Arches & Curves :: [Dr ABAP](mailto:dr_abap@planetmedalofhonor.com)  
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*These tutorials assume you are already familiar with SDK (MOHRadient) or similar and know how to create a basic room with a light (Basic room tutorial & Basic lights tutorial). But if not don’t worry, this should help build your knowledge. It’s also assumed that you have read the documentation that was released with the Editor.*

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Foreword   
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*I cannot take full credit for this tutorial I’ve adapted this from my GTK days, but cannot think who the original author was…. Sorry to that genius! The design is basically the same, however, it took a bit of working out in MOHRad, like everything else.*

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Arches  
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For this tutorial I have created a room (hollow box) with the dimensions of (approx: 512 x 512 x 512), it’s up to you! I’ve also added a light and player start point.

There’s a couple of ways to create an arch (using the Bend Brush method), we are going to explore some options in the CURVE. Now you can create a great looking arch with Bevels and End Caps but this method has some good advantages over them.

OK, we are going to make our arch! Like the one below.

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

So starting with your room, with the player start and light. We are about to make a column to stand the arch on. Make a brush about 2 x 4 and about 64 high, (see below)

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| |  | | --- | | http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image2.jpg | |  | |  | | --- | | http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image3.jpg | |

TIP : When creating brushes always apply the CAULK Texture 1st, this tells the compiler to omit drawing the face where the CAULK is assigned. So any face you don’t get to see in the world view (brushes that touch and are hidden from view) will not get drawn. Hence speeding your map up!! You then apply the required textures to the faces that are seen.

Right, go to XZ Front view as per picture on right (above), where going to do some Vertex editing! Press the ‘V’ key and LEFT CLICK and hold on the bottom left green box, now drag it (snap) down two squares, you’ll need to do this twice once for each corner. (See below)

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| |  | | --- | | http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image4.jpg | |  | |  | | --- | | http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image5.jpg | |

OK, press ‘V’ again to turn off Vertex Snap and then ESC to deselect the brush. We are now going to apply a texture to the front face, back and sides, we are going to leave the CAULK on the Top Face and the newly created 45 degree angle face (why we ain’t gonna see em once the brush is completed, so why draw them?). Load up some textures, any will do.

TIP : To select individual faces on a Brush use CTRL + SHIFT + LEFT CLICK

Once you have selected the faces apply your chosen texture.

OK, now for the arch. Create another brush to sit on top of the newly created brush about the same dimensions only a light taller, say about 128. Apply the CAULK texture (see below).

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image6.jpg |

TIP : Save your map before attempting bending or doing anything that might screw up your map. You can reload it if you make a mess of it… I know I was that person!!

OK, to bend the brush we need to apply a Patch Primitive, from the Curves menu select Primitives>Square Cylinder. In you 2D view you should see the following.

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image7.jpg |

Now you can Bend the Patch by using Vertex Snapping (Key ‘V’), but we aren’t going to do that. We’ll use Vertex snapping to finish off though…

Ok, to start (but not yet!) we are going to Bend the brush by using CTRL + B, this brings up a nice little interface with some on screen instructions. Pretty self-explanatory. Ensuring your in XZ View and that the brush is selected, Press CTRL + B. You should now see the following.

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image8.jpg |

The information window will be your guide, with a little help from me. Ok, you can see the Pink dots, if you press the TAB key you will see them move around the possible Bend Axis. We want them in there original orientation as seen in the image above, so press TAB until they are back where you started. Press ENTER.

Ok see the next image.

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image9.jpg |

Basically, you can change the rotation from the centre or the Left and right point. The one In BLUE is the point you’re going to Bend from. We are going to bend from the original point as above. So press ENTER.

This next image shows which side we are going to bend.

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image10.jpg |

We want to bend the top portion of the brush so we are going to press TAB, do so now.

The BLUE dots should be at the top now, see next image.

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image11.jpg |

Now before we go on, I should point out that you could add rows and columns to this Patch so you can be more adventurous with your arches, Bends etc…. Going to the Curves Menu and selecting Insert/Delete can achieve this. This is only a basic tutorial so I’m not going to mention them for now. You can experiment all you like once you are happy with the basics.

OK then, press ENTER and note the next Info window. I usually drag this out of the way whilst bending, so I suggest you do the same so as it’s out of the way.

Don’t press ESC to clear the window, you’ll have to go through the processes again!!!

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image12.jpg |

No hold your Left mouse button down (whilst in the 2D View), and move it so that the Patch Bends like below.

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image13.jpg |

OK, once you have got something looking like the above, press ENTER. Then press ‘V’. We are going to make it more authentic by using Vertex snapping. You should now see the following.

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image14.jpg |

This next bit can be tricky but once you get the idea you can play with getting things right. We are going to move the BLUE squares up from their current position using the same equal spacing between the dots. Lets go up by 3 squares, then move them back to the left by 1 square. (See below)

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image15.jpg |

OK, we’re almost there. Press ‘V’ to turn off Vertex Snapping. We need to apply a texture to the patch. Whilst the brush is selected move your mouse pointer into the 3D window and using your Middle mouse button click it on the brush you applied the texture too earlier. That’s the quick way to apply the same texture to a brush. The problem we have with Bending brushes is that, the texture doesn’t always align correctly so we need to do a bit of manipulation. Whilst you still have the brush selected bring up the Surface inspector by pressing the ‘S’ key as below.

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image16.jpg |

At the bottom of the Surface Inspector pop-up you will se the button called NATURAL, press it. Then click on Apply and OK.

Now I can’t remember from GTKRadiant but capping a Bend in MOHRad will cause a crash, but to be honest applying a patch will not matter to us, as the end faces will not be seen.

OK, we need to do the other side of the arch, to do this all we need to do is make a Duplicate of the 2 brushes we have created. To do this select both brushes by holding SHIFT + LEFT clicking on the brushes in the 3D view. Rotate them via the Z Axis and join them together as below.

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image17.jpg |

OK, use all views to ensure the brushes are all aligned correctly. We now need to put in the base for the window.

Create brush to span the gap and using Vertex Snapping ‘V’ fit the brush like so, use the CAULK texture.

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image18.jpg |

OK, Apply the same texture to the ONLY visible faces of the base brush. That’s it the arch is now complete and Bending should be that much easier!! But hold on, we need to do the surrounding wall!! Let’s do it!!

OK, I’ve filled in a few of the wall bits by simply applying, brushes (using CAULK and applying textures to VISIBLE faces only). Do not allow the thickness to be the same as the Arch itself for the sandy coloured wall, I only allow the trim to be the same thickness (the trim uses the same texture as the arched window). I just wanted to show you another trick and explain something about fitting brushes and clipping. (See below)

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image19.jpg |

OK, These brushes I’ve added shouldn’t pose too much trouble to you. The next bit is to add the brushes surrounding the arch. To do this we need to use the Clipper Tool .

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So for the clipped brushes! Create a brush like the one below remember to make the thickness (width) less than the arch but the same as the lower (sandy) wall, and make the brush 64 high (see below)

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image21.jpg |

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image22.jpg |

You will also notice that the brush overlaps into the arch, this is where the clipping comes into play. With the brush selected, press the ‘X’ key for clipping and chop the brush with by placing the points on the desired place on the brush. (See below)

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image23.jpg |

Notice that sometimes the wrong side of the brush is clipped!! To solve this use the TILDE key (this is actually the ‘@’ key on my keyboard) next to the ENTER Key. This flips the Clip. (see below for the result).

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image24.jpg |

OK, apply your desired texture to the front and back face. Ok, do the same to the top part of the wall using the same sort of method (see below).

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image25.jpg |

To finish of we need to select the two brushes we have just created, and make them duplicates by pressing SPACE, then flip them around their Z Axis(see below)

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You should then align them accordingly. The final product should something like this.

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| http://www.mohaaaa.co.uk/mohaa/tutorials/arches/image27.jpg |

Ok, brush overlapping. The general rule of thumb is you never over lap brushes. Brushes cannot coexist on the same plane, although in most cases the map will compile without a warning. When you see the two brushes merge into each other there will be a shimmering effect. However you can hide part of another brush inside another brush, like we did with the top part of the wall. But try to use CAULK on the hidden face wherever possible.

With time and patience you can create all sorts out of bending brushes. I hope this has helped you understand the principles and the basics

Need any help : Ask in the [Forum](http://www.mohaaaa.co.uk/mohaa/forum/index.php)