pay the information provider. Hence, you find, for example, full-text databases of computer magazines on **CompuServe**, but you pay extra for any searches in those databases, with the revenue going to the magazine publishers.

Many commercial services have added Internet email gateways and some

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even offer full access to the Internet. CompuServe's WOW! service provides email accounts and unlimited Internet access for \$17.95 per month, whereas **America Online** offers its own **Web browser** software. **Delphi** supports text-only access to the Internet, including email, gopher, FTP, and text of Web pages, but no graphics.

See Also

America Online; AppleLink; Bix; CompuServe; Delphi; Internet; Prodigy; Web Browser; World Wide Web

Common Gateway Interface

See

CGI

Common Hardware Reference Platform (CHRP)

See

PowerPC Platform

Communications on the Internet

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The **Internet** has no central “home” location. The various **Internet services** are complex and varied, and users can choose from a growing and quickly-changing range of connection methods.

Nevertheless, the Internet does have a central “backbone,” a high-speed (45Mbps) network that connects the 10 computer centers in the U.S. that comprise the National Science Foundation Network.

The basic infrastructure of Internetworking and communications is common to all users, and a number of fundamental terms and definitions can be applied to virtually all parts of the Internet.

The various parts of the Internet are connected by gateways. These gateways allow Internet users to communicate with users in **CompuServe**, for instance, or for an **America Online** user to access a **Usenet** newsgroup.

Internet, Connecting to A Macintosh user who wants to connect to the Internet for the first time has a number of options.

Email access to the Internet is supplied by:

1. Commercial online services.
2. Bulletin board services.
3. A Local Area Network-based email package with a gateway to the Internet.

All commercial online services provide email with Internet users through

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gateways. A number of services also provide other Internet services, such as access to Usenet, **FTP** sites, and the **World Wide Web**.

A growing number of bulletin board services (BBSs) now provide access to the Internet, especially the large nationwide BBBs such as FidoNet or MCIMail. Some local BBSs can also provide Internet connections and can be located from your local computer dealer.

Businesses that use email software such as **QuickMail** sometimes set up Internet gateways for their employees.

Shell access is a common method of Internet connection, on a public access machine, usually running a form of the UNIX operating system. Some local universities or colleges provide limited access to their machines.

UUCP access provides email and newsgroup access. UUCP stands for UNIX-to-UNIX CoPy, a protocol that copies files corresponding to email messages and news postings from a UUCP host to your machine on a periodic basis. UNIX machines in Computer Science or Engineering departments often support it.

MacTCP access is the richest and most varied way of connecting to the Internet. Apple's **MacTCP** enables a Macintosh to communicate with the Internet. A Mac with MacTCP can run a wide variety of software such as **Eudora** for email, **Anarchie** for FTP, **NCSA Telnet**, **NewsWatcher** for news, and **MacWeb** or **Mosaic** for the World Wide Web.

MacTCP connections are available from:

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1. **Internet services providers** , regional: These are large national companies that provide Internet access, such as PSI (800-827-7482), Netcom (800-501-8649), or Internet Express (800-592-1240).
 2. Internet service providers, local: A large number of regional or local service providers can be found around the country. Local service providers often provide services only within their own area code, and sometimes target their offerings to the needs of their community.
 3. University, government, and business-based direct connections: Students and staff at universities and employees in government offices often have Macs connected to a local network which, in turn, can be connected with MacTCP to a direct Internet connection. This is typically a very fast T1 or T3 line.

A good way to get started with an Internet connection is to purchase *Internet Starter Kit for Macintosh, Third Edition* (Hayden, 1995), which includes MacTCP and other essential software for connecting to the Internet, downloading files, and general navigation.

Internet, Connection Speeds Users have a number of ways to connect to the Internet. These can be divided into two basic types:

- A dial-up **modem** connection
- A direct connection.

The types of connections vary in **bandwidth** , the amount of information a

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user's network line can accommodate at any given time. The higher the bandwidth, the faster the user will send and receive information.

Modems make use of **asynchronous transmissions**; they vary in the **modem File Transfer Protocol** they use and in their speed, as expressed in **baud/bits per second (bps)**.

Internet Connections

<i>Connection</i>	<i>Speed</i>
Modem	Up to 28.8Kbps (depends on user's modem speed)
56Kbps	56Kbps
ISDN	64 or 128Kbps
T1	128Kbps and higher
T3	Up to 1.544 Mbps
Frame Relay	56Kbps to 1.544Mbps
ATM	100Mbps and higher

Communications on the Internet make use of **host** and **client** computers. Host computers, also called **servers**, hold information and sometimes distribute or route it to individual users. Even email communications between two individuals make use of a mail server using the **SMTP** and **POP3**

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protocols. **Client** computers connect to hosts to view or download files, whether those files exist on a news server, a World Wide Web server, or an **FTP Mac software archive**.

Internet addressing is an essential way of locating information and finding individuals online. All computers on the Internet make use of **IP address** es. Documents, objects, and computers can be found using Uniform Resource Locator (**URL**) addresses. Host computers connected to the Net are assigned **domain names** using the domain name system (**DNS**).

See Also

America Online; Anarchie; Applelink; Asynchronous Transmissions; Bandwidth; BIX; Bulletin Board Services; Client; Commercial Online Services; CompuServe; Data Communications Standards; Delphi; DNS; Domain Name; Email; Eudora; Eworld; FTP; FTPs; Modem; Host; Internet; Internet Service Provider; Internet Services; IP Address; MacTCP; Macweb; Modem; Mosaic; NCSA Telnet; Newswatcher; Prodigy; Quickmail; Server; URL; Usenet; World Wide Web

Communications Standards

See

Data Communications Standards

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Comp

In graphic arts, a comp (abbreviation of comprehensive) is a preliminary example of a publication. Often used in advertising design, the comp is shown to the client as a means to communicate concepts, indicate production values and overall design aesthetics, and provide a platform for discussion and revision.

Before digital color technologies were well-developed, comps were made on paper samples from the intended print run. Text, graphics, and color were laboriously applied by hand using ink pen, transfer lettering, photostats, colored markers, colored paper stock and anything else that would approximate the finished product. Needless to say, these were not very accurate and often misled the client. Today, most comps are made on color desktop printers and are much more accurate at showing how the finished job should look.

See Also

Graphic Design

CompactPro

This popular shareware compression utility, developed by Bill Goodman (Cyclos-CP, P.O. Box 31417, San Francisco, CA, 94131-0417), offers a wide variety of compression features and preferences. CompactPro offers:

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- Standard file compression
- The capability to create archives with multiple compressed folders or files combined into one "unit"
- Encryption and password protection for safeguarding sensitive files that cannot be accessed without the proper password
- The capability to split compressed files into multiple segments on a **disk** to be rejoined during decompression
- The creation of **self-extracting archives** (.sea), which enables the recipient to expand the compacted file without having the CompactPro software.

CompactPro also offers the capability to compress files in the background while you work in the foreground. CompactPro is available in the Macintosh Utilities Forum on America Online and at various FTP sites on the Internet.

See Also

Compressing Files; .cpt Filename Extension; Disk; .sea Filename Extension; Shareware

Company of Science and Art

See

CoSA

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CompileIt!

CompileIt! is a compiler that turns **HyperTalk** programs into **XCMDs**, **XFCNs** and other Macintosh code resources. HyperTalk, the scripting language supported by **HyperCard**, compiles (converts the script into machine readable format) each time the script is executed. This can slow down execution time. Also, anyone can open your scripts and edit them. By compiling them (turning them into machine readable format and saving them as an XCMD or XFCN) the speed of the routine improves and the script is protected.

While a HyperTalk script can be compiled as is using CompileIt!, making some adjustments to the scripts (particularly in how they use variables in memory) can greatly improve performance, especially in either long complex routines or repetitive routines.

CompileIt! supports the Macintosh ROM Toolbox, **System 7.0**, the extended XCMD interface, **SuperCard** language and callback Extensions, user-defined symbols, and much more. CompileIt! can increase the speed of HyperTalk routines and protect sensitive code from prying eyes.

Heizer Software
300 Cedar Lane
Largo, FL 34640
Price: \$149
Fax: (813) 559-0614

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Phone: (800) 888-7667 or (813) 559-6422

Web: <http://www.heizer.com>

See Also

Director; HyperCard; SuperCard; XCMD

Compiled Language

After a programmer has written a program in a high-level language, it must be converted into **machine language** before a computer can understand it. In compiled languages, a special program called a **compiler** performs this conversion all at once, translating whole blocks of source code into **object code**. This is in contrast to **interpreted** languages, which perform the conversion one line of source code at a time.

Compilation has a number of advantages. First, because the compilation process occurs separate from the actual execution of the program, execution speeds typically are significantly faster than for interpreted code. In addition, the compiler can perform various optimizations to adjacent instructions to improve speed even further.

Compiled code, however, does have its disadvantages. Because the source code is compiled into machine-specific object code, it is inherently non-portable. As a result, compiled programs cannot run on another type of computer without help from an **emulator**, a special program that converts object code from one kind of machine language to another. This isn't to say that the

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program can't be made to run on another machine. Frequently, this is just a matter of recompiling the same source code with a different compiler.

In addition, whenever a small change is made to the code in a compiled language, the entire module containing that code must be recompiled and linked to rest of the program. This is one of the major advantages of **dynamic language** s over traditional statically compiled languages.

Most languages can be implemented as either interpreted or compiled, but each language is most frequently one or the other. **C**, for example, is usually compiled, whereas **BASIC** is usually interpreted, but there are interpreted versions of C and compiled versions of BASIC.

There is another method of translating source code into machine code that straddles the line between compiled and interpreted: byte-code compilation. This method uses a compiler to convert source-code into special byte-codes rather than machine language. As with other compilations, this step is done as a batch process. The byte-codes then are fed to a special interpreter and converted to machine language one at a time as they are executed. This method has a distinct speed advantage over traditional interpreted code, while maintaining its portability. **Java** is implemented as a byte-code compiled language.

See Also

Compiler; Dynamic Language; Interpreted Language; Interpreter; Machine Language; Object Code

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Compiler

A special program that converts program source code from a human-readable format into machine-readable **object code** .

Most **programming languages** resemble, to some extent, a human-readable language, such as English. This can range from the almost-English of **AppleScript** to the more obscure notation of **C** or **LISP** . Unfortunately, none of these languages are directly understandable by a computer, so some program has to translate from these high-level languages to the low-level **machine language** computers understand. This program is called a compiler.

Strictly speaking, a compiler is a program that performs this translation in a batch process, typically an entire file or program at a time. This is in contrast to an interpreter, which translates code into machine language one instruction at a time.

See Also

Compiled Language; Interpreted Language; Machine Language; Object Code; Programming Languages

Component

Component is a transmission method that separates video signals into three channels, either **RGB** or **YUV** . The cables usually use large bayonet type

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plugs and are not supported by standard digitizing boards.

See Also

8mm; Composite ; NTSC, PAL; S-Video; VHS

Component Video (YUV)

A QuickTime video compressor that produces high-quality (if slightly large) files during capture.

See Also

Video Digitizing

Composite Signal

Composite signal is a transmission method for video signals that combines separate elements of the video signal—color and brightness—as one signal. The image quality is poorer than other formats such as **S-Video**. Most digitizing boards (equipment used to turn analog video into a digital video sequence) support this format.

See Also

8mm; Component ; NTSC; PAL; S-Video; VHS

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Compositing

The process of layering multiple images to create a final composite, or complete image. To layer the images, **matte** effects (creating an image through which a second image is visible) are needed. These can be defined in a number of ways; Adobe **After Effects** enables you to draw a matte shape, while Adobe **Photoshop** uses a separate image (called an alpha mask), which defines the transparency of the layer.

A simple way to layer an image on top of another is to cut out the unwanted areas of the top layer (this is the way layers are handled in Macromedia **Director**).

Blue screening , used frequently in video and film production is a third way of combining two images. In Blue screen a single color, or range of colors in an image are defined as the transparent color, through which a background image is visible. Adobe **Premiere** , and Avid **VideoShop** both provide Blue screening effects.

See Also

Blue screening

Compressing Files

Compressing a file is a way of making it smaller in order to facilitate transporting that file, storing it, or transmitting it on the Internet. Smaller

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files take up less disk space and require less time to transfer on a network.

In general, compression works by finding a pattern in the file and by substituting shorthand for that pattern. For example,

AAAAAAAAAAAAAAAA

is much longer than

25 As

Compressed files commonly contain a tiny segment of code that enables the compressed file to unstuff itself, so that the user doesn't need to find and use the appropriate decompression software. Such files are usually signified by the extension ".sea," which stands for *self-expanding archive*.

The filename extensions *.SIT* and *.CPT* denote the most common compression schemes on the Macintosh. *.SIT* signifies a file created by Aladdin Systems' Stuffit family of software, including Stuffit Expander. *.CPT* signifies a file created by the shareware program Compact Pro. Both programs are available via FTP at <ftp://ftp.utexas.edu/pub/mac/compression/>.

See Also

Decoding/Decompressing Files; Encoding Files; FTP; Stuffit Expander

Compression Artifacts

With **lossy** compressors, as the compression is increased, the quality of the

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resulting image decreases. At some point, compression artifacts become visible to the naked eye, often as a blockiness in the image, or color bleeding (particularly where there are sharp differences between colors). With a compressor such as JPEG, compression artifacts become visible as blocks of color, and as halo effects around sudden changes in contrast (for example, black text on a white background).

Compression Utilities

Compression utilities enable you to compress the size of files using software compression. Reasons for compressing files are to save hard disk space and to reduce the size of files you want to send over a phone line via **modem**. If, for example, you're uploading a file 200K in size to an online service, it can take you several minutes to upload that file, depending on the speed of your modem. However, if you compress the file, you can lower the size of that file from 30 percent to as much as 90 percent, uploading in well under one minute and saving you time. This also saves time for anyone downloading the file.

There are a number of compression utilities, including **Stuffit Deluxe** (from Aladdin) **DiskDoubler** (from Symantec), and **Compact Pro** (Shareware by Bill Goodman), that are popular third-party compression utilities. All three of these utilities offer the capability to create **self-extracting archive** (.sea) files that decompress even if you don't have the original software that compressed them. If you send a colleague a file via

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modem, for example, and you compress the file using StuffIt to reduce the file's size, your colleague needs StuffIt to decompress the file. By creating a self-extracting archive (.sea), the software necessary to unstuff the file is included with the file. This only adds 5K to the file and is completely transparent to the recipient of the file.

Also, most compression utilities enable you to split large files into pieces when you're compressing them and rejoin them when you decompress, or unstuff the files. Let's say, for example, you have a file that is 5MB, and after you compress it, the file is reduced to 2.1MB. That is still too large to fit on a standard 1.4MB disk. To make the file fit onto disks, you can have the compression software split the 2.1MB file into a 1.3MB file and a separate 800K file. This way, you can put the 1.3MB file on one disk and the 800K file on another. When you want to unstuff the files later, you put both files on your hard disk, double-click the files, and the application will rejoin the files back into one 2.1MB file and unstuff the files.

Another common feature of compression utilities is the capability to archive multiple files into one compressed file. This is very convenient for distributing multiple files, especially over a modem.

<i>Utility</i>	<i>Developer</i>	<i>Purpose</i>	<i>Benefit</i>
StuffIt Deluxe	Aladdin Systems	File Compression	Reduces size of files for backup, storage or modem transfers. Offers drag and drop "stuffing" and "unstuffing" of files

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AutoDoubler	Symantec	Automatic File Compression Automatically compresses files that are not in use
DiskDoubler Pro	Symantec	File Compression Reduces size of files for backup, storage, or modem transfers, adds pull-down menu to menu bar for instant access
Compact Pro	Bill Goodman (Shareware)	File Compression Reduces size of files for backup, storage or modem transfers
StuffIt Lite	Aladdin (Shareware)	File Compression Reduces size of files for backup, storage or modem transfers

See Also

Compactor; DiskDoubler; Disks; Modem; .sea Filename Extension; StuffIt

Compressor

Software routine that compresses a digital image (reduces the size). **QuickTime** uses compression on its digital movies. Compression reduces file size, so that they can be read from disk and played in real time. Compressors are actually two routines: the routine that compresses the image, and another

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routine that decompresses the image. Usually, both routines are included, although this is not always the case. For example, there is a decompressor available for Kodak's **PhotoCD** format, but Kodak only license the compression routine to photo labs that produces the PhotoCD discs.

Compressors are often called codecs (**codecs**, short for **compression/decompression**). QuickTime includes, free these compressors: **Animation** , **Cinepak** , **Graphics** , **JPEG** , **Component Video**, **None** , and **Apple Video** . These compressors are suited to different tasks because of the different techniques they use to compress a movie. Compression routines can be broken down into **lossy** and **lossless** (a lossy compressor creates a much smaller image, but the quality of the image may degrade compared to the original).

A compressor designed to compress sequences of images (a video sequence) uses additional techniques that a compressor designed for still images (such as JPEG) may not use. The primary technique that a motion compressor can take advantage of is that images in a sequence are usually very similar. By saving only the differences between the current frame and the previous frame (a technique called **temporal compression**) the amount of information that needs to be saved is reduced. Some frames should still be saved in their entirety (this is called **spatial compression**) so that the user can randomly access the movie.

Note that you do not have to use a temporal compressor to compress sequences, although it is advisable. A spatial compressor would cause poor

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playback performance. JPEG, for example, takes several seconds to compress a single image, so it is not appropriate unless you have special hardware that performs the compression (and in fact, just to confuse the issue, some hardware compression equipment such as the Radius **VideoVision Studio** card, uses JPEG as the compressor).

Compressors are often described as being **Symmetrical** and **Asymmetrical**. A Symmetrical compressor takes approximately as much time to compress and frame as it does to decompress one. (You can think of compression and decompression as being the equivalent of recording and playback for digital movies). Symmetrical compressors are used for recording and rough editing of video clips. An Asymmetrical compressor takes much longer to compress than to play back, but the movies are usually much smaller than the movies created by a symmetrical compressor. This makes asymmetrical compressors ideal for distribution.

Some companies sell third-party codecs; however, if you use one of these, make sure that you can distribute a decompressor routine with the movie, so that the person to whom you send the movie can view it.

See Also

Animation; Apple Video; Asymmetrical Compressors; Cinepak; Component Video; Graphics; JPEG; Symmetrical Compressors

CompuServe

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The oldest and one of the largest **commercial online services**, offering more than 2,000 discussion groups, news, travel, chat, and mail services.

CompuServe, like **America Online**, **Prodigy** , and the other commercial services, requires a monthly fee for membership. While many of its areas can be freely accessed by members, others require extra fees by the hour or by the minute.

In return, members get a number of benefits, including:

- CompuServe Mail: **email** to other CompuServe members or, through gateways, to members of other online services or other parts of the **Internet** .
- News and reference materials online, including the Reuters and Associated Press newswires, Ziff-Davis magazine databases, a news clipping services, stock reports.
- Travel and shopping services.
- More than 900 discussion groups called SIGs (Special Interest Groups).
- Games and entertainment.

Some of the categories listed previously fall into the “Extended Services” or “Premium Services” areas of CompuServe and carry extra charges beyond the monthly membership fee.

You can connect to CompuServe by using one of two graphical applications

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sold by CompuServe, Navigator or CompuServe Information Manager (CIM). The latter comes in a Macintosh version called MacCIM that is included with the book *Get on CompuServe in 5 Minutes* (Hayden, 1994).

When you first launch MacCIM you will be assigned an ID number and asked to specify a password and a credit card that CompuServe will bill for your connection time. You will also have to fill in personal data and asked to choose mail and promotional choices.

In another screen, you will also be asked to specify a communications port. In almost all cases, the default “modem port” will work. If your phone has Call Waiting, you will need to temporarily disable it each time you connect to CompuServe by prefixing the CompuServe number with “1170.”

CompuServe requires an addressing scheme in which you must prefix >INTERNET: to the beginning of any Internet address you use with email. Sending email from the Internet to a CompuServe member is simple as long as you realize that all CompuServe addresses are pairs of numbrs such as 766.864@compuserve.com. Such addresses can be hard to remember and are best stored in an **address book**. (Email accounts that use recognizable names are also available as an option).

In addition to providing a wider library of information than the other online services, CompuServe also features much more complete online messaging. Features such as ‘threading’ of message topics and searching for messages by sender, recipient, and topic are not available or available in a limited fashion on the other services. Therefore, when quickly looking for discussions on a

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particular topic, CompuServe can be a valuable resource.

Currently CompuServe is still somewhat more expensive than the other online services, but in recent months its rates have dropped dramatically so that the difference is now much less significant.

Warning: Unlike many of the other online services, CompuServe features a large number of additional databases which charge fees over and above the standard CompuServe connect charges. Be careful to look for the notices mentioning additional charges when entering new areas as some of these databases, such as the Dun & Bradstreet business reporting databases, can charge nearly \$100 for a single report!

Because CompuServe was originally designed to be used by **dumb terminal** programs, it is one of the few online services to provide access from any computer without custom client software. While this terminal access is of interest from a historical perspective and in a few types of uses, Macintosh-based software is recommended to make CompuServe practical for daily use. Currently two packages are available to give CompuServe the look and feel of the Macintosh: CompuServe Information Manager and CompuServe Navigator.

- CompuServe Information Manager is the standard CompuServe package, and is relatively easy to use. This package provides a standard Mac interface to make your use of CompuServe similar to moving around the **desktop**.

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- CompuServe Navigator is designed for the more advanced user. It works using a script-style session rather than the interactive method used with CompuServe Information Manager and with other online services. To use Navigator, you setup batches of actions such as which areas you'd like to read messages in, messages you'd like to post, files you wish to download or upload, and files you wish to search for. After accepting this programming, Navigator runs an entire session unattended, then disconnects, and allows you to browse through the results while the service is off-line.

When CompuServe had higher per-minute charges and charged higher rates for faster speeds (they used to charge a premium for the 1200 bps “high speed service”), Navigator was a good method of cutting down on online bills. However, now that CompuServe has dropped its access rates, and adopted the industry standard of not charging additional fees for faster access speeds, Navigator is of limited usefulness and has become much less popular, although it does allow you to download a large number of new messages or summaries of new messages without intervention.

Although its vast library of online resources can be quite compelling, CompuServe remains more difficult to use than its primary rival, **America Online**. Therefore, for an introduction to the online world, America Online remains a better value. However, once users have gained some online skills, CompuServe may be the more satisfying service for the long term business user.

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In early 1996, CompuServe announced a new service called WOW! which is aimed toward at-home computer users. WOW! provides email accounts for up to six family members, and a variety of payment options including \$17.95 per month unlimited access to the Internet.

See Also

America Online; AppleLink; BIX; Commercial Online Services; Delphi; email; eWorld; Internet; Prodigy

Computer Games

See

Entertainment

Computer Literature

See

Hypertext Fiction

Computer to Plate

See

Printing Methods, Digital

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Condensed

See

Typesetting Terms

Conflict Catcher

Conflict Catcher is a third-party commercial utility from Casady & Greene (22734 Portola Drive, Salinas, CA 93908-1119. Phone: 800-359-4920. On the Web <http://www.casadyg.com>) designed to prevent conflicts between your extensions in the **System Folder**. The key to Conflict Catcher is its capability to enable you to control how and when **extensions** and **control panels** load into your system at **startup** and how they interact with one another. Conflict Catcher also enables you to isolate groups of extensions and control panels without removing them from the system folder, which helps you track down conflicts.

If you're having a system problem, Conflict Catcher enables you to run a conflict test on your system, whereby it disables half of the extensions in your system and **restarts** the computer. If all goes well, Conflict Catcher asks you to repeat the cycle, and it loads the other half of the extensions. Conflict Catcher repeats this procedure again and again, each time using a smaller set of extensions until it isolates the culprit or culprits. If the problem is the loading sequence, Conflict Catcher rearranges the order in which extensions are loaded to help resolve any possible conflicts. If the problem is a damaged

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resource, it disables the extension.

You can also reorder **startup** items by holding down the spacebar on your keyboard during startup, which makes Conflict Catcher load before any other extensions. This brings up the Conflict Catcher control panel enabling you to decide which extensions should load and in what order. You can create custom sets of extensions that will load at startup for individual users. You can also create sets of extensions that you want to have load at startup for use with a particular application.

There are other programs that enable you to manage which items are loaded at startup including Extensions Manager, which is now part of System 7.5 and higher, and Now Startup Manager (Now Software, 921 SW Washington Street, Suite 500, Portland, OR 97205-2823, Phone: 503-274-2800, Web site at <http://www.nowsoft.com>), which is a commercial extensions manager and is part of the Now Utilities package from Now Software, Inc.

See Also

Control Panel; Extensions; Restart; Startup; System; System Folder

Connecting to Internet

See

Internet

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Constant

A constant is a special kind of programming **variable** that never changes over the course of a program's execution. It is a variable that doesn't vary. A constant always represents a single value.

Constants are useful in situations where a literal value is normally used. It is often more revealing to use a constant that has an informative name than to use the number itself. The value "42" in a program's source code, for example, has very little meaning, but if it were replaced by a constant called "kMeaningOfLife" that had the same value, its meaning would be obvious.

Constants are also helpful when a value needs to be changed by the programmer in many places throughout the program's code. If literal values were used, it would be difficult to find all occurrences and change them. On the other hand, if a constant is used, the programmer need only change the value of the constant and that change will make its way throughout the program.

See Also

Programming; Variable

Constructing Efficient Files, DTP

Desktop publishing may have made print production a lot more flexible, but there's still a right way to do some things. Following these guidelines will

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help you avoid problems when it comes time to print your documents or take them to a service bureau.

- Talk to your printer ahead of time about the requirements for your project—decisions you'll make as you create the project depend on this information. For example, **scanning** resolution depends on line screen, and that depends on your paper choice.
- Keep **bitmapped graphics** at the lowest possible resolution. The higher the resolution, the bigger the file and the better the chance that it or your page layout document will become corrupted or cause printing problems. For photos, never use a resolution of more than twice the line screen. If the image contains type, however, it needs a higher resolution than it would without the type to keep the letters clean.
- Blends created in **draw programs** will output better, with less “banding,” than those created in page layout packages. Also, the greater the change in color value and the smaller the length of the blend, the better it will look. Blends that fade to white can be difficult for printers to work with.
- Illustrator blends created with custom colors are converted to **process colors**. The only way to make sure this doesn't happen is to create several blends, each of one color shading down to no color, and layer them. Make sure each object in the set is set to overprint.

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- Don't "nest" **EPS** files by importing one into another. Copy and paste elements from one file to another, if necessary.
- Grouping elements in a draw application creates more complex **PostScript**. Group while you're working, but when the graphic's done ungroup.
- Keep vector-based paths as simple as possible—watch out for ones created by autotrace applications or from magic wand selections. Overly complex paths can cause the "limitcheck" PostScript error.
- Don't knock out delicate type from black or a dark color. Fine lines will fill in on press.
- Make sure the names of **spot colors** (such as **Pantone**) used in graphics files are the same as the ones named in your page layout files—otherwise, when you have color separations output you'll get separate plates for the two different spellings.
- Make the page size equal to the trim size of your document unless there's a really pressing reason not to. Any document that's going to be electronically imposed *must* be the correct trim size, and the margins must be the same on all master pages.
- You can proof **trapping** by setting the trap amount to a large value like 20 points and printing separations on a laser printer (on transparencies if you wish). Line everything up and make sure that there are traps where they should be and none where you don't want

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them.

- Don't scale or rotate imported graphics. Or, rather, go ahead and do it, but then go back to your image editor, scale and rotate them there, then reimport them into the page layout file.
- Don't install both **TrueType** and **PostScript** versions of the same font, and make sure you know which one you used on each document. Be aware that TrueType fonts take longer to output.
- Use the actual fonts for bold, italic, and other typeface variations.

See Also

Bitmapped Graphics; Draw Programs; EPS; Pantone; PostScript; Process Colors; Scanning; Spot Colors; Trapping; TrueType; Vector Graphics

Constructor

Constructor is an **interface builder** for programs developed using Metrowerks' C++ **PowerPlant** framework.

Constructor is a part of the Metrowerks **CodeWarrior** suite of development tools. It enables programmers to create and edit windows, views, text styles, and menus for use in PowerPlant programs.

Constructor uses drag-and-drop to enable you to add controls, text, pictures, and other panes to your windows by dragging these items from the tool

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palette into the window you're editing. Double-clicking an item brings up its properties in a separate window. (In the figure, the properties window for the Cancel button is the partially obscured window in the lower right.)

Although Constructor gives you complete control over the visual appearance of a program's windows and dialogs, it does not automatically generate code to handle the visual aspect of a program. Fortunately, PowerPlant takes care of all of the basics for you, so you only need to add your own application-specific code.

See Also

CodeWarrior; Interface Builder; PowerPlant

Consultative Committee for International Telegraph and Telephone

See

Modem Standards and Speeds

Consumer Models, Macintosh Family

Apple was one of the first computer manufacturers to develop a marketing strategy for the home market—the pre-packaged computer system. Apple calls these Macintoshes *Performas*. They are pure Macs packaged with

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bundled software, displays, faxes, modems, CD-ROM players, along with the standard memory and storage configurations found in their desktop cousins, and often auxiliary peripherals such as TV tuners and video-in cards and stereo speakers.

Performas were designed to be sold by sales personnel with little Macintosh savvy through the giant supermarket computer outlet centers, department stores, and non-traditional Apple vendors, such as office-product outlets such as Staples or Office Depot or buying clubs such as Costco/Price Club or Sam's Club. So far, Apple has packaged only the desktop models into Performas. The individual retail outlet specifies what types of configurations and software bundles they want to market and sells only those Performa models. This is why the consumer Macs often appear confusing, they come in many flavors, one for each type of user and vendor. The following figure shows the Performa 200.

The following list describes the different types of Performas and their members:

- **Series 5xx.** The Performa 580 is the last remnant of this model that is based upon the LC 575 . The Performa 580 is meant as a home office or college computer and comes bundled with basic business software and a variety of productivity, educational, entertainment, graphics and utility software. The Performa 580 also includes a double-speed, tray-loading CD-ROM drive and several CD-ROM titles, including games, home and educational reference materials, and demo programs. The

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Performa 580 is based upon the 33 MHz 68LC040 processor.

- **Series 6xx** . The Performa 630 with and without CD, 630 DOS Compatible, 631 CD, 640 CD DOS Compatible, and 636 CD are members of this series. The 6xx series is the same as the **Quadra/Centris and LC 630** Macintosh. These computers are configured with components useful for home offices or student use. Each computer is configured slightly differently, containing different sizes of memory and hard drives. But each of these computers comes bundled with Global Village TelePort Fax (either Send or Send/Receive depending upon the model), and Apple's PC Exchange, along with various educational, business, reference, and game software; as well as clip art and fonts. If the Performa 63x comes with a CD-ROM drive, it includes several educational, reference, business, and game CD-ROM titles, along with demos of other software. The Performa 63x series also uses the 33 MHz 68LC040 processor.
- **Series 52xx** . This is a PowerPC-based Performa. It has a unique design that harkens back to the original all-in-one "Mac 128, 512K, and Plus/SE chassis," where the computer, hard disk, CD-ROM drive, and display are integrated into a single unit. It is based upon the **5200LC** and is represented in the Performa series by the Performa 5215 CD. The 5215 includes a quadruple-speed, tray-loading CD-ROM drive and comes bundled with educational, business, games, and reference software titles and CD-ROM titles, clip art, and fonts. The Performa 52xx series uses the PowerPC 603 processor that performs at 75 MHz. In

addition, the 5215CD comes with an internal 14.4K baud fax modem with full-duplex speakerphone and digital answering machine that lets you use your computer as a voice mail system and speakerphone.

- **Series 61xx.** This series introduced the PowerPC Performa line of Macintoshes and is based upon the first-generation 601 60 MHz PowerPC chip. The Performa 6116CD is the current offering in this series and is based upon the **Power Mac 6100**. These computers are configured with components useful for home offices or student use. Each of these computers comes bundled with personal time management, reference, financial, and graphics software and CD-ROM titles, as well as clip art, fonts, and games, Global Village TelePort Fax (either Send or Send/Receive depending upon the model), At Ease, eWorld, and Apple's PC Exchange. If the Performa 63x comes with a CD-ROM drive, it includes several CD-ROM titles as well.
- **Series 62xx.** The 62xx series is a part of Apple's second-generation Power Mac line based on the 603 PowerPC processor. The 62xx Performa is a new desktop design similar to the 5300LC in performance, but built in a modular chassis rather than the 5300's all-in-one case. They use either a 75 MHz or 100 MHz 603 PowerPC processor, depending on the model. The 62xx series comes in many flavors, including the 6200 CD, 6205 CD, 6216 CD, 6218 CD, 6220 CD, 6230 CD, and 6290 CD configurations, each designed for a different market niche and sales outlet. The 62xx series of Performas include a quadruple-speed, tray-loading CD-ROM drive and comes bundled with

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graphics, business, educational, and reference software and CD-ROMS, as well as clip art and fonts.

- **Series 63xx.** The 63xx series is a part of Apple's second-generation Power Mac line based on the 603e PowerPC processor. The 63xx Performas are based on the same design as the 5300LC. They use a 100 MHz 603e PowerPC processor. The 63xx series is currently represented by one model: the Performa 6300CD. The 63xx series of Performas include a quadruple-speed, tray-loading CD-ROM drive and comes bundled with family and home office CD and software for graphics, reference, financial, games, and assorted other educational uses, such as cooking and medical references.

A Caveat about Software Bundling

The applications included with the Performa series change constantly, depending upon what the sales outlet vendor wants to include, and what Apple decides to bundle. Thus, those software and CD-ROM categories mentioned are approximations based upon Apple's August 1995 product list. The actual bundles may be slightly different. You should also realize that the programs included with Performas sometimes are older versions, such as ClarisWorks 2.1 or Quicken 4, that must be upgraded to their current versions; or hobbled versions that provide a taste of a product which then must be upgraded to take advantage of its full power, such as some of the games or Mangia (a recipe manager program). Another example of out of date inclusions is that you may receive a copy of eWorld with your Performa

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although Apple has announced the death of its online service as of Spring 1996. eWorld subscribers are being sent America Online memberships in lieu of eWorld.

Remember Robert Heinlein's motto "TANSTAAFL" translated as "There Ain't No Such Thing As A Free Lunch!"

See Also

CD-ROM Drives; LCs; Performas; Power Mac; PowerPCs

Continuous Tone

In graphics and desktop publishing, continuous tone art refers to photographs or other illustrations having a range of shades of gray or color.

See Also

Prepress; Printing Methods, Digital; Printing Methods, Traditional; Printing Terms

Contrast

See

Image Manipulation for Printing

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Control Key

This is a **modifier key** used with other keys to create keyboard shortcuts for **menu** commands and **mouse** actions. Although the Control key can be used by applications for keyboard shortcuts, most Macintosh applications do not have pre-set keystrokes utilizing the Control key.

A common Control key keystroke is ⌘-Control-Power Key to restart your Mac.

See Also

Menus; Modifier Key; Mouse

Control Panels

A convenient way to access your control panels is to place an **alias** of the Control Panels folder in the **Apple menu**. This way you can access the Control Panels folder directly from your Apple menu, without having to search through your **System Folder**. Also, if you have the **submenus** feature of **System 7.5** turned on, you get the additional benefit of being able to go directly to the control panel of your choice from the Apple menu without having to open the Control Panels folder at all. Starting with **System 7.1**, an alias of the Control Panels folder already appears in the Apple menu when the system is installed.

If you are running 7.0 or 7.01, follow these steps to add the Control Panels folder to the Apple menu:

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1. Choose the Control Panels submenu on the Apple menu (or in the System Folder). Select the Control Panels folder and choose Make Alias from the File menu. This will create an alias of the Control Panels folder.
2. Place this alias in the Apple Menu Items folder in your System Folder.
3. The Control Panels folder will now appear as an item under your Apple menu.

See Also

Alias; Apple Menu; Apple Menu Items Control Panel; Submenus; System 7.1; System 7.5; System Folder

Control Panels Folder

This is a folder in your **System Folder** that enables you to customize certain aspects of your system. This folder is automatically installed when a Macintosh system is installed. (And an alias of the Control Panels folder is installed in the Apple menu in System 7.1 and higher.) Within this folder are the controls for setting your computer's **time and date** functions, **color** controls, **sound** levels, and a wide range of preferences for the Finder. You can also find many third-party control panel devices that enable further customization of your Mac's system.

See Also

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Color Controls; Time and Date; Sound; System Folder

Control Points

See

Bézier Curves

Control Strip

This utility, originally introduced for PowerBooks, but now part of **System 7.5.2**, is a collapsible floating palette that enables you to have one-click access to a variety of commonly used items through a series of pop-up menus.

On PowerBook models, the control strip also displays the PowerBook's battery status using a bar graph showing the estimated time left on the battery's charge. (see Fig. 4G.sk) PowerBook users can access a wide range of controls from this floating palette including: your system's sound volume; the **spin-down** feature of your PowerBook to save battery life; a **file-sharing** switch to enable or disable file sharing across a network; an **AppleTalk** on/off switch (AppleTalk uses considerable battery power); an instant **sleep** feature; and a **video mirroring** switch.

For desktop users, you can configure the Control Strip to add a variety of options, like screen depth or sound volume, from the Control Strip Control Panel. To add an item to the Control Strip, you must add a control strip module

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to the control strip modules folder, in the System Folder. (Shareware and freeware control strip modules are available from online services and the Internet).

To extend the control strip, click the tab on the left and it will extend to its full length. To hide the control strip, leaving just the tab visible, click the tab again or the close box at the other end of the control strip. If you have more items on the control strip than can be displayed at its current size, click the arrows at the end of the strip to scroll through items.

To move items that are in the control strip, hold the Option key while dragging the item to its new location.

See Also

AppleTalk; File Sharing; PowerBook; Sleep; Spin-Down; System 7.5.2; Video Mirroring

Control Strip Control Panel

This control panel enables you to control the Control Strip feature on **PowerBook** computers or desktop Macs running **System 7.5.2** or higher.

The default for this panel is Show Control Strip, so if you don't want the floating Control Strip to appear on your Mac, simply click the button marked Hide Control Strip. You can also assign a hot key to show/hide the Control Strip.

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To use the Control Strip Control Panel, follow these steps:

1. Choose the Control Strip Control Panel from the Control Panels submenu in the Apple menu (or System Folder).
2. Click show Control strip to have the floating palette display on your Mac screen, or click Hide to keep the palette hidden.

See Also

Control Panel; PowerBook System 7.5

Control Strip Modules Folder

This enables **System 7.5 PowerBook** users to customize the features in the floating **Control Strip** palette. To remove a feature from the Control Strip, remove its module from the Control Strip Modules folder. To add a new feature, place that feature's module in the Control Strip Modules folder and restart.

See Also

Control Strip; PowerBook; Restart; System 7.5

Control Strip Shortcuts

There are a few shortcuts that make working with the **Control Strip** even easier than it already is. If you want to change the location of the Control

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Strip, hold the Option key while dragging the tab at the end of the Control Strip and relocate it to the location of your choice. To adjust the length of the Control Strip at any time, drag the tab to the desired size.

You can shrink the Control Strip down to just its tab by clicking the tab. To expand it, click the tab again. If you do not want the Control Strip visible at all, turn it off by clicking "Hide Control Strip" in the Control Strip **Control Panel**.

See Also

Control Panels; Control Strip

Controversial Themes in Games

See

Violence in Games

Convergence

See

Monitors, Image Quality

Converting and Translating Files

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The Macintosh has the capability to read, write, and translate files from the PC platform (DOS/Windows). This capability is built-in to **System 7.5** through a system extension called **PC Exchange** that enables conversion, translation, and even the capability to format PC disks. The Macintosh has the capability to read PC disks in both System 6 and 7 through third-party utilities and through Apple's own translation utility. Before PC Exchange became a part of the operating system, Apple offered a free file conversion and translation utility called **Apple File Exchange**, which enables you to mount, read, and write DOS-formatted disks. There are also third-party programs, such as **MacLinkPlus** from DataViz (55 Corporate Drive, Trumbull, CT 06611, Phone: (800) 733-0030. On the Web at <http://www.dataviz.com>) that not only translates PC documents but helps match these translated documents with Macintosh applications that can access these documents—even if the application that created the document on the PC doesn't exist on the Macintosh. MacLinkPlus also excels at translating files such as spreadsheets, databases, and graphics files, and holds formatting (such as bold and italic) as well as advanced formatting (such as tables, charts, and graphs).

See Also

Apple File Exchange; MacLink Plus; System 6; System 7; System 7.5

Cookie

See

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Magic Cookie

Cooperative Multitasking

See

Multitasking

Copland

See

System 8

Coprocessors, Types

Coprocessors are specialized processors that perform jobs, such as graphics calculations for rendering complex forms, data transfer operations, audio-visual processing, and complex mathematical calculations that the CPU can off-load. Coprocessors increase the throughput performance of the CPU because it frees up cycles for the CPU's main task—supervising the overall operations of the computer's components. The Macintosh has used four types of coprocessors over its history: math coprocessors, specialized coprocessors, graphics coprocessors, and digital signal processors.

Coprocessors, Math The introduction of a specialized chip, the 68881 math

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coprocessor (later succeeded by the more efficient 68882) with the 68020 and 68030 processors let these processors off-load instructions pertaining to the calculation and storing of floating-point values (number with decimal portions). Math coprocessors are also called **floating-point processors** because of their role in computing. The floating-point coprocessor-equipped Macs performed up to 200 times faster than those lacking this extra chip. The Macintosh II with its 68020 processor used the Motorola 68881 math coprocessor. Later versions of the Macintosh II family, such as the IIfx, IIfx, and so forth, that used the 68030 chip could use the more advanced 68882 math coprocessor that performed two to four times faster than the 68881. Both chips can store and process information in 10-byte chunks, accurately calculating values with up to 18 digits after the decimal point. 680x0 Macs not equipped with the coprocessor can only handle 14 digits after the decimal point. The coprocessors also contain built-in constants (values that do not change, such as the value of π) as well as transcendental and non-transcendental functions for performing trigonometric and logarithmic calculations. Because these functions and constants are hard-wired into the coprocessor's firmware, their use does not take up precious memory and CPU cycles to recall them when they are needed.

The 68040 processor included a portion of the functions and constants of the 68882 chip built-into its circuitry, and so could perform some of the calculations of the math coprocessor by itself. Performance was increased by the inclusion of a separate math coprocessor to perform those functions not handled by the CPU.

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One of the innovations of the PowerPC processors was the inclusion of a **Floating Point Unit (FPU)** supported by pipelining and superscalar execution capabilities. The PPC 601 supports up to three instruction dispatches during a single clock cycle. This three-way pipelining easily handles integer calculations (the predominant type of instructions processed in general computing). Applications that require sophisticated graphics rendering or use a wide range of floating-point values, have these calculations off-loaded to the FPU by the CPU. Many Mac applications have now been optimized to take advantage of the presence of the FPU on the PPC chip.

The FPU supports floating-point operations on both single-precision and double-precision values (meeting the IEEE-754 floating-point standard). The IEEE standard specifies the format for single-precision, 32-bit, floating-point values and double-precision, 64-bit, floating-point values. All IEEE-754 data types are included in the 601 instruction set. This hardware support also supports the Mac operating system's SANE (Standard Apple Numeric Environment) math routines. The FPU includes 32 registers, each 64 bits in length, for performing floating-point operations. The chip can handle six pipeline stages: fetch, dispatch, decode, execute 1, execute 2, and write back, each stage taking a clock cycle; with one instruction in each stage concurrently, like peas in a pod. The FPU can also search the bottom half of the CPU's instruction queue and execute floating-point instructions that do not depend on the results of other instructions in the queue, increasing the performance of the CPU. The PPC 604 chip builds on the design of the PPC 601.

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It contains a FPU, and *three* integer units versus the single integer unit of the 601. This design allows the PPC 604 to calculate two single-cycle integer instructions and one multiple-cycle instruction simultaneously—allowing the PPC 604 to outperform all Intel Pentium chips in both integer and floating-point performance.

Coprocessors, Specialized The Mac IIfx, Quadra AV models (660AV and 840AV), and Power Macs use several specialized coprocessors to assist in transferring data to and from the computer's modem, printer, and SCSI ports. In Power Macs, the logic board contains the Apple Memory-Mapped I/O Controller (AMIC), a Fast SCSI Driver, Ariel II, AWAC, and Curio processors to handle modem, printer and SCSI I/O. The High-Speed Memory Controller supports data transfers between the CPU and RAM.

Coprocessors, Graphics Graphics coprocessors assist in the calculations required to render and display high-end color graphics on-screen. The American Micro Device's AMD29000 chip is included in high-speed graphics display cards. The graphics accelerator card is one type of expansion card you can add to a NuBus or PCI slot on your Power Mac.

Coprocessors, Digital Signal Processor (DSP) These chips, such as the Motorola 56001, are included in the digital audio expansion cards, such as Digidesign's Audiomedia II card, used to enhance the performance of image-editing programs, such as Adobe Photoshop. Because AV cards are inserted into Processor Direct Slots (PDS), they can only be used in the NuBus-based Power Macs (the 6100, 7100, and 8100) as well as the Performa Power Macs

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(52xx, 62xx, and 63xx series). PCI-based Macs do not have PDS expansion capabilities, so there is currently no place to plug in the PDS-based cards. High-performance PCI AV cards should be available in late 1996. In the mean time, the Power Mac 8500 and 9500 come equipped with built-in video-in and video-out and a high-speed bus architecture (essentially all of the capabilities of the AV card built-into the logic board).

The Quadra AV Macs (the 660AV and 840AV) included AT&T's **3210 DSP** chip to drive the high-speed GeoPort connector used in telephony and telecommunications. The AT&T 3210 runs its own system software (Apple Real-Time Architecture (ARTA)) that independently performs signal processing, freeing up the CPU to perform other tasks.

See Also

Logic Boards; PCI Bus; Power Mac; PowerPC Processors

Copy Command

The Copy command (⌘-C) copies the selected item into the Mac's **Clipboard**. Unlike the **Cut** command, the Copy command does not delete the selected item, it just stores a copy in the Clipboard. You can paste your copy into another location at any time by selecting **Paste** (⌘-V) from the **Edit menu**.

To copy a text item, follow these steps:

1. Select the item you want to copy.

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2. Select Copy from the Edit menu or use ⌘-C.
3. Normally, the Copy command is followed by the Paste command (⌘-V), found on the Edit menu, which enables you to paste the information into another location within your document or another document.

See Also

Clipboard; Cut; Edit Menu; Paste

Copy (Keyboard Shortcut)

To **Copy** an item onto the **Clipboard** , press ⌘-C. You can paste this item as long as it remains on the Clipboard.

To copy an item, follow these steps:

1. Select an item or highlight text you want to copy.
2. Press ⌘-C to copy the item to the Clipboard.

See Also

Clipboard; Copy; Keyboard Shortcuts; Paste

Copy Protection

Making a copy of a commercial software product, other than for your own

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use as a backup copy, violates federal copyright law. But that doesn't stop some people from copying an application's disks and giving, or selling, the application to others. Because of this illegal practice, some software companies, including a large percentage of game manufacturers, build in a copy protection scheme to make illegally copying a disk either impossible or impractical. A popular form of copy protection appears in Macintosh-based games. When you launch the game, a dialog box appears asking you to enter a particular word from a particular page in the game's instruction manual. It might say, for example, "Please enter the 4th word in the 23rd line of page 115." If you own an illegal copy of the game, you probably don't have an instruction manual, and if you don't enter the correct word, the program will not start. This works well because even though disks are easy to copy, 100-page instruction manuals are not. Whenever you try to launch the game, an internal database of words and pages is accessed, so a different password from a different page is requested each time.

Some game manufacturers gave buyers a password sheet and asked them to provide a password from that sheet; however, people made copies of the password sheet to give to software swipers. This led software companies to print pages in a light blue ink that would not copy with a standard copier.

Another form of copy protection is to provide invisible files that include some key resources necessary to the execution of the program on the disk itself. This makes copying from your hard drive to a disk difficult because you can't see the invisible files. If someone tries to run a copy, the program won't launch because it is missing a resource from the invisible file. Gotcha!

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Another form of copy protection occurs when multiple copies of the same program appear on a network. If you buy PageMaker for your machine, install it, and then try to install that same copy on a co-worker's machine, the program's built-in copy protection scheme will catch you. The first time you work in PageMaker and your co-worker launches PageMaker, a dialog box will appear stating, "Cannot launch PageMaker because a program with this same serial number is already running on another machine."

Now, a copy protection scheme works when you first install the program. When you install from a disk, a mini-program goes into your system and finds the name and serial number of your Macintosh and gives that information to the disk from which you're installing. If you take the original disk and install the program on another machine, when launched it stops and alerts you that this program already has been installed on another machine, and the application cannot be used. Gotcha again! The copy protection technology gets more advanced as software piracy (illegal copies of software) becomes more prevalent.

See Also

Comments Box; Find File; Get Info

Copying Files

To copy a file from one disk to another, **select** the file you want to copy and **drag** it onto the icon of the disk you want it copied onto. When you release

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the **mouse button** , the copying begins and a copy **dialog box** with a status bar appears so you can see which files are being copied and how long it takes.

Copying Files and Folders

<i>Process</i>	<i>Media</i>	<i>Result</i>
Click and Drag	Within hard drive	Moved
Click and Drag	To disk	Copied
Click and Drag	From disk	Moved
Option-Click and Drag	Within hard drive	Copied
Option-Click and Drag	To and from disk	Copied

To copy multiple files from one disk to another disk, hold the **Shift key** and select as many files as you want to copy by clicking each file. Then drag the whole group to the disk of your choice for copying. You can cancel the copying of files while the status bar is up by clicking the Cancel button or using the **keyboard shortcut** Command-. (period).

To copy a file from a disk to a **hard disk** , follow these steps:

1. At the **Finder** , double-click the disk to reveal the disk's contents. Select the file(s) you want to copy.
2. While the file(s) is selected, drag it from the disk's window onto the

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your hard disk **icon** or into any open window from your hard disk, and the file is copied into the active window.

3. To cancel copying at any time, press the Cancel button on the copy dialog box or press Command-**.** (period).

To copy files from one disk to another (if you only have one disk drive), follow these steps:

1. Insert the disk containing the file you want to copy. Double-click the file to view its contents, making sure the file you want to copy is in sight.
2. **Eject** the disk using the Eject command (Command-E) from the **Special menu** (Note: You must use the Eject command to copy from disk to disk). By using the Eject command, a ghosted version of the ejected disk remains on the desktop and the ejected disk's open window remains open as well. Any files in the window appear ghosted.
3. Insert the disk you want the file copied onto. (It is not necessary to open this disk's window.)
4. Click the ghosted file you want to copy in the ejected disk's open window and drag it onto the icon of the newly inserted disk. The newly inserted disk ejects and you are prompted to insert the first disk (whose icon still appears ghosted on the desktop). After you insert the first disk, the Mac starts copying and then ejects the disk and prompts you for the disk you're copying onto. Follow the instructions with the

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dialog boxes.

5. Depending on the size of the file being copied, you may have to do this disk swapping a number of times before the file is copied. When you're done, a ghosted version of the disk might be on the desktop. Drag it into the **trash** to delete it.

TIP There is a simpler way to copy from one disk to another: Copy the file from the disk onto your hard disk, and then eject the disk, and insert the disk you want to copy onto. Then just drag the file from your hard disk right onto the icon of the disk and the entire file will write at one time, with no disk swapping.

See Also

Cancel; Click and Drag; Copying Files in the Background; Dialog Box; Disks; Eject; Finder; Mouse Button; Hard Disk; Icon; Keyboard Shortcut; Select; Shift Key; Special Menu; Trash

Copying Files In the Background

In **System 7.5** and higher, you can copy files in the background while you continue to work within an application. If, for example, you have to **copy** 100 or more files to a disk, you can drag the selected files to the disk's icon to start the copying process. To continue working in your application, select the application you want to continue working with by clicking a document window or selecting the application from the Application menu in the menu

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bar. The files continue to copy in the background while you work.

See Also

Copying a File; System 7.5

Copying Files from Folder to Folder

To copy files from one disk to another, drag the icon of one disk to the other and it is copied. But if you want to copy a file from one **folder** into another folder, dragging it to the new folder just relocates the file; it doesn't copy it. You're moving the original. To create a copy of the file in a different folder, hold the **Option** key while dragging the file to folder. The original file stays in place while the copy is placed in the folder.

See Also

Folder; Option Key

Copying and Pasting into the Calculator

If you're working in a word processor and you're dealing with a series of mathematical calculations, you can copy these figures and paste them into the **Calculator DA** on the **Apple menu**, and it will do the math for you. If, for example, you're typing the following calculation:

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+376

+685

+435

-16

+208

You can highlight those numbers, open the calculator, choose Paste from the Edit menu (Command-V), and the answer is calculated by the Calculator DA. You can then copy and paste the answer back into your document.

Another calculator trick lets you enable the Apple Calculator DA to work with scientific notation! Pressing E when using the calculator switches it to this higher form of math. If you type E, then 9999, and push the "=" sign, you get infinity.

See Also

Apple Menu; Calculator DA

CorelDraw

Corel, a name associated with only Windows applications in the past, has now moved to the Mac as well. Corel 6 for the PowerMac, a collection of powerful graphics programs, contains the latest version of CorelDraw. CorelDraw's feature list is impressive in both quality and variety, and contains new

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approaches to vector graphics not present in other vector drawing software. An associated module, CorelDream 3D, allows you to design, raytrace and render 3D objects or text, and to quickly place the results in a CorelDraw document. No other competitive vector packages offer this capability. All applications in Corel6 are 32-bit optimized for the PowerMac, and designed to work with System 7.5 or higher. They have built in AppleGuide, ColorSync and QuickDraw GX support. The color models supported include Pantone, FocolTone, TruMatch, SpectraMaster, TOYO, and DIC, and Corel 6 includes a Color Manager Wizard for intuitive device calibration. Page sizes up to 150' x 150' can be incorporated with full-color bitmap patterns and a preview of PostScript texture fills. The view manager also saves custom zoom levels for later use. Corel 6 includes exacting numerical dialog input that effects Position, Rotate, Size and Mirror, Size, Skew, in addition to allowing mouse control over these same parameters. Whenever possible, this same convention of allowing both exacting numerical control and more intuitive visual control over all transformational operations is followed. An entire library of preset envelope controls is included as part of the Envelope Dialog, with shapes including: ovals, rectangles, stars, certificate shapes, comic book dialogue balloons, cloud shapes, teardrops, arrows, shields, object outlines and bursts. New custom objects can also be grabbed from the screen and saved to this library. CorelDraw offers multiple UNDO features to aid in the creation of vector graphics. A Lens dialog includes Fisheye, Heat Map, Wireframe and other effects. The most useful CorelDraw drawing effect is the PowerLine option. By selecting from a number of preset shape libraries (including your own saved customized choices) you can apply line effects to

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all of the shapes you draw. These shapes add a preset thick and thinness to the lines, making them appear a more calligraphic elements. Choices include Trumpets (thin at one end and bell shaped on the other), Bullet shapes, Teardrops, Leaky Pen and more. You can set the shape of the pen nib, the maximum width that the shaped line will include, and the pen leakiness/spread/flow. Only CorelDraw has this linear option.

Basic Bezier Drawing CorelDraw contains all of the expected bezier drawing conventions (oval, rectangle and freehand) and more. A standard bezier editing function, for instance, has expanded usage when it comes to ovals. It allows you to cut away part of the oval interactively as you move the mouse, resulting in a saved arc. The arc can then be transformed into a pie section or a crescent with other CorelDraw options.

CAD Applications CorelDraw 6 fosters 2D CAD use through both its drawing and dimensioning capability. The dimensioning choices rival similar functions found in dedicated CAD software. The Dimensioning Icon is clearly accessible in the toolbox, and a pop-out menu lists all of the dimensioning types (vertical, centerline, horizontal, oblique, and more). A special Angular Dimensions dialog allows you to customize the details. It lists selections for Precision (to ten decimal points) and Units (Gradians, radians or Degrees). Also available is a toggle for Dynamic Dimensioning and Prefix / Suffix strings.

Other Drawing Tools A Contour dialog allows you to construct what appear to be contour elevation maps from the selected shape. You control the

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intervening colors and the number of steps. The contours can be drawn in a centered fashion, inside or outside of the selection. A complete Extrude dialog allows you to add perceived depth with lights, colors and shading, and extrusion parameters to any selected object.

Tracing Images CorelDraw includes a separate program, CorelTrace, that automatically converts bitmap (raster) images to line art (vectors).

Typography CorelDraw includes a full-featured listing of typographic and word processing tools. On the graphic side, these include setting text to a curved path and gradient fill options. On the word processing side, this includes spell checking, thesaurus and advanced proofreading options.

Blends and Gradients CorelDraw allows both blends and gradients. The Color Dialog is central to both operations, and it features some unique options. If the RGB palette is chosen, and a color selected, it shows both the RGB color and the CMYK equivalent (which is how the selected RGB will be printed, often very different from the RGB color on screen). CorelDraw addresses CMY, CMYK, CMYK255, RGB, HSB, HLS, LAB, YIQ, Grayscale and Registration Color. The palettes mode lists other color palette choices: Uniform Colors (default), FOCOLtone, Pantone Spot and Process, TruMatch, Spectramaster, TOYO Color Finder and DIC Colors. Colors can be added and deleted, and customized palettes can be saved. For color blends between any two selected objects, a special Blend dialog is brought to the screen. It shows the selected number of steps targeted between the colors, and whether a linear clockwise, counter clockwise blend is desired. The “Apply” button does

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the rest. (Blends also morph between the two shapes).

CorelDraw addresses linear, radial, conical and square gradients, which it calls “Fountains”. Like Illustrator, CorelDraw does not limit the user to only two colors, and in fact has more customizing gradient features than Illustrator. You can select two-color gradients and Customs. Custom gradients come in three flavors: Direct (from one color to the other across the color wheel in a linear path), Rainbow (from one color to the next in a clockwise or counter clockwise path), or Custom (where the user actually selects all of the intermediate colors without accessing a path in the color wheel). An experiment worth trying is to create two diverse shapes at each end of a page (an oval and a rectangle for instance) and fill each with a different color gradient. Now go to the blending operation, select fifteen as the number of units, select both shapes, and apply a blend. Not only will the shapes blend, but the gradients will blend in a step by step fashion across of the in-between shapes. Modifying this experiment to fit your needs can lead to interesting and colorful graphics applications.

Layers Corel 6 incorporates a View Manager dialog that allows you quick access to any layer in the artwork, plus the capability of adding, deleting and zooming. The magnification features are unique in that they allow you to click-zoom on the page, area or selected object right from the dialog.

File Load/Save Conventions CorelDraw can save out preview images in grayscale or full color with the saved files. CorelDraw opens and saves CorelDraw, Pattern, Template and Presentation Exchange files. Import file

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formats include PICT and CMX, while exports include PICT, CMX and EPS.

Cordless Mice

See

Mouse

Corrupted Files

Although it doesn't happen often, a file may become damaged or corrupted. This means that the file cannot open or be used in any way. A file might become corrupt or resources might go bad for a host of reasons. If you attempt to open a file that has been damaged, most times the application with which you're trying to open the file displays a dialog box warning you that the file is corrupt and cannot be opened. The best defense against a corrupt file is to back up your files. Otherwise, you can try to open the corrupt file in a word processor that has the capability to open a host of different file formats. If, for example, Microsoft Word opens your file, you can resave it with a different name and trash the corrupt file.

See Also

Click; Click and Drag; Disk; Duplicate; File Menu; Folder; Hard Drive Icon; Option Key

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CoSA

Company of Science and Art. Based in RI, CoSA is the original developer and publisher of **After Effects**, a **QuickTime** effects processor. The company and the product were purchased eventually by Adobe.

See Also

After Effects

Co:Writer

Co:Writer is a word prediction program that works with your word processor. When you type a letter, it presents you with a list of words beginning with that letter. If the word you intend to use is on the list, click it. Otherwise, type the next letter—and so on, until you see the word you want. Originally intended for people with physical disabilities, the word prediction program is designed to make text entry much easier and more efficient.

If you do your typing by pressing one key at a time with a mouth stick, the implications are obvious. But as the use of these programs became a little more widespread, other advantages were discovered. Co:Writer and similar programs make text entry much easier for anyone who struggles with writing. By reading the words aloud, the word prediction program helps students who are dyslexic. It helps people who are learning disabled or have limited vocabulary to express themselves. It even helps users with low vision,

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because the size of the words displayed on-screen can be varied to suit their needs.

Co:writer works easily with a keyboard and mouse or with a switch and scanning software. When the word you want to use is highlighted, click it and it becomes part of the sentence. The figure below shows how this is done. When you finish a sentence by typing or scanning in the punctuation mark, the sentence is copied into the word processor document so you can start a new one.

Co:Writer is an “intelligent” word prediction program, which means that it makes predictions based on subject-verb agreement, grammar rules, and word relationships. It can learn which words the user prefers and make them the top choices. It can be customized for users of different ages and ability levels with a 2,000-word basic dictionary, an intermediate-level dictionary, and a 40,000-word advanced user dictionary. And all these can be edited to include personal names and phrases. Co:Writer can be taught to recognize words the user commonly misspells, and to substitute the correct spelling while saying the word aloud, training the user to learn the correct word. Co:Writer can be used by people of all ages, and is a necessity for anyone who has difficulty writing.

Couch, John

See

C

Lisa

Counter

See

Typesetting Terms

CP Anti-Virus

An antivirus application and extension are included with Central Point's general utility package, MacTools. Like SAM, CP Anti-Virus can monitor your system for virus activity.

CP Anti-Virus can detect known HyperCard viruses and known Trojan horses. It can also scan compressed archives created with Compact Pro. CP Anti-Virus supports signature strings that allow it to detect (but not remove) new viruses.

See Also

Virus

CPSI

See

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Printers, Color PostScript

.cpt Filename Extension

The .cpt filename extension means the file has been compressed using Bill Goodman's **shareware** CompactPro (a shareware decompression utility found in the Utilities Forum on America Online and a various FTP sites on the Internet). This file extension enables others know to extract (decompress) the file using CompactPro. You can have the .cpt file extension added at the end of the filename for you by choosing that option from the CompactPro Preferences **command**. The amount of compression (savings in file size) is different for each type of file. Graphics files (especially in TIFF format) seem to compress quite a bit and it's not uncommon to have a TIFF graphic to compress to 95% of its original size. Text files also compress well, but printer fonts (which already use an internal form of compression) application files and sound files don't compress nearly as much.

Files compacted with Compact Pro can be expanded using StuffIt Expander (a free decompression utility found in the Utilities forum on America Online and a various FTP sites on the Internet) and vice versa. Files stuffed with StuffIt Deluxe or StuffIt Lite can be unstuffed by using Compact Pro.

See Also

Commands; Compression Utilities; Shareware

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CPU

See

Microprocessors

CPU Energy Saver

This control panel enables you to limit the energy consumption of any Macintosh computer that is **energy star compliant** by turning your computer off when left idle for a specified period of time. You can set the computer to turn off after as little as 15 minutes or as much as 12 hours. You can also set a time of the day that you'd like your computer shut down. There are a host of options that enable you to automatically log off a network after a specified amount of idle time, to automatically put your monitor into **sleep mode**, and to make sure your computer won't **shut down** if there is any activity over a network.

To use the CPU Energy Saver Control Panel, follow these steps:

1. If your Macintosh model is energy star compliant, choose the CPU Energy Saver Control Panel from the Control Panels submenu on the Apple menu (or System Folder).
2. Double-click the icon to open the control panel.
3. Click the On button to make CPU Energy Saver active. To have the

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computer shut down during idle time, click the Idle Time checkbox and use the slider to select the amount of time, in minutes, before your computer turns itself off. For additional options, press the Option button.

See Also

Energy Star Compliant Shut Down; Sleep

CPU Upgrades

The quest for speed, and often the need to extend the value of an existing Macintosh system, leads users to consider accelerator boards or CPU upgrades. Although not always better than a full computer replacement, they are often a more cost-effective answer. And in choosing this method, your CPU can win a major battle in the war against obsolescence and inefficiency, while staving off the inevitable for a while longer. Apple's latest Macs provide upgrade slots on the motherboard that accept special processor daughterboards .

See Also

Daughterboard

Crashes, System

If your system software encounters a problem while it's operating, such as

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not having enough memory for a particular application, you can experience a system crash. A symptom of a system crash is a **frozen mouse** (when the screen looks normal, but when you move the mouse on your desk, the cursor doesn't move on-screen), but you are more likely to get a **system error** dialog box that states, "Sorry, a system error has occurred."

Both of these point to a system software error, and you must **restart** your Mac to get things working again. System crashes (also called **freezes** or **bombs**) are a temporary situation. Restarting the Mac often takes care of the problem that caused the crash, enabling you to continue working.

In some instances, a system crash is more serious and may be caused by a conflict within your system such as conflicting **extensions**. If you restart your machine and the same system crash occurs, restart your machine while holding down the **Shift key**. This stops the system extensions from loading into your system. After this extensions off restart, see whether the system crash situation reoccurs. If it doesn't, then you may have narrowed the problem down to an extension conflict.

At this point, the process of elimination can determine which of the extensions is causing the conflict. The most widely used way to track down the culprit is to remove your system extensions, put them in a separate folder outside the System Folder, and add the extensions back to your system one at a time, restarting after you add each extension to see if the system crashes. When the crash reoccurs, you know the last extension you added is either the culprit itself or there is a conflict in the order in which the extensions are

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loaded into your system.

Extensions are loaded in alphabetical order, and rearranging the order in which they load can fix an extension conflict. You can add a letter or a symbol (such as ` , ~, -, and so on) to the beginning of the name of the extension to change its loading order.

You can also use the **Extensions Manager** Control Panel installed with **System 7.5** to select which items are loaded into your system at startup. The Extensions Manager saves you from moving extensions in and out of your System Folder by enabling you to turn extensions on or off from the control panel. There are also commercial products, such as **Startup Manager** from Now Software (part of the **Now Utilities** package) and **Conflict Catcher** (from Casady and Greene), that control the loading of extensions and are helpful in tracking down extension conflicts.

A system bomb is another name for a **system error** or **system freeze**). The system bomb got its name because if you have a system error, the system displays a **dialog box** stating, "Sorry, a system error has occurred," with an **icon** of a bomb. A system bomb means the software is frozen or locked up, and to begin working again, you have to **restart** the Macintosh.

See Also

Conflict Catcher; Extensions; Extensions Manager; Freeze; Frozen Mouse; Now Utilities; Restart; Startup; Startup Manager; Shift Key; System 7.5; Errors, System

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Creator Code

See

Changing Type and Creator

Crime Patrol

See

First-Person Perspective Shooters

Cropping

See

Printing Terms

Cross-Compiler

A special type of **compiler** that can generate programs for computer platforms different than the one on which the compiler itself runs.

The idea of a cross-compiler may seem a little unusual at first, but they are actually pretty common in the computer world. There are a number of very important reasons for using a cross-compiler.

For example, when a new computing platform is first introduced, the new

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machine may not be widely available to do the development on, or there may not be any development tools that run on the new platform. In the early days of the Macintosh, most development work was done on the Mac's predecessor, the **Lisa**, and cross-compiled for the Macintosh. Similarly, the first Power Mac programs were developed on IBM POWER workstations. Strictly speaking, any Power Mac program compiled on a 68K Mac (or vice versa) has been cross-compiled.

Some types of devices that we don't necessarily think of as "computers" require that their programs be written on another platform and cross-compiled. The **Newton MessagePad** is a great example. It wouldn't be practical to do development work on the Newton itself, so Newton applications are developed on the Macintosh and cross-compiled.

Another reason for cross-compiling is pure convenience. It can be much easier to do all of your development on a single kind of computer using a single development environment, rather than a different environment on a different computer for each. Metrowerks' **CodeWarrior Win32** cross-compiler and Microsoft's **Visual C++ Cross-Compiler for Macintosh** are both examples of this class. Using Metrowerks' Win32 tools, you can develop programs for Windows 95 and Windows NT from the comfort of your own Macintosh.

See Also

CodeWarrior; Compiler; Visual C++

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Cross-Dissolve

A video transition effect that fades the first clip into the second one. A similar audio effect is called a cross-fade.

Cross-Fade

A video transition effect that fades the first clip into the second one. A similar audio effect is called a cross-dissolve.

Cross-Platform Font Issues

These days most major applications are available in both Mac and Windows versions. Documents created on one platform often don't even have to be translated in a separate program to be opened in the same application on a different platform. There is another consideration, though: **fonts**.

To successfully open page layout and graphics documents created on a different platform, users must have the same fonts. They can't just have the same names—they have to be the identical fonts, from the same vendor, whether **PostScript** or **TrueType**.

Other fonts can generally be substituted when a document is opened. But if the look of the font is vital to the look of the document, it has to be the same. Also, if a different version of a font is used, line, column, and page breaks

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can change.

Mac users should be aware that certain Mac fonts (like Chicago, Geneva, Monaco, and New York) don't exist in Windows, just as some PC system fonts don't exist for Macs.

Characters such as curly quotation marks, ligatures, accents, and other special characters often don't translate correctly between platforms; these should always be checked after a document is translated.

See Also

Fonts; PostScript; TrueType

Crossword Wizard

See

Traditional Games

Crystal Caliburn

See

Pinball Games

Crystal Crazy

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You can trace the origins of Crystal Crazy from Casady & Greene back to the classic arcade game Asteroids. In Asteroids, you were a spaceship in outer space who had to blast its way out of an asteroid field. Mainly, you flew around the screen and blew everything up before anything hit you.

More recently you could trace it to game author Patrick Buckland's first attempt, Crystal Quest. Originally shareware, Crystal Quest was bought by Casady & Greene as one of their first game packages. It proved highly successful, and spawned Crystal Crazy, although inducing C&G to commercialize other shareware games. They've also brought us Glider Pro, Pararena, and the brand new **AmoebArena**.

In Crystal Crazy, a loose spin-off of Asteroids, your rocket ship must dodge mines and bizarre space creatures that want to shoot you or collide with you as you gather as many crystals as possible to get to the next level. You also get to smash things, pick up pool balls in order, uncover paintings, and assemble jigsaw puzzles—all while they're shooting at you.

Other Asteroid Style games include the **shareware game** Maelstrom from Ambrosia, Oids from MacSoft, Space Madness and PegLeg from Changeling Software and Magnet's Icebreaker. Casady & Greene's latest title, AmoebArena, has you playing an amoeba involved in an intergalactic war. Also available is Casady & Greene's original Crystal Quest, a simple version with crystals and mines but no pool balls or puzzles, which comes with a game editor that allows you to add and create your own levels and creatures.

See Also

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3-D Ultra Pinball; Lode Runner: The Mad Monks Revenge Online; StarPlay Productions

Crystal Quest

See

Crystal Crazy

CTS

See

Flow Control

Cupertino

Cupertino, California, is the home of Apple Computer, Inc. Located in the heart of Silicon Valley—technically Santa Clara Valley—between Palo Alto and San Jose, Cupertino is also home to many other major computer industry companies, including Symantec.

Cupertino was once a bustling agricultural community at the center of vineyards, orchards, and olive groves. The seeds of change were planted in the early part of this century when several Stanford University graduates set up a string of companies in nearby Palo Alto. These companies would go on to

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invent the loudspeaker and discover that vacuum tubes could be used as amplifiers, giving birth to the electronics industry.

The change continued throughout the century, with the biggest change occurring in the 50s and 60s, when the nascent semiconductor industry blossomed in Santa Clara Valley and gave it its new name: *Silicon Valley*.

See Also

Apple Computer, History

Curly Quotes

See

Smart Quotes

Cursor

The cursor is an on-screen tool you use to select or move objects and to enter text. The movement of the cursor is controlled through movement of the **mouse**, and the look and function of the cursor is controlled by the tool or task at hand. The default cursor on a Macintosh is the **pointer arrow**. If you open a word processor, however, the cursor immediately changes to a text cursor (which looks like an **I-Beam**). If you move the cursor to the **menu bar** or to the scroll bars, it immediately changes back to the pointer arrow.

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Certain applications, such as graphics applications, have custom cursors that represent each tool on the **tool palette**. If, for example, you choose the paint brush, its cursor may look like a paint brush. If you choose an eraser tool, its cursor may look like an eraser. The three most universal cursors are the pointer arrow, the text cursor, and the **wristwatch** cursor. The wristwatch cursor appears whenever the computer needs a moment to process something. The hands on the wristwatch spin to let you know it will be a few moments before your **command** is completed.

See Also

Command; I-Beam; Menu Bar; Mouse; Pointer Arrow; Tool Palette; Wristwatch

Curse of Dragor

The land of Xorinth has been put under the spell of the malevolent magician Dragor. Your party's mission is to infiltrate the castle and lift the curse from Xorinth. Of course, in the vein of Dungeons and Dragons, you pick your company and end up fighting all sorts of ghouls, renegade knights and oversized arachnids.

Dragor borrows from an older style of game and interface and suffers from the PC-like commands and **cursor** functions, as well as the less than comprehensive **auto-save** feature. On the other hand, if you've moved through **Might & Magic** and already mastered **Dungeon Master II**, you'll probably want to give this a try. One hopes that Strategic Simulations

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Incorporated's (SSI) recently released World of Aden: Entomorph and MacSoft's Odyssey will improve the standards for Mac RPG's. For now, Curse will suffice. In fact, Curse of Dragor is great for beginners just getting their feet wet and sidesteps a lot of the cumbersome game-manual reliance of similar titles.

See Also

Dungeon Master II: The Legends of Skullkeep; Might & Magic: World of Xeen

Cursive Typefaces

See

Typeface Categories

CU-SeeMe

Freeware (White Pine also has a commercial version) developed by Cornell University and several collaborators that brings videoconferencing to anyone with a Mac and a connection to the **Internet** .

CU-SeeMe brings any user with a **MacTCP**-based Internet connection, a camera, a video-capable Mac (such as a 660 AV) with a 68020 or higher processor, or a video input card the ability to do low-cost desktop videoconferencing.

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The basic CU-SeeMe setup facilitates one-to-one videoconferences. By using a **reflector** , up to eight “windows,” each containing live video from a separate location anywhere on the Internet, can be displayed at once.

Of course, the speed of a user’s connection to the Internet directly affects the speed and general quality of the video display, and direct **ISDN** or T1/T3 connections make CU-SeeMe work best.

Each participant in a CU-SeeMe videoconference can be a sender, a receiver, or both. CU-SeeMe is constantly being updated and improved. Recent versions support audio as well as the exchange of text and slides.

After downloading the CU-SeeMe software from the Internet (see the URL that follows), you launch the program and fill in your user preferences.

Once in CU-SeeMe, go to the “Conference” menu and choose “Connect.” You must know the address to type in the Connection dialog. You can CU-SeeMe in either point-to-point mode with another person (at which point you type in their address) or broadcast mode with a CU-SeeMe reflector.

An international K-12 education project, the Global Schoolhouse Project, uses CU-SeeMe to join students around the world. Several science museums around the country have CU-SeeMe displays, including the San Francisco Exploratorium.

Home Page: <http://cu-seeme.cornell.edu/Welcome.html>.

See Also

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IP Address; ISDN; MacTCP; URL; World Wide Web

Customizing

One of the benefits of the Macintosh is the ease with which you can customize your **system**. The system provides a number of built-in options for customizing your Macintosh, such as the following:

- Capability to choose a desktop pattern
- Capability to choose the default font for your file and folder names
- Capability to choose color for your window title bars
- Capability to change keyboard and mouse sensitivity
- Capability to choose from many different views for your folders and files
- Capability to choose variety of alert sounds

Besides the customization the Mac **operating system** offers, you also can choose from a host of third-party add-ons to customize your computer to fit your personal tastes.

One of the most popular add-ons for customizing your Mac is the **screen saver**. Berkeley System's AfterDark screen savers probably are the best known. From Flying Toasters to Simpsons cartoons, from StarTrek to Disney

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animations, AfterDark offers a wide choice for most every taste.

Another popular area for customization is your desktop pattern. Apple includes a limited selection within its **Desktop Patterns Control Panel**, but some of the more ambitious desktop patterns come from third-party tools such as WallPaper and Chameleon. In addition, growing collection of alert sounds are sold commercially (such as Kaboom) and posted as freebies on online services and the Internet.

Many of the customization tools are **utilities** that you can add to your system such as the following:

- Calendars
- Personal information managers (PIMs)
- **Font** management tools
- Third-party commercial and **shareware** utilities

See Also

Alert Sounds; Default Font; Desktop Patterns Control Panel; Folder; Operating System; Screen Savers; System; Title Bars; Utilities

Cut Command

This command, found on the **Edit** menu, enables you to remove an item from your document and temporarily store that item in the **Clipboard**, so you can

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paste that item in a different location. You can cut text or graphics. An ideal use of the Cut command (⌘-X) is moving a line of text from one paragraph to another by **highlighting** the line of text you want to move and selecting Cut from the Edit menu. The selected line of text disappears from the paragraph. You may now place your cursor at the location where you want to insert that line of text, and choose **Paste** (⌘-V) from the Edit menu. The line of text you cut now appears at your insertion point. The Clipboard stores your cut item until another item is copied or cut into the Clipboard, forcing the previous item to be overridden.

To cut a text item, follow these steps:

1. Select the item you want to cut.
2. Select Cut from the Edit menu (⌘-X).
3. Normally, the Cut command is followed by the Paste command (⌘-V), which enables you to paste the information into another location.

To cut a graphic item, follow these steps:

1. Select the graphic you want to cut.
2. Select Cut from the Edit menu.
3. Normally, the Cut command is followed by the Paste command (⌘-V), which enables you to paste the graphic into another location or into

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another document. If you would like to save a permanent copy of the text, or graphic, you can paste the cut item into the Scrapbook DA.

See Also

Clipboard; Copy Command; Edit Menu; Highlighting; Paste

Cut (Keyboard Shortcut)

To **Cut** an item and place it into the **Clipboard** , press ⌘-X. The Cut item will disappear, but a copy of it will remain in the Clipboard. You can paste this item for as long as it remains on the Clipboard.

To cut an item, follow these steps:

1. Select an item or highlight text you want to cut.
2. Press ⌘-X to delete the item while at the same time making a copy of the item in the Clipboard.

See Also

Clipboard; Copy; Keyboard Shortcuts; Paste

Cut (Video Editing)

In video editing, a cut is simply the point at which one clip changes to another (from original film editing terminology, where the film was actually

C

cut).

A cut is considered a very simple editing procedure, and you can cut a movie (simply copy and paste the clips) in a program such as Apple's **MoviePlayer** .

See Also

Jump Cut; L-Cut; Transition

Cyberdog

Code name assigned to Apple Computer's suite of **client** software tools for navigating and communicating on the **Internet** .

Based on Apple's OpenDoc component software technology, Cyberdog treats **URLs** and other Internet contents as objects that can be dragged and dropped from Cyberdog's **Web browser** to another Cyberdog application or to the Finder.

Cyberdog is comprised of components that provide integrated access to **Usenet newsgroups** , **email** , the **World Wide Web** , and other **Internet services** .

One exciting feature offered by Cyberdog is the ability to embed Cyberdog viewers with live Internet connections in OpenDoc documents. When you open the document, the viewer and live data appear in it.

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Cyberdog's components include:

- A notebook and a log to store URLs using drag-and-drop technology (similar to **Bookmarks** or Favorites features in other browsers).
- Email and Newsgroup clients.
- Integrated Data Viewers, which display photos, movies in their own viewing window within the Cyberdog browser window.
- A Web browser, shown in the following figure.

The beta version of Cyberdog's Web browser does not run as fast as other Web clients such as **Netscape Navigator**. Cyberdog also requires a good deal of memory: 8MB of RAM with virtual memory turned on, or 16MB of RAM if virtual memory is not being used.

Home Page: <http://cyberdog.apple.com/>.

See Also

Client; Internet; Internet Services; Newsgroups; URL; Usenet; Web Browser; World Wide Web

CyberSound FX

A set of plug-in audio filters for Adobe **Premiere** that support both 8- and 16-bit audio. Premiere's audio-filtering features are currently very limited, making a package like CyberSound FX almost a necessity.

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CyberSound FX is a collection of 15 audio filters. These filters fall into five broad categories: sound manipulation, tone equalization, ambiance (reverb and echo), dynamics (compression), and special effects (flange and chorus).

To apply a filter, select the audio track in the Construction window and open the Filters dialog box. Choose the CyberSound FX filter and set the parameters you want to use. Unfortunately, you can't preview the effect of the filter; the only way to hear what you have done is to make the movie and listen to it.

InVision Interactive

Price: \$129

Phone: (415) 812-7380

Web: <http://www.cybersound.com>

See Also

Premiere, QuickTime

Cypher, the

EPG Multimedia's serial The Cypher runs in the CD-ROM periodical Launch Magazine, which focuses on Popular Culture, music and fashion news. The Cypher is a continuing mystery that spans a thousand years. In the different installments, you rummage through the lives of the characters, read their journals and manuscripts, and even root through their chambers to solve puzzles that allow you to gradually piece together the solution to the mystery. Currently, EPG is working on putting together a CD with the entire run of

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The Cypher that will allow much more freedom of movement through the story than the segmented serial in Launch (see the following figure).

Paul Gregutt, one third of EPG, claims that The Cypher is an attempt to “put the story back in” computer entertainment. The puzzles help keep a game feel, but The Cypher is more a descendent of Interactive Fiction than puzzle or adventure games, much in the manner of The Residents’ Bad Day on the Midway and The Dark Eye, both from Inscape. You can also check out the first few chapters of The Cypher at the Launch World Wide Web site at <http://www.2Launch.com/cypehr/cypher.html>.

See Also

Adventure Games; Dark Eye, the; Hypertext Fiction; Non-Linear Storytelling; Residents Bad Day on the Midway, the