Brush Manipulation :: [Jv\_map](http://www.mohaaaa.co.uk/phpBB2/profile.php?mode=viewprofile&u=146)  
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This tutorial describes three ways of manipulating a brush, viz working with the clipper tool, edge editing and vertex editing. These are the three major alternatives you can choose from when you want to make non-axial brushes, such as diagonal roofs, brush terrain and rock formations. It's really not a tutorial on how to get the best looking end result, it merely describes how you can work with Radiant in a clean and neat way. The CSG features (subtract, merge and hollow) are not discussed as you should preferrably never use them anyway. The subtract feature tends to create a lot of small, unnecessary brushes; the merge feature usually doesn't work, freezes Radiant or creates a corrupted brush and the hollow function creates intersecting brushes. Now the intention of this tutorial was to show neat ways of editing the shapes of brushes, thus it doesn't cover these CSG features.

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The Clipper Tool  
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This is by far the best tool to use when editing brushes. See it as a knife that can slice through brushes. To activate the clipper, select a brush and press 'x'. Now you can define two or three clip points along which you want to cut your brush. Left click in the XY / YZ / XZ view to place a clip point. Once placed, you can drag it anywhere you like. As soon as you have defined two points, you can split the brush. You may want to define a third point if you want a face that's rotated on two different planes. When you're done, you can use the tilde key (~) to select which part of the brush you want to maintain, but you may also maintain both of them. Press ENTER to remove the part of the brush that's not highlighted or SHIFT + ENTER to maintain both parts. When you use SHIFT + ENTER, you'll get two brushes where you previously had one.

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| http://www.mohaaaa.co.uk/mohaa/tutorials/brush_manipulation/image1.jpg |

The clipper has the vast advantage of being very clean and functional. You can create virtually any shape using this tool and it's hardly possible to create invalid brushes. A disadvantage is that you cannot always see the new texture applied to the two faces that form a split, so you'll sometimes have to caulk and retexture a brush you clipped.

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Edge Editing  
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Edge editing is a way to modify the edges of a brush. An edge consists of two vertices. You can go into edge editing mode by pressing 'e' after you've selected a brush. Then drag the blue dots around and see what happens. It's just a matter of practice to get used to this way of editing brushes.

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| http://www.mohaaaa.co.uk/mohaa/tutorials/brush_manipulation/image2.jpg |

It's very important to work carefully when editing edges. A lot of duplicate planes and invalid brushes are created because of careless edge editing. Never drag two edges over each other. Only use edge editing to make small modifications to the shape of a brush. When possible, use the clipper instead.

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Vertex Editing  
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Vertex editing is the most difficult way of editing brushes. It allows you to modify the location of individual vertices, the actual corners of a brush. You'll need vertex editing when you want to create brush based terrain such as rock formations. Select a brush and press 'v' to enter vertex editing mode. I personally always use the 3D view when vertex editing. Select and drag one of the green dots to modify your brush.

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| http://www.mohaaaa.co.uk/mohaa/tutorials/brush_manipulation/image3.jpg |

When editing the vertices, it's often a good idea to use any of the lock X / Y / Z functions. You can enable those by clicking the X, Y or Z enclosed by a blue box on the top toolbar. This allows you to modify the direction of movement. For example, when you select lock X and lock Y, you're only allowed to change the height of a vertex. When you plan to vertex edit a certain brush, it's often a good idea to make it triangular first with the clipper. That way, you prevent MOHRadiant from making those nasty face splits.

Vertex editing is even more challenging than edge editing. It requires some experience and attention. Always be very careful when working with vertices. It's a good idea to practice a bit with it though.

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