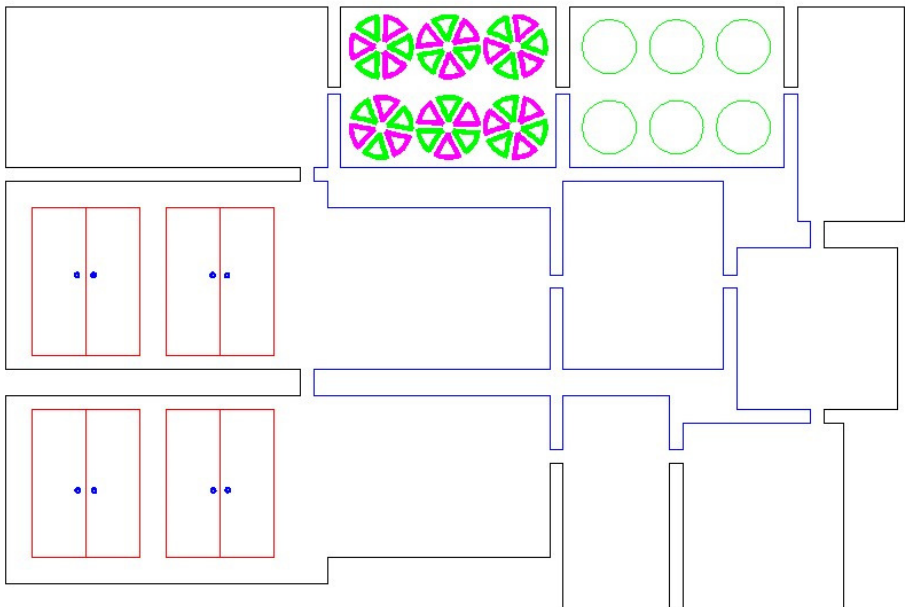


Lasercut Aircon Unit– a simple CAD example

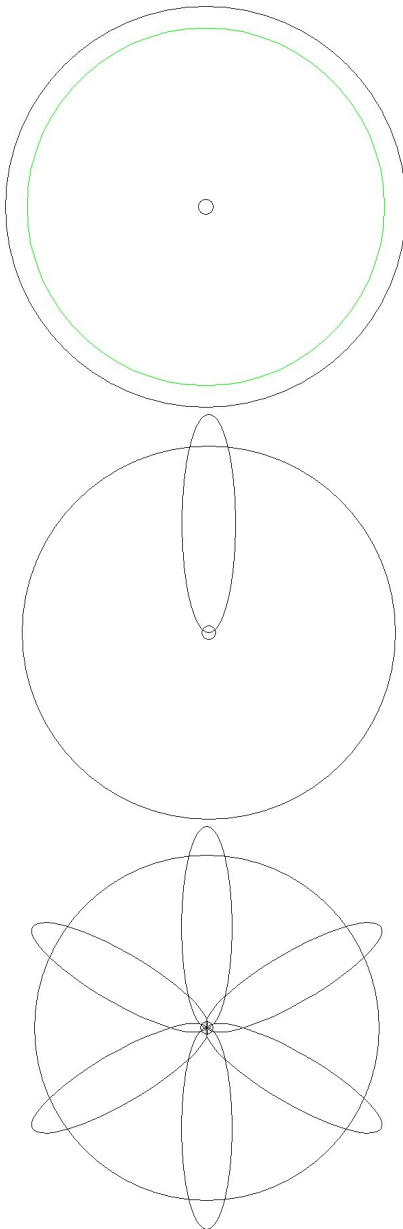
I have been busy with the laser again and have produced an aircon unit which will be installed on the roof of my N scale Department store. So if you re thinking of designing something to cut here are some tips and an example. The aircon unit is basically a box with doors and 6 fans. The fans are 2 layers: the top layer is simply 6 holes and the lower layer has the fan detail. There are a number of things to note:

- 1 All the parts are arranged close together for cutting, this model uses a 70 x 50mm piece of 0.5mm Romark. I do not draw the items like this but arrange them at the end.
- 2 All the parts have small tags <1mm to hold the parts together. This prevents small parts from dropping through the cutter bed and getting lost. It also prevents parts from moving during cutting. The more cuts you put into thin Rowmark the more it will try to curl so tabs are also needed to keep it flat.
- 3 Colours are used to control the order the laser cuts in, so in this example red (doors) is a half depth cut which is done first, then the full depth cuts in green, magenta and blue. Finally the outline of the parts is cut which is the black line. Each colour is a different layer in the drawing.
- 4 The fan blades have been drawn with thick lines. The laser does not cut thicker lines, it only has one width which is approximately 0.3mm. The thick lines allow me to see how the cut part will look and make sure I have a complete fan and not a pile of separate blades.



I use TurboCAD to produce the drawings. This is simply because I have used this program for many years and know how to operate it. Other CAD program can do the same thing.

This is how I drew the fans:

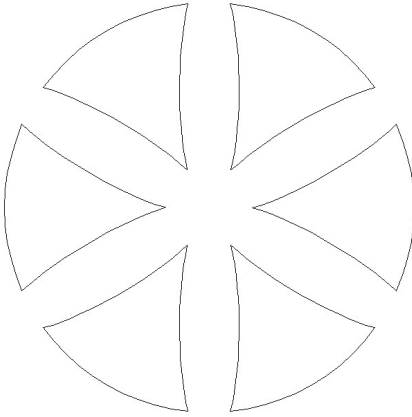


Start with the holes to get the positions of the fans, (green circle).

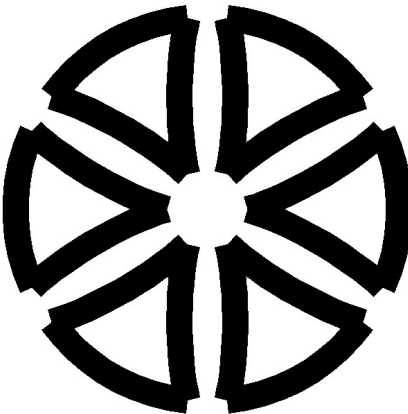
Mark the centre position with a small circle and then draw a larger circle which will be the outer edge of the fan. You could use construction lines instead of the small circle to mark the fan centres.

Remove the green circle, it was just a size guide and is no longer needed. Draw an ellipse to form the fan blade.

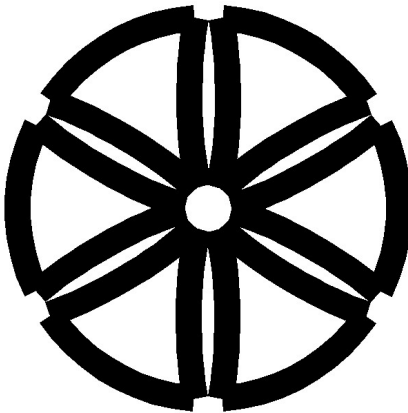
Use a array copy to produce 6 blades. This can be done by telling the software you want 6 blades or you want blades at 60 degree angles positioned around the centre point.



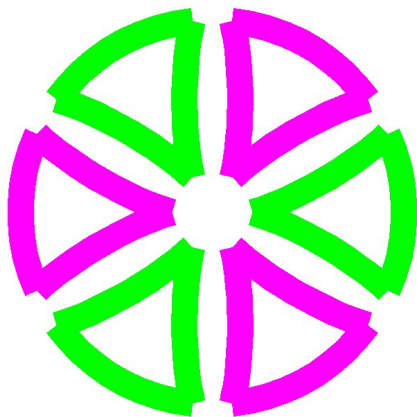
Cut away the unwanted parts to complete the fan.



Check the width of the blades by making the line 0.3mm wide. This shows the actual cut of the laser. Note: to get the finest laser line the laser cutter must be focused before you start cutting. If not, the laser will cut a wider line. The ellipse needs to be wider than you first think, in this case it is almost half the width when cut compared to the drawing.



In this example the ellipse was too narrow so when cut it all the fan blades would fall out so you just have a hole not a fan. It looked good when viewed with the thin lines you create the drawing with.



Finally the parts can be put into the correct drawing layers if you did not do that when drawing and given colours. With very fine parts it helps if you do not cut both sides of the part in the same pass of the laser. The laser puts heat into the plastic and this can cause some distortion of the part. Use 2 colours to control how the cuts are made. All the green parts will be cut first across the whole drawing, then all the magenta parts. This gives the area of the first cut time to cool. The same technique applies to cutting

windows. Now use copy & paste to produce as many fans as you need, in this case 6.



The finished aircon unit painted in a metallic silver with a wash of sepia. It will get a dusting of weathering powder to complete the dirty effect and a piece of black paper will go under the fans. There will be 3 of these on the roof with ducting from Unit Models and some plastic and brass pipework.



Here is the roof with the aircon units and ducting roughly in place showing how busy it all is. There are still more pipes to be attached.

Finally, make use of the drawing grid to get parts the right size and in the right place. I start with a 1mm grid to get the basic shapes done and then reduce the grid to 0.5mm and 0.25mm as I draw in the details. Keep changing the grid to suit the item being drawn.

Paul