# V

## V for Victory

V for Victory from Three Sixty is a CD-ROM release of four previously released war **strategy games**. Utah Beach, featuring the Battle of Normandy, Velikiye Luki, placing you on the Russian front, Market Garden, focusing on the air battle to secure Holland's bridges and Gold-Juno-Sword are all ground-breaking games that drop you into the midst of World War II.

Although newer titles like U-Boat and Drumbeat are more visually appealing, the V for Victory titles are still worth checking out, especially if you are a World War II buff. These games are the most historically accurate of all. Other title worth playing in this genre include the World at War series, developed by Atomic Games, and distributed by Avalon Hill and the spin-off war game, Onslaught from Frontal Assaultware, featuring one of the best interfaces in war strategy games and great graphics.

***See Also***

Allied General; Chaos Overlords; Empire Deluxe; Sid Meier's Worlds; Pax Imperia; Spaceward Ho!; Strategy Games; Warcraft

## V.22bis Standard

***See***

Data Communications Standards

# V

## V.32terbo Modem Protocol

V.32terbo is a modulation protocol used by modems to determine the speed and throughput of a connection. This protocol specifies a 19,200 bps connection. The v.32terbo protocol was developed unofficially by several manufacturers as an interim acceleration of the 14,400 bps v.32bis protocol while they were awaiting the finalization of the 28,800bps v.34 protocol.

Global Village was the only major Macintosh modem manufacturer to use the v.32terbo standard in their modems. The product line that included this protocol was the "Mercury" series of products that included the PowerBook PowerPort Mercury and the external Teleport Mercury. Because few other modem manufacturers used the v.32 terbo standard, most connections made with "Mercury" modems are forced to revert to v.32bis 14,400bps speeds.

Upon the release of the v.34 standard, Global Village discontinued the Mercury series, and replaced them with the v.34 Teleport Platinum series, but provided no upgrade path.

Most other modem manufacturers skipped the v.32terbo modulation protocol, and instead opted for the speedier v.FAST 28,800 bps protocol while awaiting finalization of v.34.

Currently, the only major modem to support the v.32terbo modulation protocol is the U.S. Robotics Courier “v.everything” modem, which—as its name suggests—covers all the bases.

# V

***See Also***
Data Communications Standards; V.34 Modem Protocol; V.FAST Modem Protocol

# V.32bis Standard

***See***
Data Communications Standards

# V.34 Modem Protocol

The v.34 modulation protocol is the current "top of the line" modem speed protocol. It provides speeds of 28,800 bps and above as well as advanced abilities to sense and correct for changes in the quality of the telphone lines being used for data transmission.

The most interesting feature of v.34 is its line probing function. At the begining of each call, the calling modem transmitts a series of predifined signals which the answering modems analyzes to determine the exact characteristics of the telephone line currently in use. By understanding the various sensitivities and ability of the phone line, the modems are able to maximize throughput and reliability by chosing filters and power levels that are apppropriate for the current call.

While the v.34 standard was being developed two interim standards, v.32terbo (19,200 bps) and v.FAST (28,800 bps) were used. However, v.34 is a far

superior protocol and should be used whenever possible. Because of its advanced capabilities as well as its high speeds, you should strongly consider a v.34 modem for all new modem purchases.

***See Also***
Data Communications Standards; V.32 Modem Protocol; V.FAST Modem Protocol

# V.42 Standard

***See***
Data Communications Standards

# V.42bis Standard

***See***
Data Communications Standards

# Valis' Flo'

Valis Software's Flo' is a stand-alone program which also functions as a plug-in for Photoshop. For it to act like a plug-in, it must be running at the same time Photoshop is, so make sure you have enough memory if you make the plug-in choice. Valis is known for their high end software, and Flo adds to Valis reputation in the field of image manipulation. Flo' accepts and can

generate a number of graphics screen depths: Black and White, 4 grays, 16 Grays, 256 Grays, Thousands of Colors, and Millions of Colors.

**Interface Design** Flo' has an uncluttered interface with a large image area taking most of the screen and a narrow movable toolbox. Any operation that involves a Bezier curve shows that Flo' uses Beziers as an artist might, with an intuitive grasp for Bezier movements. Beziers in Flo' can be resized with the Control key, and repositioned with the Shift key. New points can be added simply by clicking on the bezier perimeter. With a minimum of tools, Flo' is capable of a maximum amount of graphic manipulation.

**How it Works** Flo' works with a two leveled system of closed beziers, an internal bezier whose alteration determines the extent of the warping, and an external bezier perimeter that determines how far the warping effect will influence the rest of the picture. If the internal shape overlaps the external perimeter, the warping will still stop at the edge of the perimeter, although the effect will be very exaggerated (as if seen through a fish-eye lens). Small manipulations can build the final image over a long series of applications, and multiple undo levels guarantee that you can always step back to a previous unaltered condition. You can, in fact, step back and forward through a series of Undos and Redos. Alterations can be freeform, oval and rectangular, and warping can be based upon size, alterations in shape, and both trapezoidal and slanted warping of selected areas. The only confusing part of its operation that takes a few minutes to get used to is that after a new editing screen is opened , the imported graphic has to be "placed".

# V

**Warping** The end result of a Flo' session is a high quality warping of the image to the artist's vision, with only those areas effected that were not protected by perimeter shapes. Because Undos are possible, several versions of the warped image can be saved, and even returned to after a save is initiated.

**Morphing** Flo' is not morphing software in that only one image is the target of its effects.

**Animation** Flo' has excellent animation possibilities based upon an easy to understand keyframe animation method. The animations settings control has two input areas: Frames per Second (defaulted at 30) and Fast Rendering (if checked, this will be of a somewhat lower quality than if left unchecked). Next, "Start Keyframe" is chosen, making the current frame the first keyframe. The graphic is manipulated, and "Add Keyframe" is selected. This allows you to set how many frames will be calculated from the last keyframe to this one. The same dialog has an "Animate Settings" dialog for setting the rendering size, frames per second, total number of frames, and other data. Close loop completes the process, allowing the animation to run back and forth.

**Save / Load Conventions** Pictures can be saved as PICT or TIFF files at any point in the process. Animations can be saved as PICTs, Numbered PICTs, or as a QuickTime movie.

The documentation to Flo' is clear and direct, and tutorials are included to walk you through the processes involved. Flo' is an uncomplicated program

that can be used to produce warped images and warping movies. You can learn to master it in hours if you have had any experience with computer graphics, and in days if you haven't.

# Variable

In programming, a variable is a symbolic representation of a piece of data relevant to a program. Programming variables are much like variables used in algebraic equations: They can represent any one of a range of values. Depending on the **programming language** , each variable may be assigned a variable *type* that indicates what range of values it can hold. A programmer, for example, may define an integer variable that can only hold integer numbers. Attempting to put a different kind of data (say, a string of characters) into that variable causes an error.

Typically, each variable used by a program represents a location in the computers' memory that contains the data. Although the variable name stays the same, the value of the variable (the actual data stored in memory) may change as the program executes.

***See Also***
Array; Constant; Programming; Programming Language

# V

## Vector Image

describes a graphic created in a drawing software application characterized by distinct shapes and lines filled with colors or patterns. The printing resolution of a vector image is determined by the output device. Vector images are also known as object-oriented graphics.

***See Also***
Prepress; Printing Methods, Digital; Printing Methods, Traditional

## Veronica

A Veronica **server** provides a single interface that allows searching through large numbers of **Gopher** sites on the Internet so that users can locate specific files quickly and easily.

Veronica, which was developed at the University of Nevada, works by periodically searching the contents of Gopher sites around the world and recording the available data. It then puts these files listings into a database and provides a simple way of searching it.

Only four to six Veronica sites exist around the world. Three in the U.S. are at NYSERNet, University of Texas, Dallas, and SCS Nevada.

You can usually find a Veronica menu within a Gopher directory entitled Other Gopher and Information Servers. When you perform a Veronica

search, you either look for Gopher directories, which contain files, or you look for everything available via Gopher, which includes the files and information like **WAIS** sources as well.

***See Also***
Gopher; Internet Starter Kit; WAIS

# V.FAST Modem Protocol

The v.fast protocol, also known as v.fast Class or v.FC, was developed by several modem manufactures who were anxious to provide the additional speed possible with the forthcoming v.34 protocol. This protocol was a "best guess" of what the final standard would be. Manufacturers such as Supra and U.S. Robotics produced products using the “v.fast” protocol. It provides 28,800 bps performance, but lacks the advanced error detection and correction capabilities of the final v.34 specification.

Unfortunately, because v.fast is not an official standard, each vendor set his own exact specifications, which makes the v.fast standard particularly unreliable when using between modems from different vendors.

Fortunately, once the v.34 standard was announced, manufacturers quickly added this protocol to their modem’s feature sets, and provided low-cost upgrades to existing v.fast units. Today v.fast is no longer featured in modems, but is provided for backward compatibility with earlier models that were not upgraded to v.34.

# V

***See Also***
Data Communications Standards; V.32 Modem Protocol; V.34 Modem Protocol

# V.FC, V.FastClass

***See***
Modems Standards and Speeds

# VGA Monitors, Using

Just as multisync monitors have migrated from PC machines to Mac display capabilities, so have VGA and Super VGA (SVGA) monitors—once made exclusively for PC and workstation computers. Many Mac models can use VGA and SVGA monitors. This includes all Power Macintoshes (including the Performa Power Macs), Quadras and Centrises, the Performa 400 and 600 series, LCs, and PowerBook models with a monitor port.

If the VGA or SVGA monitor outputs the same picture resolution ratio that your Mac's on-board display circuitry or NuBus board is capable of generating, all you need is a simple cable adapter to use VGA and SVGA monitors on the Macintosh.

Because there many more PCs than Macs, VGA and SVGA vendors sell large quantities. You can often get good quality for less money by going to a PC vendor. However you will also find cheap quality for less money. You'll find

that the quality of cheaper PC monitors is not as high as with monitors from Apple, which usually meet high quality standards. Buying a monitor sight unseen is certainly a gamble, so it's a good idea to get a look at some of the monitors you're considering at computer stores.

You'll sometimes also find that tech support personnel at these PC companies will know little if anything about the Mac. *MacUser* magazine once reported that these companies often blame problems on the Apple video driver and the Mac adapter, which, in fact, are almost never the source of problems.

The best places to find VGA and SVGA monitors are PC magazines. The tabloid-sized *Computer Shopper* is as thick as a telephone book and can be found at most large newsstands. Shopper is filled with hundreds of dealers hawking PC peripherals. These dealers can tell you which cable-end adapter you need for their particular VGA/SVGA model so that you can run it from your Macintosh. Other good sources are PC Computing, PC World, and free regional publications such as Computer Currents.

***See Also***
Multisync Monitors

# VHS

VHS is a video tape format that uses comparatively large, 1/2-inch, cassette tapes and provides comparatively low quality images—about 250 lines of resolution.

# V

This format is very popular. The equipment is inexpensive, and for small sized digital video (less than 240 x 180 pixels), the resolution is acceptable. Because it uses a **composite** signal, the image quality (richness of color, clarity) is not as good as S-VHS and Hi-8 formats.

***See Also***
8mm; Hi8; QuickTime; S-VHS; Video Digitizing

# Video Digitizing

Turning a video image into a digital one can be surprisingly easy, provided you have the right equipment. This process is called digitizing because an analog signal is turned into a digital image. The most important piece of equipment you need to do this is video digitizing hardware. This equipment turns the NTSC analog signal into a sequence of digital pictures. Fortunately, many Macintosh models now come with that equipment built-in including the AV Macintosh models and the 7500, 7600, and 8500 model Power Macs.

With one of these computers, all you need is to connect a camcorder or VCR to the video and audio inputs, launch a video capture applications, such as Adobe Photoshop, Strata's VideoShop, or Radius' QuickFLIX or VideoFusion, record the video as a QuickTime movie.

Results are determined by several factors. Most importantly, realize that the compression of the images takes time; the larger the image the more time. Also, the faster the computer’s processor, the larger the frame and the frame

rate of the video you will be able to capture.

The 68K AV Macintosh can capture a 320 x 240 clip at a maximum of approximately 10 frames per second, whereas the NuBus Power Macintosh models can reach up to 20 frames per second. The fastest PCI Power Mac's can reach 30 frames per second. None of these machines can capture 640 x 480 at 30 frames per second (the equivalent of NTSC video for those wanting to capture, edit, then record to videotape) without some additional hardware compression acceleration, such as the Radius VideoVision Studio board, or the Truevision Targa 1000, or products from Data Translation or Avid.

Other factors that affect the performance you obtain during digitizing are

- The speed of the hard drive. A **RAID** drive provides best performance, but at a price. An **AV** drive can eliminate **dropped frames** (missing a frame during the digitization process) caused by thermal calibration. Also, all drives should be optimized before recording.
- Optimize your system software. Turn off **Virtual Memory** , disable all unnecessary Extensions (don't turn off QuickTime!), and turn off the **AppleTalk** network. This software can cause interrupts in the system, which result in dropped frames. Note: Some QuickTime recording software will prompt you to turn the network off.
- Usually, the None compressor has in best results, but the Component Video (YUV) compressor can produce good results.
- The capture bit depth must be at 16- or 24-bits when capturing video.

If you must convert to a lower bit depth, capture at a higher setting and then perform the conversion during **recompression** .

- Set the black level (this is the point at which black appears to be black). It might seem odd, but if it's not done correctly, the video can appear murky because the blacks are actually dark gray. Also, adjusting the brightness and contrast may result in a better image. Although most software editing programs enable you to adjust brightness and contrast, you will get much better results if you do this when capturing the video.
- Use a frame rate that is evenly divisible into the frame rate of the original signal. NTSC has a frame rate of 30 frames per second, so use 30, 15 or 10 if possible.
- If you are recording from videotape, there will usually a band across the bottom of the image; crop this during recording.
- The quality of the video itself plays a major factor in the quality of your final results This may not be so obvious when capturing with the None compressor, but is the most evident when you recompress the video using one of the other video compressors.
- Better quality equipment (**Hi8**, **SuperVHS** ) produce much better results than **8mm** and **VHS**. Using S-Video out (if you digitizer supports it) results in a better image. A well lit scene can make a dramatic difference, no matter what kind of equipment you use.

***See Also***
Compression; QuickTime

# Video Games

***See***
Entertainment

# Video on the Internet

Many sites on the Web serve video files. Most are in **QuickTime** format, which is native to the Mac, but you might also find files in MPEG format.

QuickTime movies can be played with the QuickTime extension and Movie Player applications included with System 7.1 and later operating systems. (Simple Player, also by Apple and with controls identical to Movie Player's has also been widely distributed.) A QuickTime plug-in for Netscape Navigator was still being eagerly awaited as this was written.)

Apple's QuickTime VR Player is an exciting Internet application that plays both regular QuickTime movies and VR movies. VR moves are *visual representations* of scenes where in you can pan around a full 360 degrees by clicking and dragging.

MPEG videos downloaded from the Web can be played with the application

Sparkle, which also plays QuickTime clips.

***See Also***
Animation on the Internet; Multimedia on the Internet; Sound on the Internet

# VideoFusion

QuickTime editing and effects software developed by VideoFusion Inc. and now published by Radius. Its collection of effects serve to complement the ones available in programs, such as Adobe's **Premiere** and Strata's **VideoShop**. In this respect, VideoFusion competes with Adobe's **After Effects**, which also provides a large number of effects (but at twice the price). After Effects offers high-end features, such as **SMPTE** support, and enables you to build effects using multiple layers of images and video. VideoFusion requires that you create an intermediate clip to apply an effect to separate clips.

VideoFusion uses a novel method for creating movies. First, QuickTime clips are pasted into the Storyboard Window. Then, when VideoFusion assembles the final movie, it starts at the top left clip in the Storyboard and adds each clip (left to right) across the Storyboard.

You can use the Storyboard to arbitrarily arrange clips; the first three clips could appear in row one, whereas the next two clips appear in row two. When it assembles the final movie, VideoFusion simply skips empty cells.

# V

The Storyboard displays the first frame of a clip. If you double click it, however, VideoFusion will play the whole clip. Also, a Time View window displays the individual frames of the movie clips.

Transitions are applied by selecting two adjacent clips in the Storyboard and then choosing Transition from the Effects menu. The length of the transition is adjusted using the time slider, and then previewed in a Preview window. This technique more closely resembles the editing technique used in VideoShop rather than Premiere. Your preferred editing method will most likely depend upon previous editing experience. Those who have used traditional video editing equipment will probably prefer Premiere's interface, whereas those with a graphics background might find VideoFusion or VideoShop easier to understand.

After you select two clips in the Storyboard, you can layer one clip on top of another using the Layer command. Note that one clip has to be made smaller than the other for you to see anything other than the clip on top!

VideoFusion can capture video if your computer supports video digitizing (such as an **AV Macintosh** , or has a **digitizing board** installed.) The program also support Avid's **Open Media Framework Standard** for transferring files between different computer platforms.

Effects include; resize and crop, blend, Chroma key, composite, mix, replace, extract channels, threshold, posterize, mosaic, warp, morph, and over one hundred fades, wipes, and dissolves. Clip speed and direction also can be adjusted.

# V

## VideoFusion, Inc.

Original developer and publisher of the QuickTime editing programs VideoFusion and QuickFLIX!. This software is published by Radius.

***See Also***
VideoFusion; QuickFLIX!

## VideoShop

VideoShop is a **QuickTime** movie editor designed for general purpose editing tasks. Originally developed by Diva, which was bought by Avid, the product is now owned by Strata, developers of 3D software.

VideoShop, like its competitor Adobe **Premiere** , edits QuickTime movies. Like Premiere, VideoShop provides many transitions and effects, but the interface is very different. Whereas Premier provides an interface that should appeal to those with video editing background (complete with "A" and "B" tracks), VideoShop was designed for the new video editor. Clips can be edited together in a single track. Simply drag one clip and then another into the document. To add a transition, move the cursor over the joining point of the two clips. The cursor changes to indicate that a transition can be applied. Clicking and dragging in either direction VideoShop highlights an equal amount of both clips (this is the region over which the transition will be applied). A transition effect is then chosen. VideoShop provides an easier to use and

grasp interface for applying transitions, but it is more limited. You cannot create **L-Cuts** using this technique.

VideoShop enables you to add additional video tracks to a movie. Rather than use these to create transition effects, you can use them to overlay one movie on top of another. As long as the first track is smaller in frame size from the second, you can see the second track behind the first one. Click and drag to arrange the location of the first track in the preview window. This is much easier than in Premiere.

VideoShop has added **EDL** (Edit Decision List) support and other high-end features, but Adobe Premiere still beats VideoShop for share number of features. VideoShop, however, is priced lower than Premiere.

***See Also***
Premiere; QuickTime

# VideoVision

A high-quality video digitizing and display board that adds video capabilities to non-AV Macintosh models. It can capture video to a **QuickTime** movie. The **VideoVision Studio** board adds a **JPEG** hardware compression expansion board that makes it possible to capture and playback full screen video.

Radius
Phone: (408) 541-6100

Web: http://www.radius.com/

***See Also***
QuickTime; Video Digitizing

# VideoVision Studio

A high-quality video digitizing and display board that adds video capabilities to non-AV Macintosh models. It can be used to capture video to a **QuickTime** movie. The **VideoVision Studio** board is a bundle of the VideoVision board with a **JPEG** hardware compression expansion board, making it possible to capture and playback full screen video (640 x 480 at 30 fps).

You must have the hardware compression board to view and play these movies at 30 frames per second, but Radius has released VideoVision SoftStudio, a software **codec** that enables you to open and edit VideoVision movies on equipment that doesn't have the VideoVision board installed.

The VideoVision Studio is a step up from the built-in video digitizing hardware, because it adds the JPEG hardware compression, and can output **NTSC** video. The quality, however, does not quite match the more expensive boards, such as Data Translations **Media 100** or Truevision **Targa 2000,** and audio is only 8-bit (unless you use the internal audio of an **AV Macintosh** or **Power Macintosh** ).

Radius

# V

Phone: (408) 541-6100
Web: http://www.radius.com/

***See Also***
Compression; QuickTime; Video Digitizing

## View Commands

You can select a variety of options for displaying the contents of an **active window** by making a selection from the View menu at the **desktop.** The default view for windows is **By Icon,** which displays the files and folders by their icons at full size. Besides viewing a windows contents by Icon view, you can also view the contents by **small icons,** which is helpful when you have many items in one window and want to display as many items as possible. The view by Small Icons option displays a very small version of the file icon to the left the filename. These drastically smaller icons give you more room in your window to display files.

You can also use the View command to view the contents of an active window in a list format, sorted by name, **size, kind, label**, or **creation date.** If you select Name as your view for a particular window, the contents of that window are displayed in an alphabetical list. If you choose to view a window by size, you'll see a list of the contents starting with the largest item in size first, listing down to the smallest item. If you select to show the window's contents by Kind, you'll see the contents listed by groups of similar kinds of

files by label. For example, first all applications are listed in alphabetical order, followed by all documents in alphabetical order, and then all folders alphabetically, and so on.

If you choose to view a window by Date, you'll see a listing of the contents in a list starting with the most recently modified document, to the oldest modified document in that window. The view by Date option uses the modification date, not the creation date, to determine the order in which documents are displayed. Using the View by Date option is helpful when you're looking for your most recent files to **back up** .

If you're viewing a window in a list view (by date, name, size, or kind), you'll notice that the currently selected view option's name is underlined just below the **title bar.** You can use a shortcut to switch your view to a different list view by simply clicking the desired option's name. When you click one of those names, it then becomes underlined, telling you that the window is now sorted by that option.

When you're viewing a window in a list view, notice that folders appearing in this view have a small triangle to the left of their name in the window. This triangle enables you to view the contents of the folder by clicking the triangle. The triangle faces downward and a list of the folders contents appears in the window, slightly indented from the rest of the list, to help you visually separate items in the window from items in a folder. This is called expanding the folder. If you no longer need to view the contents within the folder, you can "Collapse" the folder by again clicking the triangle.

# V

To use the View command to change how a window displays its contents, follow these steps:

1. Select a view option (By Small Icon, Icon, Name, Size, Kind, or Date) from the View menu.
2. The currently active window changes to the appropriate icon or list view, based on your selection. The amount of information that appears in a list view is determined in the Views Control Panel (found under the Apple menu in the Control Panels Folder). This lets you determine which info (size, date modified, label, and so on) is displayed, and you can also choose in which font and size the window's contents are displayed.
3. If you have selected a list view, you can switch to any other list view (Name, Size, Kind, or Date) by just clicking the name of the column header located just below the window's title bar. The currently active view option's name is underlined.

***See Also***
Active Window; Desktop; Views Control Panel

# View Control Panel

The Views Control Panel enables you to customize how you view information appearing in a **list view** in an **active window,** and which font and size

will be used to display file names. You can set the mini-icon size for viewing items to small, medium, or large, and you can choose to view or not to view various attributes about a file such as:

- Size
- Kind
- Label
- Date
- Version
- Comments

There's even an option to have the Mac calculate the total size of each folder in a list view and display the size of that folder.

Other options in this control panel include:

- Setting the **default font** and size for filenames.
- Setting file and folder icons to always snap to an invisible grid in any window with an icon view.
- Setting a staggered grid so that long filenames don't bump into each other in icon views.

To use the Views Control Panel, follow these steps:

# V

1. Select Views from the Control Panels submenu on the Apple menu (or System Folder).
2. Select your default filename font and size from the pull-down menus.
3. Click Always Snap to Grid if you want files and folders to snap to an invisible alignment grid. If you select this option, choose straight or staggered grid.
4. Select the size of mini-icons that appear in a window when viewed in a list view, by clicking the appropriate icon. Use the check boxes to select what information you want calculated and displayed in a list view.

***See Also***
Active Window; Apple Menu; Comments; Control Panel; Date; Default Font; Kind; Label; List View; Size; Version

# View Editor

***See***
Interface Builder

# View Menu

There are a number of ways to view the contents of an **active window** at

the **desktop** on the View menu at the desktop**.** The default view for a window is **by Icon**, which displays the files and folders by their icons at full size. Besides viewing a windows contents by Icon view, you can also view the contents by **small icons,** which is helpful when you have many items in one window and want to display as many items as possible. The view by Small Icons option displays a very small version of the file icon to the left the files name. These drastically smaller icons give you much more room in your window to display files.

You can also view windows in one of four list views, which include: View by Name, Size, Kind, Date (modification date), Label, and Version.

To change how the contents of a window are viewed, follow these steps:

1. Open, or make active, the window whose view you want to change.
2. Choose the viewing option you'd like from the View menu at the desktop.
3. The window changes to the view you selected. You can adjust how much information a list view displays in the **Views Control Panel.**

***See Also***
Active Window; Desktop; Views Control Panel

# View Windows By Option

# V

You can view the contents of a window by:

- Icon
- Small Icon
- Name
- Size
- Kind
- Date
- Label
- Version

These options are selected in the **Views menu:**

- View by **Icon** is the default view for a window and displays the contents of the windows using full-sized icons.
- View by **Small Icon** enables you to view a smaller version of the file's icon just to the right of the file's name as shown in the figure. You choose this option if you want an icon view but have many files in the window. By making the icons smaller, you can fit more files in the window.
- View by Name is a **list view** , rather than an icon view, and it lists the contents of the window alphabetically by name.

- View by Size is a list view that displays the contents of the window from the largest file (measured in **kilobytes** ) down to the smallest file.
- View by Kind groups the files by type and displays them in alphabetized groups. It will, for example, list all applications first, followed by documents, followed by folders.
- View by Date lists the contents of the window chronologically starting with the most recently modified or created document in the window and ending with the oldest.
- View by Label enables you to view files and folder by the labels you have marked them with from the Lables Control Panel.

To choose a View by option, follow these steps:

1. Open, or make active, the window whose view you want to change.
2. Choose the viewing option you want on the View menu at the desktop.
3. The window immediately changes to the view you have selected. You also can adjust how much information a list view is displayed in the **Views control panel.**

***See Also***

Active Window; Control Panel; Desktop; Icon; List View; Small Icons; Views Kilobyte; View Menu

# V

## ViewSonic 17GA

***See***
Monitors, Common Models

## Vikings

***See***
Sid Meier's Worlds

## Violence in Games

Few games, aside from Night Trap by Digital Pictures, which was actually pulled from the shelves of many software stores a few years ago because of public condemnation of its violence and suggestive themes, have raised public warning flags like **First-Person Perspective Shooters** . Instead of solving a puzzle or finding a door, to get to the next level in these games you usually have to kill every other living thing in sight. The games absolutely reek of violence and carnage. Some, like **Hexen: Beyond Heretic** , from GT Interactive and id, even add extra gore to the scene, mixing violence with humor. You can turn bad guys into pigs and then kill them, (sure to raise an animal rights ruckus somewhere). However, there is no denying that these fast-paced games are fun, addictive and are becoming even more popular.

# V

Most of the violence in Shooter games for the Mac doesn't even comes close to the bloody wreckage of Mortal Kombat (MK III will soon be available for the Mac from GT, opening a whole new can of moral worms). If you'd prefer to avoid spilled blood and guts, and don't want your kids exposed to meaningless violence, steer clear of these titles.

***See Also***
Descent; Doom II; First-Person Perspective Shooters; Hexen: Beyond Heretic; Marathon

# Virex

Virex is a popular commercial **virus** detection and eradication program from DataWatch (234 Ballardvale St. Wilmington, MA 01887. Phone (508) 988-9700. Street Price $69.95) designed to catch viruses before they infect your computer. Web site is http://www.datawatch.com. Virex can also perform a very thorough search of your **hard disk** and seek out any hidden viruses that may have infected your disks before you installed Virex.

Virex supports code strings that allow it to detect (but not remove) new viruses. Virex cannot scan compressed archives, but it can detect viruses in HyperCard stacks.

A nice feature of Virex is its capability to be updated on-the-fly as new viruses are detected, which enables enhanced protection without having to upgrade the entire program every time a new virus is discovered. DataWatch

generally distributes these free **patches**, or updates to the program's virus database, online as soon as they're available.

***See Also***
Anti-Virus; Disk Problems, Solving; Hard Disk; Patch; SAM; Virus

## Virtual Battlefield Environment in Flight Sims

***See***
A-10 Attack!

## Virtual FX Rack

A bundle of five **plug-ins** for **Digidesign**'s audio products, Virtual FX includes a panning utility, reverberation, chorus, and other effects.

Steinberg North America
Price: $399
Phone: (818) 993-4091
Web: http://www.midifarm.com/steinberg/virtual.htm

# V

## Virtual Memory

Introduced in **System 7**, virtual memory enables you to increase the computer's memory by using free space on your **hard disk** as **RAM**. This free space doesn't actually become RAM, but virtual memory makes the system think it is RAM, enabling the Mac to function as if it had more memory. You turn this on from the Memory Control Panel.

It sounds too good to be true, but there is a trade off. First, performance with virtual memory RAM is slower than with installed RAM, and second, the space you allot for RAM is subtracted from the amount of space you have available on your hard disk, as virtual memory sets aside that amount. If, for example, you have a Mac with 8MB of RAM and a 240MB hard disk (100MB of which is still available), you can use virtual memory to add another 50MB of RAM the next time you **restart**. However, because virtual memory is substituting hard disk space for real RAM, it must set aside the combined amount of your internal built-in RAM plus 50MB of your 100MB of free hard disk space for use as virtual memory RAM. So, in this case, virtual memory would set aside 58MB of RAM.

Virtual memory is also available only to users with a 68030 or higher processor. (Which includes SE/30s, Quadras, Power Macs, LC II, LC III, and Color Classics.)

You can toggle virtual memory on or off in the **Memory Control Panel**. There's also a **pop-up menu** with a list of mounted disks for you to choose

from as your virtual disk. You can choose how many MB of RAM you want to have (up to half the free hard disk space you have available) upon restart. And, yes, you have to restart to engage virtual memory. As a convenience, the amount of built-in RAM on your Mac and the amount of free hard drive space appears within the virtual memory portion of the Memory Control Panel just below the pop-up menu for choosing hard disks.

There is a limit to how much virtual memory RAM you can use. The limit on system 7.0 and 7.1 is 1,000MB, or one gigabyte. Apple upped the limit on System 7.5, enabling you to use up to 2GB.

To turn on virtual memory, follow these steps:

1. Choose Memory from the Control Panels folder on the Apple menu.
2. Click the "On" radio button to toggle virtual memory on.
3. Select the hard disk that you want to be your virtual disk (the hard disk whose free space will be used as RAM).
4. Use the up/down arrows to determine how much RAM you want upon restart.
5. Close the Memory Control Panel and restart your machine to activate virtual memory.

***See Also***
Hard Disk; Memory Control Panel; Pop-Up Menu; RAM; Restart; System 7

# V

## Virtual Memory, in 680x0 Macs

System 7 introduced the concept of *virtual memory* (VM) to the Macintosh world. System 7 lets you designate a portion of your storage as memory. The term *virtual* is used to refer to this pseudo-memory. Macintoshes which use the 68040 and 68030 computer chips, and those 68020 systems with an additional board called a *Paged Memory Management Unit* or PMMU can use virtual memory to augment their actual RAM.

This means that all Macintosh models except the SE, LC, Plus, Classic, or Portable can allocate disk space as VM. If you have not turned on 32-bit addressing (a new System 7 feature which allocates a larger register space to memory, thus enabling you to access more disk space as VM), most Macintoshes can only access up to 14MB of memory (6MB of VM and a maximum of 8MB of RAM). (Note that older Macintosh II models using NuBus cards can access 1MB less memory for each NuBus card they have installed.) With 32-bit addressing, Macintoshes can access virtually unlimited memory—up to a gigabyte, if you have double that much free hard disk space.

Virtual memory subtracts storage availability from your hard disk in proportion to the amount of RAM you have installed. You need enough disk storage to fulfill your virtual memory and built-in RAM requirements together, because the way VM operates is to map the logical memory to the virtual memory so that there is a one to one correspondence between the two systems. The correct tracking of sector numbers and knowledge by the system of how they are organized is very important to the continued health

of the Virtual Storage area of the disk. Using this mapping scheme, the System can easily and rapidly locate pages to swap. Therefore, if you have 5MB of RAM, you can allocate up to an additional 5MB of virtual memory, but you must have 10MB of storage available.

The Macintosh considers disk space assigned to virtual memory to be no different than RAM. Virtual memory is actually slower than RAM, because it works by switching blocks of data called “pages” back and forth between the virtual memory area, called the VM Storage on the hard disk and RAM as they are required. When the application requires a new segment the System swaps another least-used portion of the document out of RAM and replaces it with the required segment. VM can degrade the performance of your Macintosh because it does actually reside on the hard disk and thus must pass the physical barrier of the disk drive to transfer data to RAM.

This takes a certain amount of time, and increases as you try to load additional large programs after the system has reserved its share of the RAM. The time it takes VM to swap in enough portions of the program to be workable is called *thrashing* . To avoid this problem, set VM no higher than double the amount of built-in RAM you have installed and do not use it to install many large programs at one time.

Another way to improve the performance of the system is to avoid any time where the system has to unnecessarily access the disk drive, such when it refreshes screen when running VM. To avoid unneeded refreshes, hide all windows except the currently open one. Hidden windows are not refreshed

until you make them current.

To allocate virtual memory to your Macintosh follow these steps.

1. Return to the Finder and select the Control Panels from the Apple menu.
2. When the Control Panel window opens, double-click the Memory panel.
3. When the dialog box is displayed, click the On radio button next to the Virtual Memory icon (a fat Mac).
4. From the resulting pull-down menu select the drive from which you want to take the memory.
5. Select the amount of memory you want to allocate scrolling up or down using the arrow keys or by typing a number in the box. Note that you cannot allocate more virtual memory than you have RAM. The number represents the resulting total amount of RAM (disk plus built-in RAM).
6. Close the dialog box and pull down the Restart command from the Special window to restart the Macintosh and activate the memory.
7. To check how VM affected your RAM use, select the About This Macintosh from the Apple menu.

How you use your built-in memory is important, because in today's Macintosh the performance of memory directly affects the performance of

storage. If your memory is fragmented (lowering the processing power of your computer), or if you are using large amounts of VM to augment your memory (directly tying the performance of memory to that of storage), a disk crash is a major disaster. Understanding how memory works and is configured enables you to set up your Macintosh to make the most effective use of your resources.

***See Also***
Memory; RAM; Virtual Memory

# Virtual Memory, in Power Macs

The PowerPC processor works with RAM differently than the 68K processors. Rather than use a Paged-Memory-Management Unit (PMMU), the PowerPC logic board manages memory using a separate chip called the High-Speed Memory Controller. System 7.5.1 and later versions of the Mac operating system contains rewritten instructions to optimize memory management on the PowerPC. Suddenly, virtual memory is beneficial to the performance of the computer.

On the Power Mac, software is divided into chunks, called fragments and loaded into memory. The Memory Manager runs more efficiently in native PPC programs. For example, when real RAM needs to be used for something else, virtual memory software does not swap the file currently in RAM out to the hard disk, but rather lets the RAM overwrite the data and remembers the

location of the original code on the hard disk and retrieves it again from the original application file, when needed. When virtual memory is running, RAM requirements for programs is actually lower. As shown in the illustration, when you have VM running, the Get Info box displays an additional message giving a lower memory requirement.

A PPC-native program, such as Word 6.0.1, stores its executable code in the data fork of its application file. With virtual memory turned on, the Virtual Memory Manager in System 7.5.x on a Power Mac can reuse the data fork of the application as a paging file to help improve performance. Thus, only the needed portions of code get loaded into RAM, reducing the memory partition requirements of the application.

Turn on virtual memory when you are running native-mode applications. Set the virtual memory in the Memory control panel to 1MB above the amount of real RAM on your system. For example, if you have 16MB of RAM, set the virtual memory to provide a total of 17MB.

***See Also***
Get Info Command; Memory Control Panel; PMMU; Virtual Memory

# Virtus AlienSkin TextureShop

***See***
AlienSkin TextureShop

# V

## Virtus Walkthrough Pro

Virtus Corporation pioneered what Web surfers are beginning to take for granted, the ability to interact in real time with virtual 3D graphics worlds. If or until you personally experience the thrill of moving in a 3D environment as easily as if you were taking a stroll around the block that you live on, and until you actually create an interactive 3D environment on your own, you are missing the point (and certainly the future) of computer graphics and animation. The future of 3D graphics is an interactive future, a non-linear environment very different from a videotape or a QuickTime movie of a 3D scene that never varies in its playback. In an interactive 3D environment, you always have the choice of which way to turn and what to pay attention to, just as you do in the world outside of the computer.

Because of memory constraints (RAM), system speeds (MHz), storage issues (Terabyte drives) and other barriers that are being overcome slowly, the interactive virtual world we presently design and experience lacks the depth and variety to be totally believable. In twenty years, with the present rate of technological breakthroughs, that will not be the case. So appreciate the present when you look at a program like Virtus Walkthrough Pro, because the present will soon be the vintage history of the past. Explore like a pioneer on the edge of a whole new realm of interactive 3D design.

**The Interface** Virtus Walkthrough Pro has a two part interface. One side is devoted to object placement, manipulation, and the overall design of a 3D environment. The other side is the render screen, showing the 3D

perspective of the design environment, including the assigned texture maps. What makes the 3D perspective part of the interface so interesting is that you can use the mouse to interactively move around inside your creation, in real time.

**Modeling Tools** Seven primitive polygonal structures are included in the ToolBox. These cab be placed anywhere on the edit screen, usually from the top view. A special set of alteration icons allows you to sculpt these further, and any of the control points of an object can be grabbed and moved to deform the object. Another set of transformation tools allows you to change an objects height or width, or to resize it globally. The object can be made opaque, transparent, or invisible by selecting the proper icon. By gluing primitives and altered primitives together, complex structures can be modeled.

Modeling can also take place on separate layers, which helps when it comes to tweaking an objects shape. It needn't be nested on one layer, making it harder to select. In this way, Virtus Walkthrough reminds us of a high-end CAD program. DXF 2d files can be imported as a Trace layer, so that their designs can be traced into the environment. These traces cannot be made into 3D models however, and they will only show up in the view that was activated at their import time. Objects can also be sliced in the edit screen.

**Texture Mapping** The software comes with a library of textures (256 color is the format). You can import your own 256 color PICTs as textures and add them to the library selections. Placing a texture on an object is as easy as

selecting it in the edit screen and double-clicking on the texture. Backgrounds can be added by mapping a 256 color PICT file to a suitable vertical plane in the background.

**Lights** Lights can be added or deleted from the scene at any time. A 3D interactive Lights dialog allows you to spin the target plane of the lights and to adjust their color. Selecting “apply” from the menu shows the effects of the edited lights in the 3D perspective window.

**Rendering** Rendering as such doesn’t apply in this software. Objects can be rendered as shaded or fully textured, but the scene is always rendered automatically in the 3D Perspective window. Separate snapshots can be saved out, as can sequenced frames, QuickTime movies, or VRML files.

**Animation** This is where Virtus WalkThrough Pro shines. Fully interactive animated walkthroughs of the scene are possible at anytime. By turning on a Record Button, your mouse driven walkthrough is recorded. Selecting “Stop” and then play will play it back in the 3D window. This same animation is remembered for recording to a file as sequenced frames or as a movie.

**Other Special Features** This whole program and everything in it is special, from its modeling conventions to its animated walkthroughs of a scene.

**File Load/Save Conventions** Virtus Walkthrough Pro can import Trace Layers (PICT, DXF 2D, and TIFF), which are automatically converted to 256 colors. It can also export DXF 2D and 3D, Virtus Player, and VRML.

# V

## Virus

Computers follow the instructions provided by a program. A computer program that is written with the intent of causing harm is called a **virus**. The name is derived from the similarity between the way computer viruses and biological viruses infect a host system.

A computer virus comes in a variety of forms, but it is generally an application or hidden bits of code designed to damage the recipient's files or system in some way. It can be as harmless as a virus that displays a greeting or message on a certain predetermined day, or it can be as harmful as a virus that erases the contents of your hard disk or damages files.

One virus that spread throughout the Mac community was the WDEF virus, which infected a hard disk and then infected any disks that were mounted. This helped spread the virus as disks were exchanged between users. The WDEF virus attacked the desktop file, would sometimes crash certain models of Macintosh computers, and would set off your Macs "alert" sound when a disk became infected.

Computer viruses are sometimes created when one modifies an existing computer virus. Computer users can protect their data by using virus detection and prevention utility software. The most popular titles include: SAM (Symantec Antivirus for the Macintosh), Disinfectant, Virex, CP Antivirus, and Gatekeeper.

The virus situation on the Macintosh is not serious, but it must be contained

with a conscious effort on everyone's part to prevent the spread of infected files. Just a few minutes per week can keep your Macintosh, and possibly those computers you share files with, virus-free.

Why a person would create a virus and spread it throughout the computing world is a question that can be answered only by psychiatrists or therapists. Some people feel that viruses are created by disgruntled computer programmers. Other feel that the viruses are created by people who just want to see whether they can do it. It's probably a little of both. Recent studies show that approximately three new viruses are introduced each day to the computing world at large (Mac, PC, UNIX, and so on) and these studies reveal that by in large most viruses are created by teenagers.

Viruses are designed to attached themselves to other documents or applications. After a virus starts to spread, and it can be spread over **online services**, the **Internet**, or even on disks, and the person who created the virus will never see the people it affects or gain any monetary value for creating this program designed to do nothing but harm. There have even been isolated cases of viruses being slipped into shipping versions of applications that come directly from the software manufacturer.

Computers can get viruses by disks, networks, and modems. The virus usually tries to copy itself to other disks, applications, and documents. Some computer viruses can lie dormant waiting for a specified time, date (such as Friday the 13th), or even an event before they begin to cause disruption.

Luckily for us, **anti-virus** utilities have become so prevalent that most users

never come in contact with the effects of a real virus, and for that reason, some evil virus programmers try to devise new ways to create viruses that will slip past, undetected by anti-virus utilities. And then the anti-virus companies introduce a **patch** to the software that will stop the new virus in its tracks, and then the person that developed the virus comes out with another virus, and so on, and it continues in a vicious circle.

Because new viruses emerge periodically, you must be sure to use the most recent version of the antivirus utility to scan and repair your disks. Rather than upgrading to an entirely new application, some of these programs allow you to upgrade by typing in codes that will detect newfound viruses. These codes are either sent to you in the mail (if you are a registered user) or posted to bulletin board systems, such as America Online and CompuServe.

For those periods of time between scanning for viruses, the antivirus utilities also include a system extension that continually monitors your Macintosh for suspicious or virus-like activity. When a known virus is spotted, an alert message is displayed. At this point, the extension usually prompts you to run the application to remove the virus.

It is unlikely that any unknown viruses will find their way into your Macintosh computing environment. Changes in the way the operating system functions have reduced some of the risk of becoming infected with a virus, and the safety practice of using antivirus utilities has become widespread. However, because the known viruses have had many years to make their way into Macs all over the world, there is still a small chance you

may encounter one or more of these.

Even without virus detection software, you can employ a few techniques that decrease the likelihood of your Macintosh becoming infected by a virus:

- Keep your original software floppies locked at all times and install only from these disks or a locked copy of these disks.
- Make routine backups of your hard drive and lock the backup disks. Check your disks with virus detection software before each backup.
- Run all new software (commercial, shareware, and freeware) with a virus detection utility before using it the first time.
- Look for strange activity on your computer (unusual messages, font display problems, increased disk activity) that might be the symptom of a virus.

Applications that intentionally do damage while masquerading as something entertaining or useful are called **trojan horses**. Trojan horses do not replicate. Viruses that do nothing other than replicate (into as many locations as possible) are called **worms**.

***See Also***

ANTI Virus; CDEF Virus; CP Antivirus; CODE 1 Virus; CODE 352 Virus; Disinfectant; Frankie Virus; Gatekeeper; INIT 17 Virus; INIT 1984 Virus; INIT 29 Virus; INIT 9403 Virus; INIT-M Virus; MacMag Virus; MBDF Virus; MDEF Virus; nVIR Virus; SAM; Scores Virus; T4 Virus; Virex; WDEF Virus; ZUC Virus

# V

## Vision

Vision is a sophisticated **MIDI** sequencing program that also can record and edit audio tracks. Using Vision, a MIDI music track can be created and then a 16-bit digital audio file recorded in synchronization with the MIDI track. The program enables you to mix and edit the digital audio tracks, as well as the MIDI tracks. The program can, for example, record various keyboard and synthesizer tracks as MIDI files, while vocal track's and other acoustic instruments could be recorded as digital audio. The digital audio and MIDI tracks can be played back and adjusted until the desired effect is achieved (then the MIDI instruments can be digitized and a final recording mixed).

Vision is really a cross between a traditional sound editing application, which displays sound wave forms (such as SoundEdit), and a sequencing program. it supports **SMPTE** time code, markers, and punch-in and out points are supported. A punch-in point is a point in an existing recording where a second recording or overdub starts. The audio editing and mixing effects are non-destructive (the original files are not altered).

Vision also supports Opcodes Open Music System, a cross-platform/software format for audio information, and comes with a synthesizer patch librarian, Galaxy, which stores and retrieves patches (instrument programs) for synthesizer sounds.

Opcode Systems
Fax: (415) 856-3332

Phone: (415) 856-3333
Web: http://www.opcode.com

***See Also***
Deck II; MIDI; Sequencer; SoundEdit

# Visual Architect

Visual Architect is an **interface builder** and code generator from Symantec. It can generate the graphical interface of applications written using the think class library (TCL) **framework**. Visual Architect is a part of the **Symantec C++** development environment.

Using Visual Architect, programmers can create the visual elements of a program, such as windows, dialog boxes, alerts, and menus, using graphical tools. Visual Architect goes a step further than many interface builders by generating **C++** code for the interface that takes direct advantage of the TCL framework. If, for example, a button created in Visual Architect is linked to an action, a skeleton of the code needed to perform the action is automatically generated. To get the button to work, the programmer need only fill in the skeleton with the details of that action.

***See Also***
C++; Framework; Interface Builder; Symantec C++

# V

## Visual Arranger

Visual Arranger is a song-building program that makes use of **General MIDI**. You need a **MIDI keyboard** to use the software. Visual Arranger provides icons that represent different musical styles, and enables you to drag these icons together to assemble a song. To create more complicated structures, however, such as chords, you must use tools that are much more complicated to learn. This, along with limits in controls over dynamic expression (tempo, volume etc.) make the use of this software rather limited.

Yamaha Corporation of America
Price: $59.95
Phone:(714) 522-9240
Web: http://www.midifarm.com/yamaha

***See Also***
Entertainment; General MIDI; MIDI

## Visual C++

A **C/C++** development environment from Microsoft, Visual C++ is unlike most of the programs in this book. Visual C++ doesn't run on the Macintosh. It runs only on PCs running Windows NT or Windows95. It earns its place in a Mac book because it is capable of generating Mac applications. The *Visual C++ Cross-Development Edition for Macintosh* is a complete **integrated**

**development environment** that can generate Windows or Macintosh executables.

Visual C++ enables you to develop Macintosh programs using Microsoft's **Win32 API** or using the Mac's own API, the **Toolbox**. Win32 programs running on the Mac use the Windows Portability Libraries (WPL) to translate Win32 calls into the corresponding Toolbox calls at a penalty of diminished speed.

A remote **debugger** is included with the Visual C++ Cross-Development Edition that enables you to debug a program running on a Macintosh from a networked Windows workstation.

Although Visual C++ is poorly suited to programmers setting out to write a Macintosh-only application, it's a quick and easy way for Windows programmers to port their applications to the Mac. Programs written to the Win32 API will run and behave much like their Windows counterparts. Unfortunately, this generally means that these programs do a poor job of adhering to the Macintosh **Human Interface Guidelines** .

On the other hand, programs that have been *factored* to separate user-interface code from other parts of the program can easily use the Toolbox on the Mac and the Win32 API on Windows. Using this approach, a programmer can take advantage of a single development environment without incurring the wrath of the interface police on either platform.

Visual C++ may be the best development environment for Windows

programmers making their first forays into the Macintosh world. If you're in the opposite situation, Metrowerks **CodeWarrior** includes a similar option in reverse. The Gold and Academic version of CodeWarrior both include a compiler and remote debugger for Windows NT/Windows95 applications that run on the Macintosh.

***See Also***
C; C++; CodeWarrior; Cross-Compiler; Integrated Development Environment; Microsoft Foundation Classes; Toolbox; Win32

# Vocabulary Programs for Children

***See***
Mind Castle

# Voice/Data/Fax Modems

***See***
Voice Capability in Modems

# Voice Capability in Modems

Although not nearly as common as fax, a modem's ability to handle voice is an increasingly important feature in telecommunications. With voice

capability, the modem can pass voice calls on to your Mac. With the proper software, you can use your Mac as a speakerphone, an answering machine or voice mail system, even a complex fax-back system. A voice/data/fax modem can make a one-room office seem like a major company to outside callers.

With a voice modem, you can run software that answers the telephone and gives the caller a voice message offering different options, much like office voice-mail systems costing tens of thousands of dollars. A caller can press buttons to be transferred to a particular extension, or can leave a message for a specific person. You can also use a voice/fax modem in combination with fax-back software, which lets you create an automated system for distributing faxes. Callers can choose among several options and get information faxed to them, all without even having to speak to you.

***See Also***
Fax Capability in Modems; Modems

# Voyeur

***See***
Dungeon Master II

# V

## Voyeur II

***See***
Hollywood Games Connection

## VRAM Expansion

VRAM expansion is the addition of memory to the video circuitry of your computer, enhancing the resolution and/or color support.

***See Also***
Power Mac Logic Boards

## VRML

Acronym for Virtual Reality Modeling Language, a programming language for describing virtual reality environments on the **Internet**'s **World Wide Web**.

Although **HTML** (HyperText Markup Language) describes graphics and text in 2-D representations, VRML allows Web authors to create 3-D environments that can be displayed by VRML browser software.

Part of the promise of VRML is its potential for for constructing 3-D versions of buildings or sites. Businesses such as real estate developers can create

models that visitors can virtually “tour” on the Web. Many computer games already use VRML.

Many firms are currently developing **plug-ins** for Web browsers that provide the ability to view and maneuver through 3-D sites. For browsing VRML documents on the Macintosh, users can use applications that use Apple’s QuickDraw 3D programming interface, such as QuickTime VR.

VRML standards are currently being developed by the VRML Architecture Group (VAG) in San Francisco.

***See Also***
HTML; Internet; Web Browser; World Wide Web

# Vult Virus

***See***
Scores Virus