Contents

User Interface Overview

When VR Scout is used as a plug-in within a web browser, it appears as follows:

(You can click on the image above to get help on parts of the user interface.)

In addition, you can click the right mouse button on the VR Scout window to obtain the a popup menu of commands.

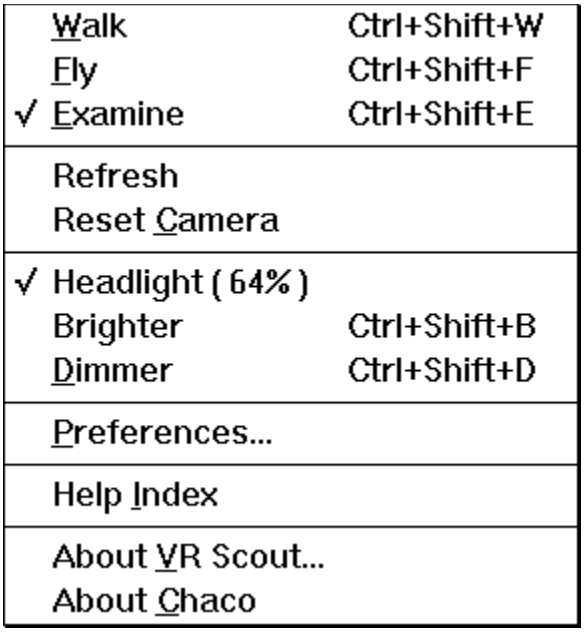
Note The toolbar will not appear at the bottom of the VR Scout display if the VRML scene is displayed as part of a larger document.

Also see

Popup Menu
The Toolbar
How to move in VR Scout

The Popup Menu

At any time you can click the right mouse button on the VR Scout plug-in window to obtain the following menu of commands:



(You can click on the image above to get help on menu items.)

Also see

- User Interface Overview
- The Toolbar

The VR Scout toolbar

When the VR Scout Plug-in occupies the entire browser display, a toolbar appears at the bottom of the window. This toolbar provides access to commonly performed VRML scene viewing activities. The toolbar appears as follows:

(You can click on the image above to get help on parts of the user interface.)

Also see

- User Interface Overview
- The Popup Menu
- How to move in VRML (explains walk, fly, and examine modes)

User Interface popup definitions

When the cursor is placed over a hotlink, the destination will appear in a hovering window. Clicking the mouse will send you to this location.

When the cursor is placed over a hotlink, it changes from the normal arrow to a hand, to indicate that this is a hotlink. If you leave the cursor for a few seconds motionless over a hotlink, the destination will appear in a hovering window.

This is where the VRML image appears. You can click and drag in this window to move within the VRML scene.

Clicking on the small Chaco logo causes the Chaco Communications home page to be loaded into the web browser.

Walk mode is very similar to being in the scene and walking around. (You may select either **walk**, **fly**, or **examine** mode. The currently selected mode is hilighted.)

Fly mode is like being in an airplane which can even hover and fly backwards. You move in whatever direction your nose is pointing. If you look up at the sky and then move forward, you start climbing. In addition in fly mode you can tilt the view from side to side. (You may select either **walk**, **fly**, or **examine** mode. The currently selected mode is hilighted.)

Examine mode is like holding an object in your hand and turning and twisting it to look at it carefully. You can also move the object closer and further away from your eyes. (You may select either **walk**, **fly**, or **examine** mode. The currently selected mode is hilighted.)

Imagine that there is a miner's lamp mounted on your head. This button controls whether the lamp is turned on. (The button 'glows' when your lamp is on.)

This button resets the scene to the original view when the button is pressed.

This button displays the VR Scout Plug-In help file.

Walk mode is very similar to being in the scene and walking around. (You may select either **Walk**, **Fly**, or **Examine** mode. The currently selected mode is checked.)

Fly mode is like being in an airplane which can even hover and fly backwards. You move in whatever direction your nose is pointing. If you look up at the sky and then move forward, you start climbing. In addition in fly mode you can tilt the view from side to side. (You may select either **Walk**, **Fly**, or **Examine** mode. The currently selected mode is checked.)

Examine mode is like holding an object in your hand and turning and twisting it to look at it carefully. You can also move the object closer and further away from your eyes. (You may select either **Walk**, **Fly**, or **Examine** mode. The currently selected mode is checked.)

This menu item redraws the scene.

This menu item resets the scene to the original view.

Selecting this menu item turns a lamp mounted on your virtual head on and off. When the headlamp is on, it also shows you its current brightness. (For example, the headlight in this example menu is turned on and is at 64% brightness.)

This item makes the headlight brighter. (Note that the headlight will never be brighter than 100%.)

This item makes the headlight dimmer. (Note that the headlight will never be dimmer than 0%, which is effectively ‘off’.)

Select this menu item to change preferences for the VR Scout Plug-In.

This menu item displays the VR Scout Plug-In help file.

Displays the VR Scout Plug-In ‘About’ dialog, with information including the version number, information on Chaco Communications, and the VR Scout team.

This menu item displays the home page for Chaco Communications, Inc.

Background on the Virtual Reality Modeling Language

by Mark Pesce (March 1995) (used with permission)

The Virtual Reality Modeling Language (VRML) is a language for describing multi-user interactive simulations -- virtual worlds networked via the global Internet and hyperlinked within the World Wide Web.

In 1969, the creation of ARPAnet, the forerunner of today's Internet, provided a methodology through which users could remotely manipulate computers, and the files stored on them. While this was a powerful extension of computing, it was also confusing; without any clear sense of "what went where", access to Internet was restricted to the class of early "net surfers" who could remember where things were stored. Most everyone else, even technically sophisticated users of computers, found it impossible to make sense of it.

In 1989, Tim Berners-Lee, a software engineer at the Center for European Particle Physics, CERN, developed a hypermedia system today known as the World Wide Web. With the creation of the Universal Resource Locator, or URL, it became possible to tell anyone "where to go and how to get there" for almost any piece of data on the Internet. Rather than a cryptic set of commands and accesses, the URL created a standard addressing mechanism for the data hidden in cyberspace. In essence, it turned the entire Internet into the equivalent of a single (very large) disk drive, and made it possible to create documents which could encompass data from many different parts of the Internet, binding them together into a cohesive whole.

Even the URL required some improvement. They're quite cryptic - for example, I can only tell you how to get to the VRML Forum home page by saying, "http://vrml.wired.com/", which is not really human-centered data, it's computer-centered data. I need to make an effort to remember it at all. As great as it is, the URL mechanism of the World Wide Web leaves a lot to be desired, particularly for human beings, and we comprise the user base; the Web was built for people, not for computers, and because of this, the Web has caused an enormous upsurge in Internet traffic. Very soon, the bulk of the traffic on the Internet will be Web-generated.

A few years ago, research into "sensualized" interfaces began to receive widespread attention in the press and the industry. A wide range of technologies, which collectively came to be known as "Virtual Reality", began a fundamental change in the nature of the user interface, moving it to a human-centered design; where the space around the user became the computing environment, and the entire sensorium was engaged in the interface. All of this was in an effort to make computers more responsive to the humans who used them, and focused around a basic realization: if something is represented sensually, it is possible to make sense of it.

Late in 1993, Mark Pesce, and Tony Parisi developed a three-dimensional interface to the Web which embodied many of the lessons learned in several years of research in both virtual reality and networking. Upon communicating these innovations to Berners-Lee, Pesce was invited to present a paper at the First International Conference on the World Wide Web, in Geneva, Switzerland. During a session to discuss virtual reality interfaces to the Web, attendees agreed there was a need for a common language to specify 3D scene description and WWW hyperlinks -- an analog of HTML for virtual reality. The term Virtual Reality Modeling Language (VRML) was coined, and the group (headed by Pesce and Brian Behlendorf, of *WIRED* magazine) began work on a VRML specification immediately following the conference.

With the blessing of *WIRED*, Behlendorf set up an electronic mailing list to facilitate discussion of a specification for VRML. The response was overwhelming; within a week, there were over a

thousand members. The list membership quickly agreed upon a set of requirements for VRML, and began a search for technologies which could be adapted to fit the needs of it.

The list members proposed several worthwhile candidates, and after much deliberation the list came to a consensus: the Open Inventor ASCII File Format from Silicon Graphics, Inc. The Inventor File Format supports complete descriptions of 3D scenes with polygonally rendered objects, lighting, materials, ambient properties and realism effects. It has all of the features that professionals need to produce high-quality work, and an existing tools base with a wide installed presence.

A subset of the Inventor File Format, with extensions to support networking, forms the basis of VRML. Gavin Bell of Silicon Graphics has adapted the Inventor File Format for VRML, with design input from the mailing list. SGI has publicly stated that the file format is available for use in the open market, and has contributed a file format parser into the public domain to bootstrap VRML viewer development.

VRML is designed to meet three criteria: platform independence; extensibility; and the ability to work over low-bandwidth (14.4 kBps modem) connections. Early on, the designers decided that VRML would not be an extension to HTML, which is designed for text, not graphics.

The next generation of Web browsers will understand and interpret VRML; here are three examples of the kinds of projects VRML will enable:

The Interactive Media Festival Gallery Tour

The Interactive Media Festival (http://www.arc.org/) is an annual event of world-wide scope, which attracts some of the best talents of the new media. Their annual gallery and awards event, which takes place in Los Angeles in early June, will also be modeled in VRML and linked into their own Web site. People anywhere in the world will be able to tour the gallery space, examine the contestants' works, and follow links from these works other items of interest. In this way, IMF can have an international scope and an international reach.

WaxWeb 2.0

David Blair, the avant-garde filmmaker of *WAX: or The Discovery of Television Among the Bees*, and Tom Meyer, a doctoral candidate at Brown University, spent the last two years developing WaxWeb (http://bug.village.virginia.edu), a hypermedia web version of the film. David and Tom have spent the last 8 months bringing WaxWeb forward into VRML; at the release of WaxWeb 2.0 in the beginning of April, it acquires a VRML component - when a user goes to the WaxWeb VRML site, WaxWeb generates an assortment of rooms and links - but no two journeys through WaxWeb are ever completely the same. At last count, they'd created over 9000 (!) possible rooms to walk through, each of which is rich with content and anchors.

Virtual SoMa

The heart of the nation's multimedia industry is San Francisco's "Multimedia Gulch", located in its "South of Market" neighborhood, nicknamed SoMa. Several organizations have initiated a project to model SoMa in VRML and make it accessible through the Web. As a pilot, the 10-block area between 1st and 3rd Streets, from Howard to King, is being modeled as a VRML world. Many of the organizations in this neighborhood already have a web presence; this model links to their web pages. You can take a stroll down the virtual 3rd Street, to the block between Bryant and Brannan, find the offices of WIRED, click on the building, and go to their home page in the web.

There are some areas where VRML is still incomplete. Except for the hyperlinking feature, the first version of VRML does not support interactive behaviors. This was a practical decision intended to streamline design and implementation. Design of a language for describing

interactive behaviors is a big job, particularly when the language needs to express behaviors of objects communicating on a network. Support for arbitrary interactive behaviors is critical to the long-term success of VRML; it will be included in the second revision of the VRML specification, which will be completed by December of 1995.

Mark D. Pesce

Moderator of the VRML mailing list

mpesce@netcom.com

Other Resources

The following pages are good places to look for more information on VRML:

- The Chaco VRML page (http://vrml.chaco.com/vrml/) contains a VRML test suite.
- The *Wired Magazine* VRML forum (http://vrml.wired.com/)
- The VRML Repository (http://www.sdsc.edu/vrml)
- The VRML Suppository (http://www.virtpark.com/theme/supp/)

is fun and *definitely* interesting.

How to move through a VRML scene

You can move through a VRML scene using either the mouse or the keyboard. How movement works depends on what movement mode you are using.

Walk mode

Walk mode is very similar to being in the scene and walking around.

Mouse controls

To use the mouse, click on the scene and move the mouse in the direction you want to walk. Dragging in a direction has the following effects:

Normally, dragging the mouse 'walks' you around in the world.

When the Control key is pressed, you can use the mouse to look up and down.

When the Shift key is pressed, your position is shifted from where you are standing, but your orientation isn't changed.

You can also drag diagonally to combine movements. The further you move away from where you originally clicked, the faster you will move. The *3D Graphics* preferences dialog allows you to degrade the quality of the image while moving, so that you move faster (but things don't look as good while you're moving.)

Keyboard controls

The keyboard movements in Walk mode are as follows:

This key:	**Does this:**	**With the Shift key pressed it does this:**	**With the Control key pressed it does this:**
←	Turn left	Shift left	
→	Turn right	Shift right	
	Walk forward	Shift up	Look up
↓	Back up	Shift down	Look down

These all work the same as described for the mouse controls above.

Fly mode

Fly mode is like being in an airplane. This airplane is really great... it can even hover and fly backwards. You move in whatever direction your nose is pointing. If you look up at the sky and then move forward, you start climbing. In addition in fly mode you can tilt the view from side to side.

Mouse controls

To use the mouse, click on the scene and move the mouse in the direction you want to

walk. Dragging in a direction has the following effects:

Normally, dragging the mouse flies you around in the world.

When the Control key is pressed, you can use the mouse to look up and down as well as tilt left and right.

When the Shift key is pressed, your position is shifted from where you are standing, but your orientation isn't changed.

You can also drag diagonally to combine movements. The further you move away from where you originally clicked, the faster you will move. The *3D Graphics* preferences dialog allows you to degrade the quality of the image while moving, so that you move faster (but things don't look as good while you're moving.)

Keyboard controls

The keyboard movements in fly mode are as follows:

This key:	Does this:	With the Shift key pressed it does this:	With the Control key pressed it does this:
←	Turn left	Shift left	Tilt left
→	Turn right	Shift right	Tilt right
	Fly forward	Shift up	Look up
↓	Fly backwards	Shift down	Look down

These all work the same as described for the mouse controls above.

Examine mode

Examine mode is for looking at objects modeled in VRML. Rather than moving through a scene, examine mode is like holding an object in your hand and turning and twisting it to look at it carefully. You can also move the object closer and further away from your eyes.

Imagine the entire scene to be contained in a big glass ball, which is right in front of you. By spinning this ball, you can look at all sides of the scene or object. To spin the ball, use the mouse to 'grab' a point, and spin the ball around, much as you would a large trackball. The program attempts to keep the same point of the ball under the mouse cursor.

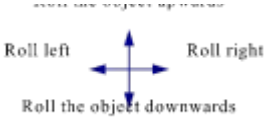
You can also zoom in or move around using the arrow keys. These do **not** affect the center of rotation. That is always defined by the sphere enveloping the world.

Probably the best way of using the examine interface is to rotate the object by grabbing it and rotating it using the mouse, and using the up and down keys to move in and move away from the object.

Mouse controls

As described above:

Dragging the mouse rotates the object you're examining:



Keyboard controls

The keyboard movements in examine mode are as follows:

This key:	Does this:	With the Shift key pressed it does this:	With the Control key pressed it does this:
←	Turn left	Shift left	Rolls the object left
→	Turn right	Shift right	Rolls the object right
↑	Move towards the object	Shift up	Rolls the object up
↓	Move away from the object	Shift down	Rolls the object down

Popup definitions

VRML is an acronym for Virtual Reality Modeling Language, and is a format for describing 3D scenes.

HTML is an acronym for HyperText Markup Language, and is a way of describing formatted text on the Internet.

TCP/IP stands for Terminal Control Protocol / Internet Protocol. This is the main means of communications between machines on the internet.

SLIP stands for Serial Line Internet Protocol, and is used to connect to an internet provider using a serial line (a modem, for instance.) SLIP is a wrapper around the TCP/IP protocol.

PPP stands for Point-to-Point Protocol, and is used to connect to an internet provider using a serial line (a modem, for instance.) PPP is a wrapper around the TCP/IP protocol.

Ping is an internet command (available on both Unix and Windows) that allows you to see if you can reach a specified machine on the internet. For example, `ping chaco.com` will indicate whether you can reach Chaco's main server.

About Chaco

About Chaco Communications, Inc.

Chaco builds advanced multiuser Internet software. Chaco software has been incorporated in a broad range of applications: from Internet game systems to document viewers, from Internet art galleries to geographic mapping systems. Our customers include leading network, media, and application software companies, educational institutions, art organizations, and individuals.

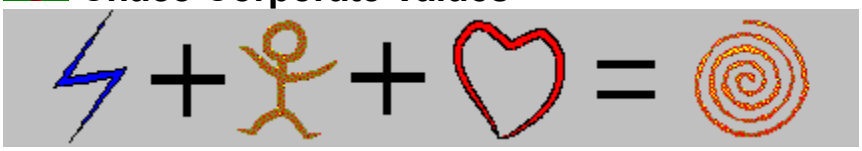
Chaco created VR Scout, the first VRML (3D graphics) viewer to be bundled with a commercial Web browser. VR Scout is currently the fastest complete VRML 1.0 viewer for Windows 3.1, 95 and NT. Chaco's revolutionary multiuser Internet client, Pueblo, adds the beauty of 3D graphics and multimedia to the social world of MUDs (multiuser dimensions).

Chaco supports the development of social media by donating a portion of its profits to MUD authors, artists, and musicians. Chaco donates server space to MUD producers. Chaco works closely with media tool and library vendors, operating system manufacturers, and network software companies to ensure our products conform to standards and have broad utility.

Also see

Chaco Corporate Values

Chaco Corporate Values



Chaco software brings people together.

We devote ourselves to customers, world society, our employees, and shareholders, in that order.

We recognize innovation as our lifeblood, and respect the innovations of others.

We tell the truth.

We never announce vaporware: it crushes the creative spirit in others and turns us into cynics.

Customers

We provide fair value for our customers, going the extra mile when in doubt.

We seek to understand our customer's needs, and offer creative solutions to their problems.

We avoid competing with our customers.

World society

We shrink the world.

We foster interactions and understanding between distant people and cultures.

We promote democracy, stability, happiness, and education.

Employees

We celebrate our people, because the unique talents of individuals help Chaco succeed.

We create a nurturing environment, free of discrimination, to encourage our employees to develop and contribute their talents.

We provide stable employment for employees who promote Chaco's values and health.

We encourage Chaco employees to communicate their concerns: to other employees, managers, executives, or board members.

Shareholders

We provide a fair return for investors.

VR Scout

Chaco Communications, Inc. has publicly released its VR Scout™ 1.2 VRML Plug-in viewer for Windows95 and Windows/NT. VRML is a standard for representing 3-dimensional scenes and objects on the World Wide Web.

The VR Scout 1.2 Plug-in works with your web browser as an internal viewer, integrating 3D images that you can maniplate directly into your web browser. VR Scout works with both NetManage WebSurfer and Netscape Navigator.

VR Scout sets a new standard for VRML viewers, implementing the full VRML 1.0 standard at a high frame rate. In particular, VR Scout 1.0 supports GIF, JPEG and BMP textures, ASCII text and font displays, point-sets, and texture transformations, unlike other VRML viewers. VR Scout uses Microsoft's Reality Lab technology, making it able to exploit new 3D rendering boards for speed.

VR Scout is free for non-commercial and evaluation purposes, and can be downloaded from http://www.chaco.com/vrscout/. Commercial users and others wanting technical support may purchase VR Scout 1.1 for $49 direct from Chaco through email at buy-vrscout@chaco.com.

VR Scout is being licensed by leading software manufacturers for bundling with browsers and other multimedia products. VR Scout is also embedded in Pueblo™, Chaco's revolutionary multimedia Internet game client.

VR Scout 1.2 supports:

- All of VRML 1.0
- Microsoft Reality Lab, for fast software rendering and hardware acceleration
- Plug-in integration with Netscape 2.0beta3 and an upcoming NetManage WebSurfer
- Windows 95 and Windows NT
- Many Open Inventor nodes, so not-quite-compliant VRML files will work
- GZIP and ZIP files, automatically and transparently
- Multi-threading (on Windows 95 and NT)
- A headlight with a brightness control
- Walk/Fly/Examiner viewing modes with heads-up toolbar
- Textures (GIF, JPEG, BMP, and SFImage)
- Extensive help

New in VR Scout 1.2:

- Plug-in support for Netscape Navigator and Netmanage WebSurfer


Support for the Netscape EMBED tag, for multiple VRML files inline in HTML


Reality Lab 3d rendering. Wow, many times faster than version 1.1!


Toolbar, for heads-up navigation changes


Tooltips anchor displays (hold the cursor over an anchor object to see the tooltips)


Improved AsciiText support


Transparency


Transparent textures


Support for concave faces


Warnings for multiple top-level nodes and other common VRML file errors

Known bugs in this version:


Navigation. We'd like your feedback on navigation. Tell us what we need to be doing, and we'll do it. The planned changes for the release are: Be sure left/right navigation feels the same as forward/back navigation. Slow down mouse navigation so it's a little less "tight".


On occasion (perhaps 1 in 100 scenes), the beta will silently fail to render a scene. This is a thread problem we're looking for, and will be fixed in the release. For now, just hit 'Reload' and all should be well.


Other stuff. Hey, it's a beta. Let us know if you run into problems, and we'll get them fixed as soon as possible. The address to email bugs to is: scout-support@chaco.com. People who report bugs first will receive, ummmm, VRML Jack-O-Lanterns or something. (Hey, we don't have as much money as Netscape for bug bounties! ;-)

VRML Support:


VR Scout renders the image progressively in pieces, so you can get started using a VRML scene before the whole scene is done being downloaded, parsed, and rendered.


VR Scout supports WWWAnchor, including hints, links to VRML documents, links to CGI scripts, links to HTML documents, etc.


VR Scout supports WWWInline, including relative URLs, nested WWWInlines, etc. If there are WWWInlines in the VRML scene, they are downloaded while you are viewing, walking around in the scene, etc. As the downloads of the WWWInlines are completed, they are added to the scene.


VR Scout supports Textures of GIF, JPEG, and BMP files. Again, these are downloaded while you're walking around in the scene, and as the downloads complete, the textures are added to their surfaces.


VR Scout supports the LOD (Level-Of-Detail) node.

VR Scout supports VRML "hints", like background color, etc.

VRML Extensions Supported:

BackgroundColor. This Info{} node allows scene authors to set the background color of the scene.
Example (sets background to black):

```
DEF BackgroundColor Info { string "0.0 0.0 0.0" }
```