Q

QC

QC is a System Extension/Control Panel developed by Onyx Technologies that provides programmers with a suite of stress-testing and memory **debugging** tools.

The most common errors Macintosh programmers make are memory related. These frequently involve misusing **handle**s and **pointer**s, or failing to check whether or not a **Toolbox** call returned an error code. Memory errors are often difficult to catch, because symptoms appear long after the error has occurred at points seemingly unrelated to the real cause of the problem. Also, memory errors occur sporadically, as a result of a number of other factors, or they may cause the machine to freeze, making traditional debugging techniques useless.

QC makes the debugging job much easier by catching most memory errors as soon as they happen. At the very least, it can make sporadic errors reproducible, which is often all it takes to find the cause.

One of the most helpful features of QC is that it can be turned on and off on an application-by-application basis. That way, only errors in the program you're debugging are captured; other applications run normally. Using the QC Control Panel (see following figure), you also can specify which test you would like to perform for each application. Any changes you make in the Control Panel take effect immediately.

The suite of tests QC performs is exhaustive. It checks for attempts to store

information at memory location zero, reasonable memory allocations, use of invalid handles and pointers, block bounds checking (writing beyond the end of a block of memory), and many others. QC tests applications in a worst-case position by scrambling and purging the application's heap at every memory allocation.

When QC does find an error, it reports the error by breaking into a low-level debugger or making a sound. When debugging with the Metrowerks **CodeWarrior** debugger, QC notifies the debugger of the error, so that it can flag the offending source code instruction.

QC supports all Macs running System 7 or higher. A demonstration version is included on the CD-ROM accompanying this book.

QC is available from Onyx Technologies:

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Q

QTVR Player

An application that players **QuickTime VR** movies. Available from Apple's Web site (http://www.apple.com) in both Macintosh and Windows versions. It can be used as a **helper application** with a **World Wide Web browser** .

See Also
Make QTVR Object; Make QTVR Panorama; QuickTime VR

QUED/M

QUED/M (QUality EDitor with Macros) is a programmer's **editor** from Nisus Software. QUED/M is an old-timer among Macintosh editors. Its predecessor QUED was one of the first editors available for the Mac. The current version is anything but out of date and sports a number of very nice features.

One of QUED/M's best features is its ability to *fold* text out of view. Folding is akin to viewing source code as an outline rather than all at one level. Like folders in the Finder's list views, you can open or close (fold or unfold) sections of code to hide or show more detail. Folding is especially handy for hiding the details of loops and if-then-else constructs to get a better view of the overall flow of a section of code.

In the following figure, the section of code marked with a black bar along the margin has been marked for folding. Double-clicking the bar hides all but the first line of this code from view. QUED/M also supports window

splitting, which enables two sections of a file to be viewed and edited at the same time.

QUED/M can display a view of a set of files using its “Catalog” window. This window works much like a standard “open file” dialog box, except that it can be left open at all times.

As its name implies, QUED/M provides a comprehensive macro language for manipulating files, although it has only limited support for **AppleScript** . It provides syntax coloring of **C**/**C++** keywords and has excellent search-and-replace capability. QUED/M also has a feature that can save a lot of time and anguish: multiple undos.

QUED/M is published by Nisus Software:

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See Also
C; C++; Editor

Q

Quest Games

See
Adventure Games, Non-Linear Storytelling; Role-Playing Games

QuickCorrect

See
AutoCorrect

QuickDraw 3D

System software that applications can use to display 3D models. QuickDraw 3D is an **Extension** that must be installed in the System Folder, and currently only runs on the Power Macintosh.

Displaying a 3D object in a non-3D modeling and rendering package has previously required copying and pasting an image into that application (for example, a word processing document). The idea behind QuickDraw 3D is that the user could copy and paste the information describing the 3D model, and QuickDraw 3D would display the model in the word processing document. Not only would it render the object in the window, but the user can click and drag the model to view it from different angles. QuickDraw 3D provides the rendering engine, the user interface, and the file format (**3DMF**) used to

transport the information, so that the developer doesn't have to do much to add this capability to their application.

Some 3D applications have already added support for QuickDraw 3D, primarily because it's a fast rendering engine. QuickDraw 3D produces reasonable quality images, but they don't match the quality of **ray tracing** . Hardware developers are already offering QuickDraw 3D acceleration cards that improve the performance of QuickDraw 3D.

See Also
3D; Rendering

QuickDraw 3D Acceleration Card

A **QuickDraw 3D** accelerator takes over the rasterization process, freeing the CPU of this task. There currently are a few boards available that are designed to help improve QuickDraw performance, but in most cases their performance is less than impressive, particularly given their prices. Also, a QuickDraw 3D accelerator might not even improve the performance of the work that you are doing. If you want to view QuickDraw 3D models or use a **VRML** browser that supports QuickDraw 3D, then an accelerator probably will be useful. If you are working with 3D modeling programs, however, remember that QuickDraw 3D does not replace **Phong** or **ray tracing** , and a QuickDraw 3D accelerator does not accelerate these tasks. An Accelerator provides faster, fairly realistic previews, but you still have to revert to

wireframe for the fastest response.

- **Apple's QuickDraw 3D Accelerator** ($400; (408) 996-1010) This card is priced competitively and offers very good performance. It produces good-looking images and supports transparency, constructive solid geometry (CSG), and alpha channels. It does not connect to an external monitor, unlike other boards, but can accelerate QuickDraw 3D renderings to multiple monitors on the same machine.
- **Matrox MGA Millenium** ($649; (514) 685-2630) An accelerator and graphics board in one (hence the higher price compared to the Apple), this board provides moderate speed improvements. Image quality is not as good as nonaccelerated images, and the board does not support texture mapping. Buy this board primarily for the graphics support.

See Also
QuickDraw 3D; Rendering

QuickDraw GX

Debuting as part of System 7.5, QuickDraw GX is an extension to the Mac's printing and display software. It includes a new **font format** and changes in printing, color matching, and document portability.

Desktop printing is a handy feature of QuickDraw GX; rather than using the

Chooser and PrintMonitor, users can print by dragging and dropping documents onto printer icons, and they can manage print jobs by double-clicking on the icons to see what's being printed on each printer.

Users can create portable digital documents that can be viewed and printed on any other Mac with QuickDraw GX, even without the original fonts and application.

GX fonts contain more information than the previous standard font formats, PostScript and **TrueType**, so that they can have many more special and alternative characters, they can contain much more **kerning** and **hinting** information, and they can be printed right to left, as is customary for some foreign languages.

GX doesn't make **PostScript** and **TrueType** fonts obsolete, but they have to be "enabled" using an included utility program. Once enabled, they can be used like GX fonts, but they don't contain the special features of the latter.

See Also
Font Formats; Fonts; GX fonts; PostScript; QuickDraw; TrueType

QuickDraw GX Extension

This extension is a technology that adds enhanced graphics and type capabilities to the Mac and includes:

- The capability to use specially designed GX format fonts that enable

automatic kerning and enhanced typographic control.

- The **ColorSync** color matching profiles to provide consistent color between the monitor's display and color output device.
- The capability to easily incorporate foreign language type and foreign type layout conventions.
- A greatly enhanced printing architecture, and many other high-end features.

See Also
ColorSync; QuickDraw

QuickDraw Laser Printing Technology

See
Printing, QuickDraw Laser, Printing Technology, Lasers

Quicken

Quicken is a personal financial management software from Intuit. The current releases, Quicken 6 (on disk) and Quicken Deluxe 6 (on CD-ROM), are PowerMac native, and will run on any Mac with System 7 and a 68020 or better processor.

Q

To those of us who find most financial matters incomprehensible, Quicken is a breath of fresh air. It's easy to use, and it makes sense. When you first open the program, you'll see something that looks like a check register. The register is what Quicken uses to keep track of your balance and the money that comes and goes from your account. Payments, deposits, ATM transactions, interest, and fees will all be entered here, either by you, or automatically if your bank supports online banking. You'll begin by entering your starting balance in the register. Then, when you start writing checks, the program will automatically transfer the information from the check into the register, do the necessary arithmetic, and show you your new balance. Because computers don't generally make mistakes in math, you can be sure that your balance reflects the numbers you've put in.

Most of us have to live within a budget these days, and Quicken helps make it easier—not by adding extra money in the "fun" categories, although that would be nice, but by showing you where the money goes each month, and helping you monitor your expenses. You can decide how much money you're willing to spend in each category, or in the case of fixed expenses, how much you must spend. Then, tell Quicken what time period the expense covers. Enter it by using the pop-up menu shown in the figure below. Quicken will calculate the portion of the expense that's covered in the monthly budget and insert the appropriate budget figures.

When you need to see whether you can afford to rent a movie, buy a new shirt, or take a vacation, all you need to do is to look at the budget monitor. If your inflow is greater than your outflow, you've got a green light to go

ahead. Otherwise, you know you need to cut back. For more detailed answers, use the reports function to ask Quicken to give you exactly the data you want. If yours is a common question like, “How much did I spend last month on groceries?” you can use the EasyAnswers function. Click on the question and the category and time period you’re inquiring about. Quicken will instantly create a report with the answers.

Quicken can track your investments, too. If you have a modem attached to your Mac, it will download current stock quotes. Quicken Deluxe includes a database of 4,400 mutual fund rankings from Morningstar, the leading source of mutual fund information and performance rankings. Search the database according to your goals: look for low-risk funds, high-yield funds, funds with five stars, funds with a better than average five year or ten year performance record, or any combination of characteristics.

Online banking lets you use your modem to download current information from your checking, savings, and credit-card accounts at any participating bank directly into your Quicken file. Banks and credit card companies currently online include American Express, Bank of Boston, Chase Manhattan, CitiBank, First Chicago, First Interstate, Sanwa Bank California, Union Bank, and Wells Fargo, along with about fifty others as of this writing. If you've already recorded checks in your Quicken register, online banking will compare your data with the bank's, warn you about any discrepancies, and mark checks as having cleared; otherwise, the bank will fill out your register for you over the modem.

Quicken Deluxe also includes a convenient Home Inventory database, in which you can keep a list of your furniture, art, appliances, and other possessions, for insurance purposes and as part of your net worth. The CD-ROM includes tips from Quicken users and personalized financial advice from financial experts Marshall Loeb and Jane Bryant Quinn. The only drawback to this program is that it doesn't include a printed manual. You can either read the CD-ROM version on-screen, or pay an extra $15 for a printed one.

Reconciling bank statements against their accounts is a necessary chore, but it's seldom fun. **Quicken** users may find the task a pleasure after doing it the old fashioned way. (Other financial management programs use a very similar method.) Simply enter the new balance or ending balance from your statement in the reconciliation window and check to make sure that the previous balance or beginning balance that Quicken has entered matches the amount on the statement. Add any interest payments or charges.

Click OK and then check off the transactions that are shown on the statement from those on the list Quicken displays. Don't mark checks that haven't cleared the bank yet. As you check off the items that have cleared, Quicken subtracts them. The "Difference This Statement" amount shown in the figure will diminish as you check off the cleared checks. When it reaches zero, the account is balanced.

If the account doesn't balance, you need to compare the check amounts actually debited against those you entered. Banks can make coding mistakes, and they may have taken more, or less, of your money than you intended

them to do. Quicken will offer to make an adjusting entry to compensate for an unbalanced account. If you accept it, the Quicken balance will be correctly synchronized with the bank's balance. Be sure you can identify the mistake before you let Quicken fix it. Otherwise, it will compound over several months and become harder to locate.

See Also
Finance Programs

QuickFLIX!

This low-end QuickTime video editing tool is based on **VideoFusion** , an editing and special effects package that is available from Radius. QuickFLIX! features the same interface and similar features as VideoFusion, but with fewer transitions and filter effects. The software digitizes video, providing you have hardware capable of digitizing (if you don't have an AV Macintosh you will need a video digitizing board).

Clips are assembled and transitions applied in the Storyboard window. Clips can be edited in the Time View, while the Player Window plays back the final movie. For the home and occasional user it is all that is needed.

See Also
QuickTime; VideoFusion

Q

QuicKeys

QuicKeys is a commercial macro **scripting** utility from CE Software. It enables you to create a macro for any keystroke, mouse movement, or combination of both to carry out long, boring, or repetitive tasks with a keystroke.

To create a macro, you activate QuicKeys and it records your keystrokes and mouse movement. When you've done the task you want recorded, you stop the recording process, and the macro application asks you to which keystroke combination do you want to assign the recorded tasks. There are hundreds of uses for macros, and their aim is to automate boring, tedious, or repetitive tasks for you at the press of a key. Besides the advantage of not having to enter each step for a repetitive task, QuicKeys macros complete tasks faster than you could manually.

QuicKeys enables you to set up a specific set of macros for each application, including the Finder and a separate set of macros that are global (such as a QuicKeys macro that types in the dates anytime it's invoked, regardless of which program you're using). QuicKeys enables you to create simple point and click-type macros, real-time macros (where it records your every computer movement, including pauses and mistakes), or sequences which can be very complex. After you have created a macro in QuicKeys, you can go back and edit the macro to update it or fix any mistakes you may have made while creating the original macro.

Q

Unlike system-level scripting systems, such as **AppleScript** and **Frontier**, QuicKeys is less centered on integrating applications and creating complex scripts than it is with simplifying everyday tasks. Using QuicKeys, you can create a simple macro that perfoms a task and assign that macro to a keystroke. This functionality is great for standardizing command keys across all applications. Rather than living with the command keys written into an application, QuicKeys enables you to expand or modify that functionality to suit your own needs.

As its name implies, QuicKeys is best at assigning functions to keystrokes. This includes the ability to launch an application (or several), choose a printer, switch applications, or type a long block of text, all with a single key press. This last feature is especially helpful for commonly used words and phrases. If you find yourself typing your address several times a day, you can create a QuicKey macro to do it for you at the press of a key.

QuicKeys can record a sequence of user events and play them back as a macro. Unlike AppleScript, QuicKeys records the exact string of events, including pauses, mouse movement and clicks, and keystrokes. If, for example, you close a window by clicking its close box while recording, AppleScript records that you closed the window, whereas QuicKeys records that you clicked the mouse at a certain location.

Because of its different focus, QuicKeys is not in direct competition with AppleScript or Frontier. In fact, one of QuicKey's best features is its ability to trigger a script written in AppleScript or Frontier at the press of a key.

Q

QuicKeys works with all applications, not just those written with special support for scripting.

QuicKeys is published by CE Software:

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Web: http://www.cesoft.com/

See Also
AppleScript; Finder; Frontier; Macros; Scripting

Quadra Monitors Extension

This extension is used by the **Monitors Control Panel** on Quadra and Centris models of Macintosh (with the exception of Quadra and Centris AV models) to describe the Quadra and Centris built-in video capabilities.

See Also
Monitors Control Panel

Q

QuarkXPress

Competing with other page layout applications such as PageMaker and FrameMaker, QuarkXPress (created by Colorado-based Quark, Inc.) has made a name for itself with its precise type controls, multiple **master pages** , and **XTension** technology, which allows users to customize XPress with add-on features sold by Quark and by third-party vendors.

XPress (also commonly called Quark) is used to format documents ranging from business cards and brochures all the way up to highly technical math and science textbooks. It's extremely popular in the magazine publishing world because of its well-designed color handling features—it was the first page layout application to be able to output color separations complete with automatic trapping. Book publishers who work on the desktop (many book composition houses still use high-end dedicated systems) like QuarkXPress because its elegant implementation of master pages and **style sheets** allow users to quickly produce large numbers of pages based on a common design.

QuarkXPress allows you to have as many as 127 master pages or master page spreads (if you're using facing pages). Items placed on a master page will also be placed on any body page to which that master page is applied, and once those items are on the body page they can be removed or altered as needed.

Each QuarkXPress document can have up to 127 paragraph style sheets per document. When applied to a paragraph (by choosing from a list of style

sheets while your cursor is in that paragraph), a style sheet changes the font, size, leading, color, and other attributes of the text in that paragraph, all at once. In its next release, version 4.0, QuarkXPress will also support character-based style sheets, which only affect the characters that are selected when the style sheet is applied. This feature, previously available only through XTensions such as FaceIt! and XStyle, is useful for bullets that need to be changed to a **dingbat** font, or when working with mathematical texts that require characters to be set in math fonts like Symbol.

Although QuarkXPress currently lacks the ability to create indexes and tables of contents and link multiple documents into a book, version 4.0, due out in 1996, is slated to contain these features.

XTensions are separate programs that only work as part of QuarkXPress. They can range from freeware XTensions that make silly sounds at every Quark function to the $7,500 book pagination XTension Autopage Pro from KyTek, Inc. The Sonar Bookends and Sonar TOC XTensions from Virginia Systems can, respectively, make indexes and tables of contents. They're installed in the same folder that holds the XPress application, and they show up as extra dialog boxes, menu items, or floating palettes. Hundreds of these add-ons are available, many of them from an XTension retailer called XChange (303-229-0620; http://www.xpsi.com/). Shareware and freeware XTensions can be found on most online services and at many ftp sites, particularly ftp://ftp.telalink.net/pub/quark and ftp.quark.com. One of the most impressive XTensions is Quark's own Immedia, set to ship this June, which will allow Quark documents to be enhanced with multimedia capabilities like

video and CD-quality sound playback, as well as built-in World Wide Web Internet links.

QuickMail

Electronic mail system by CE Software used on many Macintosh-based Local Area Networks. The version 3.5 release provides access to commercial online services and the Internet.

QuickMail's button bar and menu interface complements the Mac's own interface.

Other QuickMail 3.5 features include:

- Drag-and-drop message handling.
- A "mail log" that feature indicates whether sent messages have been read, filed, forwarded, or deleted by the recipients.
- A built-in spell checker.
- QuickConference, which enables users to have real-time conversations on their desktops.
- The ability to add emphasis to messages with stylized (bold, italic) text.

CE Software claims that almost one-third of all Mac email users choose QuickMail.

Q

Home page: http://www.cesoft.com/info/productlist.html.

See Also
Commercial Online Services; Electronic Mail; Eudora; Internet; POP3; SMTP; World Wide Web

QuickMovie

See
MovieTrilogy

QuickPan

See
Kaidan

QuickPass

See
Animaq

QuickTake 100 & 150

The QuickTake video camera was one of the first digital still cameras available

for less than $1000. The QuickTake 100 was the first release. Apple later increased the memory size and quality of the images and released it as the 150.

The QuickTake is a **range finder** camera, with fixed focus and a built-in flash. The camera is long and flat. In the front of the camera is a sliding lens cover. Be careful when you open the cover. Your natural inclination is to put a finger in the hole through which the lens appears. At the back of the camera is an LCD panel that displays how many pictures have been taken and how much memory is left. The flash can be programmed to fire automatically, always fire, or be turned off. The resolution of the pictures (640 x 480 or 320 x 240) can be chosen by pressing buttons next to the LCD display. A third button erases all images in the camera.

The shutter release is on the top of the camera, and the standard tripod mount is on the bottom. The camera is powered by four AA batteries. There is also a slot that slides back to reveal connections for an AC power supply (recommended for use while the camera is connected to the computer) and a serial port for connecting the camera to a computer.

The QuickTake is easy to use—just point and shoot. After taking a picture you must wait for several seconds while the camera stores the image. This makes it impossible to take a quick sequence of images even if you don't need to use the flash.

Like most Apple products, the QuickTake is very well designed. The software is perhaps the best part of this camera, and is better than any of the software

available with the other digital still camera currently available. As well as an application for downloading and performing simple editing to images, there is a **Control Panel** that enables you to mount the camera as though it is a disk drive.

The QuickTake saves files in its own custom format, which although efficient, takes noticeably longer to decompress than other formats, such as **JPEG**. Also, if someone doesn't have the camera, they won't be able to view the image. you could give them **QuickTake Extension** , but it is better to open the image and save it in another format.

Interestingly, Apple received assistance in developing this camera from Kodak, who then released their own low resolution digital camera, the **DC40**.

For those interested in creating low resolution QuickTime panoramic movies, **Kaidan** has released a tripod mount that works with the QuickTake.

The QuickTake camera, with the help of a special Control Panel, can appear as a disk drive on the Macintosh desktop. Simply drag the images from the QuickTake folder to the hard drive to download them from the camera.

See Also
Chinon; Digital Still Camera; Digital Video Cameras; Kodak DC40; Still Video Cameras

Q

QuickTime

QuickTime is a system **Extension** developed by Apple that adds the capability of capturing and playing **digital video** sequences on a Macintosh. Depending upon your computer you will need the QuickTime Extension, the QuickTime PowerPlug Extension (for Power Macintosh users) and the QuickTime Musical Instruments Extension. As with all Extensions, if you plan to install QuickTime, first check to see that it is not already installed in your system Folder. Also, the QuickTime Extension is usually labeled QuickTime™ with the trademark symbol, but some version have been distributed without it, resulting in multiple copies of the Extension in the System Folder.

After it is installed you still need an application to play a QuickTime movie. Apple has a utility called **MoviePlayer** that does just this and is probably the best program to use. There are some shareware and freeware utilities available as well. Check online services for these.

QuickTime makes it possible to record and play back video sequences on the computer. Playing video on a computer requires synchronizing audio and video information so that they appear to be playing together, as well as a method for dealing with the tremendous amount of information used to represent the frames in the video. A single frame of video at 24 bit depth is 640 x 480 is almost 1 megabyte. At 30 fps (frames per second), that is about 30 megabytes a minute.

Compression reduces the size of the images; however, current compression

algorithms require a lot of computing power to decompress an image. That's why, even with compression, it is usually necessary to reduce the frame size and frame rate of the video.

QuickTime movies can be created in a number of ways. Video can be digitized using a **video digitizer** . Most of the new Power Macintosh models and AV Mac's include built-in digitizing hardware capable of capturing at low frame rates and sizes (15 frames per second at 1/4 screen 320 x 240 is about the maximum).

Looking to edit QuickTime movies? If you don't want to spend any money at all, get a copy of Apple's **MoviePlayer** utility. you can cut and paste video segments together, but you can't create transitions or other dazzling effects. It's available on-line at Apple's Web site (http://www.apple.com).

For a very little money, you can get a copy of Radius's **QuickFLIX** (it's also bundled with some software and computers). QuickFLIX provides a larger collection of effects and transitions.

If you're serious about QuickTime editing you need Adobe's **Premiere** , or Strata's **VideoShop** . They provide just about all the editing tools most users need. You also can edit using Adobe's **After Effects** , but its real strength is in post processing special effects, so it's better suited as a tool to use along with an editing program. Radius's **VideoFusion** also is capable of being used as an editor. It offers some unique effects and costs less than After Effects. Strata's **MediaPaint** is an effects program also, but it actually enables you to paint on the movie!

Q

Many applications can output QuickTime sequences, including most **3D** rendering software. For special effects, morphing software, such as Gryphon's **Morph** and Avid's **Elastic Reality** , take two image or sequences and create a dynamic blend of the two as a QuickTime movie.

To capture screen activity (what's happening on the Macintosh screen) to a QuickTime movie, a utility called **CameraMan** is available from Motion Works. **Spectator** from XXXX and the shareware utility **ScreenMovie** also can accomplish this. Animation programs, such as Macromedia's **Director** and Motion Works **ProMotion** , output animation in QuickTime format.

You might also want to look at sound editing applications, such as Sound Edit and Deck (both from Macromedia), that can edit the audio in QuickTime movies with much greater control than that provided in the editing applications previously mentioned.

QuickTime has uses outside just Digital Video. QuickTime incorporates support for **MIDI** (a sound format), and a MIDI file can be opened and played using QuickTime. **CD audio** discs can be opened and played from within QuickTime. The QuickTime compressors, also called codecs (**Animation, Apple Video, Cinepak, Graphics, JPEG, Component Video and None**), can be used to compress single **PICT** images. QuickTime includes support for the **PhotoCD** image format. **QuickTime VR** makes it possible to create a virtual reality environment while QuickTime **video conferencing** provides a means to conference over phone lines.

See Also

Q

Codec; Digital Video; Key Frames; HDTV; JPEG; MIDI; PhotoCD; Video Conferencing

QuickTime Extension

This extension activates Apple's **QuickTime** technology, which enables you to play and create video movies. You still need a host application to use the technology, such as Apple's **MoviePlayer** to view a QuickTime movie, or Adobe's Premiere to create your own QuickTime movies.

See Also
MoviePlayer; QuickTime

QuickTime Musical Instruments

This extension to the **QuickTime** architecture contains a library of digital musical instrument sounds Apple has licensed for use on the Mac from Roland, a leading manufacturer of electronic musical instruments.

See Also
MIDI; QuickTime

QuickTime Power Plug Extension

Q

This **extension** contains the Power Mac native code required to use Apple's **QuickTime** 2.0 video extension on Power Macintosh models. This extension comes pre-installed on Power Macs.

See Also
Extensions; QuickTime

QuickTime VR

QuickTime VR technology makes possible a virtual reality environment using photographic quality images.

Most virtual reality environments (for example, Virtus's **WalkThrough Pro** and **VRML** viewers) use 3D models, or mathematical descriptions, to create a world that is explored by the user in real time. **3D** modeling is seriously limited by the speed of the computer. To avoid this problem, QuickTime VR uses images that have already been produced (either photographically or generated by a 3D modeling program) and stored on disk. This way the software has only to read the files and display the scene as needed, rather than calculate the scene from the mathematical models.

QuickTime VR provides very realistic simulations that require very little processing speed. Navigating in the 3D world of QuickTime VR, however, is more limited than exploring a mathematical 3D world. In a mathematically represented world, you can move to almost any position. In a QuickTime VR world, you can only go to the places where a picture was taken.

Q

QuickTime VR uses QuickTime's **compression** routines and file format to store the photographs. You must have QuickTime installed on your machine, and you must use the **QTVRPlayer** (available from Apple's World Wide Web site) to play these movies.

QuickTime VR movies are of two types—**panoramic** and **object**—and are used for very different purposes.

A **panoramic** QuickTime VR movie is created from a panoramic image of up to 360 degrees. The image is displayed in a window that shows a portion of the image stretched to appear optically correct. The user can zoom in and out of the scene and rotate the view to look in any direction. Hotspots in the image can be clicked to jump to other movies.

Creating a panoramic image . A panoramic movie can be created from a single panoramic image photographed using a panoramic camera. But these cameras are expensive. **QuickTime VR Authoring Tools Suite** , the authoring environment used to create QuickTime VR movies, includes a program that will take a sequence of images shot with a regular 35mm camera and join them together into a single panoramic image.

Object movies are very different from panoramas. These represent an object that the user can examine from any angle. These movies are made up of many images of the object. You will need some kind of rig that can hold the camera in position as the images are taken if you want to create an object movie.

Q

If you want to make QuickTime VR movies, you should purchase the QuickTime VR Authoring Tools Suite, because it provides several different tools. It's available from **APDA** for $499. Apple has made available two tools for free that will take a single panoramic image or a sequence of image and turn them into QTVR movie. They provide fewer options, but the price is right! **Make QTVR Object** makes an object movie, while **Make QTVR Panorama** creates panoramic movies. They are available on Apple's Web site.

See Also
QuickTime; VRML

QuickTime VR Authoring Tools Suite

Authoring tools for creating QuickTime VR panoramic and object movies. While you can use the free applications **Make QTVR Object** and **Make QTVR Panorama** to create these movies, only the Authoring Tool Suite includes tools for joining together multiple images into a single panoramic photograph, and for linking multiple movies together.

See Also
Make QTVR Object; Make QTVR Panorama; QuickTime VR

Q

Quit Command

Anytime you want to quit an application, you can go to the **File menu** and select Quit (⌘-Q). If you have a document open that has not been **saved,** the application asks you whether you want to **save any changes** to the document before quitting.

You'll have the option of saving the document or **canceling** the Quit command. It should be noted that quitting an application, shuts the application, whereas closing a document leaves the program up and running, but closes that document.

To quit a program, follow these steps:

1. Save any open documents.
2. Select Quit from the File menu (⌘-Q).
3. The program quits and returns you to the Finder or any other open applications.

See Also
Cancel; File Menu; Save Command