Q3Radiant Editor Manual

Based on Version 192

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Special thanks go out to the members of the Quake3world Editing forum. Your questions prompted many of the sections in this manual.

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Preface

The authors would like to thank the many supporters of Quake Engine editing who made this work possible. Several sections in the manual are based on material written by dedicated fans. Others were "corrected" by fans who found undiscovered bugs in both the editor and game code. Where possible, we have noted the contributors in the sections they helped produce.

Paul Jaquays
Robert A. Duffy

Introduction

Part of the fun of games like *Quake III Arena* is the ability to add to your own ideas to a favorite game and then have others play and enjoy them. While the technical skills needed to create a 3D graphic engine is beyond many game fans, the skills and equipment necessary to make modifications to the game are not. It has become the custom of many game developers to share their development tools with the public. This allows fans make their own game content. The Q3Radiant editor is the software used by the designers at id to create the arenas in *Quake III Arena.* In fact, it's an improvement on that editor, since it contains features that have been added since the game was completed. If you are familiar with Q3Radiant's immediate ancestor, the QeRadiant editor for *Quake 2*, then a good share of what's in this manual will be old hat to you. Whether you are a veteran mapmaker or new to the art of making game arenas, we think you will find some indispensable information in this manual.

Now comes the caveat.

This manual will tell you how to use the tools, but not necessarily, how to make what you have in mind. Many fine on-line tutorial and resource sites will be listed at the end of the document.

Minimum System Requirements

The designers at id used Q3Radiant on some heavy-duty computing equipment to make their game maps. Despite the fact that *Quake III Arena* runs under several different operating systems, not every computer that can run *Quake III Arena* will be able to run the Q3Radiant editor. Q3Radiant *only* runs under MS Windows 95, MS Windows 98, MS Windows NT, or MS Windows 2000 operating systems. There are currently no plans for Mac or Linux versions. The editor requires an Open GL compliant 3D graphics acceleration card (it is expected that all cards capable of running *Quake III Arena* will be able to handle editor functions … although some may handle it better). A 3-button mouse gives the best performance.

Minimum System

The minimum system requirements generally require that preferences such as texture quality and screen resolution be set to absolute minimums. The editor will run on the systems described, but speed of operation and visual quality will probably be less than satisfactory. It should also be noted that you would be limited to working on relatively small maps with limited texture and model usage.

Processor:	P233mmx
RAM:	64 meg
Video Card:	4 Meg, software Open GL-compliant
Screen Resolution:	1024 x 768
Pointing Device:	Two-button mouse*

Recommended System

The more powerful the machine, the better and usually faster the development experience. This will become especially true when you get to the point of compiling your maps (turning them from editor code into game code). It should come as no surprise that, more powerful machines will crunch the numbers faster when compiling a map.

Processor:	P2450 (or better)
RAM:	128 Meg**
Video Card:	Open GL accelerated video card
Screen Resolution:	1280 x 1024
Pointing Device:	Three-button mouse

* This will work, but not well. A three-button mouse, even on a minimal system is highly preferred.

** id designers often found it convenient to work with several maps open at once. The recommended 128 Meg of RAM may not be enough to accommodate this.

What Doesn't Work (well) … and How to fix it

The key to a satisfactory editing experience is whether your video card supports the demands of the editor. The original id editor was designed for a workstation card called the Realizm, which ran on Intergraph workstations in a WinNT environment. Robert Duffy expanded this to include the Win9x operating systems and a number of other video cards. But not all video cards support the editor equally well.

- The G200 and G400 require updated drivers from Matrox
- The 3fx Voodoo 3000 chipset requires a driver upgrade in order for the map grids to show.
- If the map grids don't appear when using some ATI chip sets, try turning the settings on you desktop up to 32 bit (true color).
- Nvidia TNT and GeFORCE have slowdown issues when the user selects curve patches. While this is a driver issue, it can be addressed by checking the "Solid selection boxes" feature under preferences.

Installation & Set Up

Installing the editor in the correct place is the first key to successful use. If you are working on *a Quake III Arena* project, the easiest way to work is to install the editor in the *Quake III Arena* directory on your computer. The instructions that follow assume that as a given.

Installing the editor

Extract the zip file for the game into your *Quake III Arena* directory.

Setting up Paths

This is done initially by the editor's set up procedure. If you install it correctly, the paths will be automatically have been created to access the resources sitting in *Quake III Arena's* .pk3 directory.

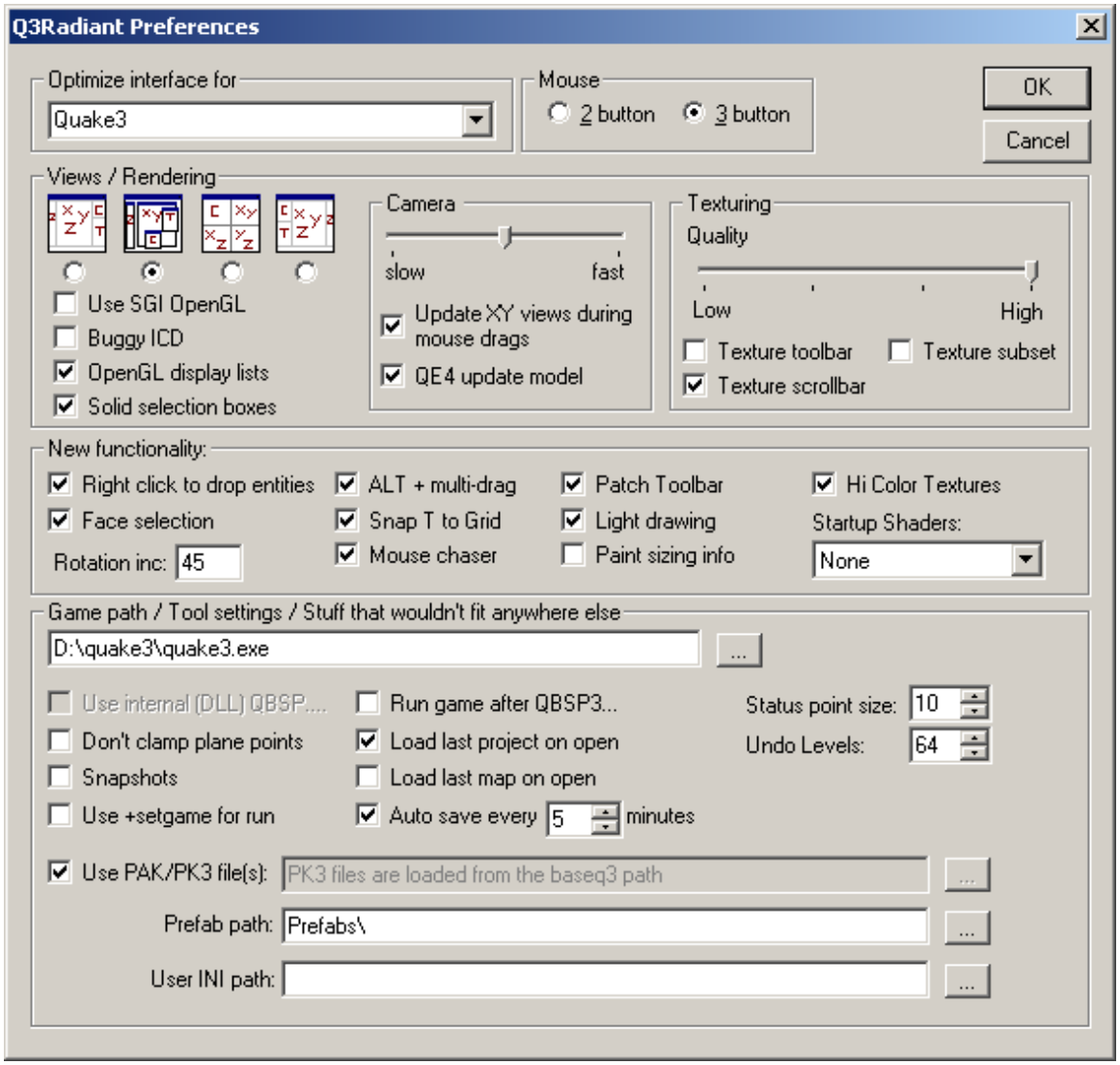
Improving Performance

If you find that the editor is sluggish on your system, try some or all of the following tweaks:

- On the View menu, check Cubic Clipping to be ON. This reduces the number of game components in view, by shortening the distance that the editor can "see." Use CTRL + [and/or CTRL +] to set the distance to 13 (a good number in this case).
- On the Textures menu, open the Render Quality option and select an option higher on the list than your current setting. We recommend not going below Nearest MipMap first. This reduces the amount of blending and filtering in the textures as they are seen in the Camera window, but still lets you see what the textures look like in a relatively undistorted manner. The Nearest setting will further improve performance, but textures may be distorted when seen in perspective.
- On View Menu, open the Entities as… option and select an option higher on the list than your current setting.
- Select Preferences … from the Edit Menu. Under "Camera", deselect (uncheck) "Update XY views during mouse drags." This will stop the 2D-map window(s) from being repeatedly redrawn during Camera window mouse drags.
- Select Preferences … from the Edit Menu. Under "Texturing Quality", move the slider one or more settings to the left, reducing overall texture quality.
- Further performance can be gained by turning off curves (CTRL + p) or reducing curve displays to wireframe only.

Setting up Preferences

To set up your editing preferences, open the Edit menu and select Preferences. Use preferences to set a variety of options that tailor the editor to a specific game: Quake2 or Quake 3; and to set up certain editor behavior based on your personal preferences.



Optimize Interface for

Choosing Quake2 or Quake3 in this list will reset certain preferences to the appropriate defaults for the selected game. Currently, the default is Quake3.

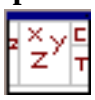
Mouse

This lets you choose between two or three-button mouse operation. The default setting is three-button operation. A three-button mouse is HIGHLY recommended for Q3Radiant.

Views / Rendering

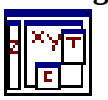
These preferences allow you to choose between one of four general layouts for the various editing windows and set the way that rendering is handled. If you are coming to *Quake III Arena* editing from a Quake engine editing tool (or from a tool for another game engine), you may want to select a layout set up that is familiar. That being said, we also suggest you check out the “id” way of working.

Split Window view



This is the QeRadiant default view. The Camera, XY Map, Z-axis Scale, Texture, and Console windows are constantly displayed. While the arrangement of the windows cannot be changed, their size is adjustable by pulling the window border splitters. The Entity and Group windows share a common pop-up window. This arrangement is one that may work particularly well for mappers using smaller monitors and slower computers.

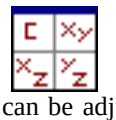
Floating Window view



This is the view used by id designers. The position, arrangement, and size of the windows are all adjustable. The windows initially come up on top of one another (a known bug), but once positioned, this view offers the greatest flexibility. The Camera, XY Map, Z-axis Scale, and a shared Entity/Texture/Console/Group window are all displayed simultaneously. Changing the size of one window does not automatically affect the others (it can lay atop the others). Additional map layout views can be cycled from menu commands or bound keys. This view only works well if you have a 20+-inch monitor.

Make it Big! In floating windows mode (ONLY), you can double-click on any window's Title Bar to enlarge the contents of the window to fill the screen. Double clicking on it again reduces it back to normal size.

Quad view



The display window is split into four equal-sized windows: Camera, XY Map, YZ Map, and XZ Map. This is similar to other editors and offers four-way viewing. You see the map components in three views simultaneously. The size of the windows (relative to each other) can be adjusted, by pulling the splitters. The combined Entity/Texture/Console/Group window is brought into view as a single, floating window that lays over the others. The Z-axis window is not used in this view. This is a popular editing configuration, but it has significant performance issues. The editor is drawing all the 2D map components three times (plus maintaining a camera view). Some mappers have notice significant performance slow-downs when working with curves. Using the Quad view is only recommended for mappers with more powerful computers.

Reverse Split Window view

Essentially the same as the Split Window view, except that the windows are all flopped left to right.

Use SGI OpenGL

This will cause Q3Radiant to load the SGI software OpenGL drivers. If you do not have hardware OpenGL, these drivers will offer better speed than the standard Microsoft drivers. You must download and install the SGI OpenGL drivers for this option to work. Here's a link to a direct download:

ftp://ftp.qeradiant.com/opengl/sgi/opengl2.exe

Buggy ICD

If you see garbled text in your 2D view windows, check this. It changes the way Q3Radiant does font rendering which corrects an error in some ICD's.

OpenGL Display Lists
This is only used for patches (bezier curves) in *Quake III Arena* editing. Turning this on will speed up curve drawing by a large factor.

Solid Selection Boxes
Selecting curves, models, or large numbers of brushes causes a noticeable slowdown the Nvidia series. This is an uncorrected driver issue. Solid selection boxes are a workaround for that problem. Checking solid selection boxes reduces the performance hit by turning the dashed line boxes solid.

Camera

Camera
The slider allows you to set how fast the camera moves.

Update XY Views during Mouse Drags
When interacting with the camera (which you will do a lot), turning this off will NOT update the camera icon location in the Map windows automatically. This can help with speed but prevents you from seeing exactly where the camera icon is positioned.

QE4 Update Model
Leave this on unless you're running on a very slow system with software OpenGL.

Texturing

Quality
This slider allows you to set the quality of the graphics displayed in the editor. The higher the quality setting the better the textures will look AND the more memory they consume. Setting the quality lower, reduces the overall visual quality of the textures (but ONLY in the editor, not in the final level), but can also *drastically* reduces memory consumption. If you are having performance problems, this is one option to set back right away.

Texture toolbar
This provides a texturing toolbar. This feature may or may not work. According to Robert Duffy, it hasn't been tested in about 100 builds of the code. That means use it at your own risk. But here's what it appears to do:

It puts a texture toolbar at the bottom of the program window. The toolbar has six data fields. Five of them have up and down scroll arrow.

Shift H: This shifts the texture horizontally in pixel increments equal to the current map grid. Values cannot be typed in.

(Shift) V: This shifts the texture vertically in pixel increments equal to the current map grid. Values cannot be typed in.

Scale H: Multiplies the texture's horizontal size by a multiple of the current grid scale. Scaling of textures does not appear to function as it may have been intended.

(Scale) V: Multiplies the texture's horizontal size by a multiple of the current grid scale. Scaling of textures does not appear to function as it may have been intended.

Rotate: This rotates the texture clockwise or counterclockwise (using the scroll arrows). The rotation increment (or decrement) uses the degree value set in the field (unnamed) to its immediate right.

(degrees): This value is *only* used by the rotate command on the toolbar and no others. It does not affect the information entered on the preferences field. The value must be typed in.

Texture Subset
This provides a texture edit window within the texture window. It is still buggy as of build 188. It puts a text field at the top of the Texture window. Type in the first few letters of a texture name and the window will only display the textures beginning with that letter or letters.

Texture Scrollbar
This adds a Windows scrollbar to the texture window. You can use it (or the customary right mouse drag within the window) to scroll the texture window.

New functionality

Right click to drop entities
This lets you to right click in a Map Window to get a Pop-up menu that allows entity dropping among other things. Remember that a *click* is different than a *press* since a right press allows you to move around the map as well (see *Moving Around* under *Map Building Basics*).

Face Selection
If this is checked, the surface dialogue references and pulls it contents from the selected face (ONLY if a face and not an entire brush). If this not checked, the editor uses the current default texture (selected in the texture window) as the source.

Rotation Inc
This is the default rotation increment used by the keyboard shortcuts and the button bars for all types of texture, brush, and patch rotation.

ALT + Multi-drag
If this option is checked, you must hold down the ALT key to drag multiple brush edges. This lets you resize more than one brush at a time.

Snap T to Grid
This snaps the Texture tweak size to the grid size. The texture tweak size is the amount textures are moved with the texture toolbar and the keyboard shortcuts.

Mouse chaser
Turning this on causes the view to chase the mouse if you drag something off the edge.

Patch Toolbar
This enables the Quake3 specific toolbar that contains patch (bezier curve) shortcuts.

Light drawing
This draws lights as shaded triangle things (octahedrons) instead of standard square entities. When enabled, the light entities also show their emitted light color.

Paint sizing info
This draws size information on the selected item(s). It also draws in real time when dragging out a new brush or altering the size of an existing one.

Hi Color Textures
This causes the editor to load 24 and 32 bit TGA and JPEG textures. This should be checked for Quake3 editing.

Startup shaders
Allows you to specify which shaders are preloaded when the editor starts. The default is None. Options are None, Custom, and All. Loading *all* of the shaders at editor load time is VERY time consuming.

Game Path/ Tool Settings/ Stuff that wouldn't fit anywhere else

Game
Set this to point at the proper game executable (Quake3.exe, for example). This is not properly set up automatically, as of build 181 and must be set manually.

Use Internal (DLL) QBSP
This is for Quake2 only and is grayed out for Quake 3 editing. The internal DLL is not provided with Q3Radiant. If you want to use it, you will need to acquire it from an earlier release of QERadiant. To get the .DLL for Quake 2 usage, you will need to download QERadiant from this site:

http://www.qeradiant.com/files.cgi?dirin=qeradiant/latest/

Don't clamp plane points
This turns off clamping of plane points. This allows for very precise brush/vertex manipulation but can make it difficult to get things properly aligned and can also cause the bsp process to take a LOT longer. In general, this should be unchecked.

Design Tip: Be warned, if at any point during design you change to a snap to grid setting, you may see everything you've worked on twist and deform to lock into grid coordinates. If you want to work to work in very fine detail, use a 1-unit map grid. But even then, you're asking for headaches you don't need.

Autosave
Checking this forces the editor to automatically save the map to the autosave name specified in project settings based on the selected time increment. This feature has saved more than one mapper's bacon.

Snapshots
This saves an incrementally named snapshot of the user's map based on the autosave time increment. The problem is it can quickly fill a hard drive, as there is no space checking in force. Current recommendation is to leave this feature turned off.

Run game after QBSP3
This will run the game pointed to by the game path with a +set map "yourmap.bsp".
Warning. With some video drivers, it is a bad idea to run *Quake 2 or Quake III Arena* and the Q3Radiant editor. The drivers just will not sustain two demanding OpenGL applications simultaneously. This feature is best left turned off.

Load last project on open
This causes the editor to load the last project file (.qe4) when it is re-started. This is a good thing.

Undo Level
There are a maximum of 64 levels or layers of Undo. This field lets you choose how many you want to use. Unless you are having serious memory problems, this it's good to leave it set at 64 layers.

Use +set game for run
This is broken as of build 181. Its intended purpose is to allow mod's to run properly when the editor (using run game after QBSP3) starts the game.

Load last map on open
This causes the editor to load the last map when it is re-started.

Status point size
This sets the point size for the status bar font. A 10-point font is the default.

Use PAK/PK3 files
Checking this will cause the editor to load the specific PAK file for Quake2 or *.PK3 file(s) in the basepath for Quake3.

Prefab path
Allows the user to specify the path from which the editor will to load prefabs (premade map components).

User .ini path
Allows you to specify an INI file that contains custom key bindings. Most of the commands in Q3Radiant can be bound to specific key combinations. The .ini file should contain a section called 'commands' and a binding for each command you want to rebind under that. You use the normal character for most keys but there are special names for certain keys. You can modify each binding with a '+ SHIFT' or '+ CTRL' or '+ ALT'. You can also combine things like:

SurfaceInspector = F4 + SHIFT + ALT

And so on.

Here is an example keymap file (note that this is NOT the default keymap):

[Commands]
NextView = TAB
BendMode = O
UpFloor = PAGEUP+shift
DownFloor = PAGEDOWN+shift
TexRotateClock = PAGEDOWN
TexRotateCounter = PAGEUP
CameraForward = E
CameraBack = S
CameraLeft = Q
CameraRight = T
CameraUp = F
CameraDown = D

CameraAngleUp = A
CameraAngleDown = G
CameraStrafeRight = R
CameraStrafeLeft = W
CenterView = 0
CenterOnCamera = U
GridDown = [
GridUp =]
ViewConsole = F1
ToggleConsole = F1
ViewTextures = F2
ViewEntityInfo = F3
SurfaceInspector = F4
EntityList = F6
MapInfo = F7
ToggleGrid = F8
ToggleCamera = F10
DragEdges = B
DragVertices = V
CloneSelection = SPACE+shift
DeleteSelection = BACKSPACE
UnSelectSelection = SPACE
NextLeakSpot = L+ctrl+shift
PrevLeakSpot = K+ctrl+shift
MouseRotate = R+shift
FlipClip = ESCAPE
ZoomIn = Y
ZoomOut = H
ZZoomOut = DELETE
ZZoomIn = INSERT
TexDecriment = END
TexIncriment = HOME
TexScaleDown = DOWN+ctrl
TexScaleLeft = LEFT+ctrl
TexScaleRight = RIGHT+ctrl
TexScaleUp = UP+ctrl
ToggleClipper = X
CycleGroupSelection = C
ToggleSizePaint = P
Copy = C+ctrl
FileOpen = O+ctrl
FileSave = S+ctrl
Exit = X+ctrl
Undo = Z+ctrl
Patch TAB = L
MakeOverlayPatch = P
ToggleView = V+shift+ctrl
ToggleZ = Z+shift+ctrl
ConnectSelection = K
ShowDetail = F9
MakeDetail = M
SelectNudgeDown = DOWN+shift

SelectNudgeLeft = LEFT+shift
SelectNudgeRight = RIGHT+shift
SelectNudgeUp = UP+shift
Preferences = F11

The Project File

The project file contains the paths for the various Q3Radiant file-processing functions. Using the installer to set up the editor should write these for you.

New Project

(Menu: File➔New Project)
This creates a new folder (which you must name) in your *Quake III Arena* directory.
This is really only needed if you've messed up your project settings (without overwriting the original), and you want to reload the defaults.

Load Project

(Menu: File➔New Project)
This opens up a browse directory pointed at the scripts directory. It is looking for a text file with a .qe4 file extension.

Changing the Project File

(Menu: File➔Project Settings…)
You can edit the project file by changing the pathnames to various functions in field of the dialogue window that pops up. HOWEVER, before doing this, you should make a backup copy of your Quake project file and give it a new name. Make your changes to this new file. If you mess things up, you can always reload the original. This is a good thing to do if you are making maps for a mod that uses a separate set of definitions for entities or directories for textures and want to easily change between types of projects.

Project Settings

Basepath: This traces a path, beginning in your root directory to the baseq3 where the editor expects to find resources.

Mapspath: This traces a path, beginning in your root directory, to the location where maps are saved and from which they are loaded. The default is the maps directory.

Rshcmd: The means "remote shell command." Use it only if you are directing a remote processing device (not your editing computer) to compile maps. The syntax for the field is: "rsh [processor name]"

Remotebasepath: If you are running your compile from your editing computer, this should be the same as your basepath. If you are working off a remote compling device, this should trace the full path to the to the baseq3 folder where the compiler will find the resources it requires.

Entitypath: This traces a path to the definition file for your game entities. This can either be a .c file which contains the game code, or a .def file which contains more instructive information about the entities.

Texturepath: This traces a path, beginning in your root directory, to the location from which textures are loaded. The default is the textures directory.

Menu commands

These commands are your map compile commands. You can CHANGE these commands or ADD your own. Each new command must start with "bsp_" The following is the compile command string for "bsp_Fullvis" taken off one of our project files.

```
! q3map $ && ! q3map -vis -threads 8 $ && ! q3map -light -threads 8 $
```

Command parameters:

!	The exclamation mark is replaced by the contents of the rshcmd field. It is the path to the processor.
$	The dollar sign is replaced by the Mapspath.
&&	The double ampersand is the command terminator (end of command)
q3map	This is the process command. Without a switch after it, it performs the .bsp compile phase.
-vis	This is a switch to select the vis compile phase.
-light	This is a switch to select the lighting compile phase.
-threads	This is a switch to break the compile up into a number of different processor threads. The number of processors follows the switch parameter.

Other parameters

-onlyents	Process only the entities in the map.
-fast	A quicker process. However, it treats the map as if it were all one vis area.
-extra	As in -light -extra. This is a second lighting pass that more finely subdivides the map into areas of light and shadow.
-nowater	Compiled without liquids in the map. Used in the first compile phase only.
-nocurves	Compiles without curves in the map. Used in the first compile phase only.

Misc settings

Use brush primitives in MAP files.

Once this is set for a map, the program converts the texture mapping to this format. Once chosen, there is no going back to the old format. Brush primitives are described in detail under the Working with Textures section.

Setting up the Windows

There are six configurable windows in Q3Radiant.

The Camera Window (CAM)

The Camera window initially shows a gray field. This is where the 3D in-progress view of your map appears. You can SHIFT + click mouse button 1 to select objects in this window. If the images in this window appear overly dark, you can adjust the gamma value. Open the Misc menu and select Gamma. Enter a value between 0 and 1 for the light value. Close the program. Reopen the program. Check the darkness. Repeat this until you have a value you like.

Entity/Texture/Console/Group Window

Depending on the Windows layout view that you've chosen, one or more of the following sub-windows share this window. They are selectable by the tab at the bottom of the window, or by shortcut keys.

Entity Window

(Shortcut: N)
The Entity window is one of four windows that share the same window space: Console, Entity and Texture and Group. The entity window is used to create and modify the properties of game entities. The uppermost box in this window contains the entity names. Use the scroll bar to find the one you want or for speed, type in the first letter of the class of entity you desire ("w" for weapon, "I" for item and so on). Refer to the Working with Entities section for more details on this.

Texture Window

(Shortcut: T)
The Texture window displays textures that have been loaded from the texture directories for easy use. The texture subset tool (set in preferences) allows you to quickly jump to a texture if you know the first few letters of its name. The scrollbar tool adds normal Windows functionality to the window. The most common method of navigating the window is to right-mouse click and drag through the window contents. SHIFT + right-mouse click and drag speeds up the rate of movement through the window's contents. A thin green outline around a texture indicates a non-shadered texture in use in the map. A thin white outline indicates a shadered texture. A bold red outline indicates a selected texture.

Console Window

(Shortcut: O)
The console tracks the editor's processes, like loading, saving, and compiling. When you compile (selecting an option from the bsp menu), the contents of the console are dumped into the junk.txt file in your Temp file folder on your root drive. In the Split Window view layout, the Console window is always in view.

Groups Window

(Shortcut: none)
This window will deal with the future grouping functions that will soon be a part of the editor. At this time, it is only a non-functioning window.

Z-axis Scale Window

This window is used by three of the four views to show the Z-axis position (height) of the Point of View and any selected map components.

Map Window(s)

The Grid

Think of the Map window as a piece of graph paper, neatly divided into squares. However, unlike graph paper, you can change the size of the grid to fit your needs of the moment. You can change grid size from the Grid menu, but it's faster to learn the key shortcuts listed below.

Setting Grid Size

Grid size Key

1 unit grid	(1)	
2 unit grid	(2)	
4 unit grid	(3)	
8 unit grid	(4)	
16 unit grid	(5)	
32 unit grid	(6)	
64 unit grid	(7)	
Grid Down	Decreases the size of the grid.	[key
Grid Up	Increases the size of the grid.	] key

Grid and Window Layouts

There are four distinct ways of laying out the work windows for Q3Radiant.

Design Notes:

Try not to build architecture with a grid smaller than 8 units.
Use a smaller grid if you need to build small details.
Use a large grid (32 or 64) for roughing in a level.
Use a large grid for moving large chunks of architecture around.

Snap to Grid

When this is checked, the edges and vertices of brushes and patches will "snap" to grid coordinates. Unless you are attempting some very fussy maneuvering of a map component, Snap to Grid makes life much easier. In fact, if you are building objects out of curve patches, it is crucial that you be able to line up patch control points with the vertices of surrounding solid geometry brushes.

Colors

Q3Radiant allows you to select the colors of your grids and tools. Because the manual refers to the colors of some features, you may wish to wait until you are more comfortable using the editor before changing too many things. You can always revert to the Q3Radiant defaults, should you choose change too much.

To change Map window and Texture window colors, select the "Misc" menu and choose colors. The pop-up lists a number of options.

Themes

Brings up three options:
QE4 Original: The settings for id's original Quake 2 editor
Q3Radiant Original: The default setting.
Black & Green: a black background with a green grid major.

Each of the following options opens the Windows color selector.

Grid Background…

The background color for the map window.

Texture Background…

The background color behind the textures in the texture window. This is probably best left a neutral color.

Grid Major…
These bolder grid lines mark 64 unit increments in the map window. These never change.

Grid Minor…
The finer grid lines in the map window.

Grid Text…
The color of the scale numbers along the left and top of the map window.

Grid Blocks…
These lines mark the 1024 x 1024 unit grids on the map.

Default Brush…
This is the color of unselected brushes in the map.

Selected Brush…
The color of selected brushes in the map.

Active View Name…
This is the text that says “XY Top” or “YZ Side” or “XZ Front” in the map view window(s).

Entities and Assets

What are Entities?

Quake III Arena divides map components into two classes: World Geometry and Entities. World Geometry represents the brushes (the Q3A term for the blocks of geometry used to build the physical game world) and patches (anything built with calculated curves). Entities are a broad category that not only includes simplistic editor representations of game play objects like weapons and ammo, but also includes diverse things like player start spots, and lights. Typically, they are displayed as brightly colored cubes (for those entities not constructed of brushes). The following are the general category of entity types. The actual entities and the rules and tips for their use are listed in the Appendices.

Brush entities. The "brush" is the basic building block of Quake engine games (including *Quake, Quake 2, Quake III Arena,* and a host of games using the engine licenses). In its most basic form, it's a block, a solid rectangular volume defined by the coordinates of its corner vertices. A single brush or a linked grouping of brushes can be turned into a brush entity. Brush entities include the movers (see below), triggers, and func_statics.

Movers. Most moving objects or "Movers" are built from brushes. These include doors, lifts or "plats", rotating objects, buttons, pendulums and trains (objects following pre-defined paths), and bobbers (platforms that are constantly in motion, up and down or side to side).

Triggers. Triggers are brush entities that cause an event to occur when a player's bounding box moves inside the volume of the trigger. Triggers can be targeted on many other entities, including most movers and targets. Some triggers also have more specialized functions. There are triggers that cause injury, activate other entities, and push or teleport the players.

Targets. Targets are the entities that are activated to cause events to happen in *Q3A*, or to redirect activations, insert time delays, mark locations for team play, or act as destination points for teleportation or pushing.

Lights. These are point lights, disembodied (read as no visible source) sources of illumination. They ca n be targeted at info_nulls to create spotlights. They can be turned into colored lights. Usually, they are used to create unfocused fill light in a large area or placed near glowing surface textures to create an effect.

Info. This category includes non-team player spawn spots, targets for lights, and camera locators for intermission shots.

Items. With the exception of ammo and weapons, these are things in the map that the players grab to use during play. Included are armor, power ups like the quad, and one-use items like the personal teleporter.

Ammo. Locations for ammo boxes. Each weapon type in *Q3A* has its own unique ammo entity.

Weapons. Each of the weapons that can be picked up has an entity that can be placed.

Miscellaneous. This is another catchall category. It includes things like the misc_model which links into the models directory when placed, func_timers which are automated repeating triggers, shooters which fire one of three different weapon fire types, camera and portal surfaces, and path corners.

What are Assets?

Assets are the textures, sounds, and models that are used to flesh out the appearance and ambience of a game map. The editor is designed to use the assets stored in the pak0.pk3 file in your quake3 directory. Using Q3Radiant, the mapmaker can work with the assets in the *Quake III Arena* pak0.pk3 file or create new ones.

What are Textures?

The art appearing on the walls of maps are generally referred to as "textures." Textures are created and stored as true color targa (.tga) or jpeg (.jpg) graphic files. The textures do not use a pre-defined color palette (as was the case with both *Quake* and *Quake 2*). Shader scripts can further combine textures and/or modify them in numerous ways. This document will briefly touch on shaders. For an in-depth treatment of shaders, refer to the accompanying Shader Manual.

What are Sounds?

Quake III Arena world sounds are played by target_speaker entities in the maps. They are stored as 22 khz, 16-bit, mono format .wav files.

What are Models?

The statues and lights in Q3A are models, just like the player characters. They are placed with the misc_model entity.

Creating New Assets

If you are familiar with the required tools, creating new assets for use in Quake III Arena is not particularly difficult. As a rule, you should create new directories for each map with names different from the names used by id. If you are making a map that will be called "H4x0r_D00M", every directory containing new assets for that map should be titled H4x0r_D00M. This is to try and avoid asset directories overwriting each other as the editor and the game load in assets.

Creating Textures

Any combination of graphic programs and plug-ins that can output a 24 bit MS windows compatible Targa (.tga) or JPEG (.jpg) graphic file. If you plan to make textures that will have an alpha channel component (see glossary for definition), you must have a program that can create 32-bit art with that fourth channel.

Adobe PhotoShop has the ability to easily create alpha channels. Paint Shop Pro from JASC (v5.0+) can also make an alpha channel by creating a mask and naming it "alpha".

Generally speaking, regardless of the program used, we found it best to do most of the art manipulation of the alpha channel in a separate layer or file and then paste it into the alpha channel before saving.

Setting up Files

The editor and the game program look for assets to be located along the paths set up in your project file. Start by creating a directory for you new textures by creating file folders to make a directory path as follows: quake3\baseq3\textures\[mymapname]

The installation of Q3Radiant will create a text document called "shaderlist.txt" in the following path:

Quake3\baseq3\scripts\shaderlist.txt

Q3Radiant will use the contents of this script to grab your new textures for inclusion in the game. The contents of shaderlist.txt document will contain a listing of all the shader documents that were used by id Software to create *Quake III Arena.*

Since you will obviously want to create your own shaders, you need to put them in separate folders and create a new shader script for them.

If you plan to work on several maps at once and want to distinguish between textures used in each map, simply add additional map names here. For map and mod makers, we STRONGLY recommend that any new shader scripts created use the name of the map or mod in the shader file name. We know we can't avoid every incident of files overwriting each other, but we certainly can advise you how to try.

Now, create another text file within the scripts directory and call it:

```
[mymapname].shader
```

This file will contain the shader scripts you write to modify a particular texture.

Rules

Follow these rules when creating textures for the *Quake III Arena* engine:

- Save your textures into your new [map name] directories.
- Don't use the same names that id used for textures. It will cause problems.
- For best quality, save textures without an alpha channel as 24 bit TARGA files. Using JPEG files can save memory space, but at the risk of losing detail and depth in the texture. JPEG files cannot be used for textures requiring an alpha channel.
- Textures containing an alpha channel must be saved as 32 bit TARGA files.
- If a new texture requires no further manipulation, it does not need a shader script.
- Size textures in powers of 2. Example: 8x8, 16x16, 32x32, 64x64 pixels and so on.
- Textures don't need to be square. A 32x256-pixel texture is perfectly acceptable.

Guidelines

The following are some things the id designers learned about textures.

- Create textures in "suites" built around one or two large textures with a number of much smaller supporting detail or accent textures.
- Very large textures are possible, but some video cards compress textures larger than 256x256 pixels.
- Textures are grouped alphabetically by name in the texture display window, so you may want to give suites of textures similar names.
- Use the shader function qe3_editorimage to conserve memory when making multiple versions of a single texture (as in the case of a glowing texture with several light values).
- Unless you are creating special effects or textures designed to draw the player's eye to a specific spot, muted, middle value colors work best with the game engine.
- Extremely busy (a lot of fussy detail) textures can break up or form visually unpleasant patterns when seen at distances.

Creating Sounds

Tools needed: Any sound editing program that can create and save out sound files as 22 khz, 16-bit, mono format .wav files.

Set up: The editor and the game program look for assets to be located along the paths set up in your project file. Start by creating a directory for you new textures by creating file folders to make a directory path as follows: quake3\baseq3\sounds\world\[map name]

Place your completed .wav files in the [map name] folder. You can access (and play) this file from within the editor (see instructions for Target_Speaker).

Creating Models

Map models need to be converted from their native file format into *Quake III Arena's* native md3 file format. The modeling program, Milkshape 3D supports the file format needed to create map models for Quake III Arena (a link for this program is in the On-line Resources appendix). The compiling process merges the models into the bsp file. If you want other mappers to be able to use your models, you will need to include the md3 and supporting texture files within your pk3.

Making the .pk3 File

When you go to distribute your creation to the gaming world, you need to put your newly created map, textures, bot area files, and shader documents into an archive format called a "pk3" file. You do not need to include the shaderlist.txt file, since only the Q3Radiant editor uses that. Start by creating folders/directories in your root drive (C: for most of us). The game assumes that these folders are placed in the baseq3 directory, so you need to write your path names accordingly. You will need to keep the paths to the various assets the same as they are for the rest of the assets in the game. So your paths should be something like this:

Textures: textures/[mymapnamefolder]
New Models: models/mapobjects/[mymodelnamefolder]
Map, bsp & aas: maps/mymapname.bsp , mymapname.aas
Shader scripts: scripts/mymapname.shader
Server scripts: scripts/mymapname.arena

Move or copy all your new game assets in their folders.

We used an archiving program call Winzip to make the pk3 file. Get Winzip from http://www.winzip.com/winzip/winzip.htm

NOTE: Do not include or redistribute any game assets that are not your own (at least without permission). This specifically refers to id-copyrighted material that came with the original game or subsequent id released patches.

Make a zip archive called "map-mymapname.zip"

If you plan on distributing other resources separately, we strongly recommend the following naming conventions:

md3-xxx.pk3	User Model with original associated skin files and sound files
bot-xxx.pk3	User bot files. May contain additional model or skin and texture files
skin-xxx.pk3	User skin with associated skin and texture files
map-xxx.pk3	User created map(s) and supporting files (arena, texture, sound, music)
tex-xxx.pk3	User texture and shader files
snd-xxx.pk3	Sounds only
mus-xxx.pk3	Music only
pfb-xxx.pk3	Map prefabs

(special thanks to Rogue13 of http://www.polycount.com for this naming convention)

When you go to add a resource to the archive, click on options to "Recurse Folders" and "Save Extra Folder Info"

Zip all the required assets into a zip archive file (*Quake III Arena* DOES support compressed pk3 files).

Rename the zip archive to mymapname.pk3

Put it where the *Quake III Arena* community can find it.

My .pk3 File is Huge! No One is downloading it!

Large pak files are daunting as downloads. And as specified by the *Quake III Arena* End User License Agreement, that is the only way those new game assets may be distributed. Be kind and remember that not everyone has access to DSL, ADSL, ISDN, Satellite, Cable Modem or other high speed internet connections. Before packing up your resources, you may want to look into some dieting tricks to make it smaller.

- First, resave all your new non-alpha channel textures in JPG format. That will give you some significant art size savings.
- Streamline your map's art package. Id designers had to go on a rip 'n strip rampage through their levels to cut down on unique texture usage. Do you really need all that additional art? Can you substitute more of the original *Q3A* art, or get more duty out of some of your new work?
- Recompile your area files with the optomize switch. That will reduce their size. That's why it's in there as a command. This is also one of the biggest savings that you can make.
- Turn up the level of compression when archiving into the pk3 file.
- Compress again when zipping up the files.
- Take a SERIOUS look at any new sound resources you've created. Sounds, especially long sounds can be HUGE! Can short sounds be cleverly used to replace longer sounds in your map? The id designers did a bunch of that for *Q3A*. Very short sounds, played off sync against each other were made to sound like longer, more expensive sound files.

Map Building Basics

Once you have the editor installed and the preferences set, open the map and let's get started.

Moving Around

There are a number of ways to move your point of view around in the map and camera windows. Some are easy to master. Others are a bit trickier. Find one that works for you and master it.

Moving in All Directions

All movement directions are given relative to directions in the XY map. When other map views are shown, movement is still calculated in terms of the XY view. Key press movement occurs in discrete increments.

Forward (in facing direction)	(Up Arrow Key) or (Keypad 8)
Turn left	(Left Arrow Key) or (Keypad 4)
Turn right	(Right Arrow Key) or (Keypad 6)
Backward	(Down Arrow Key) or (Keypad 2)
Move up	(D)
Move down	(C)
Look up	(A)
Look down	(Z)
Level View	(END)

Flying … through the Map (and other 3D commands)

Some mappers prefer using mouse-fly to move around their map. Mousefly works by clicking and pressing with the Mouse button 2 (Right mouse button) on the Camera window. This takes a lot of practice to master. Clicking farther away from the window center increases the speed of movement.

Forward (in facing direction)	(Right Mouse click above window center)
Turn left	(Right Mouse click left of window center)
Turn right	(Right Mouse click right of window center)
Backward	(Right Mouse click below window center)
Move up	(D)
Move down	(C)
Look up	(A)
Look down	(Z)
Level View	(END)

Zoom with a View

The zoom keys increase or decrease the visual scale of the map, letting you move in close to work with small details or move away to see the entire map at once. Currently, there are 24 steps of zoom, from most distant to

closest. If Quad view is used (XY, YZ, and XZ views simultaneously), all three windows may zoomed at different scales. The Z-axis scale window is also zoomed separately

Zoom in
(DELETE)

Zoom out
(INSERT)

Z-axis Zoom in
(CTRL + DELETE)

Z-axis Zoom out
(CTRL + INSERT)

Jump to Location

(CTRL + Middle Mouse Button)
Click on a 2D map or the Z-axis window and your point of view immediately moves to that location. In the 2D map windows, neither the facing, nor the "height" of the point of view changes.

Moving the Maps Around

A right-mouse-button click and drag on a 2D Map window will cause the map to be dragged, allowing you to easily reposition what is being viewed.

Basic Construction Tutorial

This is a simple, step-by-step guide to making your first room. Before attempting it, you may want to familiarize yourself with some of the Brush selecting and handling tools. A *Quake III Arena* aficionado who goes by the handle "The Dog!" posted this simple on a *Quake III Arena* on-line message board. It appears here with his permission. It will walk you through creating a new map file, making your first "brush," adding a start spot and a light and then compiling the map.

The Dog!'s Ten Quick-n-Dirty steps to a SIMPLE room:

1) Create new map:

a) click file, new map

2) Create a small hollow room (make a box and hollow it out):

a) Make a box. In the *XY Top* window, click/hold your left mouse button at coordinates 256,-256 (upper left) - then drag your mouse to the -256,256 (lower right) [you should see a red square appear in grid].

b) Make the box taller. In the *Z Window* (this is also called the height bar): This brush appears as a red box. Click/hold your left mouse button above the upper edge of the box and drag that bar up to about 256. [you have just raised the height of the box]

c) Make it hollow. On your Toolbar below the Menu bar, locate the ***'Make Hollow'*** Button (should be a red box with a dotted box inside of it)located under the M in Misc). Press that button. This breaks the box up into six pieces: four walls, a ceiling and a floor. [you should now see a hollow room in the texture view window]

3) Press Escape to deselect the box (you are finished with room/box for now).

4) Add a player starting point:

A) **Bring up the Easy Entity Menu.** With your pointer over the room in the *XY To*p window, right mouse click INSIDE the newly created room box to open up the easy entity menu.

B) **Place a Start Spot.** Select info, then select **info_player_deathmatch**. [you should see a small pink box appear - this is where you will start in this map anytime its loaded]

C) **Is it in there?** Make sure that your new starting point is 'really inside' the room that you have created.

1) Click the ***xyz button*** on your toolbar so that you can toggle through each 'view' of that coordinate (*XY top, XZ front,* or *YZ side*).

2) Watch the red box (**info_player_deathmatch**) as you toggle through each view to make sure the red box is inside room

3) If there is a view it is not located inside - simply stop and drag it inside the box. (You can learn how to put it in optimal places later), until it is totally inside the room.

5) Press Escape to deselect the info_player_deathmatch item.
The box now turns into a solid pink, box outline.

6) Now add some textures:

A) **Load up Textures.** Click on the texture menu and drag down to select the gothic_wall texture directory.
B) **Open Texture window.** Press "T" to open the texture window. It should be full of wall textures.
C) **That wall will do just fine.** Then decide what wall surface you want to apply the texture to. Hold the left-CTRL and the left-SHIFT key down and then left click on a wall. The wall will turn red.
D) **Pick a Texture, any Texture**. in the 'texture view' window, left mouse click on any wall texture. A red border will now surround this texture. And presto, the wall becomes that texture too.
E) Repeat this step for all the walls that you want to apply textures to.

7) Save your map.
The editor doesn't like to work with "unnamed" map files. From the menu, select File ➔ Save. Name the map "test1". Always use lower case for your map names.

8) Add a light.
A) **Bring up the Easy Entity Menu Again.** With your pointer over the room in the *XY To*p window, right-mouse-click INSIDE the newly created room box to open up the easy entity menu.

B) **Place a Light.** Select info, and then select **light**. [You should see a small red box appear (smaller than the player start).

C) **Move it into place.** Do the same procedure you did for the player start spot, making sure that this light is inside the room.

D) **Deselect the light.** It will become a green box.

9) Compile it.

In the BSP menu, select "bsp_fastvis". Wait patiently for the program to finish three phases of compile: bsp, vis, light.

10) Start 'er up.

Start your Quake III Arena game. When the menu appears, hit the tilda key (~). On most American keyboards, this is in the upper left corner of the keyboard, below ESC.

A) **Enter the Devmap.** In the console, type "\devmap test1" and then ENTER.

B) **Play it for all it's worth.** The map should start and you will be standing in the center of your first room.

Now go make something more complicated on your own!

Tools 1: Selecting and deselecting

The most basic interaction with the editor is selecting and deselecting the map components. Everything else builds off from these commands.

The Component Handling Tools

Escape (ESC)

This is the all-purpose deselect key. Use it to back out of operations you don't want to complete or to stop working on a map component or group of components.

Select single component

(SHIFT + mouse button 1 while mouse pointer is over desired unselected component)
In the XY Window (or XZ or YZ), this selects a single map component that is "closest" to the top of all components beneath the pointer. The following is an exception: If an entity is directly beneath the pointer, it will be chosen in preference to a non-entity, even if the non-entity is "between" it and the pointer.

Select single face on brush

(SHIFT + CTRL + mouse button 1 while mouse pointer is over desired unselected brush face in the Camera Window).
This selects a single face on one brush, not the brush itself.

Select multiple faces on one or more brushes

(SHIFT + CTRL + ALT + mouse button 1 while mouse pointer is over desired unselected brush face in the Camera Window).
Use this to select several brush faces on one or more brushes.

Cycle through stacked components

(SHIFT+ALT+mouse1 while pointer is over map view)
Beginning with the component that has the greatest Z value, the user can cycle through vertically stacked components that are directly beneath the mouse pointer.

Deselect single component

(SHIFT+mouse1 while mouse pointer is over desired selected component)
In the XY Window (or XZ or YZ), SHIFT clicking on a selected component deselects it. The following is an exception: If a selected entity is directly beneath the pointer, it will be chosen and deselected in preference to a non-entity, even if the non-entity is "between" it and the pointer.

Deselect all selected components

(Menu: Selection➔Deselect)
(Shortcut: ESC)
All selected components are deselected.

Group Component Selections

There are four commands for selecting large groups of components. These involve creating a brush that encloses or touches numerous other components. In most cases, the brush used to create the grouping is deleted by the operation. These operations can be selected by menu commands or by buttons on the toolbar. The toolbar buttons are in the third grouping (as counted from the left). The command buttons on the toolbar are given as they relate to the Selection sub-grouping on the toolbar.

Design Note: These grouping commands are particularly useful when you want to region off a small area of the map.

Select Complete Tall

(Menu: Selection➔Select Complete Tall)
All brushes from the top to the bottom of the map that are totally enclosed within the XY dimensions of the grouping brush will be selected. The grouping brush is discarded.

WARNING: Undo will restore selected components but will delete the selection brush.

Select Touching

(Menu: Selection➔Select Touching)
All brushes that are in contact with the grouping brush will be selected. The grouping brush is NOT discarded.

Design Tip: Need to work an area around a particular brush? Use this tool to select the brush and then use the selected brushes to create a regioned area.

Select Partial Tall

(Menu: Selection➔Select Partial Tall)
All brushes from the top to the bottom of the map that are touched by the XY dimensions of the grouping brush will be selected. The grouping brush is discarded.

Select Inside

(Menu: Selection➔Select Inside)
All brushes from the top to the bottom of the map that are totally enclosed by the XY and Z dimensions of the grouping brush will be selected. The grouping brush is discarded.

Copying, Pasting, Cloning, Deleting and Prefabs

Save Selected

(Menu: File)
The selected brushes are saved as a map file. Not a true prefab, but a way to duplicate pieces of a map for later insertion.

Copy brush

(Menu: Edit)
(CTRL+C)
This function copies all hi-lighted brushes, patches, and entities onto clipboard. Contents of clipboard may be pasted into the current open map file or into another open map file.

Paste brush

(Menu: Edit)
(CTRL+V)
The map information previously copied into the clipboard is pasted at the same XYZ coordinates as the original. UNDO will delete the paste.

Clone

(Menu: Selection➔Clone)
(Shortcut: SPACE)
Selected map components are immediately duplicated. The clone appears +1x and -1y units (current map grid) away from the original (down and to the right). The clone remains hi-lighted until deselected.

Save Selection as Prefab

(Menu: Edit➔Save Selection as Prefab)
(Shortcut: none)
The user is prompted to save the selected map components as a prefab file (*.pfb) in the directory set by Preferences.

Load Prefab

(Menu: Edit➔Load Prefab)
(Shortcut: none)
Opens a file selection window into the directory set in Preferences. Select from that directory or browse for another. The selected prefab is pasted into the map at the same XYZ coordinates as the original.

Delete

(Menu: Selection➔Delete)
(Shortcut: BACKSPACE)
All selected map components are removed from the map.

Undo

(Menu: Edit➔Undo)
(Shortcut: none)
Undo will undo recent command actions affecting brush geometry, curve patches, and in-map comands that affect entities (move, rotate, delete, etc.). Undo has no effect on texture operations.

The number of levels or layers of Undo can be set in Preferences. The maximum number is 64. Unless your computer memory is extremely low, there is no real reason to use less than all 64 levels of Undo.

Working with Regions

Regions are an important tool to learn and use early on. Whether you isolate off a single brush, or half a map, you'll wonder how you ever got along without this tool in other editing programs. The selections on the Region Menu allow the mapper to isolate, and work on, a subset of the map. There are innumerable benefits to working in a "regioned" area of the map. However, the following are the most important:

- It allows you to work with a few map components at a time, without the distraction of the rest of the map pieces.
- When you want to perform CSG operations, regioning lets you isolate the pieces from the rest of the map, reducing risk of making unwanted cuts or splits.
- Map regions can be compiled without having to compile the rest of the map. This can be an incredible timesaver. Instead of spending hours to compile an entire map just to check for leaks in new construction, or check the appearance of a room, or test a lighting effect, minutes can be spent processing just the room itself.

There are several ways to select a region, by a group selection, by XY map window dimensions (or the corresponding view in YZ and XZ), or by a few selected map components.

The commands for selecting regioned areas are found under the Region Menu heading.

Region Menu

Off

(Menu: Region➔Off)
This returns you back to the full map. Brushes that were selected while in the regioned mode remain selected until ESC is pressed to unselect them.

Set XY

(Menu: Region➔Set XY)
Any map components that are inside, or that are touched by the bounds of the XY Map window are converted into a region. The size or shape of the window does not matter. Nor does the degree of Zoom matter. This is an excellent way to select are larger subset of your map, such as a complex room or group of rooms. Any brushes selected before regioning the map remain selected.

Set Tall Brush

(Menu: Region➔Set Tall Brush)
This functions in a similar manner to the group selection command, Select Partial Tall. Any map components contained within the XY bounds, or touching the XY bounds of the brush will be regioned off. The selecting brush itself is discarded.

Set Brush

(Menu: Region➔Set Brush)

This functions in a similar manner to the group selection command, Select Touching. Any map components contained within the XYZ bounds of the brush, or touching the XYZ bounds of the brush will be regioned off. The selecting brush itself is discarded.

Set Selected Brushes

(Menu: Region➔Set Selected Brushes)

If you need to work with just a few brushes, this is the option to choose. Hi-light the brushes to be worked upon then select this option. Only those brushes are moved to the region. The selected brushes are unselected when the region is created.

Compiling Notes: Sometimes, when compiling a regioned area, md3 map object models near the edge of the region can cause a “false leak” situation to occur. This can usually be corrected by adjusting the region size to include more of the map near the md3 map object model.

Tools 2: Working with Brushes

The geometry brushes are the basic building block of the Quake III Arena engine. These are the tools to make them work for you.

Geometry Brush Handling Tools

Escape (ESC)

This is the all-purpose deselect key. Use it to back out of operations you don't want to complete or to stop working on a brush or group of brushes.

Create New Brush

(Click mouse button 1)
(Shortcut: none)
While mouse1 clicking over the main map window (or any open map window) drag the mouse pointer across the grid. A brush will be created that has the height of the current map grid size. If you have the "snap to grid" function set in your preferences, the brush will start and stop on gridlines. The texture will be either the default texture (if none has been selected) or the most recently used texture. For all these functions, you will first need to select a brush in either the Map or Camera windows.

Move Geometry Brush

(Click mouse button 1)
The Undo command will return the brush to its original size (if the brush is still selected). If the brush has been deselected, the resized version will remain and another brush will be created at full size.

In the Map Window. In the map window, select the brush. Click on the selected brush. With the mouse 1 button depressed move the brush around the map to the position you desire.

In the Z (height) Window. In the map window, select the brush. Next, click on the selected brush in the Z window. With the mouse 1 button depressed move the brush around the map to the position you desire.

In the Camera Window. Select a brush in the camera window (see ***select single component*** above). Mouse button 1 click on the brush and drag it in the desired direction. You may need to adjust your camera view to make dragging easier.

Stretching the Brush

(mouse1)
Think of this as stretching the brush. The Undo command will return the brush to its original size (if the brush is still selected). If the brush has been deselected, the resized version will remain and another brush will be created at full size.

In the Map Window. In the map window, click next to the selected brush on the side you want to pull. With the mouse 1 button depressed pull in a direction away from the nearest edge. The brush will grow larger in that direction.

In the Z (height) Window. Use this to make the brush taller. In the Map or Camera window, select the brush. Next, click above or below the selected brush in the Z window. With the mouse 1 button depressed pull away from the select brush. The brush will grow in that direction.

In the Camera Window. Select a brush in the camera window (see ***select single component*** above). Mouse1 click near the edge of the selected brush. With the mouse 1 button depressed pull in a direction away from the nearest edge. The brush will grow larger in that direction. You may need to adjust your camera view to make dragging easier.

Shrinking the Brush

(mouse1)
Think of this as crunching the brush smaller.

In the Map Window: In the map window, select the brush. Click next to the selected brush on the side you want to pull. With the mouse 1 button depressed pull in a direction toward the nearest edge. The brush will shrink in that direction.

In the Z (height) Window: Use this to make the brush shorter. In the Map or Camera window, select the brush. Next, click above or below the selected brush in the Z window. With the mouse button 1 depressed, push towards the select brush. The brush will shrink in that direction.

In the Camera Window: Select a brush in the camera window (see ***select single component*** above). Mouse1 click near the edge of the selected brush. With the mouse 1 button depressed push in a direction towards the nearest edge. The brush will grow larger in that direction. You may need to adjust your camera view to make dragging easier.

Flip Brush

(Menu: Selection ➔Flip)
There are three separate actions here. They flip a brush along either X, Y, or Z-axes. A menu command and toolbar button controls each. The six flip and rotate toolbar commands are the second grouping (from the left) on the toolbar. The rotate command for the same axis is always next to the flip command. Flipping will not change the facing on non-model entities.

Flip X (Menu: Selection) (Toolbar: Leftmost button)
Flips brush along x-axis.
Flip Y (Menu: Selection) (Toolbar: left of center button)
Flips brush along y-axis.
Flip Z (Menu: Selection) (Toolbar: second button from the right)
Flips brush along z-axis.

Rotate Brush

(Menu: Selection ➔Rotate)
There are three separate actions here. They rotate a brush in 90 degree increments around a brush's X, Y, or Z axes. Both a menu command and toolbar button controls each action. The six flip and rotate toolbar commands are the second grouping (from the left) on the toolbar. The flip command for the same axis is always next to the rotate command for the same axis. The rotation will not change the facing on non-model entities.

Rotate X

(Menu: Selection ➔Rotate➔Rotate X)
Rotates brush around the x-axis.

Rotate Y

(Menu: Selection➔Rotate➔Rotate Y)
Rotates brush around the y-axis.

Rotate Z

(Menu: Selection➔Rotate➔Rotate Y)
Rotates brush around the Z-axis.

Arbitrary Rotation

The Rotate commands accessed from the toolbar all rotate affected map components 90 degrees; no more, no less. Arbitrary Rotation allows the user to set angles individually for the X, Y, and/or Z-axes. Enter a number value for each axis you want to rotate. Value can be positive or negative. After the values are entered, select OK. This rotates the object and closes the pop-up window. If you don't like the rotation, you can use Undo, so long as the brush is still selected, and the brush will return to its un-manipulated facing.

Free Rotate in Map Window

(Shortcut: R)
Press the "R" key. The selected map component(s) turns lavender. The purple square at the center is the center of the selection and the axis around which it will rotate. Left Mouse clicking on or near the selected component (in the map or camera window) and dragging will cause it to rotate. If the user does a SHIFT + middle mouse button click on the 2D map window, the axis square will relocate to the coordinates of the click. Deselecting and reselecting the component returns the axis to its original center.

Drag

There are two "drag" functions that involve control points or "handles" on the brush.

Drag Edges

(Menu: Selection➔Drag Edges)
(Shortcut: CTRL + E)
This highlights the edges of a geometry brush, marking those edges with a blue "handle" box at the center of each side. Press again and the feature will toggle off. Pull on a handle to resize part of a brush. If *Snap-to-Grid* is active (Menu: Grid), the handle will snap to the nearest grid coordinate as it is pulled. Undo functions with this effect.

Drag Vertices

(Menu: Selection➔Drag Vertices)
(Shortcut: CTRL + V)
This highlights the corner vertices of a geometry brush, marking those corners with a green "handle" box where the sides of each brush face connect. Press again and the feature will toggle off. Pull on a handle to resize part of a brush. If *Snap-to-Grid* is active (Menu: Grid), the handle will usually snap to the nearest grid coordinate as it is pulled. Undo does NOT function with this effect.

Design Note: Drag Vertices is a balky tool at best. It works well if the user is manipulating a triangular brush face, raising or lowering corners of the triangle. Work with care, it is quite easy to pull a brush out of useable (or recoverable) shape.

Scale

(Menu: Selection➔Scale)

With Scale you can enlarge or reduce a brush, patch, or group of brushes and patches. You choose the axes to scale (X, Y, or Z) and the factor of the scale. The scaling factor can be different for each axis. Selecting this option brings up a tool window. The size of the brush or group of brushes is multiplied by the numbers in the boxes adjacent to the X, Y, or Z axes. Leave the value as 1 and no change occurs. If the value is a decimal less than one, the size of that axis shrinks. If the value is greater than 1, it grows. Hit OK to activate the scaling function with you chosen values. Undo functions with this effect.

CSG Operations

CSG stands for "Computed Solid Geometry". The two functions here, ***CSG Subtract*** and ***Make Hollow,*** calculate the removing of sections from that geometry and breaking solid brushes (not curve patches) into smaller pieces. Although they are convenient to use for some operations, they often do things that the user may not care for. These "side effects" can include breaking brushes into inconvenient parts, cutting up adjacent brushes, and creating hard to find and remove micro brushes.

Subtract

(Menu: Selection ➔ CSG➔ Subtract)

When you select this, the selected brush or brushes subtract its volume from all the geometry that contacts it. The cutting brush is not removed. Undo does not fix this action.

Design Note: Region off together the brushes that will be cut and the brushes which will be used for cutting. This keeps other brushes in the map from being affected by the action. It's also a good idea to save just before doing the action, so the user can "back up" to an earlier version.

Hollow

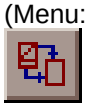
(Menu: Selection ➔ CSG➔ Hollow)

When the user selects this, the sides of the highlighted brush are turned into separate brushes. The thickness of these brushes is equal to the grid size. Undo functions with this action.

Design Note: This works best with rectangular brushes. The edges of the created brushes overlap each other.

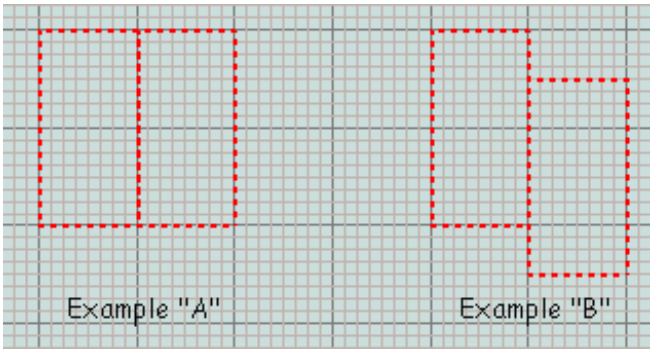
Merge

(Menu: Selection ➔ CSG➔ Merge)



When the user selects this, the highlighted brushes are turned into a single, convex brush. If the result of the merge would not create a convex brush, the following message appears in the editor console: " Cannot add a set of brushes with a concave hull."

Examples: Example "**A**" shows two brushes can be merged together. Example "**B"** shows two brushes that cannot merge.



Clipper

(Menu: Selection➔Clipper)
(X toggles the clipper tool on or off)

If you think of this tool as being near the same as the miter box that a carpenter uses to cut wood or moldings, then you are not far from the truth.

Placing Clip Points

Clip points are placed in the map views by two methods:

(Mouse button 1 after Clipper has been toggled on)
(CTRL + Mouse button 2 at any time)

The figure below shows a square brush that has been "clipped" from the lower left (point 1) to the upper right (point 2). The editor creates a line between the first point and the second point. The piece to be kept when the brush is cut is always created in a clockwise direction from the line (assuming that the first point is the center of the "clock")

In a two-point clip (shown here), the cut occurs perpendicular (at a 90 degree angle) from the plane of the map view. Adding a third point, and adjusting its position in a different map view can change the angle of the cutting plane. This will take practice to master.

Toggle Clipper

(Menu: Selection➔ Clipper➔Toggle Clipper)
(X)
This toggles the Clipper function on and off. After completing a cut, the tool remains active and must be toggled off before another brush is selected.

Clip Selection

(Menu: Selection➔ Clipper➔Clip Selection)
(SHIFT)
If the "clip selection" action is completed the red portion of the brush will be discarded and only the yellow will remain. The brush is unselected. Undo currently returns the original brush and keeps the clipped off piece.

Split Selection
(Menu: Selection➔ Clipper➔Split Selection)
(SHIFT + CTRL)
If the "split selection" action is completed the red and yellow portions of the brush will remain, split into two triangular brushes. The brush is unselected.

Flip Clip Orientation
(Menu: Selection➔Clipper➔Flip Clip Orientation)
The yellow and red hi-lights toggle so what was red is now yellow and what was yellow is now red.

Make Detail
(Menu: Selection➔Make Detail)
(Shortcut: CTRL + M)
In *Quake 2*, this was a surface flag. In *Quake III Arena*, it is used on the brush itself. Detail makes a brush non-structural. This means that it cannot be used to seal the hull of the map world. Don't use it for wall, floors, or ceilings. If it is used as a hull, the map will "leak" when compiled. But it can be used on things that jut out away from the walls (as long as there is a structural brush behind it).

Detail has two beneficial effects:

1. Detail brushes are less likely to cause additional cuts to occur in non-detail brushes that they touch ... thus reducing triangle counts. This can help reduce frame rate.

2. When the compiler does Vis, it breaks the world up into many small volumes. Any break in the surface of the box that forms a room creates additional volumes that must be. Detail brushes don't create these breaks. Therefore, using them speeds up compiling.

Make Structural
(Menu: Selection➔Make Structural)
(Shortcut: none)
Structural is the Default State for brushes. Textures that are not manipulated by shader scripts to be transparent or non-solid) do not change this. Essentially, this is a *change-it-back* command for Make Detail. It removes the detail flag from the brush. This surface WILL block Vis when the map is compiled (so long as there isn't shader content that says otherwise).

Func_Group
(Entity Window➔Func_Group➔Enter)
Technically, this is a b_model (brush model) entity. However, it's a great way to manage and handle related groups of map components for ease of selection. To use, select the brushes and patches you want to group and then open the Entity window (press "N"). Click on the entity list sub-window and type in "F" to move to the top of the "funcs". Double-click on Func_Group and all the brushes and patches selected are bound together into a group. Select one and you select them all.

Thumb through Components
(Shortcut: TAB)
When you have a Func_Group b_model entity selected, press the TAB key to "thumb" through the component pieces, hi-lighting them individually, one at a time. This allows you to work on part of a multi-piece group without having to work on all pieces

Find Brush

(Menu: Misc➔Find Brush)
Find brush allows you to locate a brush in the map by its identifying number. As the map is built, the editor assigns identification numbers to each map component. For brushes (and patches) these include an Entity number and a brush number. For any brush that is not part of a brush model (b_model), the entity number is zero (0). Each b_model will have it's own number.

When the compiler outputs error messages in the console and junk.text file, an identification number will call out brushes with problems. Be prepared for them. Even when you do things right, you will get error messages.

Selecting Find brush pops up a dialogue window with two fields. The first field is the entity number. For most brushes, this will be zero. The second number is the brush's individual number. Selecting "OK," jumps the 2D map window(s) to the selected component and hi-lights it.

Brush scripts…

(Menu: Edit➔Brush scripts…)
(Shortcut: none)
The command allows you to perform multiple step operations that manipulate a single brush. Currently, only two of the list scripts function.

BuildSpiral This walks you through the steps of building a spiral staircase. Select a brush, then click on the map to locate the spiral origin. Click again to bring up a dialogue window that prompts you to enter the number of steps, the angle of rotation, and the height of each step.

BuildStep This clones the selected brush and moves it +X 16 units and +Z 8 units.

Brush Menu Commands

The Brush menu lets the mapmaker convert a selected brush into a brush of a different shape. Most of the commands change the number of sides that the brush possesses. It will also change the brush to a single color. There are individual commands for three through nine sides. The brush will be given the number of sides indicated by the command (Plus top and bottom). The "top" facing is always relative to the view in which it is created. The sides are always at right angles to the view facing.

Poly-Sided Brushes

3 sided	(Menu: Brush➔3 sided)	(Shortcut: CTRL + 3)
4 sided	(Menu: Brush➔4 sided)	(Shortcut: CTRL + 4)
5 sided	(Menu: Brush➔5 sided)	(Shortcut: CTRL + 5)
6 sided	(Menu: Brush➔6 sided)	(Shortcut: CTRL + 6)
7 sided	(Menu: Brush➔7 sided)	(Shortcut: CTRL + 7)
8 sided	(Menu: Brush➔8 sided)	(Shortcut: CTRL + 8)
9 sided	(Menu: Brush➔9 sided)	(Shortcut: CTRL + 9)

Arbitrary sided…

(Menu: Brush➔Arbitrary sided…)

This command opens a dialogue window. You can enter a number of sides in the field from 3 to 64. Select OK to execute the command.

Primitives

(Menu: Brush➔Primitives)
Primitives are pre-made shapes other than squares or the polygonal multisided boxes made by the "number" sided brush commands.

Cone…

(Menu: Brush➔Primitives➔Cone…)
This opens a pop-up dialogue window that lets you enter an arbitrary number of sides. The height of the cone is equal to the Z height of the brush. The cone is always made with its axis along the Z-axis. At first, the radius of the base of the cone appears to be unrelated, or at least unevenly related to the XY dimensions of the brush from which it is transformed. However, if you make a four sided brush, the point to point "diameter" of the resulting pyramid is equal to the longest XY dimension of the brush. Starting the same size brush as you used for the four-side cone, an eight-sided cone fits neatly within the volume of the four-sided cone, four of its sides congruent with the side planes of the four-sided cone. Do the same for a 16 sided cone, and the same again for both a 32 sided cone. However, the number of sides seems to max out at 56.

Sphere…

(Menu: Brush➔Primitives➔Sphere…)
This opens a pop-up dialogue window that lets you enter an arbitrary number of sides. The maximum number of sides, which the editor seems willing to handle is 32.The diameter of the sphere, is roughly equal to the length of the longest XY side of the brush from which it is transformed. Attempts to create spheres with more faces than 32 may result in the brush disappearing and becoming infinitely tall. Use Undo to back up from this or hit backspace to discard the brush.

Torus…

Non functioniong command. No donuts for you!

Moving Selected Brushes

Moving the Brush

These keys move the brush around the map in discrete map grid increments.

Move Selection Down

(Shortcut: Keypad MINUS)
Each press moves the selected map component down along the Z-axis by one grid position (at current grid setting). Not affected by current 2D-map view.

Move Selection Up

(Shortcut: Keypad PLUS)
Each press moves the selected map component up along the Z-axis by one grid position (at current grid setting). Not affected by current 2D-map view.

Nudging the Brush

These keys move the brush around the map in discrete map grid increments. The movement is in terms of the selected window, not in terms of XYZ coordinates.

Nudge Down

(Shortcut: ALT + DOWN ARROW)
Each press moves the selected map component "down" the map view by one grid position (at the current grid setting). The movement is relative to the selected map view, not XYZ coordinates.

Nudge Up

(Shortcut: ALT + UP ARROW)
Each press moves the selected map component "up" the map view by one grid position (at the current grid setting). The movement is relative to the selected map view, not XYZ coordinates.

Nudge Left

(Shortcut: ALT + LEFT ARROW)
Each press moves the selected map component "left" the map view by one grid position (at the current grid setting). The movement is relative to the selected map view, not XYZ coordinates.

Nudge Right

(Shortcut: ALT + RIGHT ARROW)
Each press moves the selected map component "right" the map view by one grid position (at the current grid setting). The movement is relative to the selected map view, not XYZ coordinates.

Snap Selection To Grid

(Shortcut: CTRL + G)
If you are using the map grid to keep brushes in alignment, this is a great tool. Rotated brushes and brushes that have had their vertices tweaked can have vertices that no longer lie on map grid intersections. This snaps the vertices to align with the grid. Be warned that snapping to large grids may be hazardous to the health of your brush (Snap and it's gone! But that's what UNDO is for).

Efficient Brush Building Techniques

Developed from a Quake 3 World online posting by Astrocreep

Compiling a map is a necessary evil. It takes time, it ties up your processor, and in the early phases of map construction, comes up with construction errors as often as not. Nothing you can do about that … except the time thing. It is possible, through more careful construction (or perhaps reconstruction) to significantly reduce both map and bot compile times, and reduce map and .bsp file sizes (the latter being important for downloads). The following is based on reports written by Astrocreep that documents his extensive work to streamline the compile on one of the id sample maps.

Brush Construction

It cannot be overstressed. If you want shorter compile times and small file sizes, efficient brush construction is "critical" in building your map. There is one rule that stands above all:

DO NOT OVERLAP BRUSHES AT ANYTIME.

No matter what you have to do to build your map, do not overlap brushes. Overlapping means that all or parts of two or more brushes share the same physical space. If brushes overlap, you can expect to add time to your compiling, and add size to your .map, .bsp and, .aas file sizes.

Efficient map construction means that all brushes butt up against each other, but never intersect.

Brush Counts

The sample map to be reworked on had 1,100 brushes in it. Without changing the layout or appearance of the map, Astrocreep was able to remove 110, or 10% of the total brush count.

Learn how to do more with a single brush than with multiple brushes. Evaluate your map after you complete initial construction phases on all or part of it. Pick a part of the map, look at the layout and ask yourself if you could do that with fewer brushes. In all likelihood, nine times out of 10, the answer will be yes.

If you make a structure out of three brushes (or whatever) and have the same floor height and ceiling height (in some cases heights can be different), look at it in the "top view". Can you draw a line from each vertex and not cross out side of those three brushes? If you can, then that grouping of three can become one brush instead of three.

Example: here's how the engine might look at this.

Using 3 square brushes, you have 18 faces (with a texture mapped on each side) to be calculated. This doesn't take into consideration the number of in-game triangle faces that those brushes may generate. Even if two-thirds of those faces are not being drawn, they are still being calculated by both the compile process and the bot navigation compile process.

As compared to:

Using one brush (filling the same area), you have only 6 faces to be calculated. Here, you are compiling only a third of the total geometry. It should go faster.

Efficient map construction means using fewer brushes to build the world.

Caulking

It is possible to even further reduce the number of brush faces being calculated by applying a special non-drawing, but "solid" texture called "caulk" (common/caulk) to surfaces that cannot be seen in the game. When seen in the editor, this texture is a bright garish pink. In the game, it does not draw at all. Apply caulk to any brush face that either doesn't form the "shell" of the world or can't be seen by a player during play. Doing this may not improve your map's frame rate, but since your are telling the compiler that as many as five of the six faces on a square brush don't have to be calculated, it should have some significant effects on compile times. As long as you do not have any brushes that "share" the same space, caulking brushes should help reduce compile times. However, if you use caulk on a brush that "shares" the space of another, your compile time and all file sizes will actually increase.

Astrocreep compiled the test level nearly 200 times, many of those times were when he moved just a single brush, just to see what would change. Caulking seems to help the *-light* phase of compiling the most.

Efficient map construction means caulking all unseen brush faces.

Miscellaneous Tips

Lights: You can further improve compile times by careful use of lights. Entity lights, especially LOTS of entity lights can reduce compile time. If you need to reduce compiling time even more look to this.

Clip brushes: Clip brushes that have more than two sides not touching another brush appear to increase compile times.

Hint brushes: Use these only if you need to resolve a vis problem. Using them can significantly add to compile times.

Tools 3: Working with Curve Patches

Escape (ESC)

This is the all-purpose deselect key. Use it to back out of operations you don't want to complete or to stop working on a patch or group of patches.

Curve Menu Commands

The next set of commands comes from the Curve Menu. Some are duplicated on the Patch Tool Bar.

Cylinder

(Menu: Curve➔Cylinder)
This creates the simplest cylinder. Cylinders are always drawn with their open ends facing up and down. It does not matter which map view is open when the cylinder is created.

More Cylinders:

(Menu: Curve➔More Cylinders)

Dense Cylinder
This is a cylinder with a set of extra rows. It allows a 180-degree bend into a half donut (half torus).

Very Dense Cylinder
This is a cylinder with two extra sets of rows. This allows a bend into a full donut (torus).

Square Cylinder
This is a cylinder whose columns have been adjusted so that a square, with flat sides, is formed.

End Cap

(Menu: Curve➔Endcap)
This is a half cylinder.

Bevel

(Menu: Curve➔Bevel)
This is a quarter cylinder

More End caps, Bevels:

(Menu: Curve➔More End caps, Bevels)

Square Endcap
This is an endcap without the backside removed.

Square Bevel
This is a bevel with squared off back faces

Cone

(Menu: Curve➔Cone)
A cone is a cylinder with control points drawn together and welded at one end to form a point.

Sphere

(Not implemented)
Design Note: A curve patch sphere can be constructed from a cone. Start with a cubic brush. Convert into a cone. Go into edit vertexes mode and grab the control point at the peak of the cone. Pull it downward to half the height of the cone. Clone the resulting piece and flip it upside down.

Simple Patch Mesh…

(Menu: Curve➔Simple Patch Mesh…)
The patch mesh is the basic building block use to create all curves. All the curve primitives are deformations of this item. For this to work, you must first create a brush of the dimension desired for the patch. Selecting this opens a Patch dialogue window. This lets you select the vertical (rows) and horizontal (columns) complexity of the patch. The more complexity means being able to perform more deformations on the patch. It also means adding a greater number of triangles that must be rendered.

Insert

(Menu: Curve➔Insert)
Adding control points increases the complexity of a mesh. This action does not increase the physical size of a mesh. Additions are usually done before manipulating the patch mesh.

Insert (2) Columns
This adds two columns of control points to the left edge of a patch.
Add (2) Columns
This adds two columns of control points to the right edge of a patch.
Insert (2) Rows
This adds two rows of control points to the lower edge of a patch.
Add (2) Rows
This adds two rows of control points to the upper edge of a patch.

Delete

(Menu: Curve➔Delete)
Deleting control points reduces the complexity of a patch mesh. Be warned that the features created by the removed points are also removed. It does not make the mesh a less complex version of the former design. Deletions also change the dimensions of the mesh, removing the area created by the deleted control points. A mesh cannot be reduced smaller than a 3 column by 3 row complexity.

First (2) Columns

This removes two columns of control points from the left edge of a patch.
Last (2) Columns
This removes two columns of control points from the right edge of a patch.
First (2) Rows
This removes two rows of control points from the lower edge of a patch.
Last (2) Rows
This removes two rows of control points from the upper edge of a patch.

Matrix

(Menu: Curve➔Matrix)
This has nothing to do with Neo and Trinity. It's the patch mesh taken as a whole.

Invert

(Menu: Curve➔Matrix➔Invert)
(Shortcut: CTRL + I)
This command inverts the normals of the patch mesh. The normals control the direction of facing for the texture skin and the clipping surfaces.

Re-disperse

(Menu: Curve➔Matrix➔Re-disperse)
This is used on a selected patch. When rows or columns are inserted or added to a patch, the dimensions of the patch are not changed. The distances between the new additions and the old points are not the same. This command averages out the distance between the points. It does not change the size of the patch. **WARNING!** Only apply this BEFORE adjusting the patch. Otherwise, you may lose your work on it. With some patches, selecting this command will destroy the patch itself.

Cols
(Menu: Curve➔Matrix➔Re-disperse➔Cols)
(Shortcut: SHIFT + CTRL + E)
The distance between columns is averaged and evened out.

Rows
(Menu: Curve➔Matrix➔Re-disperse➔Rows)
(Shortcut: CTRL + E)
The distance between rows is averaged and evened out.

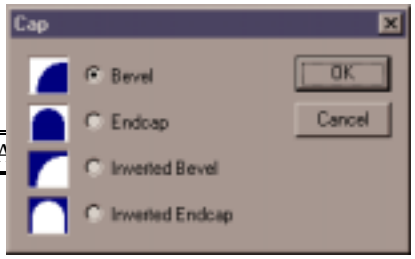
Transpose

(Menu: Curve➔Transpose)
(Shortcut: SHIFT + CTRL + M)
(Function undetermined)

Cap

(Menu: Curve➔Cap)
This command adds "cap" patches to the ends of the patch. The original brush and the caps are linked together as a func_group entity. A Patch Tool Bar button duplicates this command. The type of cap depends on the selected patch:

Cylinder The ends of the cylinder are sealed with circular patches.



Square Cylinder	The ends of the cylinder are sealed with square patches.
Cone	Both ends are capped (open and point). You will want to discard the cap on the point end.
Bevel	If you select to cap a bevel, a dialogue window pops up. A normal bevel cap covers the space between the curve and the center.
Inverted Bevel	An inverted bevel covers the space between the curve and the outer corner.
Endcap	If you select to cap an endcap, the same dialogue window pops up.
Patch Mesh	The bevel/endcap window will pop up. Results will vary depending on the manipulations done to the mesh.
Square Bevel	Capped in the same manner as a cylinder
Square End Cap	Capped in the same manner as a cylinder

Cycle Cap Texture
(Shortcut: CTRL + SHIFT + N)
Press this repeatedly until the texture on the cap patch looks correct.

Overlay
(Menu: Curve➔Overlay)
Overlay turns the grid of control points on for the selected patches and leaves them on until the Clear command is selected. By having the control points on a curve patch be visible, it is easier for the designer to align the vertices of adjacent solid geometry brushes.

Set
(Menu: Curve➔Overlay➔Set)
(Shortcut: Y)
This is the command to turn on the control points in a selected patch.

Clear
(Menu: Curve➔Overlay➔Clear)
(Shortcut: ALT + Y)
This is the command to turn off all control points in all patches.

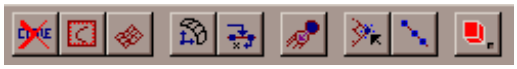
Thicken
(Menu: Curve➔Thicken)
(Shortcut: CTRL + T)
If you think about it conceptually, Thicken transforms a curve patch into a three-dimensional object. It does this by duplicating the selected curve and moving it a distance away from the copied curve, and, if the "seams" checkbox is checked, it will cover the space between the original and the copy with patches. The distance between original and copy is selected in a pop-up dialogue window. The direction is determined by the facing of the curve's normals (the textured side). The duplicated curve appears on the opposite side of

the textured face. The resulting object depends on the nature of the curve primitive being thickened. The following are some examples:

Cylinder	A pipe is created. Checking "seams" caps the ends.
Bevel	A matching bevel is created. Checking "seams" creates a bent square tube.
Endcap	A matching endcap is created. Checking "seams" creates an arch.*
Patch Mesh	A mesh that echoes the shape of the selected patch is created, but with XY dimensions smaller or larger by the measure of the thickness (smaller if the normals are on the concave side; larger if on the convex side).

- Thickening an Endcap is not the best way to create this shape. Bending a square cylinder will produce better results.

Patch Tool Bar



The patch tool par is turned on in the Preferences. Each of these buttons enables or disables a curve editing feature, or initiates a process on a selected curve patch.

Don't Select Curved Brushes

This button toggles the ability to select or not select curve patches in the map. If turned on (depressed), the user will not be able to individually select curve patches. Group selections will still include any curve patches within their boundaries.

Show Patch Bounding Box

This button toggles the display of the bounding box that defines the limits of the patch. On (button depressed) shows the bounding box.

Show Patches as Wireframe

This button toggles the display of patches between a fully textured mesh (off) and a wireframe-only mode (on). The wireframe mode makes it easier to see the deformations of the mesh and allows the user to see some control points that may be hidden by the texture when it is mapped on the mesh. It can also be a performance-enhancer for the editor (by setting the view to wireframe until you need to see the brush textured).

Design Tip: When manipulating the control points on a patch mesh, using wire frame allows you to best see both the control points and the deformations.

Patch Bend Mode

If a curve patch is selected, this button initiates a multi-step bending procedure. There are tutorials available on several sites that address the fine points of bending a patch, whether it is a cylinder or a simple flat mesh. The ESC key will exit the procedure at any point. The following are just the steps:

- Select the patch (and only the patch).
- Press the Patch Bend Mode button. This brings up an instruction window that says:

"Use TAB to cycle through available bend axis.
Press ENTER when the desired one is highlighted"

This highlights (turns pink) a row or column of patch control points. One of these control points will likely be the axis for your bend. Pressing ENTER locks in your choice and advances to the next step.

- A second instruction window message appears:

"Use TAB to cycle through available rotation axis.
This will LOCK around that point. You may also
use Shift + Middle Click to select an arbitrary
point. Press ENTER when the desired one is
highlighted."

This highlights the specific control point around which the patch will bend. Pressing ENTER locks in your choice and advances to the next step. You can also choose the control point by SHIFT + middle mouse button clicking on the map window. The click need not be within the bounds of the patch.

- A third instruction window message appears:

"Use TAB to choose which side to bend. Press
ENTER when the desired one is highlighted."

This highlights the side or end of the patch (relative to the bend point) around which the patch will bend. Pressing ENTER locks in your choice and advances to the next step.

- A fourth instruction window message appears:

"Use the MOUSE to bend the patch. It uses the
same ui rules as Free Rotation. Press ENTER to
accept the bend, press ESC to abandon it and exit
Bend mode."

Clicking and holding the Left mouse button on the map window and dragging it around will cause the patch to bend. Pressing ENTER or ESC at this point will accept any changes that you have made.

Redisperse Patch Points

This is used on a selected patch. When rows or columns are inserted or added to a patch, the dimensions of the whole patch are not automatically adjusted. The distances between the new additions and the old points are not the same. This command averages out the distance between the points.

WARNING: Only apply this BEFORE making adjustments to the patch, otherwise you may lose your work on it. With some patches, the patch itself will be destroyed.

CAP (put caps on the current patch)

This is used on a selected patch.

Design Notes:

Endcaps: Don't cap endcaps with this tool. Make a pair of opposing bevel caps that match the arch of the endcap

Messed Up Texturing: If an inverted bevel endcap covers something other than an arc of a perfect circle, it is likely that the texture won't appear right when you apply the CAP function to the texture. Press SHIFT + CTRL + P a few times until it looks right.

Weld Equal Patch Points (welds equal patch points during moves)

(Patch Control Bar only) This feature, when selected (button pressed in) causes control points to weld together if they are moved to the same coordinates. Undo will undo the move and the weld.

Drill Down (selects drill down rows and columns)

When this is toggled on (depressed), clicking on a control point in a 2D Map view selects all the control points in the row or column beneath it.

Moving Patches

Moving Selected Curve Patch

These keys move the curve patch around the map in discrete map grid increments.

Move Selection Down

(Shortcut: Keypad MINUS)
Each press moves the selected map component down along the Z-axis by one grid position (at current grid setting). Not affected by current 2D-map view.

Move Selection Up

(Shortcut: Keypad PLUS)
Each press moves the selected map component up along the Z-axis by one grid position (at current grid setting). Not affected by current 2D-map view.

Nudging the Curve Patch

These keys move the curve patch around the map in discrete map grid increments. The movement is in terms of the selected window, not in terms of XYZ coordinates.

Nudge Down

(Shortcut: ALT + DOWN ARROW)
Each press moves the selected map component "down" the map view by one grid position (at the current grid setting). The movement is relative to the selected map view, not XYZ coordinates.

Nudge Up

(Shortcut: ALT + UP ARROW)
Each press moves the selected map component "up" the map view by one grid position (at the current grid setting). The movement is relative to the selected map view, not XYZ coordinates.

Nudge Left

(Shortcut: ALT + LEFT ARROW)
Each press moves the selected map component “left” the map view by one grid position (at the current grid setting). The movement is relative to the selected map view, not XYZ coordinates.

Nudge Right

(Shortcut: ALT + RIGHT ARROW)
Each press moves the selected map component “right” the map view by one grid position (at the current grid setting). The movement is relative to the selected map view, not XYZ coordinates.

Snap Selection To Grid

(Shortcut: CTRL + G)
If you are using the map grid to keep curve patches in alignment, this is a great tool. Rotated curve patches and curve patches that have had their vertices tweaked can have vertices that no longer lie on map grid intersections. This snaps the vertices to align with the grid. Be warned that snapping to large grids may be hazardous to the health of your curve patch (Snap and it’s gone! But that’s what UNDO is for).

Tools 4: Working with Textures

There are three skill and knowledge components to working with textures as they regard *Quake III Arena*. They are Texture creation, Texture Manipulation, and Texture Application. Only the third, Texture Application, is absolutely necessary for making maps. You need not master all three.

Brush Primitives: A New Format

With the release of version 192, the Q3Radiant editor takes a new direction in the way textures are mapped to the surfaces of brushes. The texturing format will roughly be the same as the way textures are handled on curve patches. While there are no changes to the user interface within the editor, you should see a change in the way textures behave on brushes during transformation operations like move and rotate. Because textures are mapped to the S and T coordinates of a brush (as they are with curve patches), locked textures will now maintain their positions on brushes when they are moved or located. Even complex rotations should now be possible without the textures going askew.

Checking the Brush Primitives checkbox turns on this feature. (Menu: Project Settings…➔Use brush primitives in map files). Once you change a map to Brush Primitives, you cannot go back to the earlier method of texture mapping with that map. The prudent mapper makes backups before making major changes to projects.

Texture Creation: Making new Assets

This is covered earlier in the manual.

Texture Manipulation: Shader Overview

Technically, each texture already has a default shader that passes it through the pipeline to appear much as it does in the graphic program that made it. A shader is a short script, separate from the texture file, that the game engine uses to make further adjustments to the texture's appearance or function. The shader is to *Q3A* what the surface properties flags were to *Q2*, only ever so much more powerful. If you plan on creating your own textures, you should get to know and understand how shaders work. The Q3A Shader Manual contains the information you need.

Shaders and Multi-Pass Texture Effects

(*Drawn from an original essay by Small Pile of Gibs*)

Shaders give the mapper control over special graphics effects that require multiple redrawing passes before they are finally displayed on the game screen. Every shader that changes the visual component of a texture uses these “Multitexture” effects. Multitexture is ON by default in *Quake III Arena*. It is turned off with the cvar, “set r_ext_multitexture 0 (entered in the console or bound to a key) – see the Debugging section in this document for more details.

To understand how multitexture works, you need to understand how the *Quake III Arena* graphic engine renders a scene. All the faces you see in *Quake III Arena* are made up of triangles – you can see this by using the cvar command “r_showtris 1.” Initially, each triangle adds one to the "tris" number in r_speeds (the numbers that are used to estimate whether a scene is too complex). With every frame that *Q3A* “paints”, it draws triangles onto the scene in layers, starting at the back of the scene and drawing every triangle visible until it reaches the front. It takes time to draw each triangle. If a triangle is painted with a texture that is “see through” in some way

(either transluscent, transparent, or containing cut-outs), any triangles seen through that triangle must be redrawn one additional time for each stage in the the shader. If a single transparent triangle takes up the whole screen, for example, a glass window – The whole area of the screen has to be redrawn. Each triangle of glass takes an entire screen worth of "overdraw" and each extra stage on the glass adds another screenful, which is why glass can be such a big framerate hit.

The simplest form of multitexture is a Lightmap. In most cases, the Q3A engine first draws the lightmap (precalculated light and shadow information). Then, on top of that, it adds in the information from the texture art specified for that triangle using a special effect (blendfunc filter) – which blends the lightmap with the texture to make areas of the texture look light or dark. Using the cvar command "r_vertexlight 1" (Vertex Lighting instead of Lightmaps) stops Q3 from drawing the lightmap triangles (which is why many gamers use vertex lighting to gain additional playing speed).

Every extra stage in a shader is an extra triangle drawn over and blended with the first triangle in a special way. Like the lightmap example above, each additional stage requires an extra triangle to be drawn for each frame. On certain 3D accelerator cards (like the TNT - TwiN Texture), the multitexture effect cancels out the real cost of the first pass of blending. The blending for the first additional stage is done before the triangle is drawn. However, if the shader takes 3 stages (like all the shiny metal effects) it costs an extra triangle for every triangle it is used on. Every extra triangle used adds a triangle to the r_speeds triangle count. Because there are cards that don't automatically handle this first blending pass, the map maker needs to occasionally check his r_speeds with the multitexture turned off.

Texture Application: Texture Handling Tools

These tools manipulate textures within the editor. They do not create textures or shader scripts.

Escape (ESC)

This is the all-purpose deselect key. Use it to back out of operations you don't want to complete or to stop working on a brush face, a brush, a patch, or a group of brushes or patches.

View Textures

(Shortcut: T)
This is only used in the four-view and floating windows modes (as set in Preferences). It brings up the Texture selection window (also accessible from a folder tab). If the Entity window is open, you may need to click on a map view window first for the "T" command shortcut to work.

Show in Use

(Menu: Textures➔Show in Use)
(Shortcut: U)
This command affects the content of the Textures window. It filters the contents so that only those textures currently in use in the map are displayed in the window.

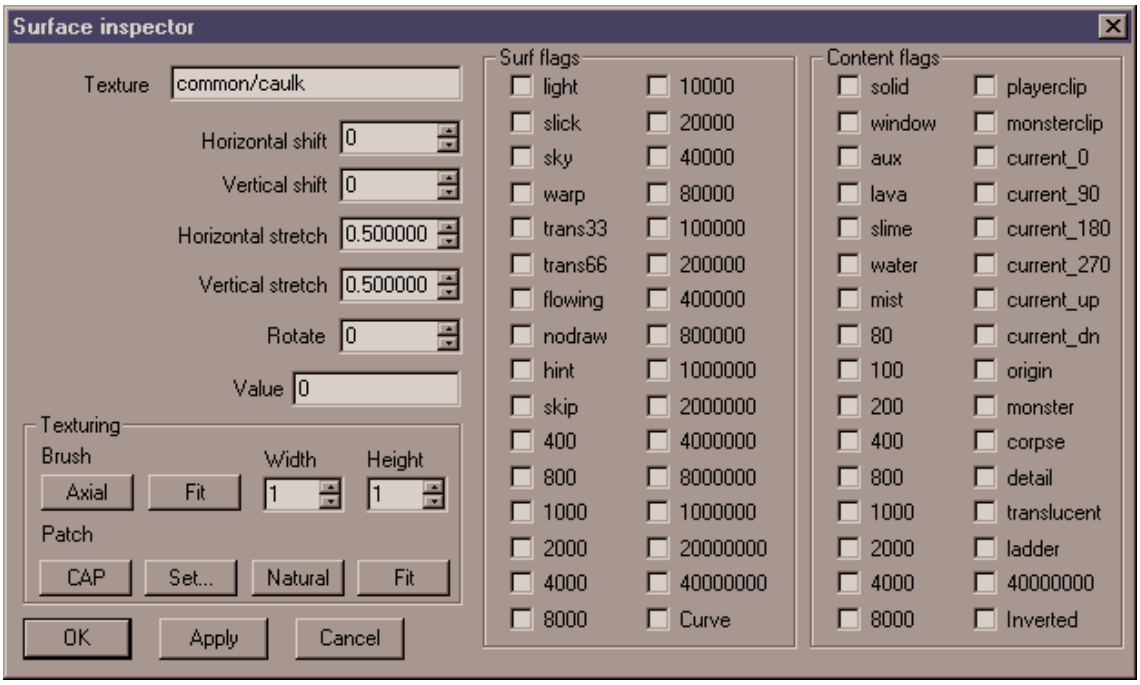
Show All

(Menu: Textures➔Show All)
(Shortcut: CTRL + A)

This command affects the content of the Textures window. It "un"-filters the contents so that all the texture directories previously loaded during the mapping session are re-displayed.

Surface Inspector

(Menu: Textures➔Surface Inspector)
(Shortcut: S)



This brings up a pop-up dialogue box. This is one of the more complicated interfaces used during map development and may take some getting used to.

Texture

This is the path/name (beginning in Textures directory) for the texture. You can copy from this field or paste into it. If you know the pathname of a texture, you can enter it here. It will load without having to first load the entire directory that contains it.

The next five commands work on both patches and brushes. However, the results of applying a Horizontal Shift to a brush and to a patch may be substantially different. When working with patches, the numbers in the fields do not change … although the texture on the map component may be changing.

Design Note: When a curve patch butts flush up against a piece of solid geometry, as if it were an extension of that geometry, it may be difficult to align the textures exactly. In fact is often *extremely* difficult to align a texture on a patch with the texture on an adjacent geometry brush. It works best when the dimensions of the patch are an exact multiple of the dimensions of the texture being used. Otherwise, you may want to consider designing your architecture in such a way that it is logical for a new texture to begin at that point. Use your judgement.

Horizontal Shift
This allows you to change the Horizontal texture offset (position of texture on a surface). You can type an offset value into field or use the scroll buttons on the right to shift the texture. If "Snap T to Grid" is set in Preferences, the scroll increments will move a number of pixels equal to the grid size.

Vertical Shift
This allows you to change the Vertical texture offset (position of texture on a surface). You can type an offset value into field or use the scroll buttons on the right to shift the texture. If "Snap T to Grid" is set in Preferences, the scroll increments will move a number of pixels equal to the grid size.

Horizontal Stretch
This allows you to change the dimensions of textures as they are mapped into the world. You can type a size value into field or use the scroll buttons on the right to enlarge or reduce the texture. The default value is 0.5. This gives a presentation in the game world of two pixels for each game unit. A Horizontal Stretch value of 1.0 would double the amount of area covered by a single repeat of the texture. Of course, doing that also reduces the apparent resolution of the texture by half (can you say blurry?)! Making the stretch value a negative number horizontally flops the texture's normals (i.e.; flops the texture left to right).

Design note: Textures are "projected" onto brush surfaces. This means that if a surface is angled, the texture stretches to fit the space upon which it is projected. To make the texture look "unstretched" you need to change the dimension so that it looks correct when stretched. Example: If you want to map a texture on a 45-degree angle, it should be scaled to 0.35 along the direction perpendicular to the axis of the angle.

Vertical Stretch
This is the same as for the Horizontal Stretch, but along the vertical axis. Making the stretch value a negative number vertically flops the texture's normals (i.e.; flops the texture up and down).

Rotate
This rotates the texture around the center point of the brush (or patch). If the texture is not centered on the map component, the rotation will not necessarily look correct. The increment of rotation is set by the value given for the Rotation Inc field on the Preferences window. The default value is 45 (degrees), roughly 1/8 rotation around the axis.

Value
(This *Quake 2* function is not used by *Quake III Arena*)

Texturing
This next grouping of commands in the lower left corner of the window provides two separate sets of buttons. The top set deal with texturing geometry brushes. The lower set is for texturing curve patches.

Axial (Brush)
Realigns texture to the X and Y axes (removing the effects of rotation)

Fit (Brush)
The texture is stretched to fit the dimensions of the brush. The width and height fields to the right are the number of repetitions to be used in the S and T dimensions (S corresponds to X on the actual texture and T corresponds to Y on the actual texture). The default value for the height and width fields is 1. You can type a size value into field or use the scroll buttons on the right to enlarge or reduce the texture. Only integer values can be entered (meaning that you can't enlarge a texture 1.5 times).

CAP (Patch)
This function is most often applied to patches used to fill in the gaps between curves and solid geometry. It can also be applied to flat patches so that the texture doesn't appear to follow the arc of the patch. You may need to use the SHIFT + CTRL + N command to normalize the texture on the patch.

Set… (Patch)
This command functions almost like the "Fit" command above for brushes. The texture will be fit across the patch based on the X and Y values given. However, there is a notable difference. The X and Y fields will accept non-integer values (e.g. 6.4 x 3.8). It may take some experimentation to determine which dimension of your patch is considered to be "X" and which is thought to be "Y". If a value of 1x1 is given, the texture will be "fit" to the patch.

Natural (Patch)
The engine does its best to map the texture onto the patch in a "natural" appearing manner. This means that the texture will curve and flow with the curves and bends in the patch. Unless you are texturing a cap, this should be your first choice when applying a texture.

Fit
The texture's coordinates are mapped to fit the patch (with no repeats).

Find / Replace

(Menu: Textures➔ Find / Replace)
(Shortcut: none)
This feature allows the user to replace a texture within a single brush, a set of selected brushes or globally throughout the entire map. Selecting the command from the menu opens up a dialogue window. The top line is for the texture path and name of the texture to be replaced. The second line is for the texture to be used for replacement. Several checkboxes allow fine control over what, exactly, is to be changed. This command does not respond to UNDO. If you accidentally mistype a texture name in the replace line, you will need to enter it again (as mistyped) on the find line and then enter the correct texture on the replace line.

Texture replacement is global (throughout the map) unless the selected checkboxes state otherwise.

Replace within selected brushes only. Only the hi-lighted brushes that contain the texture to be replaced will be affected.

Force replacement (ignore current texture name). *All* textures in the map will be replaced. Best if used with ***Replace within selected brushes only.*** Be very careful with this one.

Live Updates from Texture/Camera windows. Using Live Update the user can find and replace textures with a fully point and click interface.

Texture Replacement using Live Updates

Click on the Find box, then click on any texture in either the Camera window or the Texture window. The texture path/name for that texture appears in the box. Next click on the Replace box and click on the replacement texture. That texture's path/name appear in the Replace box. Select "OK" and the replacement will occur.

Step-by-step for replacing a texture on a brush face (if live update is not used).

- In the Camera window, hi-light (CTRL+SHIFT+mouse1) the texture to be replaced.
- Open Surface Inspector. If the name of the texture is not hi-lighted, then hi-light it.
- Press CTRL+C to copy the texture name.
- Open the Find/Replace window.
- Paste (CTRL+V) the name into the find window.
- Hit ESC to deselect the texture in the CAM winow.
- Open the Textures Window. Find the texture you want to replace with and select it.
- Open Surface Inspector again.
- Copy the texture name there.
- Open Find/Replace again and paste the new texture into the Replace box.
- Select OK. Replacement occurs and the dialogue window closes.

Texture Lock

(Menu: Textures➔Texture Lock)
(Shortcut: none)
Opens Pop-up window with two options for "locking" texture shifting during brush or patch movement.
NOTE: If you have selected the BRUSH PRIMITIVES option under Project Settings… then Texture lock will always be on.

Moves

(Menu: Textures➔Texture Lock➔Moves)
(Shortcut: SHIFT + T)
When this option is checked, textures stay locked in position on the brush as brushes are moved around the map. If unchecked, the texture appears to shift across the brush, because they are fixed to the world, not the individual brush. On small brushes and small textures (such as the small square lights), some "creepage" may occur, with textures shifting 1 or 2 units off their locked position.

Rotation

(Menu: Textures➔Texture Lock➔Moves)
(Shortcut: SHIFT + R)
When this option is checked, textures stay locked in position on the brush or brushes as they are rotated around the map. If unchecked, the texture appears to shift across the brush, because they are fixed to the world, not the individual brush. On small brushes and small textures (such as the small square lights), some "creepage" may occur, with textures shifting 1 or 2 units off their locked position.

Load from List…

(Menu: Textures➔Load from List…)
(Shortcut: none)
Opens a dialogue box listing all texture directories currently recognized by the editor. Hi-light a directory title then click on the "Load" button. The textures in the selected directory will be loaded into the Textures window.

Shaders

(Menu: Textures➔Shaders)
(Shortcut: none)
This command pops up a Pop-up window with two shader-related commands.

Load All (Reload)

(Menu: Textures➔Shaders➔Load (All) Reload)
(Shortcut: none)
This command loads or reloads all the .shader scripts recognized by your shaderlist.txt file. When you change and save a shader script, execute this command, then reload the affected texture directory to see any changes.

Show

(Menu: Textures➔Shaders➔Show)
(Shortcut: none)
When checked, this command surrounds all shader-manipulated textures in the Texture window with a thin white border.

Flush

(Menu: Textures➔Flush)
(Shortcut: none)
The flush command frees up texture memory and should improve editor performance. Exactly how much is flushed depends on your choice of commands.

Flush All

(Menu: Textures➔Flush➔Flush All)
(Shortcut: none)
This command flushes all the texture memory, restarts OpenGL and reloads the map from the last saved copy.

Flush Unused

(Menu: Textures➔Flush➔Flush Unused)
(Shortcut: none)
This command flushes all UNUSED textures from memory.

Texture Window Scale-

(Menu➔Textures➔Texture Window Scale)
(Shortcut: none)
This affects the size of the texture images displayed in the Textures window. Clicking on the menu entry opens up a pop-up window with the following size selections: 200%, 100%, 50%, 25%, and 10%. Adjust it to suit your liking. If seeing the detail in the textures is important to you, set the size to 100% or larger. If you know your way around the textures without having to see each pixel, set it for smaller.

Texture Directories

(Menu: Textures)
This is not a command. The entries on the Textures Menu below "Texture Window Scale" are the names of the available texture directories (all whose filenames are listed in the shaderlist.txt script). Clicking on one loads the contents of the directory into the Texture window.

Texture Shift Key Shortcuts

A brush, brush surface, or curve patch must already be selected before using these shortcuts. This feature closely copies the function of the Texture Shift fields and scroll bars on Surface Inspector pop-up window. If Snap to T is selected in preferences, then the texture shifts in pixel increments equal to the current grid setting. Shifting textures on curve patches may produce unexpected results.

Texture Shift Down	(SHIFT + DOWN ARROW)
Texture Shift Up	(SHIFT + UP ARROW)
Texture Shift Left	(SHIFT + LEFT ARROW)
Texture Shift Right	(SHIFT + RIGHT ARROW)

Texture Rotate Key Shortcuts

A brush, brush surface, or curve patch must already be selected before using these shortcuts. This feature closely copies the function of the Texture Rotate field and scroll bar on Surface Inspector pop-up window. The texture rotates in degree increments set in Preferences. Rotating textures on curve patches may produce unexpected results.

Texture Rotate Clockwise	(SHIFT + PAGEDOWN)
Texture Rotate Counter-Clockwise	(SHIFT + PAGEUP)

Texture Scaling Shortcuts

A brush, brush surface, or curve patch must already be selected before using these shortcuts. This feature changes the scale of the texture (the amount of area that a single instance of the texture covers). The texture scale seems inconsistent, except that opposite directions appear to cancel each other out. The amount of increase delivered by the first use appears to be about a ratio of 1:15.

Texture Scale Down	(CTRL + DOWN ARROW)
Texture Scale Up	(CTRL + UP ARROW)
Texture Scale Left	(CTRL + LEFT ARROW)
Texture Scale Right	(CTRL + RIGHT ARROW)

Using Interactive Textures

Interactive textures are the shader-manipulated textures that have an effect on game play, not just the appearance of the map. There are two classes of Interactive Textures: Special Content Textures and Texture Entities. For more detail and instructions regarding shader manipulation of textures, refer to the *Q3A* Shader Manual.

Special Content Textures

Special content textures are textures where the “surface” parameters of the texture actually change the physical nature of the geometry brush and in so doing, affects the play of the game.

Water

Water is a content parameter that allows a player to “swim” inside a geometry brush, causes a pulsing visual distortion of the underwater geometry, and prompts the game engine to draw bubbles as projectiles pass through it. A player can only remain under water for a short time (without a battlesuit) and then begins to drown.

Water usage rules:

- A water texture is defined by the presence of surfaceparm water in the shader that creates it.
- Because water is typically a "transparent" surface, the shader passes used to create surface effects on water are added to the shader passes of textures seen through the water surface. This can significantly increase the number of redraw passes necessary to draw the game world and may negatively affect performance.
- If you place water brushes side by side, the touching sides must be marked with the common/nodraw texture.
- Both the top and the bottom surfaces of a water brush must be water texture.
- Water brushes cannot be stacked so they touch another water brush vertically, only set side by side.
- If you want to be able to exit water easily, keep the distance from the top of the water brush to the adjacent "shore" or pool edge at no more than 16 game units. Somewhat less is actually better.
- If fog is to be used as a part of a water volume, the water surface should not deform.

Fog

Fog content is used to block or diminish player vision and provide "atmosphere" for a level. Like water, fog can affect game performance, especially if one can see additional shader effects within it. The following information is taken from the *Q3A* Shader Manual regarding fog creation and usage.

fogparms <red value> <green value> <blue value> <distance to Opaque>

This surface parameter (or "surfaceparm") defines the contents of the fog.
Note: you must also specify "surfaceparm fog" to cause q3map to identify the surfaces inside the volume. Fogparms only describes how to render the fog on the surfaces.

<red value> **<green value>** **<blue value>** These are normalized values (number range from 0 to 1). A good computer art program should give you the RGB values for a color. To obtain the values that define fog color for *Quake III Arena*, divide the desired color's Red, Green and Blue values by 255 to obtain three normalized numbers within the 0.0 to 1.0 range.

<distance to opaque> This is the distance, in game units, until the fog becomes totally opaque, as measured from the point of view of the observer. By making the height of the fog brush shorter than the distance to opaque, the apparent density of the fog can be reduced (because it never reaches the depth at which full opacity occurs).

Fog usage rules:

- If a room (or rooms) is to be filled completely with a fog volume, it can only be entered through one surface (and still have the fog function correctly).
- The fog volume can only have one surface visible (from outside the fog).
- Fog must be made of one brush. It cannot be made of adjacent brushes.
- Fog brushes must be axial. This means that only square or rectangular brushes may contain fog, and those must have their edges drawn along the axes of the map grid (all 90 degree angles).
- If a water texture contains a fog parameter, it must be treated as if it were a fog texture when in use.
- Additional shader passes may be placed on a fog brush, as with other brushes.
- If a light-emitting fog brush is placed beneath normal brush geometry, the light may cause light artifacting on the solid brush surface. Use with care.
- Brush models (trains, doors, rotating objects, etc.) within, or partially within fog volumes will have drawing priority problems against the fog. It is best not to place these entities in fog volumes.
- There are unconfirmed reports of moving entities being made with fog shaders.

Lava
Lava content, for most practical purposes, is a variation of water content. The damage that it does to players in contact with it is defined by game code and cannot be directly affected by the map designer.

Slime
Slime content, for most practical purposes, is a variation of water content. The damage that it does to players in contact with it is defined by game code and cannot be directly affected by the map designer.

Texture Entities
There are a number of shader-manipulated textures that are used in an entity-like fashion. The shader files that manipulate the textures are what give them their game properties. These are the ones that id used and their relevant properties.

Areaportal
Color: Opaque Red Orange
Location: (textures/common/areaportal)
The bsp tool uses areaportals to create hard, visual breaks between areas in the map. Until triggered, the areaportal blocks geometry behind it from being drawn or seen. The area portal brush should be a thin (2 to 4 units thick) brush. It should touch all the brushes that form the hull of the opening being portalled. It must be placed inside a door. The opening of the door triggers the portal function. The closing of the door returns it to its former state. The areaportal texture must completely seal off a volume from another volume (although this can be in conjunction with other areaportals). If a door is being used to block off an area from view, consider placing an areaportal brush inside the door. Example in Quake III Arena: All the doors out of the central courtyard in Q3DM12, The Dredwerkz, are areaportalled.

Caulk
Location: (common/caulk)
Color: Opaque Pink
Game Function: Caulk, the miracle texture. It blocks vis. It seals the world off from the void. It doesn't draw (so it doesn't add to triangle counts). It keeps curves from competing with textures behind them. It looks like hell if you see it in your world. From the View menu (View➔Show➔Caulk), you can toggle on and off the display of caulk brush sides.

Design Tips: When you build a brush entity (a.k.a. b_model), mark all the brush sides that you will never see with caulk. Otherwise, the game draws every one of them. Even if you're only making a one-piece door, mark all the non-viewed sides with caulk. The same holds true for detail brushes. If you can't (or won't ever) see a brush face on a brush that's been marked as detail, paint it with caulk. Next, whenever you build a curve, try to build the brush geometry immediately behind it out of caulk. Finally, look around your map for brush faces that you suspect are being drawn, but are never seen: door pockets, bars, underneath bridges or very low railings and so on. It may sound like work, but attention to detail like this buys you both the appearance of greater geometric detail in the map AND faster game running speed.

More Design Tips: Finally, and this should be used with great care, a caulk brush can be used to create an invisible support for entities. If you place a very thin caulk brush floating above a surface that would otherwise not support an entity (example: a grate made of clip

brush), the brush will not draw in the world, but will support the entity. The reason for this is that SUSPENDED entities are not "seen" by bots unless they can be reached by a jump pad.

Clip

Location: (textures/common/clip)
Color: Transparent Red
Game Function: If you look at a professionally made map, quite often you'll see that nearly every bit of wall surface is covered in a transparent red texture called "common/clip." Clip is a nondrawing texture that blocks player movement. Clip does not block weapon fire. Entities, such as ammo or weapons, are not supported by clip brushes. If placed or dropped on a clip brush, they will pass through them.

Design Tips: Place clip brushes to smooth the passage of players through the world. This could mean creating a slope that allows the player to slip past a piece of architectural trim, or filling a window to keep players from getting into it. It can be used to create an artificial ceiling that prevents players from flying or jumping too high.

Cluster Portal

Location: (textures/common/clip)
Color: Translucent lavender
Game Function: Works like an area portal, but for the bot navigation file only. Cluster portal is used by the bspc utility to subdivide the map into smaller areas for calculating bot navigation. Appendix C: Bot Navigation Files contains the specific details for using cluster portal texture entities.

Cushion

Location: (textures/common/clusterportal)
Color: Translucent pale aqua
Game Function: A player falling on this does not take damage. They also don't make a "landing" sound, so use with caution.

Do Not Enter

Location: (textures/common/donotenter)
Color: Transparent Pale Orange
Game Function: It is a tool used to solve bot navigation problems. Use it like a clip brush, but sparingly. When you observe bots doing stupid things in your map, try to block off the area with this texture. The Bot Navigation Files appendix contains the specific details for using the Do Not Enter texture entity.

Hint

Location: (textures/common/clusterportal)
Color: Transparent Yellow Green
Game Function: Helps determine the vis portals. It is used as a suggestion to the compiler during the vis phase, when the world is subdivided. Generally speaking, they are used to correct vis problems, whose chief symptom is the "hall of mirrors" effect seen during game play. These can often be corrected by careful placement of a hint brush. If you fill the volume where the error is seen or the volume adjacent to it, the problem may be corrected in the next compile. This is really more art than science.

Invisible

Location: (textures/common/noimpact)
Color:

Game Function: This was used to create a surface that would be marked by weapon fire, but would not be drawn in the world. This was created specifically to resolve a problem where func_static brushes were being used to replace floor textures that marked the location of weapons in Q3DM8. Because the rocket launcher was located in different places between the team and the deathmatch games, the designer wanted to make floor markers that would not only change between game types, but would be marked like adjacent floor pieces.

Nodrawnonsolid

Location: (textures/common/trigger)
Color: Opaque light yellow
Game Function: This is the same as nodraw.

Noimpact

Location: (textures/common/noimpact)
Color: black
Game Function: Used to create a surface which does not block weapon fire.
Weapon fire will pass through this. This usually used as a shader key on other textures.

Origin

Location: (textures/common/origin)
Color: Opaque Orange
Game Function: Used to create origin point in moving b_models, such as trains, plats, and rotating objects. This texture, applied to a square or rectangular brush, is used to create the point of origin for moving b_models, such as trains, plats, and rotating objects. It is used by func_trains as the point that passes through path entities and the source for sound attachment

Skip

Location: (textures/common/skip)
Color: Transparent yellow
Game Function: Do not use in Q3A. This texture was used in Quake 2 maps to discard sides of hint brushes. It is nonfunctional in Q3A.

Slick

Location: (textures/common/trigger)
Color: Translucent Pale Blue
Game Function: Not stick coating for map surfaces. Reduces friction. Use like a very thin clip brush over surfaces you want to be low friction.

Trigger

Location: (textures/common/trigger)
Color: Transparent Dark Yellow
Game Function: Used to make trigger brushes.

Weapon Clip

Location: (textures/common/weap_clip)
Color: Transparent Red
Game Function: This version of the clip brush only stops weapon projectiles from passing through it. No marks are left on the surface.
Design Tip: Use to create clip surfaces for map object models.

Tools 5: Working with Entities

The entities in *Quake III Arena* are limited to those defined by the game code. The editor can draws entity information from the game code, or from special definition (.def) files. Version 192 of the editor comes with a .def file developed from an original supplied by EutecTic. Mods made to Quake III Arena can add to and/or subtract from the entities used by a game. If you plan to work on mods, you should create multiple project files (copy and rename your project file) with the changes required for the mod.

The Entity Window

You make game design decisions about entities and modify their features within the Entity Window. The definition file that you select on the Project Settings… window determines what entities will be shown in the Entity List and what, if any, property descriptions appear in the Key Descriptions and Check box Spawn Flags.

Entity List

The Entity List is the field on the Entity Window. It contains the "classnames" of all the entities defined by the definition file in alphabetical order.

You can use the scroll bar to scroll through the entities or, after clicking on the field, type in the first letter of the class you want to use (e.g.; type in "T" to select "target", or "A" for ammo, "W" for weapon).

Double-click on the classname to select it and enter it on the first line of the Active Properties field.

The Entities appendix of this document contains a complete listing of all the entities used in Quake III Arena.

Key Descriptions

The entries in the Key Description field are the "rules of use" for the hi-lighted classname in the Entity List field. You can use the scroll bar to scroll up and down through the lines, but the entries are not interactive. If you are using the .def file accompanying release version 192 of the editor (or Eutectic's original), all the key commands are described and their acceptable values (or value ranges) are listed. If you are using the descriptions in the .c game code file, they may be substantially less descriptive.

Check box Spawn Flags

Spawn flags are properties assigned to entities by use of check boxes. Check the box to set the feature for the selected entity. Many entities have only a single spawn flag property, while others have numerous ones. Note that the check boxes to the right are only relevant for Quake 2 single player games and will not work for *Quake III Arena.*

Active Properties

This field shows all the properties currently assigned to the selected (or newly-created) entity. Each property has two parts: key and value. Once created or assigned, they appear on the same line together. Only properties that are valid for an entity (that is, ones that appear in the Key Descriptions field) will function in game. Adding others may create error messages. You cannot directly affect the properties in this field.

Clicking on an active property hi-lights it and fills in the key and value fields below. You can edit both the key and the value in those fields, or use the Del Key/Pair button to delete it altogether.

Key & Value Fields

Keys (and their values) are assigned to entities by typing them into the fields. There is no spell check or auto-correction, so make sure that your typing is accurate. Start by typing in the name of the key. Then hit TAB or ENTER to change to the value field. This also clears the contents of the value field. Now type in the value for the key (the Key Descriptions list the acceptable value ranges for the keys). If you hit ENTER, the key and value appear in the Active Properties field. If you hit TAB, the cursor moves up to the key field. You can also click directly on a field to edit it. The cursor will appear after the last character in the field. Use arrow keys to position the cursor within the field.

Angle Buttons

The Angle Buttons (below the value field) are used to assign a facing direction (as is the case with player start spots or misc_models) or movement direction to entities (such as doors and buttons). Click on a button to create an Angle key with that button's value in the Active Properties field. Clicking on another key changes the angle value.

There are two clusters of angle buttons. The first cluster represents rotation around the Z-axis for entities like player start or spawn spots or misc_models. The entity will face in the selected direction. The buttons represent angle directions in 45 degree increments. There is a direct correspondance between the angle that the entity will face (or move) and the position of the button in the cluster. If you select the 90-degree button at the top center of the cluster, the entity will face "up" on the XY 2D Map. If you select the 180-degree button on the left side of the cluster, the entity will face left on the XY 2D Map

For entities like doors or buttons, it represents the direction that entity will move when activated.

The second angle button cluster assigns an up (-1) or down (-2) direction to the entity. Note that an entity can only have one facing direction. It cannot face up and 45 degrees. It can only affect one or the other.

It is also possible to directly edit the angle value in the value field. This allows for a much more precise angle selection.

The Other Buttons

A third cluster of buttons sits to the right of the Angle buttons. Each has a unique function.

Del Key/Pair

If you have selected an active property, clicking on this button will delete the property.

Sound…

This opens a Windows directory browser in the directory that contains the map sounds. Double clicking on a sound file name in the browser window creates an active property with the appropriate key and the value as the path/name for that sound.

Model…

This opens a Windows directory browser in the models/mapobjects directory. Double clicking on an .md3 file name in the browser window creates classname misc_model active property with the value as the path/name for that model.

Entity Handling Tools

These tools manipulate the in game entities. The map component handling tools that are described in the Working with Brushes section also work with entities.

Escape (ESC)

This is the all-purpose deselect key. Use it to back out of operations you don't want to complete or to stop working on an entity.

Connect Entities

(Menu: Selection➔Connect Entities)
(Shortcut: CTRL+ K)
This targets one entity, typically an activating trigger, at another entity, usually a target of some kind. Some entities may be linked in multi-part chains, where each entity has some effect on the one(s) that follow it. To use, do the following:

1. Hi-light the acting entity (usually a trigger, or a button).
2. Hi-light the targeted entity (examples: target_position, target_relay, a door).
3. Select Connect Entities (or press CTRL + k).
4. A path is drawn between the two entities. The first entity selected always targets on the second.

Troubleshooting: If the connection is not made check the following:

- Are both objects already entities? Sometimes it's easy to forget to make a trigger brush into a trigger.
- Did you select ONLY two objects? If you accidentally click on something you don't intend to link, you have to start the linkage over.
- Did you select the objects in the correct order?
- Is the second object something that can be triggered remotely?

Ungroup Entity

(Menu: Selection➔Ungroup Entity)
(Shortcut: none)
This unbinds an entity made of brushes, and/or patches, and md2 models back into separate map components. Once ungrouped, the entity is no longer an entity and loses any and all key value properties it may have had.

Design Note: If you intend to rebuild an entity after ungrouping it, write down its key properties and values first.

Moving Selected Entity

These keys move the Entity around the map in discrete map grid increments.

Move Selection Down

(Shortcut: Keypad MINUS)
Each press moves the selected map component down along the Z-axis by one grid position (at current grid setting). Not affected by current 2D-map view.

Move Selection Up

(Shortcut: Keypad PLUS)
Each press moves the selected map component up along the Z-axis by one grid position (at current grid setting). Not affected by current 2D-map view.

Nudging the Entity

These keys move the Entity around the map in discrete map grid increments. The movement is in terms of the selected window, not in terms of XYZ coordinates.

Nudge Down

(Shortcut: ALT + DOWN ARROW)
Each press moves the selected map component “down” the map view by one grid position (at the current grid setting). The movement is relative to the selected map view, not XYZ coordinates.

Nudge Up

(Shortcut: ALT + UP ARROW)
Each press moves the selected map component “up” the map view by one grid position (at the current grid setting). The movement is relative to the selected map view, not XYZ coordinates.

Nudge Left

(Shortcut: ALT + LEFT ARROW)
Each press moves the selected map component “left” the map view by one grid position (at the current grid setting). The movement is relative to the selected map view, not XYZ coordinates.

Nudge Right

(Shortcut: ALT + RIGHT ARROW)
Each press moves the selected map component “right” the map view by one grid position (at the current grid setting). The movement is relative to the selected map view, not XYZ coordinates.

Rotating Entities = BAD!

All the commands that rotate brushes and patches will work on entities. Unfortunately, what they do to some entities is BAD! Don't use free rotate or menu rotation commands to rotate Misc_models or any entity model represented by a wireframe model in your map. The movement will separate the model wireframe from its bounding box and will not actually change the facing of the entity.

Changing Facing = GOOD!

To change the direction that a misc_model or entity with a facing (such as a player start or spawn spot) faces, use Angle keys and values. You should "rotate" (change facing) entities with either the Angle buttons on the Entity Window or by entering an Angle key and giving it a rotation value between 1 and 360 (inclusive).

Mass Rotations

If you are building a Capture the Flag map, or other map where you only build one portion and rotate it to make the others, consider doing the following. Change the display of all non-misc_model entities to bounding boxes only. Select the entities to be moved and clone them. Then rotate them using the menu rotating commands. Position them in the new map section. Next, move misc_models individually. Change their facing and set them in place.

Tools 6: Lights & Lighting

Lighting a map is both an art and a science. For *Quake III Arena,* the id designers worked to create instances of dramatic lighting, while attempting to maintain a relatively consistent intensity of light throughout the maps. Other designers worked to create dark realms, full of shadows in which lurking assassins could hide.

Whatever style of lighting you strive for, remember one key rule: The bots don't use light information. In a pitch-black room, they would still see an opponent. Keep that in mind when designing your maps.

Entity Lights

There are several ways to create light emitting objects. The simplest is to place a light entity into your map. If you do nothing, it has a default value of 300 and emits white light. If you think of the light value as the wattage for an incandescent light bulb, you are not far off target. The section on the Light entity in the Entities Description Appendix contains specific information on using light entities.

Texture Lights

Textures can be made to emit light. The amount of light that they give off is determined by two factors: the size of the texture and the value given for its q3map_surfacelight parameter.

If you only plan on using id textures in your maps, simply use the textures surrounded by a white box in the texture window. Many of them have their light values as part of their names: Example: ceil22a_5k. This would be a small, square light with a light value of 5000. There is not a direct correspondence between the light value of a texture light and an entity light.

If you want to make your own lights, either with new, custom textures, or changing the light and/or color values of the emitted light in existing id textures, plan on learning your way around the shader files. The Shader Manual explains the light commands. Place the new lights in unique directories. Example: Mymapname_light\skull_light_2k. Use the q3map_editorimage key to make multiple light intensity versions of your new lights.

Generally speaking, very small lights need to have very large values to look right (a 32x32 pixel light could easily have a surfacelight value of 10,000 or more). As the surface area of the light becomes larger, the amount of light needs to be substantially reduced for it to look right in the world. A word of warning, though. Very large glowing surfaces (other than skies) can look odd in the game world, especially if they are made from a repeating texture. The light source will appear to be generated from the center of the brush with the glowing texture.

"Sky" Lights

Quake III Arena was designed so that sky textures could appear to emit light in a natural way. The q3map_sun parameter creates a single light source in the sky. The mapper can control the brightness, color, and position in the sky of this light source. Furthermore, the designer can add a q3map_surfacelight value to the sky, giving it an overall lighting value.

Ambient Light

Ambient light is a property of the map's worldspawn entity. By assigning a number value to the ambient key, the overall lighting level of the map is raised. This has the tendency to flatten the difference between

light and shadow. The color of the light can also be modified. This technique is considered a “hack.” It does not come recommended. You will find instructions that are more complete later in this manual under the worldspawn entity heading in the Entities Appendix.

Tools 7: Miscellaneous Commands

Feedback & Read-outs

The bottom border of the map window holds four clusters of feedback information.

Z-Axis Layers

(Shortcut: SHIFT + Middle mouse click on 2D map window)
If you are using any window layout that includes the Z-axis scale, you can see the vertical relationships between components with this function.

Cursor Coordinates

These three coordinates, found to the left of center, report the xyz position of the cursor in the 2D map window.

x:: 0.0 y:: 0.0 z:: 0.0

Brush & Entity Counter

This readout is located at roughly center position. It reports the number of brushes (including brushes forming brush entities) and the number of non-brush entities (items, spawn spots, lights, etc.)

Brushes: 0 Entities: 0

Pushing the Limits

This is a good place (as any) to talk about limits. *Quake III Arena* has an upper limit of 2048 entities (including entity lights!!) and while it's not an upper limit, staying under 8000 brushes is a pretty good idea.

Selection

This readout temporarily replaces the Brush & Entity counter when a map component is selected. The numbers represent the dimensions of the selection.

Selection X:: 0.0 Y:: 0.0 Z:: 0.0

Origin

This readout temporarily replaces the Brush & Entity counter when a select map component is moved. The numbers represent the origin point of the selection (and track it as it moves).

Origin X:: 0.0 Y:: 0.0 Z:: 0.0

Cursor Travel Distance

These three coordinates, found to the right of the brush and entity counter, report the distance that cursor has traveled from the point where the user has clicked on the 2D map window.

Distance X:: 0.0 Y:: 0.0 Z:: 0.0

Control Settings

In the lower right corner of the editor window, you will see a string of letters and numbers that might look something like this:

G:8 T:16 R:45 C:10 L:MR

Each of these letter/number combinations represents the setting for one of the commonly used tools.

G Grid. Here, it's set to 8 units.
T Texture Tweak. This the increment in pixels that a texture will shift. Here, it's set to 16 pixels.
R Rotation. This is the amount of increment, in degrees that a texture or brush will rotate.
C Cubic Clip depth of field. When cubic clip is set, this is how far, in terms of 64 unit blocks that you can see into the map. Here, the setting of 10 would allow you to see 640 units into the map.
L Texture Lock. If M is showing, then it is locked for moves. If R is showing, then it is locked for rotations.

Viewing, Seeing, Not seeing, and Hiding

This group of commands all relates to what you see in the map and how you see it. Some are designed to reduce map clutter. Others are designed to improve editor performance.

Toggle…

Camera View

(Menu: View➔ Toggle➔Camera View)
(Shortcut: SHIFT + CTRL + C)
Toggles (hides or shows) the Camera View (CAM) window.

Console View

(Menu: View➔ Toggle➔Console View)
(Shortcut: O)
(Window: Click mouse button 1 on Console tab)
Toggles (hides or shows) the Console window.

Entity View

(Menu: View➔ Toggle➔Entity View)
(Shortcut: N)
(Window: Click mouse button 1 on Entity tab)
Toggles (hides or shows) the Entity window.

XY (Top)

(Menu: View➔ Toggle➔XY (Top))

(Shortcut: SHIFT + CTRL + V)
(Toolbar: XYZ button)
Toggles (hides or shows) the XY map window.

YZ (Side)
(Menu: View➔ Toggle➔YZ (Side))
(Shortcut: SHIFT + CTRL + C)
(Toolbar: XYZ button)
Toggles (hides or shows) the YZ map window.

XZ (Front)
(Menu: View➔ Toggle➔XZ (Front))
(Shortcut: SHIFT + CTRL + C)
(Toolbar: XYZ button)
Toggles (hides or shows) the XZ map window.

Z View
(Menu: View➔ Toggle➔Z View)
(Shortcut: SHIFT + CTRL + Z)
Toggles (hides or shows) the Z (height) window.

Center
(Menu: View➔ Center)
(Shortcut: END)
Centers the pitch (up and down) angle of the user view.

Up Floor
(Menu: View➔Up Floor)
(Shortcut: PAGE UP)
This is a shortcut for moving up between "floors" in map. It changes the user's Z height in the camera and map views. The view moves to a point where it appears that the user is "standing" on a "floor" (a brush with "air" space directly above it) directly above the user's current position in the map.

Down Floor
(Menu: View➔Down Floor)
(Shortcut: PAGE DOWN)
This is a shortcut for moving down between "floors" in map. It changes the user's Z height in the camera and map views. The view changes to a point where it appears the user is "standing" on a "floor" (a brush with "air" space directly above it) directly below the user's current position in the map.

Next (XY, YZ, XZ)
(Menu: View➔ Next (XY, YZ, XZ))
(Shortcut: CTRL+TAB)
(Toolbar: XYZ button)
Cycles the content of the XY map window with the other views (side and front).

Layout

(Menu: View➔Layout)

XY (Top)

(Menu: View➔Layout➔XY (Top))
(ALT + X when pop-up is held open, cycles with XZ, ENTER to select)
This returns the main map view to XY Top view.

YZ

(Menu: View➔Layout➔YZ)
(ALT + Y when pop-up is held open)
Changes main (XY) map view to YZ Side view

XZ

(Menu: View➔Layout➔XZ)
(ALT+ X when pop-up is held open, cycles with XY, ENTER to select)
Changes main (XY) map view to XZ Side view

Zoom

(Menu: View➔Zoom)
If the ***XY Top*** window is changed to display either ***XZ front*** or ***YZ side*** the XY commands below function the same way relative to the window, zooming in and out as commanded.

XY 100%

(Menu: View➔Zoom➔XY 100%)
Changes zoom on main map view to full size.

XY Zoom In

(Menu: View➔Zoom➔XY Zoom In)
(Shortcut: DELETE)
Zooms closer to main map. Working in smaller grid scale becomes easier.

XY Zoom Out

(Menu: View➔Zoom➔Zoom Out)
(Shortcut: INSERT)
Zooms out away from the main map. Working in larger grid scale becomes easier.

Z 100%

(Menu: View➔ Zoom➔Z 100%)
Changes zoom on the z (height) scale to full size.

Z Zoom In

(Menu: View➔Zoom➔Z Zoom In)
(Shortcut: CTRL + DELETE)
Zooms in closer on the z (height) scale.

Z Zoom Out

(Menu: View➔Zoom➔Z Zoom Out)
(Shortcut: CTRL + INSERT)
Zooms out and away from the z (height) scale.

Cubic Clip Zoom In
(Menu: View➔Zoom➔Cubic Clip Zoom In)
(Shortcut: CTRL +])
This requires that the Cubic Clipping function be toggled on. It decreases the Depth of Field (distance in which map components are seen) in the Camera window. Less map components are seen at one time. Decreasing the distance seen in the Camera window can significantly improve editor performance when viewing large numbers of map components. See **Cubic Clipping**.

Cubic Clip Zoom Out
(Menu: View➔Zoom➔Cubic Clip Zoom Out)
(Shortcut: CTRL + [ )
This requires that the Cubic Clipping function be toggled on. It Increases the Depth of Field (distance in which map components are seen) in the Camera Window. Increasing the distance seen in the Camera window can significantly slow down speed at which your point of view moves in the camera window. Increase the zoom to maximum distance only if you have a relatively powerful editing system. See **Cubic Clipping**.

Show
(Menu: View➔Show)
This is a pop-up menu with checked toggle functions for each of the features on the list. If a feature is checked, all map components of that type will show in both the Camera window and the Map windows. If the feature is not checked, all map components of that type will be hidden.

Names
(Menu: View➔Show➔Names)
(Shortcut: none)
Shows names of entities.

Blocks
(Menu: View➔Show➔Blocks)
(Shortcut: none)
Shows an additional grid over the Map window with subdivisions every 1024 units.

Coordinates
(Menu: View➔Show➔Coordinates)
(Shortcut: none)
Shows the Map window coordinates along the left and top edges of the Map window.

Entities
(Menu: View➔Show➔Entities)
(Shortcut: none)
Shows entities, including brush entities, lights, and models.

Paths
(Menu: View➔Show➔ Paths)
(Shortcut: none)
Shows the linkage connections between entities. This includes triggers targeted at entities and path lines.

Lights
(Menu: View➔Show➔Lights)
(Shortcut: none)
Shows Light entities.

Water
(Menu: View➔Show➔Lights)
(Shortcut: none)
Currently non-functional. Look for future fix. Shows brushes with water, lava, or slime content.

Clip Brush
(Menu: View➔Show➔Clip Brush)
(Shortcut: none)
This shows brushes with the common/clip content, including common/clip and common/weapon_clip. The entire brush is affected, not just clip brush texture sides.

Hint Brush
(Menu: View➔Show➔Hint Brush)
(Shortcut: none)
Shows brushes made with the hint texture.

World
(Menu: View➔Show➔World)
(Shortcut: none)
Shows all non-entity brushes.

Detail
(Menu: View➔Show➔Detail)
(Shortcut: CTRL + D)
Shows all brushes marked with a Detail setting.

Curves
(Menu: View➔Show➔Curves)
(Shortcut: CTRL + P)
Shows all curve patches.

Caulk
(Menu: View➔Show➔Caulk)
(Shortcut: none)
Shows brush sides containing the common/caulk texture (does not affect entire brush).

Design Tip: When you optimize detail brushes by caulking unseen brush faces, isolate the detail brushes in a region then turn off Caulk. Brush faces that need caulking will show up clearly as you move around the brushes.

Angles
(Menu: View➔Show➔Angles)
(Shortcut: none)
Shows facing angle of player start spots by way of a white arrow.

Hide/Show

(Menu: View➔Hide/Show)
This is an immensely powerful and useful tool. It lets the user temporarily hide map components that may be in the way of working on other brushes. Hidden components are not affected by CSG actions.

Hide Selected

(Shortcut: H)
Selected map components are hidden from view (and CSG cutting operations) until the Show Hidden command is executed.

Show Hidden

(Menu: View➔Hide/Show➔Hide Selected)
(Shortcut: SHIFT + H)
Previously hidden map components are returned to view.

Entities as…

(Menu: View➔Entities as…)
(Toolbar: Show Entities as, rightmost button on toolbar)
The editor can show model entities (referring at this point only to Misc_Model entities) in several formats.
Note: More detail in a model shown in the Camera and map views will affect the ability of the editor to display the map. If the editor responds sluggishly, try reducing the level and/or type of detail shown for models.

Bounding Box

(Menu: View➔Entities as…➔Bounding Box)
(Shortcut: none)
This is the simplest form of display. A box defines the outer dimensions of the model. This is the least costly manner of display.

Wireframe

(Menu: View➔Entities as…➔Bounding Box)
(Shortcut: none)
Non-functioning.

Selected Wireframe

(Menu: View➔Entities as…➔Selected Wireframe)
(Shortcut: none)
The Model is displayed as a bounding box until selected, at which point the wireframe mesh for the model appears.

Selected Skinned

(Menu: View➔Entities as…➔Selected Skinned)
(Shortcut: none)
The Model is displayed as a bounding box until selected, at which point the skinned mesh for the model appears.

Skinned
(Menu: View➔Entities as…➔Skinned)
(Shortcut: none)
Only the skinned mesh for the model appears in the map and Camera views.

Skinned and boxed
(Menu: View➔Entities as…➔Skinned and boxed)
(Shortcut: none)
The skinned mesh for the model appears inside a wire frame of the bounding box in both the map and Camera views.

Cubic Clipping
(Menu: View➔Cubic Clipping)
(Shortcut: CTRL + \ )
(Toolbar: Cubic Clipping button, to right of XYZ & Texture view mode buttons)

This command toggles on (checked) or off when selected. Cubic Clipping may be the most effective way to improve editor performance. When turned on, only those map components near the player are displayed in the Camera window. Any map components beyond a certain depth of field will not be displayed in the camera window (it has no effect on map windows). As the user moves through the map in camera view, map components will pop into being as the point-of-view (POV) draws closer and disappear as the POV moves farther away. The shorter the distance "seen" in the camera view, the better will be the editor performance when moving through the map. Use the ***Cubic Clip Zoom*** commands (see above) to modify the depth of field seen in the camera view.

Open GL Lighting
(Menu: View)
(Shortcut: none)
This feature is not fully implemented yet. It toggles on (checked) or off when selected. When it is finished, all planes facing a particular direction will shade the same way (curves will shade like brushes) and the overall quality of the camera view will be better. It will be slower however.

Tip: As it currently is implemented, this lighting can be useful when working with irregular surfaces all covered with the same texture.

Show Brush/Patch Dimensions
(Shortcut to turn on: Q)
(Shortcut to turn off: SHIFT + Q or CTRL + Q)
When you select a brush, the hi-lighted image in the map window shows its dimensions, in game units. If multiple patches or brushes are selected, the size will be the dimensions of the grouping. If any kind of non-brush model entity is included in the grouping, the dimensions are not shown.

File Management Commands

New Map
(Menu: File➔New Map)
(Shortcut: none)

This creates a new map file. If the current map file contains any unsaved changes, the editor will offer the option to cancel.

Open…

(Menu: File➔Open…)
(Shortcut: CTRL + O)
(Toolbar: opening folder icon)
This opens up the Maps folder as defined in the preferences. It will show all valid map files in that directory. User may browse to other directories from here. Double clicking on a map file icon or hi-lighting that map and selecting Open will open the map. The user may also type in a map file name. Be sure to add the ".map" or ".reg" extensions or the editor will not find the file.

Save…

(Menu: File➔Save…)
(Shortcut: CTRL + S)
(Toolbar: disk icon)
Saves a new map file to the default Maps directory. A reopened map file will be saved to its source directory. Note, that it is usually a good idea to save the map into the directory used by the compiler as the source of its map data. Remember to give the file a name. The compiler doesn't like to work with files called Unnamed Map.

Save As…

(Menu: File➔Save As…)
(Shortcut: none)
Opens the default directory for maps and prompts the user to give the map a filename.

Save Selected…

(Menu: File➔Save Selected…)
(Shortcut: none)
The selected brushes are saved as a map file. This is not the way to make prefabs, though.

Save Region

(Menu: File➔Save Region)
(Shortcut: none)
If the user has "regioned off" a subset of the map, this command will save it as a separate file. It is grayed out unless the user has created a regioned area. The editor prompts the user to enter a file name before saving.

Reopening Maps

(Menu: File)
(Shortcut: none)
(ALT+1 to 6 when File menu is held open)

OK, There isn't actually a command called this. When you open the File Menu, you will see (after you've done some work on maps), the path/file names for the last six maps that you worked on. They are listed here for easy opening access).

Projects and Preferences

New project…

(Menu: File➔New project…)
(Shortcut: none)
Make a new project file. This allows you to set up different preferences.

Load project…

(Menu: File➔Load project…)
(Shortcut: none)
Make a new project file. This allows you to set up different preferences.

Project Settings…

(Menu: File➔Project Settings…)
(Shortcut: none)
Change pathnames and add, remove or modify commands.

Miscellaneous Commands

Map info…

(Menu: Edit➔Map info…)
(Shortcut: none)
This gives a readout of brushes (including curve patches) and entities in the map, including the total number of brushes that are not part of entities. There is also a breakdown, by type, showing the number of entities in the map.

Entity info…

(Menu: Edit➔Entity info…)
(Shortcut: none)
This gives a read-out of the entities in a map by their type. It allows you to select an entity, which hi-lights it in the XY Map. Good for locating lost entities.

Preferences

(Menu: Edit➔Preferences)
(Shortcut: P)
This opens the window for setting or modifying the parameters, paths and features of the editor. Preferences are discussed in the Installation & Set Up section earlier in this document.

Opening Menus from the Keyboard

These are the keyboard shortcuts that open up the menus. If you continue to hold down the ALT key, many of the commands in that menu may be activated with an ALT+ keystroke command.

File	(ALT + F)	
Edit	(ALT + E)	
View	(ALT + V)	
Selection	(ALT + S)	
Bsp	(ALT + B)	Note: Toggles between BSP & Brush. Hit enter to open selected.
Grid	(ALT + G)	
Textures	(ALT + T)	
Misc	(ALT + M)	
Region	(ALT + R)	
Brush	(ALT + B)	
Curve	(ALT + C)	
Plugins	(ALT + P)	
Help	(ALT + H)	

Tools 8: Compiling Maps

To turn a map file from editor code into game code, it must be processed or "compiled". In Quake engine gaming, this is often referred to by the name "BSP", as in "I need to BSP my map before you can play it." The word "BSP" is actually an abbreviation for "binary space partition", the type of data organization procedure John Carmack used when creating the graphic engine for "DOOM".

The primary BSP process builds the game spaces, establishes the position of entities, and builds a lighting map of the arena. Altogether, there are four distinct processes that can be run together or separately. The first, the bsp process establishes the data organization of the map. The second phase, the vis process, builds the walls and internal spaces. The third process lights the map, calculating brightness and shadow and the color of the light that falls on every map surface. The fourth and final process is the Bot bsp, which creates the area (.aas) file that the bots use to navigate the map.

The size and complexity of a map and the computer's raw processing speed determine how long it will take a map to compile. Tiny one-room maps that lack detail or numerous lights will compile rapidly. As maps become larger, are broken up into more spaces and have more complex lighting, the speed of compile drops.

Generally speaking, if you have an older, slower processor, you may want to make very small maps.

The BSP Menu

The bsp menu contains a number of compile options. The process you choose will depend on what you are doing with the map at the time you choose to compile.

novis – Only the bsp function is performed. Checks for map leaks. No light information is created, so the map is seen at "fullbright". Because there are no shadows to get in the way, this mode is also good for looking for overlapping brushes, and texture misalignment.

fastvis – Performs a bsp and a quick version of the vis process. The entire world is made into a single bsp partition. It's fast, but when you look in a particular direction, you see every single detail in that direction. Nothing is blocked. A light map is created. This mode was used for space maps.

fullvis – the world is subdivided and broken up into smaller chunks so you can see only what is logically in your view. A light map is created. This is what is used to check polygon-in-view counts. Combined with light extra, it is the final compile for all maps.

entities only– When you add or subtract non-brush model entities from a map, use this compiler. It's very quick. If you change the brush components of a brush model entity (like a trigger or a door), you must do a compile that includes a vis stage (fast or full). If you are only changing the properties, an entities-only will do. However,, if a brush model entity also has a md3 model component, the map must be at least fastvis'd for that entity to appear in the map.

relight – Use only if no geometry (or light emitting textures) have been changed. It will rebuild the light map with the new information.

(nocurves) – This function is always a modifier to another bsp command. It does (or doesn't do) what it says. The map is compiled without curves.

(nowater) – This function is always a modifier to another bsp command. The map is compiled without water, lava, or slime.

(no light) – This function is always a modifier to another bsp command. No light map is generated. A fast way to check polycounts. Most often used in conjunction with the novis bsp command.

(-light extra) -- This function is always a modifier to another bsp command. A finer degree of subdivision is used to create a more detailed light map. This is generally only done when the lighting is going through a final fine-tuning because it takes a long time. Instead of being calculated in 16 unit increments, the light is calculated in 8 unit increments. This has no effect on final map size, only on the time needed to compile.

Tools 9: Debugging Maps

Regardless of your skills, you can almost guarantee that you are going to make mistakes building your maps. You need tools to help you find and correct those mistakes. There are two classes of map debugging tools usable with *Quake III Arena*. The first are those that the editor gives you. The second are commands usable in the game.

The Editor's Debug Tools

The Q3Radiant editor has some built in debugging tools

The Pointfile

One of the most useful tools in the box, this is the "red flag" that warns you about problems with the "hull" or "shell" of the map. When you compile a map, the bsp process checks the integrity of the map hull. If a map has a hole in it's hull or if an entity's origin point is placed outside the map hull, the map will "leak". *Quake III Arena* maps must be totally contained volumes. They cannot have "leaks" in them. Leaks are openings in the hull between the contained space (or "breathable" as one mapper has described it) and the outer void where nothing can abide.

The pointfile appears as a series of points, connected by red line segments, that traces a connecting path between an entity inside the hull and a point in the outside world.. Follow the pointfile through the map and note where it passes out of the enclosed space and into the void. In the case of an entity outside the world, it may just draw a line near the entity. You may need to turn off the display of clip and hint brushes, and curves to find the leaks. Adjust your solid map geometry to close up the leaks.

When you save the map (or an auto-save occurs), the pointfile disappears. You can bring the pointfile back by toggling this command.

Note: If you use a front-end program for compiling, such as *Q3Build,* you will need to reload the map file and select the "pointfile" command under the File menu.

Next leak spot

(Menu: Misc➔Next leak spot)
(Shortcut: SHIFT + CTRL +K)
If you have a pointfile displayed in your map, use this command to move from point to point along the file. It's an easy way to move along the path to the point where the red line passes out of the contained space of the map.

Previous leak spot

(Menu: Misc➔Next leak spot)
(Shortcut: SHIFT + CTRL +K)
A feature just like "Next leak spot", except that you move backwards along the pointfile.

Junk.txt

The Q3MAP compiler outputs this log file. It logs what the compiler is doing during the process; displays error messages and gives final compile times for each phase. Because the compiler works in three discrete

phases, you can also use this output to gauge how far along the compile has gone. Edit the project file to change the path to the destination for this output.

Error Messages

When you compile a map, you are likely to get error messages. Most of these are not serious and the game engine either corrects them or ignores them. This is a sampling of common messages and what you should do about them.

Mixed faces: One or more faces on a brush has a surface parameter that conflicts with the other surface parameters. This is not a problem. Putting nodraw or clip on a brush that has a face that draws will cause this. That includes most all “flame” brushes, many water brushes, and just about every instance where alpha-channel textures are used to create see-through brush faces.

Bad point to polygon form factor: A curve patch is larger than 512 units in at least one dimension. This is not fatal, but may result in some unusual light artifacts on the curve.

Unknown surfaceparm: “nomipmaps” Some shaders contain old or incorrectly spelled parameters. This is not a problem.

Too many portals. Your map is broken into too many separate hulls by areaportal brushes. Try to keep the number of discrete portalled areas under 16.

Duplicate plane. During the course of manipulating brushes, you may have moved edges in such a manner that two adjacent sides of a brush now form a single brush side. Use Find brush to locate the problem brush. Use the old brush as a template or pattern, but build the new one with a single side in the place of the duplicate plane sides. One way to solve the problem is to use the Clipper tool cut off a corner instead of collapsing two faces into one. While this is not a serious problem for multiplayer play, it can create “solid” areas in the bot navigation (.aas) file. This makes the bots think there are walls in places where there appear to be none. You can check for solid areas with the “bot_testsolid 1” inside the game (after creating an .aas file). See the Bot Navigation appendix for more details.

********* Leaked *******.** There is a hole between the contained space of your map and the outer void. Use the pointfile to locate the problem.

Couldn't load baseq3/pics/colormap.pcx trying tools/colormap.pcx...failed! This is not a compile error, but a loading error. Correct it by checking the hi-color textures setting in Preferences.

Loading base_light/light_flare...failed, using default shader. Just ignore this.

match token ("{") failed at line [line number]. You broke a shader while editing it. Go closely look at the shader you most recently edited. Chances are you’ll find a bracket error in the syntax.

In-game Debug tools

One of the best places to look for errors in your map is within the Quake III Arena game itself. After the map has compiled, execute your Debug Config and load your map. The commands here will help you discover the errors in your map.

General Cheats

The following are the general *Quake III Arena* cheat codes (they're actually developer's tools). You can enter them from the console, or bind them to whatever keys you prefer using the syntax bind [key] [command]. If the command is a string with spaces, then the string should be enclosed with quotation marks.

```
give [weapon/item/ammo/health] [amount] // Give selected weapon/item/ammo/health

give all // Gives all weapons, ammo, armor, and items

god // Godmode

noclip // Pass through anything. Use in conjunction with r_fastsky 1 or r_clear
1, or you will have hall of mirror problems when you pass out of the bounds of
the map.

notarget // Bots think you're a pal viewpos // Outputs player coordinate
position and facing angle.
```

General Toggle Binds

(Thanks to original authors GrandMaMa and Eutectic)
The following are some binds that you might like handy. Note that some of these will alter saved settings, so make sure that your preferred settings are loaded on startup, like in your autoexec.cfg file.

```
bind "your key" toggle r_speeds // polycount report
bind "your key" toggle r_showtris // tris triangles
bind "your key" toggle cg_drawfps // framerate counter
bind "your key" toggle com_speeds // shows all stats
bind "your key" toggle r_drawentities // ents won't be drawn
```

Debug Mode: Logfile Creation

One method that can be used for troubleshooting maps where curious errors occur (usually when simply too much is going on at once) is to resort to poring over the developer output. The console buffer is limited, and error-producing maps may crash, so printing the output to a logfile is desired. This script allows the toggling of these functions.

```
bind "your key" vstr dbg set dbg vstr debug_1

set developer 0 set logfile 0 set debug_1 "set dbg vstr debug_0;echo DEBUGMODE
ON;developer 1;logfile 2" set debug_0 "set dbg vstr debug_1;echo DEBUGMODE
OFF;developer 0;logfile 0"
```

GL_Showtris/R_Speeds/FrameCounter Toggle

(Based in part on an article by orginal author MD)

The “gl_showtris” and “r_speeds” commands allow you to see the number and location of polygons (surface triangles) in your view. The “

Show me the Triangles

Showtris draws a white line around each triangle used to create the world when it is a part of a map’s potential viewable set (PVS). This is especially effective tool, since it shows the triangle outlines of map areas that are being “seen” by the engine, which are not always just the ones that the player sees.

Depending on your video card, this may work well, or it may not. For some (like the Matrox cards, it comes with a huge performance hit).

The Need for (R_) Speeds

This output is one of the more valuable reports you can get on a map. The numbers show you the numbers that can tell you what kind of real visual costs you are encounter. Combined with other commands that turn features like entities, curves, and multi-pass texturing on and off, you can get a realistic idea of where you’re having problems.

Here’s what those cryptic numbers mean.

When r_speeds = 1, the numbers read as follows (where the # sign equals a number)

/ # shaders/surfs # leafs # verts # / # tris #.## mtex #.## dc

 # / # shaders/surfs is the number of shaders in view, followec by the number of surfaces in view.

 # leafs is how many leaf nodes are potentially visible.

 # verts is how many vertexes are in view

 # / # tris is the number of trangles drawn by the renderer in a single pass single pass followed by the number of triangles drawn by the renderer with all passes. These are the numbers that are most often implied when someone talks about “r_speeds.” If the r_ext_multitexture variable is off, the numbers will reflect a more accurate accounting of the real triangle count (see multi-pass texturing section below).

 # .## mtex #.## dc [definition under construction]

Frame Rate

There is a tendency for rate of frame display to become a sort of god (or at least a “greatest good”) for some players. Their quality of play, whether real or psychological, revolves around how fast their computer is flipping through screen updates. Everything else, to them, is throw away. While the design and complexity of a map can affect this, so can many features that are outside of the designer’s control. For that reason, frame rate is not a particularly good way to judge the quality of your map.

The “cg_drawfps 1” command gives you instantaneous frame rate readout.

Use this command string to toggle the three at once. Include the following lines in your Debug Config script:

```
set r_showtris 0
set r_speeds 0
set cg_drawfps 0
bind “your key” “toggle r_showtris;toggle r_speeds;toggle cg_drawfps”
```

Lock the PVS Table

(Author: MD)
"PVS" means "potential viewable set." The PVS includes all the polygons that can be seen from a particular location in the map (i.e., where you are standing now). The game engine updates what is visible and what is not as you move through the map. You can stop this updating process, and see just how far the engine can see by moving until you find an area of the world that's not being drawn. Use this to debug views where the frame rate drops below an acceptable level. Go to a place where you get a bad "fps" reading. Execute this command. When the PVS Table is locked, you can walk through the map and see exactly how far your view extends. Surfaces in view will be drawn as normal. Non-seen surfaces will show up as the Hall of Mirrors effect (unless the fast sky or r_clear options are also set). Use the information as a guide for changing what can be seen in a view.

This command string script toggles the use of the PVS table to let you do this. It also toggles on the r_clear option, so instead of Hall of Mirrors the void beyond the world is seen in fashion doll pink.

```
set r_lockpvs 0 set r_clear 0
bind "your key" vstr lockview set lockview vstr lockview1
set lockview1 "set lockview vstr lockview0;echo PVS Locked;r_lockpvs 1;r_clear
1"
set lockview0 "set lockview vstr lockview1;echo PVS Unlocked;r_lockpvs 0;r_clear
0"
```

MultiPass Texturing Toggle

(Based on an article by original author: MD)
The number of triangles that must be drawn before a frame can be displayed affects the speed at which the game is played. More triangles means lower speed. When a texture on a triangle requires additional drawing passes, it is the same as drawing an additional triangle again for each pass of redraw. The ideal video card for the *Quake III Arena* game is one that has a multi-pass texturing feature. What this means is that the second rendering pass on a texture is essentially free. Its triangle cost is not calculated into the r-speeds. Unfortunately, the map designer cannot plan on every user having such a card and must instead design for worst case scenarios. If you are working on machine that has a multi-pass texturing feature, you will need to find out how the other half plays. You need to toggle the feature off for this.

This feature toggles between multi-pass texturing and single-pass texturing. When multi-pass texturing is enabled, the additional triangles are masked. They won't appear in the r_speeds report.

For this feature to work, the video must be restarted. That command is included in the binding. For best results, refrain from pressing the bound key again until the video has re-initialized and the map has re-loaded. Your normal setting for r_ext_multitexture should appear also. In the key binding below, it's been set to a value of 1, which is the most common. This way it will be properly set on startup, since this toggle can hose that setting.

```
set r_ext_multitexture 1
bind "your key" "toggle r_ext_multitexture;vid_restart"
```

Turning Off Curves and Entities

How much of the r_speed cost in your map can be attributed to entities. How much to curves? These two commands turn off the drawing of those entities. The set commands start by setting the features to their "on" condition.

```
bind "your key" toggle r_drawentities // entities won't be drawn
bind "your key" toggle r_nocurves // curves won't be drawn
```

Curves, Caulk, T-Junctions and Cracks

(From an article on the same by Martin Ka'ai Cluney)

During the course of *Quake III Arena* development, a number of solutions were created to deal with the idiosyncrasies of the compiling process. None of these problems is a game killer, but the presence of these little flaws tends to reduce the professional appearance of game maps.

An Explanation of "Z-Fighting"

"Z-fighting" is caused when the engine tries to simultaneously draw two surfaces that share the same plane. "Z-fighting" commonly occurs when two brushes with different textures are in the same place (see fig. X-1,) but it can also occur on some video cards when a patch is placed over a textured brush (see fig. X-2.)

An Explanation of T-Junction Cracks

"T-junction cracks" are a little more complicated than 'Z-fighting', and can be more difficult to track down and fix. They are caused when the vertices (control points) of a curve patch don't match up with surrounding world geometry. They can be caused when a patch extends into the world on one or more sides (see fig. X-3,) or when there is a split in the faces that make up one or more edges of a patch (fig. X-4.)

Avoiding T-Junction Cracks and Z-fighting

The best way to keep maps free of "T-junction cracks" and "Z-fighting" is to keep these problems in mind while adding patches and supporting geometry. There are a few simple methods for adding patches. Initially, they may seem like more work that they're worth, but they will save hours of hunting down and fixing problems that can arise through careless construction.

1. **Avoid spanning more than one brush with one edge of a patch.** For example, if an inverted bevel is 128 units tall, back it with 128 unit tall caulk brushes. Likewise, if the wall is made up of two vertically stacked brushes; use two vertically stacked patches of matching heights.

2. **Avoid patches that extend into world brushes, unless *all* of the edges extend into world brushes.** When adding patches, if one edge of the patch extends into the world, while the other edges line up with other brushes, there will most likely be cracking. Sometimes, particularly in the case of 'flesh' elements, it is necessary to extend parts of a patch into the world. In these cases, extend all edges into the world, or into surrounding patches.

3. **Be Careful with vertices.** Use Snap to Grid. Without it, your curves will create far more problems than they will otherwise might. Sometimes, especially after resizing patches, vertices can get "knocked off" the grid. Always make sure vertices are where they're supposed to be. If needed, patch vertices can always be snapped back to the grid using CTRL+ G. It's always a good idea to be completely aware of where things are in relation to the grid.

4. **Caulk, caulk and more caulk.** Get into the habit early of building the space behind curve patches with caulk brushes. You will eliminate Z-fighting, seal up the area behind the curves, and unless you are building a map in fashion doll pink, edges that aren't aligned with the curves have a better chance of showing up.

Here are a few examples of common elements from the maps in *Quake III Arena*, and how they should (and should not) be built to avoid Cracks and "Z-Fighting":

Jump Pads
Jump pads are probably the most common occurrence of T-junction cracks in Quake III Arena Maps. They usually extend upwards through at least two 'levels' (layers) of textures, so they're a perfect illustration of proper caulking. They are also a perfect illustration of 'binding' curves within structural brushes.

Flat arches
Flat Arches are another good example of 'binding' curves with structural brushes. This is a handy technique when incorporating a curve into a complex map element seamlessly.

Rounded Wall Edges (endcapped)
This is a simple example of terminating a wall in a rounded edge. The most important thing to keep in mind here is where the vertices are placed. If the patch is extended into the ceiling or floor, there will almost certainly be cracks.

Inverted Wall Bevels
Filleting a wall seems like it would be a simple thing, but there are many cases that could cause cracks. It's important to make sure heights are consistent, especially in the case of layered texturing, as is the case in this example.

Finding and Fixing T-Junction Cracks and Z-Fighting
There will usually be cases where, despite careful building, cracks appear. When looking for cracks that may have been missed, there are three console commands that will be a great help:

\r_clear 1: This will clear the frame buffer on each frame, eliminating the Hall of Mirrors effect.

\r_fastsky 1: This will draw the sky as a single, solid color, making it easier to see the void behind curves. This makes cracks stand out. Be aware that fastsky also disables the function of portal screens and mirrors.

\r_showtris 1: This will draw white lines around all of the triangles in the world, showing exactly how the geometry in the map is affecting the patches.

NOTE: Another good way to use these commands is to set them to toggle on a key. The Debug Config below contains these commands as toggles.

Turn on r_clear, and r_fastsky, and run through the map, looking at the patches from all possible angles. If there is a crack, turn on r_showtris, and make sure that the patch does not extend into the world, unless it was intended to. Next, look at the surrounding brushes. Make sure that no splits meet the edge of the patch. If neither case is true (it happens these case… 'mystery cracks'), then try a different approach to building the area; perhaps splitting one patch into two, or rearranging the brushes surrounding the patch. When none of the above seems to work, experiment with as many different ways as possible. If something works, keep it in mind for the next time.

A Debug Config
The following script should be copied and pasted into a text file. Save the text file as "debug.cfg". When you want to use these commands while playing a map, you need to load the map using the console. First type in

"/devmap [mymapname] to load the map. Next type in "/debug.cfg". This executes your development configuration. Note that this changes the key assignments of some keys (you define which one is used for each assignment of "*yourkey*". These debugging tools are considered "cheats." They will not function during normal game play.

```
//++++++++++++++++++++
//toggle on/off frames per second, polygon wireframes, and polygon in view
counts with one keypress
set r_showtris 0 //sets triangle display to off
set r_speeds 0 //sets triangle counter display to off
set cg_drawfps 0 //sets frame display counter to off
bind "your key" "toggle r_showtris;toggle r_speeds;toggle cg_drawfps"

//The following are some individual binds for a few debug tools
set r_drawentities 1
set toggle r_nocurves 0
bind "your key" "toggle r_speeds" // polycount report
bind "your key" "toggle r_showtris" // Shows the actual triangles that form the
world
bind "your key" "toggle cg_drawfps" // framerate counter
bind "your key" "toggle com_speeds" // shows all stats
bind "your key" "toggle r_fastsky" //turns off detailed sky and turns void to
sky color
bind "your key" "toggle r_clear 1" // This will clear the frame buffer on each
frame.


//Show coordinates that can be related to map coordinates.
bind "your key" "viewpos" // Outputs player coordinate position and facing
angle.

//Turn off Entities and Curves
bind "your key" "toggle r_drawentities" // entities won't be drawn
bind "your key" "toggle r_nocurves" // curves won't be drawn

//Toggle off the multi-pass texturing feature
set r_ext_multitexture 1
bind "your key" "toggle r_ext_multitexture;vid_restart"

//Output console messages to a log file
bind "your key" vstr dbg set dbg vstr debug_1
set developer 0 set logfile 0 set debug_1 "set dbg vstr debug_0;echo DEBUGMODE
ON;developer 1;logfile 2" set debug_0 "set dbg vstr debug_1;echo DEBUGMODE
OFF;developer 0;logfile 0"

//Lock the PVS Table
set r_lockpvs 0 //turns off any existing PVS lock
set r_clear 0 //turns "void" bright pink
bind "your key" vstr lockview set lockview vstr lockview1 //binds three vstr
scripts to a key
set lockview 1 "set lockview vstr lockview 0;echo PVS Locked;r_lockpvs 1;r_clear
1"
set lockview 0 "set lockview vstr lockview 1;echo PVS Unlocked;r_lockpvs
0;r_clear 0"

//Game Cheats (for debugging purposes)
bind "your key" "give all" // Gives all weapons, ammo, armor, and items
bind "your key" "god" //toggles god mode //makes player invulnerable to
everything but kill triggers
bind "your key" "toggle noclip; toggle r_clear 1"//toggles ability to pass
through walls and clear function
bind "your key" "notarget" // Bots think you're a pal (until you shoot them)
```

Appendix A: Glossary of Terms

Alpha Channel: This is a fourth 8-bit grayscale channel that is used by the shaders to further manipulate the art. It is often used to create transparency and translucency.
Arena: A confined space in which *Quake III Arena* game play occurs. This is also called a "map" or a "level".
B_Model: An entity, such as a lift, train, door, or rotating object, made of geometry brushes. These models can also contain curve patches and md3 models as components.
Brush: A single piece of map geometry defined by four or more vertices that define a solid, convex volume.
Bot: A computer-controlled player. To the server, a bot is treated as if it were a player. Some entities can make a distinction between interaction with, or use by "live" players and/or bots.
Bsp: An abbreviation for Binary Space Partitioning. This is used as a name for the compiling process.
BSPC: The utility, which creates a bot navigation .aas file for a map. Currently, it is run from outside the editor.
Compile: A number crunching process that turns editor code into game code. This is also referred to as "bsp".
CTF: (g_gametype 4) Abbreviation for the team game type "Capture the Flag."
Delay: A keyword for the amount of time, expressed in seconds (value), between the moment when activation occurs and the moment when the event it triggers occurs.
DM: Abbreviation for "Death Match."
Editor: Usually refers to the tool, in this case, Q3Radiant, used to make game maps.
Entity: One of several classes of objects that are placed into game maps. Entities include miscellaneous models, ammo, weapons, point lights, doors, moving objects and so on.
Event: Something that happens during game play. Activating a trigger is an event.
FFA: (g_gametype 0) Abbreviation for "Free for All" a style of play in which every player is pitted against all other players.
FPS: This is Frames per Second, sometimes call frame rate. This number shows approximately how many times the screen is being redrawn each second. This number depends on many factors, including the complexity of the map, the number of players in the map (bots are worse than humans), the processing power of the computer and the processing power of the video accelerator card in that computer. It is not the best measure for determining the playability of a map.
FOV: Field of View how much of the game world can be see at one time, either in the game or the camera window of the editor.
Game Unit: The basic unit of measure in a game map. Eight game units are approximately equal to one foot (30.48 cm) in the "real" world. This measure is also referred to as simply a "unit."
Grid: In the Map Windows, this is a measuring tool, much like graph paper.
Key: A key is a property possessed by an entity in the game. Light entities have a default value of 300. See the Entity description appendix for details Entering in the key "light" with a "value" of 150 reduces that by half.
Map: Also called an arena or a game level. It is a self-contained game play area created by an editing tool like Q3Radiant. It can refer to both the map file and the final playable product.
Map Component: This is anything placed in the editor to create the map. It includes geometry brushes, curve patches, lights, entities, and models.
Md3: Shorthand for a mesh model created and textured outside of Q3Radiant. The acronym refers to the custom file format used for the models in *Quake III Arena*.
Patch: Any map component built from bezier curves. This includes bevels, caps, patches, and cylinders.
Pathname: The sequence of file folders/directories from a starting point to a game asset or executable.
Pixel: The smallest definable graphic component. This literally means, "Picture element". A game unit typically consists of a square cluster of 4 pixels (two pixels by two pixels).

POV: Point of View. This is essentially, where the eye sits in relation to the game world.
Project: A text file that contains the path designations for the various editor functions of Q3Radiant.
PVS: Potential Viewable Set. Refers to those world triangles that might be seen from a position in the game world.
R_Speeds: This is a set of numbers used to debug maps for visual complexity**.** They show the number of triangles that are being drawn in a given point of view. Lower numbers are better.
Region: A subset of the map. Selecting one or more map components and using a menu command to set them off temporarily from the rest of the map create regions.
Script: A text file that contains instructions for the game. Examples: arena.txt, base_floor.shader, debug.cfg.
Shader: A short script of program commands that define the way the graphic engine processes a texture.
Team DM: (g_gametype 3) A team of players takes on another team to get the most frags.
Texture: A graphic file designed to suggest a physical surface or a component for a graphic special effect.
T-Junction Cracks: A visual artifact resulting from patch vertices that are not properly matched to world geometry. This is characterized by 'sparkles' running along the edge of the patch.
Tournament: (g_gametype 1) This is a mode of game play characterized by a one on one match with other players watching as spectators while waiting their turns. The winner of the match plays the next opponent.
Trigger: A map component that activates events in the game world under the right conditions.
Unit: (See "Game Unit")
Value: A setting for a key possessed by an entity. Depending on the key, values can be numbers, pathnames, word strings, or word commands. See individual Entity descriptions for details.
Z-fighting: A visual artifact caused when two z-buffered surfaces share the same plane, resulting in the engine trying to draw both simultaneously.

Appendix B: Entity Descriptions

This Section owes much of the background and testing research to three dedicated Quake Engine editing supporters, *Suicide20*, *inolen*, and *EuteTic*. It is based on version 1.1 (12/22/99) of a document that they created and gave us permission to include with the official id editor documents.

"Keys" are keywords that represent the in-game properties of an entity. Some are flags that determine whether an entity will appear in a particular game play mode. Others define extents or rates for entity movement. Others establish how much of some game effect will occur (example: damage) or how long to wait until an event occurs or can reoccur.

With the exception of properties that can be set by checkboxes, the map maker will need to type in keys (names for game function properties) and their values (numbers or strings) into fields within the entities window.

Keys that are set by checkboxes in the editor are called "Spawnflags" and will be shown in All Caps. The rest are shown in lowercase, as they should be typed into the editor field.

Basic Key information

Angle: This is the direction of facing or direction of movement for an entity. Set this value with the Angle buttons on the entity window. The angle value can be typed in as any positive value between 1 and 360.

Color: This key only affects md3 models that are built into func_entities. The color is the color of light used to illuminate the model. It is expressed as a normalized three digit RGB formula.

Entity Dimensions: The minimum and maximum coordinate dimensions of the entity box.

Light: This key only affects md3 models that are built into func_entities.

Map Entity Color: This is the color of the generic entity box used to represent the entity in the map editor.

Ammo_* Entities

The properties for ammo entities are all very similar.

Map Entity Color: Blue
Entity Dimensions: (-16 -16 -16) (16 16 16)

These are ammunition boxes for weapons in the game. They can be represented by either a blue entity box, or the ammo box model itself. With the exception of the type and amount of ammo given to the player upon pick up, all ammo entities have the same properties.

ammo_bfg

Game Function: BFG ammo. Gives the player 15 shots by default.

Custom Keys

count: sets the amount of ammo given to the player when picked up (default 15).

ammo_bullets

Game Function: Machine Gun ammo. Gives the player 50 shots by default.

Custom Keys

count: sets the amount of ammo given to the player when picked up (default 50).

ammo_cells

Game Functions: Plasma Gun ammo. Gives the player 30 shots by default.

Custom Keys

count: sets the amount of ammo given to the player when picked up (default 30).

ammo_grenades

Game Function: Grenade Launcher ammo. Gives the player 5 shots by default.

Custom Keys

count: sets the amount of ammo given to the player when picked up (default 5).

ammo_lightning

Game Function: Lightning Gun ammo. Gives the player 60 shots by default.

Custom Keys

count: sets the amount of ammo given to the player when picked up (default 60).

ammo_rockets

Game Function: Rocket Launcher ammo. Gives the player 5 shots by default.

Custom Keys

count: sets the amount of ammo given to the player when picked up (default 5).

ammo_shells

Game Function: Shotgun ammo. Gives the player 10 shots by default.

Custom Keys

count: sets the amount of ammo given to the player when picked up (default 10).

ammo_slugs

Game Function: Railgun ammo. Gives the player 10 shots by default.

Custom Keys

count: sets the amount of ammo given to the player when picked up (default 10).

Common Keys

wait: time in seconds before the item respawns after being picked up (default 40, -1 = never respawn).
random: random time variance in seconds added or subtracted from “wait” delay (default 0 - see Notes).

team: set this to team items. Teamed items will respawn randomly after team master is picked up (see Notes).
target: picking up the item will trigger the entity this points to.
targetname: a target_give entity can point to this for respawn freebies.
notbot: when set to 1, a bot will never seek out this item
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Check Boxes/Spawnflags
SUSPENDED: item will spawn where it was placed in map and won’t drop to the floor. Set by Checkbox. Bots will only be attracted to suspended entities if they are reachable by way of a jump pad or launch pad (trigger_push).

Notes
The amount of time it takes for an item in the team to respawn is determined by the “wait” value of the item that was picked up previously. So if one of the items in the team has it's “wait” key set to -1 (never respawn), the random respawning cycle of the teamed items will stop after that item is picked up.

When the random key is set, its value is used to calculate a minimum and a maximum delay. The final time delay will be a random value anywhere between the minimum and maximum values: (min delay = wait - random) (max delay = wait + random).

Design Notes
An ammo item can be given a negative “count” value. Taking away ammo in combat would be a bad idea but in combination with a target_give entity, it can be used to set up games mods like Rocket Arena by removing the machinegun ammunition from a player when he spawns into the map.

Func_* Entities

Func_Entities include a wider variety of game purposes than other entity classes. They are sometimes represented by simple function boxes. But many are built out of brushes, patches and models. These constructions are sometimes called “b_models”, though for many of them the word “mover” works as well, since they are made to be moving objects in the game world.

func_bobbing
Map Entity Color: N/A
Dimensions: size of map components used
Game Function: Solid entity that oscillates back and forth in a linear motion. By default, it will have an amount of displacement in either direction equal to the dimension of the brush in the axis in which it's bobbing. Entity bobs on the Z axis (up-down) by default. It can also emit sound if the “noise” key is set. Will crush the player when blocked.

Keys
speed: amount of time in seconds for one complete oscillation cycle (default 4).
height: sets the amount of travel of the oscillation movement (default 32).
phase: sets the start offset of the oscillation cycle. Values must be 0 < phase < 1. Any integer phase value is the same as no offset (default 0).
noise: path/name of .wav file to play. Use looping sounds only (eg. sound/world/drone6.wav - See Notes).

model2: path/name of model to include (eg: models/mapobjects/jets/jets01.md3).
origin: alternate method of setting XYZ origin of sound and .md3 model included with entity (See Notes).
light: constantLight radius of .md3 model included with entity. Has no effect on the entity's brushes (default 0).
color: constantLight color of .md3 model included with entity. Has no effect on the entity's brushes (default 1 1 1).
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Check Boxes/Spawnflags
X_AXIS : entity will bob along the X axis.
Y_AXIS : entity will bob along the Y axis.

Notes
In order for the sound to be emitted from the location of the entity, it is recommended to include a brush with an origin shader at its center, otherwise the sound will not follow the entity as it moves. Setting the origin key is simply an alternate method to using an origin brush. When using the model2 key, the origin point of the model will correspond to the origin point defined by either the origin brush or the origin coordinate value. The movement of the func_bobbing follows a sinoid wave pattern.

func_button

Map Entity Color: N/A
Dimensions: size of map components used
Game Function: When a button is touched by a player, it moves in the direction set by the “angle” key, triggers all its targets, stays pressed by an amount of time set by the “wait” key, then returns to its original position where it can be operated again.

Keys
angle: determines the direction in which the button will move (up = -1, down = -2).
target: all entities with a matching targetname will be triggered.
speed: speed of button's displacement (default 40). Speed is in game units per second.
wait: number of seconds button stays pressed (default 1, -1 = return immediately).
lip: lip remaining at end of move (default 4 units).
health: if set to a non-zero value, the button must be damaged by “health” amount of points to operate.
light: constantLight radius of .md3 model included with entity. Has no effect on the entity's brushes (default 0).
color: constantLight color of .md3 model included with entity. Has no effect on the entity's brushes (default 1 1 1).
model2: path/name of model to include (eg: models/mapobjects/pipe/pipe02.md3).
origin: alternate method of setting XYZ origin of .md3 model included with entity (See Notes).
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Notes
Setting the origin key is simply an alternate method to using an origin brush. When using the model2 key, the origin point of the model will correspond to the origin point defined by either the origin brush or the origin coordinate value.

func_door

Map Entity Color: N/A
Dimensions: size of map components used
Game Function: Normal sliding door entity. By default, the door will activate when player walks close to it or when damage is inflicted on it. Doors move a distance equal to their dimension along the selected angle of travel, minus the "lip" key value.

Keys

angle: determines the opening direction of door (up = -1, down = -2).
speed: determines how fast the door moves (default 100). Speed is in game units per second.
wait: number of seconds before door returns (default 2, -1 = return immediately - see Notes).
lip: lip remaining at end of move (default 8).
targetname: if set, a func_button or trigger is required to activate the door.
health: if set to a non-zero value, the door must be damaged by "health" amount of points to activate (default 0).
dmg: damage to inflict on player when he blocks operation of door (default 4). Door will reverse direction when blocked unless CRUSHER spawnflag is set.
team: assign the same team name to multiple doors that should operate together (see Notes).
light: constantLight radius of .md3 model included with entity. Has no effect on the entity's brushes (default 0).
color: constantLight color of .md3 model included with entity. Has no effect on the entity's brushes. (default 1 1 1).
model2: path/name of model to include (eg: models/mapobjects/pipe/pipe02.md3).
origin: alternate method of setting XYZ origin of .md3 model included with entity (See Notes).
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Check Boxes/Spawnflags

START_OPEN: the door will spawn in the open state and operate in reverse.
CRUSHER: door will not reverse direction when blocked and will keep damaging player until he dies or gets out of the way.

Notes

Unlike in Quake 2, doors that touch are NOT automatically teamed. If you want doors to operate together, you have to team them manually by assigning the same team name to all of them. Setting wait =-1 for normal touch doors makes them work erratically. Use this only for damage-only ("health" key set to non-zero value) or targeted doors. Setting the origin key is simply an alternate method to using an origin brush. When using the model2 key, the origin point of the model will correspond to the origin point defined by either the origin brush or the origin coordinate value.

func_group

Map Entity Color: Light blue
Dimensions: Determined by dimensions of map components.
Game Function: This is not an entity. It is strictly an editor utility to group world brushes and patches together for convenience (selecting, moving, copying, etc). You cannot group entities with this.

Notes

The TAB key can be used to flip through the component pieces of a selected func_group entity, isolating individual components.

func_pendulum

Map Entity Color: Light blue
Dimensions: Determined by dimensions of map components.
Game Function: Solid entity that describes a pendulum back and forth rotation movement. Rotates on the X axis by default. Pendulum frequency is a physical constant based on the length of the beam and gravity. Contact with the pendulum instantly kills a player.

Keys

angle: angle offset of axis of rotation from default X axis (default 0/360).
speed: angle of swing arc in either direction from initial vertical position (default 30).
phase: sets the start offset of the swinging cycle. Values must be 0 < phase < 1. Any integer phase value is the same as no offset (default 0).
noise: path/name of .wav file to play. Use looping sounds only (eg. sound/world/drone6.wav).
model2: path/name of model to include (eg: models/mapobjects/jets/jets01.md3).
origin: alternate method of setting XYZ origin of entity's rotation axis and .md3 model included with entity (default "0 0 0" - See Notes).
light: constantLight radius of .md3 model included with entity. Has no effect on the entity's brushes (default 0).
color: constantLight color of .md3 model included with entity. Has no effect on the entity's brushes (default 1 1 1).
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Notes

You need to have an origin brush as part of this entity. The center of that brush will be the point through which the rotation axis passes. Setting the origin key is simply an alternate method to using an origin brush. Pendulum will rotate along the X axis by default. Pendulum cannot rotate along Z axis. The speed of swing (frequency) is not adjustable, and the "dmg" key (although set in the Q3A maps) has no effect whatsoever. When using the model2 key, the origin point of the model will correspond to the origin point defined by either the origin brush or the origin coordinate value.

func_plat

Map Entity Color: Light blue
Dimensions: Determined by dimensions of map components.
Game Function: This is a rising platform that a player can ride to reach higher places. Plats must always be drawn in the raised position, so they will operate and be lighted correctly but they spawn in the lowered position. The plat will stay in the raised position until the player steps off. There are no proper sounds for this entity, only beep noises, so sound call paths must be adjusted (see Notes).

Keys

speed: determines how fast the plat moves (default 150) in game units per second.
lip: lip remaining at end of move (default 16). Has no effect if "height" is set.
height: if set, this will determine the total amount of vertical travel of the plat (see Design Notes).
dmg: damage to inflict on a player when he blocks operation of plat (default 4). Plat will reverse direction when blocked.
targetname: if set, the trigger that points to this will raise the plat each time it fires. The plat raises and comes back down a second later if no player is on it.
light: constantLight radius of .md3 model included with entity. Has no effect on the entity's brushes (default 0).

color: constantLight color of .md3 model included with entity. Has no effect on the entity's brushes (default 1 1 1).
model2: path/name of model to include (eg: models/mapobjects/pipe/pipe02.md3).
origin: alternate method of setting XYZ origin of .md3 model included with entity (See Notes).
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Notes

By default, the total amount of vertical travel of a platform is implicitly determined by the overall vertical size of the brushes of which it's made minus the lip value. But if the "height" key is used, then the total amount of vertical travel of the plat will be exactly that value regardless of the shape and size of the plat and regardless of the value of the "lip" key. Using the "height" key is the best method for any kind of platforms and the only possible one for thin plats which need to travel vertical distances many times their own thickness. Setting the origin key is simply an alternate method to using an origin brush. When using the model2 key, the origin point of the model will correspond to the origin point defined by either the origin brush or the origin coordinate value.

Design Notes:

Clip brushes can be used to create the additional size for "thin" plats. Func_plats were pulled from all maps in the final build of Quake 3 Arena due to some problems in their operation, particularly as it related to bot function. The id designers recommend using plats with care and that plats be built as "solid" pillar-like lifts (more like those in Doom).

There is a way to make plats play proper sounds. Just create a sound\movers\plats folder under baseq3 and put 2 sounds named pt1_start.wav and pt1_end.wav in it. Those can be the renamed sounds from the Q2 plats or renamed copies of the sound\movers\doors sounds you can extract from your pak0.pk3 file or new custom sounds if you're up to it. Thanks to Fragzilla for the tip.

func_rotating

Map Entity Color: Light blue
Dimensions: Determined by dimensions of map components.
Game Function: Solid entity that rotates continuously. Rotates on the Z axis by default and requires an origin brush. It will always start on in the game and is not targetable.

Keys

speed: determines how fast entity rotates (default 100).
noise: path/name of .wav file to play. Use looping sounds only (eg. sound/world/drone6.wav).
model2: path/name of model to include (eg: models/mapobjects/bitch/fembotbig.md3).
origin: alternate method of setting XYZ origin of entity's rotation axis and .md3 model included with entity (default "0 0 0" - See Notes).
light: constantLight radius of .md3 model included with entity. Has no effect on the entity's brushes (default 0).
color: constantLight color of .md3 model included with entity. Has no effect on the entity's brushes (default 1 1 1).
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Check Boxes/Spawnflags
X_AXIS: entity will rotate along the X axis.
Y_**AXIS:** entity will rotate along the Y axis.

Notes
You need to have an origin brush as part of this entity. The center of that brush will be the point through which the rotation axis passes. Setting the origin key is simply an alternate method to using an origin brush. It will rotate along the Z axis by default. You can check either the X_AXIS or Y_AXIS box to change that

func_static
Map Entity Color: N/A
Dimensions: Determined by components
Game Function: Static solid bspmodel. Can be used for conditional walls and models for different game types.

Keys
model2: path/name of model to include (eg: models/mapobjects/bitch/fembotbig.md3).
light: constantLight radius of .md3 model included with entity. Has no effect on the entity's brushes (default 0).
color: constantLight color of .md3 model included with entity. Has no effect on the entity's brushes (default 1 1 1).
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Notes
When using the model2 key, the origin point of the model will correspond to the origin point defined by either the origin brush or the origin coordinate value. Because the map has only a single bot navigation file, Func_Statics cannot be used to make significant changes in game play flow between differing game types.

func_timer
Map Entity Color: Dark blue (0.3 0.1 0.6)
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: Time delay trigger that will continuously fire its targets after a preset time delay. The time delay can also be randomized. When triggered, the timer will toggle on/off.

Keys
wait: delay in seconds between each triggering of its targets (default 1).
random: random time variance in seconds added or subtracted from “wait” delay (default 0 - see Notes).
target: this points to the entities to trigger.
targetname: a func_button or trigger that points to this will toggle the timer on/off when activated.
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Check Boxes/Spawnflags
START_ON: timer will start on in the game and continuously fire its targets.

Notes
When the random key is set, its value is used to calculate a minimum and a maximum delay. The final time delay will be a random value anywhere between the minimum and maximum values: (min delay = wait - random) (max delay = wait + random).

func_train

Map Entity Color: (0 .5 .8)
Dimensions: Determined by components
Game Function: Trains are moving solids that follow a string of path_corner entities. Trains in Q3A are very basic, they also require an origin brush (see Notes).

Keys
speed: speed of displacement of train (default 100 or overridden by speed value of path).
target: this points to the first path_corner of the path which is also the spawn location of the train's origin.
model2: path/name of model to include (eg: models/mapobjects/pipe/pipe02.md3).
origin: alternate method of setting XYZ origin of the train's brush(es) and .md3 model included with entity (See Notes).
light: constantLight radius of .md3 model included with entity. Has no effect on the entity's brushes (default 0).
color: constantLight color of .md3 model included with entity. Has no effect on the entity's brushes (default 1 1 1).
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Notes
1. Trains always start on in the game.
2. Trains do not damage the player when blocked.
3. Trains cannot emit sound.
4. Trains are not triggerable or toggle-able.
5. Trains cannot be block-stopped just by getting in their way, the player must be wedged between the train and another obstacle to block it.

Setting the origin key is simply an alternate method to using an origin brush. When using the model2 key, the origin point of the model will correspond to the origin point defined by either the origin brush or the origin coordinate value.

Holdable_* Entities

holdable_medkit

Map Entity Color: blue (.7 0 1)
Dimensions: (-16 -16 -16) (16 16 16)
Game Function: This is a Medkit that can be picked up and used (once) later. Brings the player's health back to 100 when used. Player can only carry one holdable item at a time.

Keys
wait: time in seconds before item respawns after being picked up (default 60, -1 = never respawn).
random: random time variance in seconds added or subtracted from “wait” delay (default 0 - see Notes).

team: set this to team items. Teamed items will respawn randomly after team master is picked up (see Notes).
target: picking up the item will trigger the entity this points to.
targetname: a target_give entity can point to this for respawn freebies.
notbot: when set to 1, a bot will never seek out this item
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Check Boxes/Spawnflags
SUSPENDED: item will spawn where it was placed in map and won’t drop to the floor. Bots will only be attracted to suspended entities if they are reachable by way of a jump pad or launch pad (trigger_push).

Notes
The amount of time it takes for an item in the team to respawn is determined by the “wait” value of the item that was picked up previously. So if one of the items in the team has it's “wait” key set to -1 (never respawn), the random respawning cycle of the teamed items will stop after that item is picked up.

When the random key is set, its value is used to calculate a minimum and a maximum delay. The final time delay will be a random value anywhere between the minimum and maximum values: (min delay = wait - random) (max delay = wait + random).*/

holdable_teleporter
Map Entity Color: blue (.7 0 1)
Dimensions: (-16 -16 -16) (16 16 16)
Game Function: Teleporter item that can be picked up and used (once) later. Teleports the player to a random player spawn point when used. Player can only carry one holdable item at a time.

Keys
wait: time in seconds before item respawns after being picked up (default 60, -1 = never respawn).
random: random time variance in seconds added or subtracted from “wait” delay (default 0 - see Notes).
team: set this to team items. Teamed items will respawn randomly after team master is picked up (see Notes).
target: picking up the item will trigger the entity this points to.
targetname: a target_give entity can point to this for respawn freebies.
notbot: when set to 1, a bot will never seek out this item
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Check Boxes/Spawnflags
SUSPENDED: item will spawn where it was placed in map and won’t drop to the floor. Bots will only be attracted to suspended entities if they are reachable by way of a jump pad or launch pad (trigger_push).

Notes
The amount of time it takes for an item in the team to respawn is determined by the “wait” value of the item that was picked up previously. So if one of the items in the team has its “wait” key set to -1 (never respawn), the random respawning cycle of the teamed items will stop after that item is picked up.

When the random key is set, its value is used to calculate a minimum and a maximum delay. The final time delay will be a random value anywhere between the minimum and maximum values: (min delay = wait - random) (max delay = wait + random).

Info_* Entities

info_camp

Map Entity Color: Dark green (0 0.5 0)
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: This atttracts bots which have a camping preference in their A.I. characteristics. It should be placed at least 32 units away from any brush surface.

Keys
range: number of units that the bot can move away from camp entity while camping on it.
weight: number that is compared against the weight assigned to all the other camp spots in the map to determine if a bot chooses to camp there. The value is normalized against all other weight values.

Notes
Examples of Q3A bots which have a high camping preference are: Razor, Tank Jr., Grunt, Patriot and Doom. Examples of Q3A bots which have a low camping preference are: Klesk, Mynx, Sarge, Keel and Xaero. Info_Camp entities should be reachable by “normal” means, including relatively non-complex rocket jumps.

info_notnull

Map Entity Color: Dark green (0 0.5 0)
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: Used as a positional target for entities that can use directional pointing. A target_position can be used instead of this but was kept in Q3A for legacy purposes.

Keys
targetname: must match the target key of entity that uses this for pointing.
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

info_null

Map Entity Color: Dark green (0 0.5 0)
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: Used as a positional target for light entities to create a spotlight effect. A target_position can be used instead of this but was kept in Q3A for legacy purposes.

Keys
targetname: must match the target key of entity that uses this for pointing.
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).*/

info_player_deathmatch

Map Entity Color: Pink (1 0 0)
Dimensions: (-16 -16 -24) (16 16 32)
Game Function: Normal player spawning location for Q3A levels.

Keys

angle: direction in which player will look when spawning in the game. Does not apply to bots.
target: this can point at a target_give entity for respawn freebies.
nobots: when set to 1, bots will never use this spawn point to respawn in the game.
nohumans: when set to 1, human players will never use this spawn point to respawn in the game.
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Check Boxes/Spawnflags

INITIAL: makes the spawnpoint the initial place for the player to spawn at the beginning of the game. This is also where the player spawns as a spectator.

Design Tip: If you include an info_player_deathmatch entity in a CTF map, players from both teams can respawn at that location. Great for placing respawn spots in contested central battleground areas.

info_player_intermission

Map Entity Color: Pink (1 0 1)
Dimensions: (-16 -16 -16) (16 16 16)
Game Function: Camera for intermission screen between matches. This also automatically generates the podium for bot arena matches (see Notes). Can be aimed by setting the "angles" key or targeting an pointing to an aiming entity. Use only one per level.

Keys

angles: alternate "pitch, yaw, roll" angles method of aiming intermission camera (default 0 0 0).
target: point this to an info_notnull or target_position entity to set the camera's pointing angles.

Notes

In Single Player bot arena matches, the podium for the 1st, 2nd and 3rd place players at the end of the match is generated by this entity. The podium's origin will automatically be located 128 units in the direction of the camera's view and 84 units down from the y height of the view line at that point. It will also always be generated on a level plane regardless of the pointing angle of the camera so if that angle is too steep, part of the podium model might not be visible. If the origin point of the podium model is inside brush geometry, the podium will not draw. Make sure you leave at least 106 units of free space in front of where the camera points to otherwise the podium model won't be visible at all.

info_player_start

Map Entity Color: Red (1 0 0)
Dimensions: (-16 -16 -24) (16 16 32)
Game Function: Player spawn location. It works in Quake III Arena, but is not used in the id maps. Use info_player_deathmatch instead.

Keys
angle: direction in which player will look when spawning in the game.
target: this can point at a target_give entity for respawn freebies.

Item_* Entities

Most of the properties for item entities are the same and are listed immediately below. Properties that are unique to specific entities follow those entries.

Shared Keys (for all item entities)
All the entities in this grouping can have the following keys.

team: set this to team items. Teamed items will respawn randomly after team master is picked up (see Notes).
target: picking up the item will trigger the entity this points to.
targetname: a target_give entity can point to this for respawn freebies.
notbot: when set to 1, a bot will never seek out this item.
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Two other keys, wait and count, do not apply to all entities and are described as they apply to individual entity types.

Check Boxes/Spawnflags
SUSPENDED: item will spawn where it was placed in map and won’t drop to the floor. Bots will only be attracted to suspended entities if they are reachable by way of a jump pad or launch pad (trigger_push).

Notes
Team: Just as you would set doors to work together with the "team" key, you can do the same for item, weapon and ammo entities. Give each entity in the team the same key value (example: “team” “powerups”). The game randomly selects which team member respawns next. You can set your own wait times. You can skew the weighting towards a particular item by including multiple copies of it. Example: 1 quad and 2 hastes in a team mean a greater chance that a haste entity will appear next.

The amount of time it takes for an item in the team to respawn is determined by the “wait” value of the item that was picked up previously. So if one of the items in the team has it's “wait” key set to -1 (never respawn), the random respawning cycle of the teamed items will stop after that item is picked up.

When the random key is set, its value is used to calculate a minimum and a maximum delay. The final time delay will be a random value anywhere between the minimum and maximum values: (min delay = wait - random) (max delay = wait + random).

item_armor_body

Map Entity Color: blue
Dimensions: (-16 -16 -16) (16 16 16)
Game Function: Red Armor - 100 points of protection. All armor can be cumulated up to a maximum of 200 points and slowly decays back to 100 points.

Custom Keys
wait: time in seconds before item respawns after being picked up (default 25, -1 = never respawn).

item_armor_combat

Map Entity Color: blue
Dimensions: (-16 -16 -16) (16 16 16)
Game Function: Yellow Armor - 50 points of protectiong. All armor can be cumulated up to a maximum of 200 points and slowly decays back to 100 points.

Custom Keys
wait: time in seconds before item respawns after being picked up (default 25, -1 = never respawn).

item_armor_shard

Map Entity Color: blue
Dimensions: (-16 -16 -16) (16 16 16)
Game Function: Green Armor Shard - 5 points of protection. All armor can be cumulated up to a maximum of 200 points and slowly decays back to 100 points.

Custom Keys
wait: time in seconds before item respawns after being picked up (default 25, -1 = never respawn).

Item_botroam

Map Entity Color: orange
Dimensions: (-16 -16 -16) (16 16 16)
Game Function: An invisible entity that attracts a bot to it. Used to move bots to parts of a map that might otherwise not be used.

Custom Keys
Weight: non-zero floating point value, most often in the range 0 to 400. Very low values are unlikely to attract a bot to that area, since most bots have “desires” that attract them to other game entities. (Higher values are allowed but keep in mind that the bot should also be attracted to normal items. Don't make the weight value too high.

Notes
The item_botroam entity can be used when a bot does not roam the whole level or prefers to go to only specific areas. But don’t confuse these items with “way points”. They are more like magnets. This (invisible) item can be placed in a map just like regular items. Nobody can actually pick up the item it’s only used to attract bots to certain places of the map. The value is the weight of the roam_item is relative to the weight assigned other items in the map (each bot has its own weights). The bot character specific item weights are stored with the bot characters in the botfiles/bots/ sub-folder in the .pk3 file.

When a bot should never go for a specific item the key "notbot" with value “1” can be used for that item. This key with value can be used for every available item in Quake III Arena.

Design Tip: Wait to place these items until you’ve done a significant amount of live play testing on the final map against bots. Observe a bot-only match. See which parts of the map they DON’T use frequently. Use bot_roam entities to encourage the bots to follow more paths through the map. Example: In one of id’s CTF

maps, it was eventually observed that bots were most likely to use only one entrance when assaulting the base. Placement of item_botroam entities along the other entrance paths might have solved this.

item_enviro

Map Entity Color: blue
Dimensions: (-16 -16 -16) (16 16 16)
Game Function: Battle Suit power-up. Lasts 30 seconds. Battle suit provides full protection against explosion radius damage, slime, and lava damage. It gives partial protection against falling, and direct rocket hits.

Custom Keys

wait: time in seconds before item respawns after being picked up (default 120, -1 = never respawn).
count: time in seconds that power-up will last when picked up (default 30).

item_flight

Map Entity Color: blue
Dimensions: (-16 -16 -16) (16 16 16)
Game Function: Flight power-up. Lasts 60 seconds. Will not appear in single player games. Bots do not understand its use.

Custom Keys

wait: time in seconds before item respawns after being picked up (default 120, -1 = never respawn).
count: time in seconds power-up will last when picked up (default 60).

item_haste

Map Entity Color: blue
Dimensions: (-16 -16 -16) (16 16 16)
Game Function: Speed power-up. Makes player run at double speed for 30 seconds.

Custom Keys

wait: time in seconds before item respawns after being picked up (default 120, -1 = never respawn).
count: time in seconds power-up will last when picked up (default 30).

item_health

Map Entity Color: blue
Dimensions: (-16 -16 -16) (16 16 16)
Game Function: Yellow cross bubble - 25 Health. Cannot be picked up over 100 health.

Custom Keys

wait: time in seconds before item respawns after being picked up (default 35, -1 = never respawn).
count: sets the amount of health points given to the player when item is picked up (default 25).

item_health_large

Map Entity Color: blue

Dimensions: (-16 -16 -16) (16 16 16)
Game Function: Gold cross bubble - 50 Health. Cannot be picked up over 100 health.

Custom Keys
wait: time in seconds before item respawns after being picked up (default 35, -1 = never respawn).
count: sets the amount of health points given to the player when item is picked up (default 50).

item_health_mega

Map Entity Color: blue
Dimensions: (-16 -16 -16) (16 16 16)
Game Function: Blue M bubble - 100 Health. Adds 100 health points to current health up to a maximum of 200.

Custom Keys
wait: time in seconds before item respawns after being picked up (default 40, -1 = never respawn).
count: sets the amount of health points given to the player when item is picked up (default 100).

item_health_small

Map Entity Color: blue
Dimensions: (-16 -16 -16) (16 16 16)
Game Function: Green cross bubble - 5 Health. Can be picked up to give over 100 health but slowly decays back to 100.

Custom Keys
wait: time in seconds before item respawns after being picked up (default 35, -1 = never respawn).
count: sets the amount of health points given to the player when item is picked up (default 5).

item_invis

Map Entity Color: blue
Dimensions: (-16 -16 -16) (16 16 16)
Game Function: Invisibility power-up. Lasts 30 seconds.

Custom Keys
wait: time in seconds before item respawns after being picked up (default 120, -1 = never respawn).
count: time in seconds power-up will last when picked up (default 30).
team : set this to team items. Teamed items will respawn randomly after team master is picked up (see Notes).

item_quad

Map Entity Color: blue
Dimensions: (-16 -16 -16) (16 16 16)
Game Function: Quad Damage power-up (3 times damage). Lasts 30 seconds.

Custom Keys
wait: time in seconds before item respawns after being picked up (default 120, -1 = never respawn).
count: time in seconds power-up will last when picked up (default 30).

item_regen

Map Entity Color: blue
Dimensions: (-16 -16 -16) (16 16 16)
Game Function: Health Regeneration power-up. This will boost your current health by 5 points every second up to a maximum of 200. The boost continues for a period of 30 seconds. Aftewards, any health points over 100 slowly decay back to 100.

Custom Keys

wait: time in seconds before item respawns after being picked up (default 120, -1 = never respawn).
count: time in seconds power-up will last when picked up (default 30).

Light Entity

light

Map Entity Color: bright green (see Notes)
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: Non-displayed light entity. The default condition emits white light in all directions at a value of 300. The apparent brightness of the light is modeled on "real world" physics, so the falloff in brightness willl be an inverse square of distance from the source. It can be colored. It can be targeted on an info_null entity to make a spotlight.

Keys

light: value of light intensity (default 300).
_color: weighted RGB value of light color (default white - 1 1 1).
target: point this to an target_position, info_null or info_notnull to create a spotlight effect.
radius: sets radius of light cone for spotlights (default 64) in game units. Radius measurement is made at the targeted entity. Light must target an info_null entity (info_nulls are only used by the compiler and need not be "remembered" by the game engine during play).

Check Boxes/Spawnflags

LINEAR: light falloff will be linear instead of inverse square of distance from source.

Notes

- Linear fall off will not make much difference on low value lights. Useful on high value lights where the light travels long distances.
- If the "Light drawing" preference is selected (under Preferences), the editor shows the light entities as diamond shaped pieces the color of the light they cast. If not, they are light yellow green cubes.

Coloring Lights

To quickly change the color of a light entity, use on of the following methods.

CTRL + k: With the entity window open, select a light entity in either the map or camera window. Press CTRL + k. This brings up the windows color selector. Select a color and choose "OK". The editor automatically normalizes the light colors.

Sample Texture: Select the light entity. Select a texture in either the texture window or the camera window. Hit SHIFT + middle mouse button.

Manual Entry: Type in the value for the key _color as a 3 numbers between 0 and 1 (inclusive).

Copy Existing: Select another light entity whose color value the user would like to duplicate. In the editor window, lef click on the key "_color". Now select the light entity to be colored. Hit ENTER.

misc_model

Map Entity Color: red
Dimensions: (-16 -16 -16) (16 16 16)
Game Function: Generic, one-size-fits-all placeholder for inserting .md3 models in game. Requires compilation of map geometry to be added to level.
Keys
angle: direction in which model will be oriented.
model : path/name of model to use (eg: models/mapobjects/teleporter/teleporter.md3).*/

Notes

This is a premade mesh model, created in a program like Kinetix's 3d Studio Max. It is a static (non-animating) model. Shaders can give it the appearance of motion, but no animation. The models should be stored in a directory with the pathname: models/mapobjects. The process by which models are made is not a part of this document. Currently, models only have rotation on the Z axis.

Models do not "clip" against players or weapon hits. They are entirely non-solid. If clipping is important, The user will need to build clip brushes that are roughly the size and shape of the models.
Do not use the flip or rotate tools on models. Only use the entity facing buttons or manually change the angle value. The purple "3d crosshair" is the origin point of the model.

Make it: Right mouse press on a map window to bring up the floating entity selector. Select misc_model. A selection dialogue box will open giving access to available .md3 files. Select the one you want and it will load into the map. Now, hit "n" to open the entity window. Click on the "model" key in the key list box. Now edit the value field to remove part of the line.

Example: `"c://program files/quake III arena/baseq3/models/mapobjects/storch.md3"`

… should be edited to read:

`"models/mapobjects/storch.md3"`

misc_portal_camera

Map Entity Color: light orange
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: Portal camera. This camera is used to project its view onto a portal surface in the level through the intermediary of a misc_portal_surface entity. Use the "angles" key or target a target_position or info_notnull entity to set the camera's pointing direction.

Keys

angles: this sets the pitch and yaw aiming angles of the portal camera (default 0 0). Use "roll" key to set roll angle.
target: point this to a target_position entity to set the camera's pointing direction.
targetname: a misc_portal_surface portal surface indicator must point to this.
roll: roll angle of camera. A value of 0 is upside down and 180 is the same as the player's view.
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.

notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Check Boxes/Spawnflags

SLOWROTATE : makes the portal camera rotate slowly along the axis of camera to target or (selected direction).
FASTROTATE : makes the portal camera rotate faster along the axis of camera to target or (selected direction)..

Notes

- Both the setting "angles" key or "targeting a target_position" methods can be used to aim the camera. However, the target_position method is simpler. In both cases, the "roll" key must be used to set the roll angle. Generally, this is adjusted after compiling the map at least once.
- If either the SLOWROTATE or FASTROTATE spawnflag is set, then the "roll" value is irrelevant.

misc_portal_surface

Map Entity Color: light orange
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: Portal surface indicator. This will "lock on" the brush face closest to it and identify as a portal. The view displayed on the portal surface is the view of the misc_portal_camera that this entity targets. Also used for mirrors (see Notes).

Keys

target: point this to a misc_portal_camera that "sees" the view you want to display on the portal.
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Notes

- The entity must be no farther than 64 units away from the portal surface to lock onto it.
- To make a mirror, apply the common/mirror shader to the surface, place this entity near it but don't target a misc_portal_camera.
- When used as a mirror, the mirror surface will display what the entity can "see."

misc_teleporter_dest

Map Entity Color: red
Dimensions: (-32 -32 -24) (32 32 -16)
Game Function: Teleport destination location point for trigger_teleporter entities. A "target_position" can also be used for this.

Keys

angle: direction in which player will look when teleported.
targetname: make the trigger_teleporter point to this.
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Notes
In most cases, this is replaced by the “target_position” entity.

Path_* Entities

path_corner

Map Entity Color: brown
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: Path corner entity that define the routes that func_trains can be made to follow.

Keys
target: point to next path_corner in the path.
targetname: the train following the path or the previous path_corner in the path points to this.
speed: speed of func_train (in game units per second) while moving to the next path corner. This will override the speed value of the train.
wait: number of seconds func_train will pause on path corner before moving to next path corner (default 0 - see Notes).
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Notes
- Setting the wait key to -1 will not make the train stop on the path corner, it will simply default to 0.
- The center of the origin brush in the func_train follows the path.

Shooter_* Entities

shooter_grenade

Map Entity Color: red-violet
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: This will shoot a grenade each time it’s triggered. Aiming is done by setting the “angles” key or by targeting an info_notnull or target_position entity.

shooter_plasma

Map Entity Color: red-violet
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: This will shoot a plasma ball each time it's triggered. Aiming is done by setting the “angles” key or by targeting an info_notnull or target_position entity.

shooter_rocket

Map Entity Color: red-violet

Dimensions: (-8 -8 -8) (8 8 8)
Game Function: This will shoot a rocket each time it's triggered. Aiming is done by setting the "angles" key or by targeting an info_notnull or target_position entity.

Keys
angles: this sets the pitch and yaw aiming angles of shooter (default 0 0). The roll angle does not apply.
targetname: activating trigger points to this.
target: this points to a target_position entity for aiming the grenades.
random: random aiming variance in degrees from the straight line to the targeted entity (default 0 - see Notes).
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Notes
- When the random key is set, its value is used to calculate a maximum angle deviation from the normal trajectory formed by a straight line between the shooter and the aiming entity it targets. The final trajectory will be a random value anywhere between no deviation at all (0) to maximum deviation (value of the random key).
- Both the setting "angles" key or "targeting a target_position" methods can be used to aim the shooter. However, the target_position method is simpler.*/

Target_* Entities

target_delay

Map Entity Color: aqua
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: The target_delay trigger is an intermediary time delay trigger. Like a target_relay (see below), this can only be fired by other triggers which will, in turn, cause it to fire its own targets

Keys
targetname: activating trigger points to this.
target: this points to entities to activate when this entity is triggered.
wait: delay in seconds from when this gets triggered to when it fires its own targets (default approx. 1).
random: random time variance in seconds added or subtracted from "wait" delay (default 0 - see Notes).
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Notes
When the random key is set, its value is used to calculate a minimum and a maximum delay. The final time delay will be a random value anywhere between the minimum and maximum values: (min delay = wait - random) (max delay = wait + random).

target_give

Map Entity Color: red
Dimensions: (-8 -8 -8) (8 8 8)

Game Function: This is used to give ammo, weapons, health or items to the player who activates it.

Keys
target: this points to the item(s) to give when activated.
targetname: activating trigger or spawn entity points to this.
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Notes
- There are 2 ways to use this entity.
  a) To automatically give items to players when they spawn in the game: make a spawn location entity like info_player_deathmatch or CTF respawn points target this entity, then make it target the item(s) to give to the player upon respawn.
  b) To give items to players during the game: make a trigger_multiple target this entity, then make it target the item(s) to give to the player when the trigger is touched. This is how the column of health and armor in Q3DM10 works.
- Items targeted to be given are not seen in the map.

target_kill

Map Entity Color: gray
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: This will kill the player who activates the trigger that fires this target.

Keys
targetname: the activating trigger points to this.
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).*/

target_laser

Map Entity Color: red
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: Generates a red laser beam. I think this can somehow spawn in the game, I saw it once but it's too inconsistent to be usable. Commented out.

Keys
angles: alternate "pitch, yaw, roll" angles method of aiming laser (default 0 0 0).
target: point this to a target_position entity to set the laser's aiming direction.
targetname: the activating trigger points to this.
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Check Boxes/Spawnflags
START_ON: when set, the laser will start on in the game.

Notes
Since none of the game maps in Quake III Arena used this function, it is not likely to be a functioning entity.

target_location

Map Entity Color: Dark Green
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: Location marker used by bots and players for team orders and team chat in the course of Teamplay games. The closest target_location in sight is used for the location. If none is in sight, the closest in distance is used.

Keys
Message: name of the location (text string). Displayed in parentheses in front of all team chat and order messages. Shorter is better.
count: color of the location text displayed in parentheses during team chat. Set to 0-7 for color.
0 : white (default)
1 : red
2 : green
3 : yellow
4 : blue
5 : cyan
6 : magenta
7 : white
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Design Tips: The target locations are “line-of-sight.” If a player can “see” it, and that target is the closest to the player, then that location message is displayed. Be conservative in placing location markers. Because of the way the location code is implemented, it causes a large amount of data to be transmitted regularly. It has been explained that the game serrver has to constantly keep track of, and update to the clients, a data table equal to all the location markers multiplied by all the players. Not only that, but it must calculate line of sight from players to location markers and calculate the distance from the location marker. Place the target locations in such a way that the entity can be "seen" from most, if not all, the positions that a player can stand in when it is inside that area. Fewer are better, even if it means that occasionally, a team mate is in an unknown location.

target_position

Map Entity Color: Dark Green
Dimensions: (-4 -4 -4) (4 4 4)
Game Function: This is an aiming target for entities like light, misc_portal_camera, and trigger_push (jump pads and launch pads) in particular.

Keys
Targetname: the entity that requires an aiming direction points to this.
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.

notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Notes

- Use this as the target for any entity that must be actively targeted during the game (do not use it as a target for spotlights).
- See Tips, Tricks and Tutorials for the method used to make jump pads.

target_print

Map Entity Color: dark green
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: This will print a message on the center of the screen when triggered. By default, all the clients will see the message.

Keys

message: text string to print on screen.
targetname: the activating trigger points to this.
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Check Boxes/Spawnflags

REDTEAM : only the red team players will see the message.
BLUETEAM : only the blue team players will see the message.
PRIVATE : only the player that activates the target will see the message.

target_push

Map Entity Color: gray
Dimensions: (-8 -8 -8) (8 8 8)

Game Function: This is not recommended for creating jump pads and launch ramps. The direction of push can be set by the “angles” key or pointing to a target_position or info_notnull entity. Unlike trigger_push, this is NOT client side predicted and must be activated by a trigger.

Keys

angles: this sets the pitch and yaw aiming angles of push entity (default 0 0). The roll angle does not apply.
speed: speed of push (default 1000 game units per second). Has no effect if entity targets an aiming entity.
targetname: the activating trigger points to this. Push originates from the location of the trigger.
target: this points to the aiming entity to which the player will jump.
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Check Boxes/Spawnflags

BOUNCEPAD : if set, trigger will play bounce noise instead of beep noise when activated (see notes).

Notes

- The player will first move from the trigger to the target_push and then on towards the target_position.
- To make a jump pad or launch ramp, create a trigger_multiple where the jump must originate. Place the target_push directly above the trigger_multiple and place the target_position entity at the highest point of the jump. Target the trigger_multiple to the target_push and target the target_push to the target_position/info_notnull (or set the target_push's "angles" key).
- Note that the "angle" key also works.
- A target_push can be used to make a wind tunnel push effect (as opposed to the jump pad effect of a trigger_push). It pushes the activator in the direction of the angle value or towards its apex, a targeted target_position entity.
- The default speed is 1000.
- If bouncepad is checked, it will play the bouncepad sound instead of windfly.

Design Tip:

There is a way to make the target push play proper sounds. Just create a sound\movers\plats folder under baseq3 and put a sounds windfly.wav in it. It can be the sound from the Q2 or your own custom looping if you're up to it.

target_relay

Map Entity Color: aqua
Map Entity Color: (-8 -8 -8) (8 8 8)
Game Function: This can only be activated by other triggers, which will, in turn, cause it to activate its own targets.

Keys

targetname: activating trigger points to this.
target: this points to entities to activate when this entity is triggered.
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Check Boxes/Spawnflags

RED_ONLY : only red team players can activate trigger.
BLUE_ONLY : only red team players can activate trigger.
RANDOM: one of the targeted entities will be triggered at random.

Notes

Use this when you need to split off targeting functions along separate paths.

target_remove_powerups

Map Entity Color: blue
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: This takes away all item_* type powerups from player except health and armor (holdable_* items are not taken away either). This must be activated by a button or trigger_multiple entity. The player that activates the trigger will lose any powerup(s) currently in his possession.

Keys
targetname: activating trigger points to this.
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).*/

target_score

Map Entity Color: bright green
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: This is used to automatically give frag points to the player who activates this. A spawn location entity like info_player_* or CTF respawn points can target this entity to give points to the player when he spawns in the game. Or a trigger can also be used to activate this. The activator of the trigger will get the points.

Keys
targetname: activating entity points to this.
count: number of frag points to give to player (default 1).
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).*/

target_speaker

Map Entity Color: bright green
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: Sound generating entity that plays .wav files. Normal non-looping sounds play each time the target_speaker is triggered. Looping sounds can be set to play by themselves (no activating trigger) or be toggled on/off by a trigger.

Keys
noise: path/name of .wav file to play (eg. sound/world/growl1.wav - see Notes).
wait: delay in seconds between each time the sound is played ("random” key must be set - see Notes).
Random: random time variance in seconds added or subtracted from “wait” delay ("wait” key must be set - see Notes).
targetname: the activating button or trigger points to this.
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Check Boxes/Spawnflags
LOOPED_ON: sound will loop and initially start on in level (will toggle on/off when triggered).
LOOPED_OFF: sound will loop and initially start off in level (will toggle on/off when triggered).
GLOBAL: sound will play full volume throughout the level.
ACTIVATOR: sound will play only for the player that activated the target.

Notes
- The path portion value of the “noise” key can be replaced by the implicit folder character “*” for triggered sounds that belong to a particular player model. For example, if you want to create a “bottomless pit” in which the player screams and dies when he falls into, you would place a trigger_multiple over the floor of

the pit and target a target_speaker with it. Then, you would set the "noise" key to "*falling1.wav". The * character means the current player model's sound folder. So if your current player model is Visor, * = sound/player/visor, if your current player model is Sarge, * = sound/player/sarge, etc. This cool feature provides an excellent way to create "player-specific" triggered sounds in your levels.

- The combination of the "wait" and "random" keys can be used to play non-looping sounds without requiring an activating trigger but both keys must be used together. The value of the "random" key is used to calculate a minimum and a maximum delay. The final time delay will be a random value anywhere between the minimum and maximum values: (min delay = wait - random) (max delay = wait + random).

target_teleporter

Map Entity Color: red
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: Activating this will teleport players to the location of the targeted misc_teleporter_dest entity (target_position can also be used). Unlike trigger_teleport, this entity must be activated by a trigger and does NOT allow client prediction of events.

Keys

targetname: activating trigger points to this.
target: this must point to a misc_teleporter_dest entity.
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Notes

When you give multiple targets the same target name, the teleporter will randomly select from one each time it is used.

Team_* Entities

These entities only function when a team style game is being played. Most are for Capture the Flag. They do not need to be marked with notfree, since that is part of their nature.

team_CTF_blueflag

Map Entity Color: blue
Dimensions: (-16 -16 -24) (16 16 32)
Game Function: Blue team flag for CTF games.

Notes

This cannot be suspended (or the bots won't find it). It must be reachable by players of both teams, since it is where a player must return an opponent's flag.

team_CTF_blueplayer

Map Entity Color: blue
Dimensions: (-16 -16 -24) (16 16 32)

Game Function: Initial Blue team spawning position for CTF games. This is where players spawn when they join the Blue team (at the start of a game or upon entering a game in progress).

Keys
target: this can point at a target_give entity for respawn freebies.

team_CTF_bluespawn

Map Entity Color: blue
Dimensions: (-16 -16 -24) (16 16 32)
Game Function: Blue team respawning position for CTF games. This is where Blue team players respawn after they get fragged.

Keys
target: this can point at a target_give entity for respawn freebies.

team_CTF_redflag

Map Entity Color: red
Dimensions: (-16 -16 -24) (16 16 32)
Game Function: Blue team flag for CTF games.

Notes
This cannot be suspended (or the bots won't find it). It must be reachable by players of both teams, since it is where a player must return an opponent's flag.

team_CTF_redplayer

Map Entity Color: red
Dimensions: (-16 -16 -24) (16 16 32)
Game Function: Initial Red team spawning position for CTF games. This is where players spawn when they join the red team (at the start of a game or upon entering a game in progress).

Keys
target: this can point at a target_give entity for respawn freebies.

team_CTF_redspawn

Map Entity Color: red
Dimensions: (-16 -16 -24) (16 16 32)
Game Function: Red team respawning position for CTF games. This is where red team players respawn after they get fragged.

Keys
target: this can point at a target_give entity for respawn freebies.

Trigger_* Entities

trigger_always

Map Entity Color: gray
Dimensions: (-8 -8 -8) (8 8 8)
Game Function: Automatic trigger. It will fire the entities it targets as soon as it spawns in the game.

Keys

target: this points to the entity to activate.
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Notes

For reliable internet play, make any trigger which can be passed through at least 32 game units deep.

trigger_hurt

Map Entity Color: gray
Dimensions: size of brush used
Game Function: Any player that touches this will be hurt by "dmg" points of damage once per server frame (very fast). A sizzling sound is also played while the player is being hurt.

Keys

dmg: number of points of damage inflicted to player per server frame (default 5 - integer values only).
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Check Boxes/Spawnflags

START_OFF: if set, the trigger will initially start off in the game.
SILENT: supresses the sizzling sound while player is being hurt.
NO_PROTECTION: player will be hurt regardless of protection (see Notes).
SLOW: changes the damage rate to once per second.

Notes

- The invulnerability power-up (item_enviro) does not protect the player from damage caused by this entity regardless of whether the NO_PROTECTION spawnflag is set or not.
- A trigger_hurt always starts on in the game.
- For reliable Internet play, make any trigger which can be passed through at least 32 game units deep.

trigger_multiple

Map Entity Color: gray
Dimensions: size of brush used
Game Function: Variable size repeatable trigger. It will fire the entities it targets when touched by player. Can be made to operate like a trigger_once entity by setting the "wait" key to -1. It can also be activated by another trigger that targets it.

Keys
target: this points to the entity to activate.
targetname: activating trigger points to this.
wait: time in seconds until trigger becomes re-triggerable after it's been touched (default 0.2, -1 = trigger once).
Random: random time variance in seconds added or subtracted from "wait" delay (default 0 - see Notes).
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Notes
- When the random key is set, its value is used to calculate a minimum and a maximum delay. The final time delay will be a random value anywhere between the minimum and maximum values: (min delay = wait - random) (max delay = wait + random).
- For reliable Internet play, make any trigger which can be passed through at least 32 game units deep.

trigger_push
Map Entity Color: gray
Dimensions: size of brush used
Game Function: This is used to create jump pads and launch ramps. It MUST point to a target_position or info_notnull entity to work. Unlike target_push, this is client side predicted.

Keys
target: this points to the target_position to which the player will jump.
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Notes
- To make a jump pad or launch ramp, place the target_position/info_notnull entity at the highest point of the jump and target it with this entity.
- This trigger automatically makes the bouncepad sound.
- Speed of travel is determined by the distance needed to reach the target entity. Longer = faster.
- For reliable Internet play, make any trigger which can be passed through at least 32 game units deep.

trigger_teleport
Map Entity Color: gray
Dimensions: size of brush used
Game Function: Touching this will teleport players to the location of the targeted misc_teleporter_dest or target_position entities. This entity allows client prediction of events. It is the preferred method.

Keys
target: this must point to a misc_teleporter_dest entity or a target_position entity.
notfree: when set to 1, entity will not spawn in "Free for all" and "Tournament" modes.
notteam: when set to 1, entity will not spawn in "Teamplay" and "CTF" modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Notes

- For reliable Internet play, make any trigger which can be passed through at least 32 game units deep.
- When you give multiple targets the same target name, the teleporter will randomly select from one each time it is used.

Weapon Entities

weapon_bfg

Map Entity Color: blue
Dimensions: 32x32
Game Function: Big Freaking Gun. Default ammo load is 20.

weapon_gauntlet

Map Entity Color: blue
Dimensions: 32x32
Game Function: Melee weapon. No ammo. There is no reason to place this entity in a map.

weapon_ grapplinghook

Map Entity Color: blue
Dimensions: 32x32
Game Function: Grappling Hook. Spawns in the game and works but is unskinned. Does not use ammo.

weapon_grenadelauncher

Map Entity Color: blue
Dimensions: 32x32
Game Function: Lobs bouncing grenades. Comes with 10 grenades.

weapon_lightning

Map Entity Color: blue
Dimensions: 32x32
Game Function: Also called the “shaft” by some. Comes with 100 “shocks”

weapon_machinegun

Map Entity Color: blue
Dimensions: 32x32
Game Function: Player automatically starts with this. Comes with a default load of 100 “shots.”
Design Tip: For a “Rocket Arena” type game, the designer may wish to use the target_give entity to “give” the player an ammo_bullets entity with a count of -100 to remove the machinegun from play.

weapon_plasmagun

Map Entity Color: blue
Dimensions: 32x32
Game Function: Comes with 50 shots.

weapon_railgun

Map Entity Color: blue
Dimensions: 32x32
Game Function: Comes with 10 slugs.

weapon_rocketlauncher

Map Entity Color: blue
Dimensions: 32x32
Game Function: Comes with 10 rockets.

weapon_shotgun

Map Entity Color: blue
Dimensions: 32x32
Game Function: Also called the “shaft” by some. Comes with 10 rockets.

Keys

wait: time in seconds before item respawns after being picked up (default 5, -1 = never respawn).
random: random time variance in seconds added or subtracted from “wait” delay (default 0 - see Notes).
count: sets the amount of ammo given to the player when weapon is picked up.
team: set this to team items. Teamed items will respawn randomly after team master is picked up (see Notes).
target: picking up the item will trigger the entity this points to.
targetname: a target_give entity can point to this for respawn freebies.
notfree: when set to 1, entity will not spawn in “Free for all” and “Tournament” modes.
notteam: when set to 1, entity will not spawn in “Teamplay” and “CTF” modes.
notsingle: when set to 1, entity will not spawn in Single Player mode (bot play mode).

Check Boxes/Spawnflags

SUSPENDED : item will spawn where it was placed in map and won’t drop to the floor. Bots will only be attracted to suspended entities if they are reachable by way of a jump pad or launch pad (trigger_push).

Notes

The amount of time it takes for an item in the team to respawn is determined by the “wait” value of the item that was picked up previously. So if one of the items in the team has it's “wait” key set to -1 (never respawn), the random respawning cycle of the teamed items will stop after that item is picked up.

When the random key is set, its value is used to calculate a minimum and a maximum delay. The final time delay will be a random value anywhere between the minimum and maximum values: (min delay = wait - random) (max delay = wait + random).

Worldspawn Entity

Worldspawn

Only used for the world. You access the worldspawn entity by selecting any non-entity brush in your map.

Keys

message: text to print at user logon. Used for name of level.
music: path/name of looping .wav file used for level's music (eg. music/sonic5.wav). This is for a piece of music with only one part. To make a song play with both an intro and a looping portion, the following is the correct form for the music value:

music/intro.wav music/loop.wav

ambient: Adds a constant value to overall lighting. Use not recommended. Ambient light will have a tendency to flatten out variations in light and shade.
_color: This is the normalized formula for RGB values for ambient light. A value is considered normalized when it fits in a range between 0 and 1. If you are using a tool like the Windows color picker, divide the value for each component of the RGB values by 255. The result will be a normalized value.
gravity: gravity of level (default is normal gravity: 800).

Appendix C: Bot Navigation Files

(Original Document Title: BSP Converter)
Version: 1.8
Date: 2000-01-11
Author: Mr. Elusive

Introduction

This appendix is based on documentation that has been released and updated by Mr. Elusive. It deals with the Navigation file that must be created in order for the *Quake III Arena* bots to be able to navigate and play in game maps. It is not a manual for the creation of bots.

Description

The BSPC tool is used to create AAS files from BSP files. An AAS file is a file with areas used by the Quake III Arena bot in order to navigate and understand a map.

Installation

Place the BSPC program in your Quake III Arena folder.

Usage

Unless you are using a front-end utility, which gives you check-button access to compiler functions, you will need to run this program from the command line of your DOS Command Prompt program. If the command line is not already pointing the *Quake III Arena* directory, change directories (cd\quake III arena).

The command line should be formatted as follows:

bspc [-<switch> [-<switch> ...]]

Example 1: bspc -bsp2aas d:\quake3\baseq3\maps\mymap?.bsp
Example 2: bspc -bsp2aas d:\quake3\baseq3\pak0.pk3\maps/q3dm*.bsp

In the first example a “?” is used as a metacharacter variable to indicate any single keyboard character. This allows you to compile the latest version of a map (“mymap1” or “mymapb”).

In the second example a “*” is used as a metacharacter variable to indicate any string of keyboard characters. This allows you to compile the latest version of a map (“mymap1” or “mymapb”).

The bot navigation compile process can be further modified by the use of “switches” that change some of the parmeters used in compilation. Some of these can be used to compile only certain features, such as reachability. Others allow the compiler to use more than a single processor, as is the case with “threads.”

Switches:
bsp2aas <[pakfilter/]filter.bsp> = convert BSP to AAS

```
reach    <filter.bsp>          = compute reachability & clusters
cluster  <filter.aas>          = compute clusters
aasopt   <filter.aas>          = optimize aas file
output   <output path>           = set output path
threads  <X>                 = set number of threads to X
cfg      <filename>            = use this cfg file
optimize                     = enable optimization
noverbose                    = disable verbose output
breathfirst                  = breath first bsp building
nobrushmerge                   = don't merge brushes
freetree                     = free the bsp tree
nocsg                        = disables brush chopping
forcesidesvisible              = force all sides to be visible
grapplereach                 = calculate grapple reachabilities
```

Several metacharacters may be used in the filter and pakfilter.

* Match any string of zero or more characters
? Match any single character
[abc...] Match any of the enclosed characters; a hyphen can be used to specify a range (e.g. a-z, A-Z, 0-9)

.pk3 files are accessed as if they are normal folders (whether they are compressed or not).

For instance, use “d:\quake3\baseq3\pak0.pk3\maps/q3dm1.bsp” to access the map q3dm1.bsp from the pak0.pk3 file.

Multiple files may be listed after the switches bsp2map, bsp2aas, reach, cluster and aasopt.

If a BSP file is being converted to an AAS file and no output path is entered on the command line then the AAS file will automatically be stored in the same folder as the BSP file. However if the BSP file was stored in a .pk3 file then the AAS file will be stored in a folder with the name 'maps' outside the .pk3 file.

Updating the Entity Lump

If an AAS file is already available for a BSP file and you ONLY change the entities inside this BSP file then you only have to recalculate the reachabilities. This way you can move items, platforms etc. around without the need to recalculate the whole AAS file -- which can save quite some compile time. You can recalculate the reachabilities as follows:

bspc -reach mymap.bsp

Where mymap.bsp is the BSP file. The mymap.aas file has to be in the same folder as mymap.bsp or should be in the output folder specified with the -output option.

Keep in mind that as soon as ANY geometry in the map changes (including b_models and trigger brushes) the whole AAS file HAS to be recalculated in order to play with bots.

Leaks

Just like there can be vis "leaks" in a map there can also be clipping leaks. Two things can be wrong when the BSPC tool outputs that a map leaks.

1. There are no entities in the map at all, or all entities that are actually in the map are placed in solid locations (see Test Solid below). In this case the BSPC tool outputs: "WARNING: no entities inside." The map must contain at least one player start entity to load in the game.

2. There is a spot in the map where players can go outside the map into the void. This is bad, players should never be able to fall out of a level. In this case the BSPC tool outputs: "WARNING: entity reached from outside." The BSPC tool also writes a mymap.lin file that can be loaded in the Q3Radiant editor to show lines that go through the actual leak.

Make sure the .lin file is stored in the same folder as where q3radiant stores the .bsp file. Load the map in q3radiant and use the menu ➔ File ➔ Pointfile... to load the .lin file. A thick red line will be shown in the map. Follow this line to find the leak.

Useful Map Information

The following information is given as a reference for bot capabilities. The area file information is used by bots. It tells them when and where they can make jumps. Human players don't have this information readily available to them, so you may want to be more forgiving when designing tricky jumps.

Map Boundaries

Currently all the contained area of a *Quake III Arena* map should fall within the bounds (8192, 8192, 8192) - (-8192, -8192, -8192) for the bspc tool to compile. These are the same bounds as the Q3Map compilers.

Game Physics

Player Dimensions

Model size: The player model's actual size is a bounding box 30 units by 30 units square with a height of 56 units. In the game world, eight units roughly equal one foot (30.5 cm). From this, we deduce that the characters are a heroic 7 feet tall (2.13 meters).

Step Heights

For scale purposes, "normal" steps should be no higher than 8 units. However, the maximum value that a player may step up is 18 units (just keep steps 16 units or lower).

Normal Jumps

The maximum height for barriers the bots will jump on is 32 units.

Water Jump Heights (or "Everyone, out of the pool!")

The maximum distance that a bot may jump to exit water is 18 units. This is the height difference between the water surface and the adjacent floor that the bot is jumping onto. If the water jump height is made higher, human players will have a hard time getting out of the water.

Rocket Jumps

With normal gravity and without the quad, the maximum rocket jump height is around 280 units (you can sometimes jump a few units higher but this is a safe value for reference). In practice, except for especially tricky jumps, this value should be substantially lower. Test rocket jumps repeatedly before settling on a final height.

Math for Map Makers

Here's some math to calculate some other values of interest:

Gravity = 800;
Jump velocity = 270;
Max vertical rocketjump velocity = 670;
Max run velocity = 320;
Max step height = 18;

Max jump height = 0.5 * gravity * (jumpvelocity/gravity)*(jumpvelocity/gravity);
Max normal jump height = 45 units **NOTE:** even though this is the mathematical maximum jump height always keep the the 32 units maximum barrier height for bots in mind when building maps.

Maximum horizontal jump distance over a gap from one spot to another when both are at the same height:

t = sqrt((maxjumpheight + maxstep) / (0.5 * gravity));
t = 0.3986 seconds;
dist = maxrunvelocity * (t + jumpvelocity / gravity);
dist = 235 units;

Because players use a bounding box we can jump a full bounding box width further in the ideal case. (15 units at the jump starting position and 15 at the landing place).

235 + 15 + 15 = 265 units.

Again, remember that this is the mathematical maximum which players can only reach under ideal circumstances.

Optimizing a Map for bspc Compiling

The area file is the tool that the bots use to understand the map. If it is overly complex, it can cause navigation problems. With careful attention to detail, many of these problems can be eliminated, or avoided altogether.

First, understand that hint brushes, which are of great use to the bsp compiler, have no effect on the bspc tool that creates area files. Only solid, clip and liquid brushes and curve patches are used by the bspc tool. Using these mapcomponents, the bspc tool outputs how many "areas" will be created for a map. Having fewer areas in a map is better than having more.

Quite often, map trim and detail create many of these small areas. For the most part, these small areas are too small to enter and are thus useless to the bots. Brushes that project out into the map's floor cut it up and create additional areas. Often the number of areas can be greatly reduced by adding additional clip brushes. Take a look at Q3DM7 in the map editor, and you will see the walls are literally covered with clip brushes. This not only smooths out passage for human players, but also has the added benefit of eliminating unnecesary

navigation areas. This is also why, as many "camping style" players have found, many areas above door and window trim have also been clipped off.

Another way to reduce complexity is to use clip brushes to simplify the collision area around complex objects. For exmple, the map maker can add clip brushes with simple shapes (axial or "square" brushes are prefered) around (small) detail brushes. Simple shaped clip brushes can also be added around curves to reduce the collision complexity (for instance, place an axial clip brush around a small cylinder). It is better to place the clip brushes around the whole curve (not just part of the curve). The map maker should also use shader scripts to make the textures on brushes or curve patches non-solid (surfaceparm nonsolid) when they are enclosed by (full) clip brushes. This will also speed up bspc calculations.

Always try to align your geometry to the grids. Always use the largest grid possible for alignment of your geometry. Also try to align the backsides of brushes which may not be visible. The more brush sides are aligned the better. This will also speed up bspc calculations.

Align adjacent brushes as much as possible. Make sure that badly aligned brushes create no tiny faces.

Quite often there are also places in a map that are visible to players but where players can never go (even determined, rocket-jumping players). If a player could reach that area, they would be able to walk around upon it. If the mapmaker decides not to allow that, he or she should use large clip brushes to enclose the entire unreachable space. This will also speed up bspc calculations and reduce the number of areas created by the bspc tool.

Note: the number of areas relative to the map size tells something about the navigation complexity for players in general (also human players). Reducing the collision complexity for bots also makes the map easier to navigate for human players

Entities & the Navigation File

There are specific rules and guidelines for using a number of entities and entity-like textures with the bspc tool.

Func_plat and Func_bobbing

When func_plat or func_bobbing entities are placed in a map, the bots will use them if possible. The bots assume they can stand on top of the bounding box (xy extents of all components used to create the entity) of the model used for the func_plat or func_bobbing entity. As a result, creating complex-shaped func_plat or func_bobbing models is mostly a bad idea. You have to make sure the bots (and players) can actually stand everywhere on top of the bounding box of the model. The basic rule: If a bot is going to use a func_plat or a func_bobbing, make sure the top surface is a solid, rectilinear rectangle or square.

Cluster Portals

Cluster portals are one of the several "texture entities" used by the game engine. These are textures, which as used by the game engine, function like entities. The bspc tool divides the map into many, much smaller areas, which are essentially the surfaces a bot can move upon during play. Several of these areas can be grouped together to create a cluster. The clusters are seperated by cluster portals, which are also areas themselves. One of the things the bot uses these clusters for is to create a multi-level routing algorithm. When a map is efficiently divided up into clusters bot calculations (in run time) will be faster.

Guidelines to Consider When Placing Cluster Portals:

- The BSPC tool creates cluster portals automatically, but placing “clusterportal” brushes can create additional cluster portals.
- Placing “clusterportal” brushes inside the map manually creates cluster portals.
- The "clusterportal" brushes should not be used outside the world hull.
- The cluster portals do not have any effect on map vis.
- If a door is already sealed with an areaportal brush, a clusterportal is not necessary there. (areaportals are used by the bspc tool as if they were cluster portals).
- Just like the areaportals, the cluster portals must seal a space off entirely from other areas.
- The cluster portal areas should seal off a cluster in a way that the only path towards another cluster is through a cluster portal area.
- Only create cluster portals where people can walk or swim through.
- Don't create cluster portals in gaps in the floor. (people would fall through)
- Cluster portals must separate no more and no less than two (2) clusters.
- Try to create clusters with all the same number of “reachability” areas. For instance if the map has 5,400 areas try to create 10 clusters with 540 areas each, or 12 clusters with 450 areas each, etc. The BSPC tool lists the number of reachability areas in each cluster.
- Avoid creating clusters with only a few (less than 10) areas.
- When adding “cluster portal” brushes, try to place them in places with minimal geometric complexity. For instance place them inside convex door openings or small hallways (not in front of door openings). Ideally, the shape of the face through which a player walks or swims into the cluster portal is the same as the shape of the face through which a player leaves the cluster portal. Also ideally, the open space inside the cluster portal brush is convex.
- Make cluster portals about 16 or 32 units thick.

“Do Not Enter” Areas

The Do Not Enter texture is another one of the “texture entities” that the game engine uses as if they were entities. In some regards, it is like a clip brush, intended to prevent a bot from moving into or through it. However, this works more as a “strong suggestion” and is, in reality, not a physical barrier to the bot. A simple example of how a bot may enter a “Do Not Enter” area is knockback. If an explosion tosses a bot about, it may end up inside a prohibited area. Bots may pass out of such areas, but they will not actively try to enter them.

When bot navigation problems show up or you want to make sure a bot never tries to go to a certain place use a "do not enter" brush.

Guidelines to consider when placing “Do Not Enter” brushes:

- The “do not enter” brushes should not be used outside the world hull.
- The “do not enter” brush is Not a clip brush for the bot.
- The “do not enter” brush is a tool of last resort. Do not use it unless there are serious navigation problems.
- The number of “do not enter” brushes should be minimized because these brushes create additional areas for the bots.
- The “do not enter” brush will create a new area that the bot will try to avoid. However if the bot somehow ends up inside a “do not enter” area or there is a valid goal (game entity or item_botroam entity) inside the “do not enter” area then the bot is allowed to go into and out of that area. So if the bot somehow gets in a “do not enter” area the bot will be able to get out.

Bot Control Entities

These entities encourage a bot to move about and use more parts of the map.

Item_botroam

The item_botroam entity can be used when a bot does not roam the whole level or prefers to go to only specific areas. This (invisible) item can be placed in a map just like regular items. Nobody can actually pick up the item. It's only used to attract bots to certain places of the map.

The item_botroam has a key "origin" that is set by Q3Radiant automatically.

The item_botroam also has a key "weight." The value is the weight of the roam item and is relative to the weight of other items in the map, which are individual to each bot. The bot character-specific item weights are stored with the bot characters in the botfiles/bots/ sub-folder in the .pk3 file. The value of the weight is a non-zero floating-point value, most often in the range 0 to 400. Higher values are allowed but keep in mind that the bot should also still go for normal items, so don't make the item_botroam weight too high.

"Notbot" Means "Don't Touch"

When a bot should *never* go for a specific item, the key "notbot" with a value of "1" can be used for that item. This notbot key and its value can be used for every available item in *Quake III Arena.*

Info_Camp

This entity suggests locations where the bot can wait for enemies to come into view.

Suspended

The suspended checkbox flag can be used on all items (item_botroam included). However keep in mind that when a suspended item is not anywhere near the ground the bot will ONLY try to go for this suspended item using jump pads.

Testing .AAS files

Solid Areas

A solid area in the map is an area that looks empty to the human player, but is solid, like a wall, to a bot player. One of the easiest ways to test the AAS file for solid areas is to load the map in *Quake III Arena* in teamplay mode (type /set g_gametype 3 on the console before loading the map). Enter a team and add a bot to your team. Use the team order menu (by default bound to the F3 key) to command the bot to follow you. Walk around the map and see if the bot is able to follow you everywhere. If a bot stops at any point, it may have encountered an area of the map that appears to be unblocked to you, but to the bot, it is like it has encountered a solid wall.

Test Solid

In most cases, solid areas are the result of careless design. But, if you insist on making maps that are not axial in layout (say, your average cave), they can result from brushes meeting at non-axial angles. These "map bugs" can sometimes cause certain places in the map to show up solid in the AAS file. To test for these solid places set the cvar bot_testsolid to "1" on the console. (type /set bot_testsolid 1)

As you walk through the map, either "empty area" or "SOLID area" will be printed on the screen while traveling through a map.

The Culprits: What May Cause Map Bugs

Several map bugs can cause these solid places in the AAS file.

- Sometimes microscopic brushes are created by CSG subtraction on one or more brushes. Search for such brushes in the problem area and delete them.
- Tiny brush faces (not curves) can also cause problems. Due to vertex snapping in the q3map tool, those tiny brush faces can be snapped out of existence. Such faces will not show up in *Quake III Arena* and you'll see tiny peek holes or slits where you can view through the geometry (often into other rooms). Align vertexes of adjacent brushes to remove and avoid such tiny faces. Placing a clip brush in front of the face that is snapped out of existence will also remove the "solid area" but of course it's preferred to remove the peek hole or slit. Another cause could be a brush with a collapsed side. Check how many sides a brush has and how many sides actually have a surface. Rebuild brushes with collapsed sides.
- Lava creates a solid area. All faces contained within liquid brushes using a shader without "surfaceparm trans" set will be removed (this includes some lava textures). Those contained surfaces will not be visible and can cause the liquid to appear "solid" in the aas file.

Hacking Away the Problem

If you insist creating an .AAS file for a map with bugs, then the BSPC compile option **-forcesidesvisible** can be used. This should fix all the problems with areas showing up solid in the .AAS file. However creating an .AAS file with this option takes a lot longer (often more than twice the normal compile time). This is not recommended as a default option for compiling.

Testing Jump and Launch Pads

Jumppads can also be tested. Type the following on the *Quake III Arena* console, before loading your map:

/set bot_maxdebugpolys 1024
/set bot_visualizejumppads 1
/set bot_forcereachability 1

Now load the map. A counter will be shown and goes from 0% to 100%. When the counter has reached 100% type /set r_debugSurface 2 on the console. For every jumppad the default arc of travel (without using air control) will be visualized.

Version Changes

1.8 (2000-01-08)

- increased max points on winding
- made “HashVec: point x y z outside valid range” non-fatal
- fixed rocket jump reachabilities
- added force sides visible option
- increased simulated stack size for area traces

1.7 (1999-12-22)

- fixed ducked bounding box size
- fixed sv_maxsteepness being zero in aas configuration
- AAS files are now automatically stored in BSP file folder
- fixed crash bug caused by overflow of a simulated stack

Appendix D: Tricks, Tips, and Tutorials

Making the death fall sound…

The death yell that occurs when a player or bot falls into the void or fog of death is triggered by the falling character passing through a trigger multiple (should be no less than 32 units thick) that is targeted on a target_speaker. If you look at q3DM17 and find a target speaker, you will see that it plays the falling to death sound of the player who activates the trigger. Put that sound in your own target_speaker.

Making a Mirror …

Apply a mirror texture to brush (it will only work on brushes, not curve patches). Next, place a misc_portal_surface entity within 64 units of the mirror and at roughly eye level for the character. Because a mirror shows all that it can "see" the mapmaker needs to take special care that his mirror doesn't see so much of the map that it affects game performance.

Rules: A mirror should not be able to see another mirror or portal surface. This means no mirror mazes or mirror facing each other to produce infinite reflections.

Making a Jump Pad

1. Make the brush that contains your pulsing pad texture. It can be set in the floor or raised up on separate brush.
2. Make a trigger_push brush entity that is smaller than the pad (the id triggers are usually octagonal).
3. Create a target_position entity and move it to the height and location you want. The target position is both the aiming point for the trigger_push and the highest point (apex) of the assisted jump.
4. Hi-light the trigger first, then the target_position (order is important).
5. Press CTRL + k to connect the two entities (pointing the first at the second).
6. Compile and test it. The first compile needs to be a full or fast vis. If you need to make adjustments to the target_position, you only need to use an entities compile.

Lining Up the Pad Texture

The combination of shader keys that make the jump pad pulsing texture work can be tricky to line up. Try the following methods if your own attempts bring no joy.

1. Make the brush that will be your pad (128x128 units).
2. Apply the pad texture. If it doesn't line up, turn off the lock texture feature and move the pad until it lines up perfectly.
3. Lock the texture and move the brush into position.

If that doesn't work:

1. Build your brush in place.
2. Apply the pad texture so that several corners of the pad circle are visible.
3. Compile a regioned area with the jump pad in it.
4. At least one of the pad circles should have a pulsing circle in it.

5. Back in the editor, slide the pad circle with the active pulse so it fills the pad.
6. Recompile. It *should* work now.

Making a Launch Pad

Target the trigger_push that you put above the pad at a target_position. The player will accelerate until he reaches the target. Physics does the rest.
Note: The center point of the target must be *higher* than the center point of the trigger_push.

Making a "Rocket Arena" style map

1) Create all the entities you want the player to spawn with when he enters the arena, and make sure they are somewhere within the enclosed space of the map.
2) Add a "target_give" entity somewhere in the world.
3) Create all the spawn spots you want to be in your map.
4) Select the "target_give" entity.
5) Select one of the "give on spawn in" entities.
6) Hit Ctrl-K in the editor to link the two items together.
7) Repeat steps 4 through 6 until the target_give is linked to all the entities you wish the player to spawn into the world with.
8) Select a spawn spot
9) Select the target_give entity
10) Hit Ctrl-K in the editor to link the two entities together.
11) Repeat steps 8 through 10 until all the spawn spots are linked to the target_give entity.
12) Compile the map
13) Set g_gametype to tournament mode and set fraglimit of 1.
14) Get a bunch of your friends to connect into your server and have fun playing a "Rocket Arena" style game =)

An alternate use of target_give is how I used it in q3dm10 to create the "power tube" that gives you health and armour. The tube has a trigger_multiple with a wait of 0.5, linked to a target_give which is linked to a small health and an armour shard.

Making an Environment Box …

This is the shader script taken from the sky.shader that I used to make a test sky box months and months ago.

In baseq3, make an 'env' folder.

Put your skybox art in here and use this naming convention:

[skyname]_lf.tga
[skyname]_rt.tga
[skyname]_ft.tga
[skyname]_bk.tga
[skyname]_up.tga
[skyname]_dn.tga

* Make a directory in your quake3 folder with the following path:

  `quake3/baseq3/textures/[mymapname]`

* Make a directory in your quake3 folder with the following path:

  `quake3/baseq3/scripts`

* Make a script document called [mymapname].shader

* Make a script document called shaderlist.txt

In shaderlist.txt put [mymapname] on the first line and close the document.

```
//*******************************************************
//*              Sample environment box shader
//*******************************************************
textures/[mymapname]/[skyname]01
{
      qer_editorimage textures/[mymapname]/[skyname]

      surfaceparm noimpact
      surfaceparm nolightmap
      surfaceparm sky
      q3map_sun   0.933333 0.541176 03.13725 60 160 11
      q3map_surfacelight 100 //lots of diffuse light
      skyparms - 512 -
      sky env/[skyname]

// the following stuff lays clouds over the skybox map which you may not
want with a city skyline
      //{
      //    map textures/skies/dimclouds.tga
      //
      //    tcMod turb 0 0.001 0.5 0.001
      //    tcMod scale 3 3
      //    tcMod scroll 0.01 0.01
      //    blendFunc GL_ONE GL_ONE_MINUS_SRC_COLOR
      //    depthWrite
      //}
      //{
      //    map textures/skies/pjbasesky.tga
      //    blendfunc GL_ONE GL_ONE
      //    tcMod scroll -0.01 -0.01
      //    tcMod scale 5 5
      //}
//}
```

Making a Shooter

The shooters; shooter_rocket, shooter_grenade, and shooter_plasma all fire a single projectile when they are triggered by an event.

- Make a shooter entity (rocket, grenade or plasma)

- Give it a facing (1 to 360 degrees), or,
- Target it at a target_position.
- Give it a random value (potential degrees off target)
- Create an Activator. Make a trigger multiple or target an entity at the shooter. When the trigger is entered or the entity is taken, the, shooter is activated.
- If you want a shooter to fire multiple times, target the activator on two or more target_delays. Set the delay time to a different value for each (if using a trigger multiple, the WAIT value on the trigger should be greater than the longest delay on the target_delay). Target each target_delay on the shooter.

Appendix E: Online Resources

The Internet is an excellent source for information about Quake engine editing. The sites listed here provide a variety of useful editing resources.

Disclaimer: Most of these sites are established, heavily trafficked web pages with a history of stability. But, because these sites are not maintained by id Software, we make no claims that they will be there when you go looking for them or that they will still have the information of the type you are seeking.

News about the Editor

QeRadiant.Com

Qeradiant.com is the official site for the id editing tool that was the predecessor of Q3Radiant.
http://www.qeradiant.com/

Quake3World.com

http://www.quake3world.com/

Looking for a heavily trafficked message board where questions often get answered by the id designers? Look no further than the community section of Mplayer's Quake3World.com.

Editing Tutorials

These tutorials are located at several sites that have been around for a while, and may continue to be around.

Astrocreep's Map Diary

http://www.organicfusion.com/astrocrp/
Astrocreep has made a presence helping others on Quake3World's editing forum. In addition to letting you see his own design progress, his site is worth the visit just for the quick links to valuable editing resource sites.

Claudec's Lair of Shaders

http://www.claudec.com/lair_of_shaders/
Numerous tutorials on editing subjects.

QeRadiant.Com

http://www.qeradiant.com/
Qeradiant.com is the official site for the predecessor of Q3Radiant. You'll find useful information and links here to other editing sites.

Quake3mods.net

http://www.quake3mods.net/tutorials/mapping/
Again, don't ignore the Quake 2 tutorials.

Q3Workshop

http://qw3.gamedesign.net/
Some more good Quake 3 Arena specific design tutorials.

RiceBug.Com

http://ricebug.qeradiant.com/
Some good tutorials on Q3Radiant and QeRadiant (the Quake 2 editor). Don't ignore the the Quake 2 editing tutorials because many of the editor features are the same.

Rungy's Metropolis

http://quake3mods.net/rungy/
Rungy has a bit of everything. Highly recommended!
http://www.quake3mods.net/rungy/lorimar/contents.html

RUST – Game Design.net

http://www.gamedesign.net/
RUST has been a prime source for Quake engine editing for some time.

Editing Tools

GenSurf

http://tarot.telefragged.com/gensurf/index.shtml
GenSurf is a "natural" terrain creation tool that converts a grayscale bitmap into a web of triangular brushes or curve patches. Used with care, it can make some very interesting irregular surfaces.

Milkshape 3D

http://www.swissquake.ch/chumbalum-soft/home.html
This is a shareware editor for 3D models. Support for *Quake III Arena's native* md3 format is forthcoming.

Quake 3 Arena Shader Editor

http://www.larian.com/rat/q3ase.html
This is a tool for editing shaders. It allows you to construct the shader in realtime, seeing what works you build it.

Prefab Sources

Gamedesign.net Prefabs

http://prefabs.gamedesign.net/game.php3?game_id=13&num=0
This Rust's source for prefabricated map plug-ins. These here are in the form of .map files instead of *Quake III Arena's* native .pfb format.

Rungy's Metropolis

http://quake3mods.net/rungy/
Rungy has a bit of everything. Highly recommended!

Quake Prefab Park 2

http://www.planetquake.com/qpp/qpp2/
These are prefabs designed for use with *Quake* and *Quake 2*, which means the ones with movement or action gimmicks most likely will not work. And of course, you'll need to retexture anything you find here if it's not a *Quake III Arena* prefab.

Texture Sources

The following sites include shader documents, downloadable textures, tutorials or links to tutorials on making your own.

Alex d.g.

http://www.alexdg.com/tips.php3
This guy's web page is a great source for Adobe PhotoShop tutorials, including one on working with channels.

ArenaHub

http://arenahub.quake3world.com/maps.htm
Textures, links, tutorials, maps and more.

Freetextures.com

http://www.freetextures.com/
This site isn't as active as it once was (it keeps promising to return), but it has a lot of high quality texture source material in it. Use is free, but they do require written acknowledgement in your projects.

Graphitallica

http://graphtallica.ingava.com/
The folks at Graphitallica are creating paks of textures for use by game mod makers.

Maj's Stuff: Shader Docs

http://maj.gamedesign.net/shaderDocs.shtml
This is another look at the Shader scripts that are used to manipulate textures. It may be more "approachable" than the id Shader Manual.

Mean Arena

http://www.planetquake.com/meanarena/Q3_textures.html
This site had a large (100+)-texture pak in the works … but not released yet.

Quake III Arena Shader Manual

http://www.planetquake.com/polycount/resources/quake3/tutorials.shtml
http://www.quake3world.com/files/Q3Ashader_manual.doc
This is the official id documentation of *Quake III Arena* shaders. The second source is a download.

Rungy's Metropolis

http://quake3mods.net/rungy/
Rungy has a bit of everything. Highly recommended!

Texture Forest

http://www.planetunreal.com/forest/main1.html
It is possible to learn some tricks from artists who work for that "other" game engine.

Map Object Model Sources

Polycount

http://www.planetquake.com/polycount/resources/quake3/index.shtml
This link takes you to the resource page for Quake III Arena modeling

Rungy's Metropolis

http://quake3mods.net/rungy/
Rungy has a bit of everything. Highly recommended!

Milkshape 3D Modeling Tutorial

http://www.quake3mods.net/rungy/lorimar/contents.html
This is a tutorial on making map object models with Milkshape 3D

Sounds

None found.

Frequently Asked Questions (FAQ)

Developer's FAQ (Quake3mods)

http://quake3mods.net/faq/
This site answers a lot of questions about map making, model making, texturing and skinning. Mod makers appear to have submitted much of the information.

Official Quake III Arena FAQ (Quake3world.com)

http://www.quake3arena.com/faq/
This is the official FAQ, created and maintained by id Software. Most of the information pertains to general problems players encounter with Quake III Arena, and doesn't have a lot to do with map making.

RUST – Game Design.net

http://www.gamedesign.net/quake3/faq/

This development-oriented site has a Quake III Arena FAQ … though at the moment it's not particularly helpful.

Map Reviews, General Information

Z-Axis

http://q3a.stomped.com/
This is a more general Quake III Arena site devoted to map reviews, mod development.

Quake3nation

http://www.quake3nation.de/review.html
German language site with reviews of maps.

Appendix F: Default Key Shortcuts

On the odd chance that you (like the author of this manual) seriously mess up your default key bindings when making an .ini file, here are the default assignments to correct your mistake. Copy these below the [commands] line of your .ini file.

HideSelected	H
ShowHidden	Shift + H
BendMode	B
FitFace	Control + B
FitBrush	Shift + B
FreezePatchVertices	F
UnFreezePatchVertices	Control + F
UnFreezeAllPatchVertices	Shift + Control + F
ViewTextures	T
ThickenPatch	Control + T
MakeOverlayPatch	Y
ClearPatchOverlays	Control + Y
SurfaceInspector	S
PatchInspector	Shift + S
ToggleShowPatches	Shift + Control + P
ToggleShowPatches	Control + P
RedisperseRows	Control + E
RedisperseCols	Shift + Control + E
InvertCurveTextureX	Shift + Control + I
InvertCurveTextureY	Shift + I
InvertCurve	Control + I
IncPatchColumn	Shift + Control + PLUS
IncPatchRow	Control + PLUS
DecPatchColumn	Shift + Control + SUBTRACT
DecPatchRow	Control + SUBTRACT
Patch TAB	TAB
Patch TAB	Shift + TAB
SelectNudgeDown	Alt + DOWN
EntityColor	K
CameraForward	UP
CameraBack	DOWN
CameraLeft	LEFT
CameraRight	RIGHT
CameraUp	D
CameraDown	C
CameraAngleUp	A
CameraAngleDown	Z
CameraStrafeRight	PERIOD
CameraStrafeLeft	COMMA
ToggleGrid	0
SetGrid1	1
SetGrid2	2
SetGrid4	3
SetGrid8	4
SetGrid16	5

SetGrid32	6
SetGrid64	7
DragEdges	E
DragVertices	V
ViewEntityInfo	N
ViewConsole	O
CloneSelection	SPACE
DeleteSelection	BACKSPACE
UnSelectSelection	ESCAPE
CenterView	END
ZoomOut	INSERT
ZoomIn	DELETE
UpFloor	PAGEUP
DownFloor	PAGEDOWN
ToggleClipper	X
ToggleCrosshairs	Shift + X
TogTexLock	Shift + T
TogTexRotLock	Shift + R
ToggleRealtime	Control + R
EntityList	L
Preferences	P
ToggleCamera	Shift + Control + C
ToggleConsole	O
ToggleView	Shift + Control + V
ToggleZ	Shift + Control + Z
ConnectSelection	Control + K
Brush3Sided	Control + 3
Brush4Sided	Control + 4
Brush5Sided	Control + 5
Brush6Sided	Control + 6
Brush7Sided	Control + 7
Brush8Sided	Control + 8
Brush9Sided	Control + 9
ShowDetail	Control + D
MakeDetail	Shift + Control + M
MakeDetail	Control + M
MapInfo	M
NextLeakSpot	Shift + Control + K
PrevLeakSpot	Shift + Control + L
FileOpen	Control + O
FileSave	Control + S
Exit	Control + X
NextView	Control + TAB
ClipSelected	RETURN
SplitSelected	Shift + RETURN
FlipClip	Control + RETURN
MouseRotate	R
Copy	Control + C
Paste	Control + V
Undo	Control + Z
ZZoomOut	Control + INSERT
ZZoomIn	Control + DELETE

TexDecrement	Shift + SUBTRACT
TexIncrement	Shift + PLUS
TextureFit	Shift + 5
TexRotateClock	Shift + PAGEDOWN
TexRotateCounter	Shift + PAGEUP
TexScaleUp	Control + UP
TexScaleDown	Control + DOWN
TexShiftLeft	Shift + LEFT
TexShiftRight	Shift + RIGHT
TexShiftUp	Shift + UP
TexShiftDown	Shift + DOWN
GridDown	[
GridUp	]
TexScaleLeft	Control + LEFT
TexScaleRight	Control + RIGHT
CubicClipZoomOut	Control + [
CubicClipZoomIn	Control +]
ToggleCubicClip	Control + \
MoveSelectionDOWN	SUBTRACT
MoveSelectionUP	PLUS
DumpSelectedBrush	Shift + D
ToggleSizePaint	Q
SelectNudgeLeft	Alt + LEFT
SelectNudgeRight	Alt + RIGHT
SelectNudgeUp	Alt + UP
CycleCapTexturePatch	Shift + Control + N
NaturalizePatch	Control + N
SnapPatchToGrid	Control + G
ShowAllTextures	Control + A
SelectAllOfType	Shift + A
CapCurrentCurve	Shift + C

Appendix G: Shortcut Keys and Mouse Functions

By Eutectic

Preface

This section is included here with the permission of *Eutectic*, a "fan" involved in Quake Engine map making. It contains instructions for working with both *Quake 2* and *Quake III Arena* game engines. Should you choose to print this portion of the manual, consider using a color printer if one is available. Many of the instructions are color-coded and maintaining those codes may help you in the future.

1. Introduction

This is a list of all the command shortcut keys and key-mouse functions in QeRadiant and Q3Radiant. Please note that there are some commands that work in QeRadiant, but not in Q3Radiant and vice versa. This is mainly because those are actually two different map editors for two very different game engines (*Quake II* and *Quake III Arena*) although they share a common interface. Unless otherwise specified, the commands in this list work for both editors. Also, note that there are some features that work when selected from the menus but for which the shortcut key doesn't. Whenever this is the case, this is clearly indicated with a color-coded table cell.

2. Shortcut key list

The commands are sorted by category and color coding was implemented in the table boxes.

- **Red** background:

  This denotes commands that exist in the Help command list but do not work. In some cases, the shortcut key conflicts with another shortcut key.

- **Green** background:

  This denotes commands that do work in the menu but for which the shortcut key doesn't work.

- **Purple** background:

  This denotes commands which do work but are either redundant and/or conflict with a Q3Radiant command or each other.

- **Teal** background:

  This denotes commands & shortcut keys that apply only to Q3Radiant.

Action	Description	Shortcut Key
2D view and Z view navigation & control keys		
Toggle View	Only used in free window mode. Toggles the 2D view on/off.	CTRL+SHIFT+V
Next View	Cycles the 2D view through all 3 views (top, front, side). Not used in 4 view mode.	CTRL+TAB
Zoom In	Zooms 2D view in.	DELETE
Zoom Out	Zooms 2D view out.	INSERT
Center On Camera	Centers the 2D view on the camera's current location.	G
Toggle Z	Only used in free window mode. Toggles the Z view on/off.	CTRL+SHIFT+Z
Z Zoom In	Zooms Z checker window in.	CTRL+DELETE
Z Zoom Out	Zooms Z checker window out.	CTRL+INSERT
3D view navigation & control keys		
Camera Back	Makes the POV in the 3D view move backwards.	DOWN ARROW
Camera Forward	Makes the POV in the 3D view move forward.	UP ARROW
Camera Left	Makes the POV in the 3D view look left.	LEFT ARROW
Camera Right	Makes the POV in the 3D view look right.	RIGHT ARROW
Camera Strafe Left	Makes the POV in the 3D view move left.	COMMA (,)
Camera Strafe Right	Makes the POV in the 3D view move right.	PERIOD (.)
Camera Down	Makes the POV in the 3D view move down.	C
Camera Up	Makes the POV in the 3D view move up.	D
Camera Angle Down	Makes the POV in the 3D view look down.	Z
Camera Angle Up	Makes the POV in the 3D view look up.	A
Center View	Centers the POV in the 3D view.	END
Down Floor	Moves the POV in the 3D view down by one floor (strange to use).	PAGE DOWN
Up Floor	Moves the POV in the 3D view up by one floor (strange to use).	PAGE UP
Toggle Camera	Only used in free window mode. Toggles the 3D view on/off.	CTRL+SHIFT+C
Toggle Cubic Clip	Toggles 3D view clipping on/off (shortcut key doesn't work).	CTRL+\
Cubic Clip Zoom In	Makes the cubic clipping plane come in closer. Best used for speed optimizations.	CTRL+]
Cubic Clip Zoom Out	Makes the cubic clipping plane move further out.	CTRL+ [
Grid control keys		
Toggle Grid	Turns grid view on/off.	0
Set Grid 1	Sets the grid to 1 unit.	1
Set Grid 2	Sets the grid to 2 units.	2
Set Grid 4	Sets the grid to 4 units.	3

Set Grid 8	Sets the grid to 8 units.	4
Set Grid 16	Sets the grid to 16 units.	5
Set Grid 32	Sets the grid to 32 units.	6
Set Grid 64	Sets the grid to 64 units.	7
Grid Down	Decreases the size of the grid.	[
Grid Up	Increases the size of the grid.	]
Brush & entity creation and manipulation keys		
Brush (3 sided)	Creates a 3 sided brush.	CTRL+3
Brush (4 sided)	Creates a 4 sided brush.	CTRL+4
Brush (5 sided)	Creates a 5 sided brush.	CTRL+5
Brush (6 sided)	Creates a 6 sided brush.	CTRL+6
Brush (7 sided)	Creates a 7 sided brush	CTRL+7
Brush (8 sided)	Creates a 8 sided brush.	CTRL+8
Brush (9 sided)	Creates a 9 sided brush.	CTRL+9
Unselect Selection	Deselects all currently selected objects.	ESC
Delete Selection	Deletes all currently selected objects.	BACKSPACE
Clone Selection	Creates a duplicate of the currently selected objects.	SPACEBAR
Drag Edges Mode	Toggles edge manipulation mode on/off. Edges are represented by blue dots on the brush.	E
Drag Vertex Mode	Toggles vertex manipulation mode on/off. Vertices are represented by green dots on the brush.	V
Brush Clip mode	Toggles brush clipping mode on/off.	X
Flip Clip	Switches which part of the brush is going to be clipped away on the set clip plane points while in clipping mode.	CTRL+SHIFT+ENTER
Clip Selected	Clips the selected brush/brushs on the set clip plane points while in clipping mode.	ENTER
Split Selected	Splits the selected brush/brushs on the set clip plane points while in clipping mode.	SHIFT+ENTER
Move Selection Down	Moves the selected object down in Z axis by units equal to the grid size (independent of current 2D view).	KEYPAD MINUS
Move Selection Up	Moves the selected object up in Z axis by units equal to the grid size (independent of current 2D view).	KEYPAD PLUS
Select Nudge Down	Moves the selected object down in current 2D view by units equal to the grid size.	ALT+DOWN ARROW
Select Nudge Up	Moves the selected object up in current 2D view by units equal to the grid size.	ALT+UP ARROW
Select Nudge Left	Moves the selected object left in current 2D view by units equal to the grid size.	ALT+LEFT ARROW
Select Nudge Right	Moves the selected object right in current 2D view by units equal to the grid size.	ALT+RIGHT ARROW
Snap Selection To Grid	Snaps the vertices of the currently selected brush or patch mesh to the grid.	CTRL+G
Mouse Rotate	Turns on Free Rotation mode for currently	R

	selected objects (feature only work in Q3Radiant and conflicts with the **Toggle Realtime** shorcut key which does nothing).	
Make Detail	Turns selected brush into a detail brush (In Q3Radiant, this only marks the brush as “detail” in regard to the filter settings but doesn't **really** make it a detail brush.).	CTRL+M
Dump Selected Brush	Feature doesn't work.	SHIFT+D
View Entity Info	Brings up the entity dialogue window.	N
Select Whole Entities	**QeRadiant only**: Toggles feature on/off. When feature is on, selecting any single brush of a multiple brush entity automatically selects all the brushes that belong to that entity (This command does a **Redisperse Rows** in Q3Radiant, see the bottom section at the end of this list).	CTRL+E
Cycle Group Selection	Cycle selects all the individual brushes of currently selected solid entity (**Select Whole Entities** must **not** be on in **QeRadiant**).	TAB
Connect Selection	Connect entities target to targetname.	CTRL+K
Entity Color	Use this to set the "_color" key of a entity by bringing up the standard Windows RGB color selector. Used for choosing the color of lights for example.	K
Drop Path Corner	Feature doesn't work (This command does a **Toggle Show Patches** in Q3Radiant, see the bottom section at the end of this list)	CTRL+P
Texture manipulation keys		
View Textures	Only used in 4 view and free window modes. Brings up the texture selection window (toggle in 4 view mode).	T
Surface Inspector	Brings up the surface properties dialogue (only used to align textures in Q3Radiant). The surf flags have no effect on Q3A textures.	S
Texture Shift Down	Moves texture on currently selected brush face(s) downwards. Also works for patches but might sometimes give unexpected results.	SHIFT+DOWN ARROW
Texture Shift Up	Moves texture on currently selected brush face(s) upwards. Also works for patches but might sometimes give unexpected results.	SHIFT+UP ARROW
Texture Shift Left	Moves texture on currently selected brush face(s) to the left. Also works for patches but might sometimes give unexpected results.	SHIFT+LEFT ARROW
Texture Shift Right	Moves texture on currently selected brush face(s) to the right. Also works for patches but might sometimes give unexpected results.	SHIFT+RIGHT ARROW
Texture Rotate Clockwise	Rotates texture clockwise on currently selected brush face(s). Also works for patches but might sometimes give unexpected results.	SHIFT+PAGE DOWN
Texture Rotate Counter-	Rotates texture counter-clockwise on currently	SHIFT+PAGE UP

Clockwise	selected brush face(s). Also works for patches but might sometimes give unexpected results.	
Texture Scale Down	Decreases vertical scale of texture on currently selected brush face(s). Also works for patches but might sometimes give unexpected results.	CTRL+DOWN ARROW
Texture Scale Up	Increases vertical scale of texture on currently selected brush face(s). Also works for patches but might sometimes give unexpected results.	CTRL+UP ARROW
Texture Scale Left	Decreases horizontal scale of texture on currently selected brush face(s). Also works for patches but might sometimes give unexpected results.	CTRL+LEFT ARROW
Texture Scale Right	Increases horizontal scale of texture on currently selected brushface(s). Also works for patches but might sometimes give unexpected results.	CTRL+RIGHT ARROW
Texture Fit	Automatically fits the texture to the size of the currently selected face or mesh by scaling it vertically and horizontally. (Does **not** work in Q3Radiant.)	SHIFT+5
Texture Fit To Face	Same as Texture Fit (This command does a **Unfreeze Patch Vertices** in Q3Radiant, see the **Orange** section at the end of this list).	CTRL+F
Toggle Texture Lock	Toggles brush move texture alignment locking on/off (shortcut key only works in Q3Radiant).	SHIFT+T
Toggle Texture Rotate Lock	Toggles brush rotation texture alignment locking on/off (shortcut key only works in Q3Radiant).	SHIFT+R
Texture Decrement	If Snap to T is not set in Preferences, this decrements the number of pixels that the texture will shift.	SHIFT+KEYPAD MINUS
Texture Increment	If Snap to T is not set in Preferences, this decrements the number of pixels that the texture will shift.	SHIFT+KEYPAD PLUS
Dialogues and special features keys		
View Console	Only used in 4 view and free window modes. Brings up the console (toggle in 4 view mode).	O
Toggle Console	Feature doesn't work and is redundant with **View Console**. This should be removed from the Help Command list.	CTRL+SHIFT+O
Preferences	Brings up the user preferences dialogue.	P
Entity List	Brings up the entity list "tree view" window (shortcut key doesn't work).	L
Map Info	Brings up the map info status window (shortcut key doesn't work).	M
Filter Settings	Brings up the filters dialogue window (this does **not** work in Q3Radiant since the key is assigned to the **Freeze Patch Vertices** command).	F
Find Coordinates	Feature doesn't work and shortcut key conflicts with the **Camera Down** key. This was removed from Q3Radiant's Help Command list.	C

Show Detail	Toggles display of detail brushes on/off.	CTRL+D
Animate Selected Entities	Toggles animation of selected mover entities (doors, buttons, etc.) on/off. Does **not** work in Q3Radiant.	~~CTRL+A~~
Previous Leak Spot	Takes POV in the 3D view to the previous leak spot (pointfile must be loaded).	CTRL+SHIFT+L
Next Leak Spot	Takes POV in the 3D view to the next leak spot (pointfile must be loaded). Shortcut key doesn't work.	~~CTRL+SHIFT+K~~
Toggle Realtime	Feature doesn't work and conflicts with **Mouse Rotate** which also doesn't work in QeRadiant.	~~R~~
Misc utility keys		
File Open	Opens a file.	CTRL+O
File Save	Saves a file.	CTRL+S
Exit	Closes the editor.	CTRL+X
Copy	Copies whatever is currently selected.	CTRL+C
Paste	Pastes what ever is in the clip board. Only works with text and Radiant's stuff.	CTRL+V
Undo	Undo. Doesn't work in all cases.	CTRL+Z
Q3Radiant miscellaneous features keys		
Toggle Size Paint	Feature doesn't work.	Q
Mouse Rotate	Turns on Free Rotation mode for currently selected objects (conflicts with the **Toggle Realtime** shorcut key which does nothing).	R
Select Type All	Selects all "identical" based on type of "currently selected". If type is a surface, all solids with the same texture are selected. If type is an entity, all the other entities of its classname are selected.	SHIFT+A
Toggle Crosshairs	Toggles between the regular mouse pointer and a large crosshair style pointer in the 2D view.	CTRL+SHIFT+X
Fit Brush	Feature doesn't work.	CTRL+B
Fit Face	Feature doesn't work.	SHIFT+B
Hide Selected	Hides all currently selected objects from the 2D/3D views.	H
Show Hidden	Un-hides all objects currently hidden from the 2D/3D views.	SHIFT+H
Show All Textures	Shows all the textures currently loaded in Q3radiant's texture window. Use this to un-set **Show In Use** in the textures menu.	CTRL+A
Q3Radiant curve patch manipulation keys		
Bend Mode	Toggles bend mode on/off. This is used to bend patch meshes. Follow the instructions that come up in the dialogue box when you use this. Best used for making arches and such.	B

Cap Current Curve	Automatically creates cap patches for the currently selected patch if it's a cylinder. For bevels and endcaps, it will bring up the cap dialogue instead. The patch and its caps will then automatically be grouped in a func_group.	SHIFT+C
Cycle Cap Texture Patch	This cycles the cap texturing type on the currently selected patch.	CTRL+SHIFT+N
Cycle Cap Texture Axis	This cycles the cap texturing axis on the currently selected patch.	CTRL+SHIFT+P
Naturalize Patch	Makes the texture natural on the patch mesh (sometimes the textures are stretched to fit the patch, this will make the texture fit normal instead of streching it).	CTRL+N
Decrease Patch Column	Removes first 2 columns from currently selected patch (assuming patch currently has more than 3 columns).	CTRL+SHIFT+KEYPAD MINUS
Decrease Patch Row	Removes first 2 rows from currently selected patch (assuming patch currently has more than 3 rows).	CTRL+KEYPAD MINUS
Increase Patch Column	Adds 2 columns to currently selected patch	CTRL+SHIFT+KEYPAD PLUS
Increase Patch Row	Adds 2 rows to currently selected patch.	CTRL+KEYPAD PLUS
Redisperse Columns	Evenly re-disperses all the columns of the currently selected patch. Useful after adding new columns	CTRL+SHIFT+E
Redisperse Rows	Evenly re-disperses all the rows of the currently selected patch. Useful after adding new rows (this command does a **Select Whole Entities** in QeRadiant).	CTRL+E
Freeze Patch Vertices	Can't determine what this does. Shorcut key conflicts with the command **Filter Settings** in QeRadiant.	F
Unfreeze Patch Vertices	Can't determine what this does. Shorcut key conflicts with the command **Texture Fit To Face** in QeRadiant.	CTRL+F
Unfreeze All Patch Vertices	Can't determine what this does.	CTRL+SHIFT+F
Invert Curve	This inverts the patch mesh's matrix. In the world, it changes side of the patch the texture to which texture is applied and against which clipping occurs.	CTRL+I
Invert Curve Texture X	Inverts the X value of the texture on the matrix. Use this to mirror the texture vertically on a patch.	SHIFT+I
Invert Curve Texture Y	Inverts the Y value of the texture on the matrix. Use this to mirror the texture horizontally on a patch.	CTRL+SHIFT+I
Make Overlay Patch	Turns on display of the currently selected patches control points. The display of the patches control points will remain on until turned off by **Clear Patch Overlays**.	Y
Clear Patch Overlays	Turns off display of the currently displayed	~~CTRL+Y~~

	patches control points previously turned on by **Make Overlay Patch**.	(not working)
Patch Inspector	Brings up the patch inspector dialogue. (This function has been mostly supersceded by controls in Surface Inspector)	SHIFT+S
Thicken Patch	Creates a copy of current patch and spaces it by X amount of units (as per value entered in dialogue box) then caps off the mesh.	CTRL+T
Patch Tab	Cycle selects all the individual brushes or patches of currently selected solid entity (does the same thing as the **TAB** key).	SHIFT+TAB
Toggle Show Patches	Toggles display of patch meshes from 2D/3D views on/off (shortcut key conflicts with inoperational command **Drop Path Corner** in QeRadiant).	CTRL+P

Action	Description	Mouse Function
2D view mouse functions		
Scroll View	Scroll or pan the 2D view. Also works in the Z view.	RIGHTBUT+DRAG
Move Z Checker	Moves the location of the Z Checker box icon in the 2D view to where you click. Dragging the mouse makes it follow around.	SHIFT+MIDBUT SHIFT+MIDBUT+DRAG
Move Camera	Moves the location of the Camera eye icon in the 2D view to where you click. Dragging the mouse makes it follow around. Also works in the Z view.	CTRL+MIDBUT CTRL+MIDBUT+DRAG
Create/Modify Brush	This will create a new brush if no object is currently selected. If one or more brushes are selected, this will: 1. Resize the brush when click-dragging outside. 2. Move the brush when click-dragging inside. If one or more point entities are currently selected, this will just move them. Also works in the Z view but for brushes, only move and vertical resize are possible. In the 3D view, only move and resize work.	LEFTBUT+DRAG
Select Object	Selects/Deselects brush or entity under cursor. Entities have priority over brushes. This also works in the Z and 3D views.	SHIFT+LEFTBUT
Cycle Select Object	Cycle selects all brushes or entities under cursor in order of depth. This only works in the 2D view (supposed to work in all views in Q3Radiant).	SHIFT+ALT+LEFTBUT
Drag Brush Face	Drags the face of the currently selected brush. The face nearest to the cursor is dragged. Brushes can also be sheared by using this. This also works in the 3D view.	CTRL+LEFTBUT+DRAG
Entity Menu	Brings up the entity pop-up menu. You can then select the entity to create. For solid entities (doors, buttons, triggers, etc.), at least one brush must be selected beforehand.	RIGHTBUT
3D view mouse navigation functions		
Drive Camera	Makes the POV in the 3D view move forward/backwards and turn left/right when	RIGHTBUT+DRAG

	mouse is dragged.	
Strafe Camera	Makes the POV in the 3D view strafe up/down and sideways when mouse is dragged.	CTRL+RIGHTBUT+DRAG
3D view mouse texturing functions		
Select Brush Face	Selects brush face under cursor. Only one face at a time can be selected. Will automatically deselect any currently selected objects. Also grabs the face's current texture + alignment + flags into Surf Inspector.	CTRL+SHIFT+LEFTBUT
Grab Texture	Grabs the texture + alignment + flags of the brush face under the cursor into Surf Inspector. Any currently selected face or brushes will automatically be assigned the grabbed values.	MIDBUT
Apply Texture To Brush	Applies the current texture + alignment + flags in Surf Inspector to the whole brush under the cursor.	CTRL+MIDBUT
Apply Texture To Face	Applies the current texture + alignment + flags in Surf Inspector to the single brush face under the cursor.	CTRL+SHIFT+MIDBUT
Apply Texture Only To Face	Applies the current texture in Surf Inspector to the single brush face under the cursor but face retains its current alignment + flags.	SHIFT+MIDBUT
Shift Texture	Shifts the texture's vertical and horizontal alignment on the currently selected face or brushes. Does **not** work in Q3Radiant.	ALT+RIGHTBUT+DRAG
Scale Texture	Stretches up/down the texture's vertical and horizontal scale on the currently selected face or brushes. Does **not** work in Q3Radiant.	SHIFT+ALT+RIGHTBUT +DRAG
Rotate Texture	Rotates the texture on the currently selected face or brushes. Does **not** work in Q3Radiant.	CTRL+ALT+RIGHTBUT +DRAG
Texture window mouse functions		
	Selects the texture under the cursor and pastes the texture + default flags into Surf Inspector. All currently selected brushes or face will automatically be assigned the selected texture.	LEFTBUT
Select Texture + Surf Inspector	Same as above but also automatically brings up the Surf Inspector window. Does **not** work in Q3Radiant.	CTRL+LEFTBUT
Scroll Texture Window	Scrolls up/down through the texture window (same as scrollbar or mouse wheel).	RIGHTBUT+DRAG
Scroll Texture Window Fast	Same as above but will scroll much faster. Useful for browsing through very large	SHIFT+RIGHTBUT+DRAG

	texture folders.	
Entity dialogue mouse functions		
Create Entity	Double-clicking on an entity name in the dialogue's list will create an entity at the location of the currently selected brush (mandatory). 1. If a point entity is chosen from the list, it will automatically replace the selected brush(es). 2. If a solid entity is chosen from the list, the selected brush(es) will belong to the entity. 3. If an entity or nothing is selected beforehand, you will get an error dialogue: "Failed to create entity".	DOUBLE-LEFTBUT
Q3Radiant mouse functions		
Apply Texture Angled	Applies the current texture properly to angled faces under the cursor. Feature doesn't work.	CTRL+LEFTBUT
Edit Shader	Shader window function. Shift-click on a shader opens the proper shader file in EditPad and automatically places the cursor at the beginning of the shader.	SHIFT+LEFTBUT