

# MCnurbs Creator 1.0

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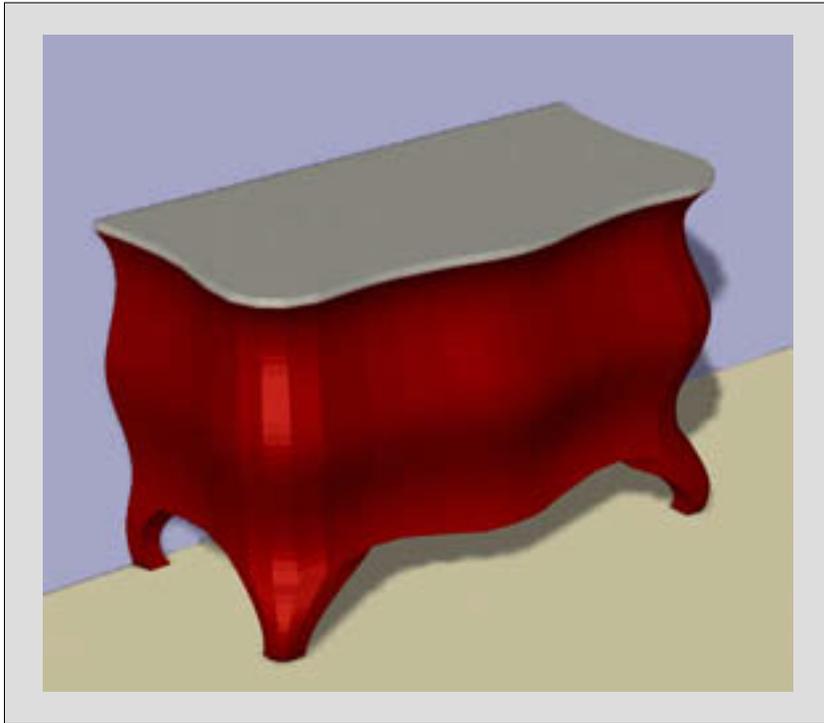
for VectorWorks 8 and MiniCad 7



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# Sample models

# Introduction



MCnurbs Creator is a set of MiniPascal based tools for Diehl Graphsofts MiniCad version 7, and VectorWorks 8. It adds the ability to quickly generate spline based super smooth looking 3D surface models in MiniCad, so called Nurb surfaces.

## **Uses for MCnurbs Creator.**

So, who needs MCnurbs Creator? Probably most MiniCad users creating 3D models more complex than cubes and cylinders. It can for example be used for creating smooth looking terrain models using a very limited number of control points (yes, it is compatible with the Terrain Modeller unit), curved (or double curvature) walls and roofs with variable cross sections, bridges, roads, furniture, tubes (with variable cross sections), mechanical components, industrial design, etc. MCnurbs Creator simply adds a surprising amount of 3D modelling power to MiniCad.

## **Hardware.**

MCnurbs Creator requires MiniCad version 7.0 or later. It requires some additional RAM compared to standard MiniCad set-up (+ 3-5 MB). A Power Mac or Pentium is highly recommended since the MCnurbs Creator commands rely heavily on processor speed, and 68nnn and 486 machines do not have a reasonable amount of power.

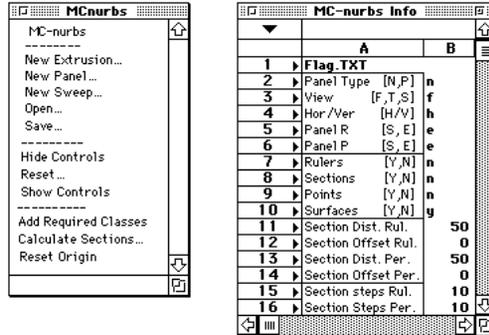
## **Price.**

The MCnurbs Creator toolkit costs US\$ 120. Contact Lundstrom Design for further information and ordering information. You can also visit the MiniCad / VectorWorks web site at ([www.algonet.se/~ludesign](http://www.algonet.se/~ludesign))

# Introduction 2

## Some basic concepts.

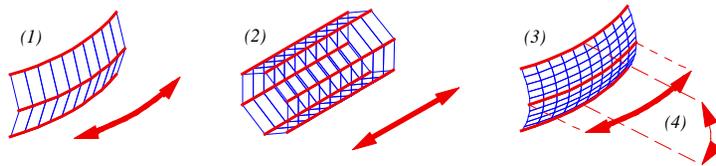
Since Nurbs surfaces are not a generic part of MiniCad we have had to use a number of work arounds to make it work. You will not always be able to use the standard tools and methods in MiniCad, such as for example the Object Info palette. Instead, we have created a worksheet called "MC-nurbs info" where the "Object Info" controls are located.



The tools are all located in a floating palette called "MCNurbs". MCNurbs elements are not generic drawing elements and are therefore not "live" objects in the same sense as a rectangle which can be resized at any time. In order to update a MCNurbs object, you have to double click on the MC-nurbs macro in the palette. This command automatically recalculates the model based on the locations of the ruler points and the settings in the worksheet.

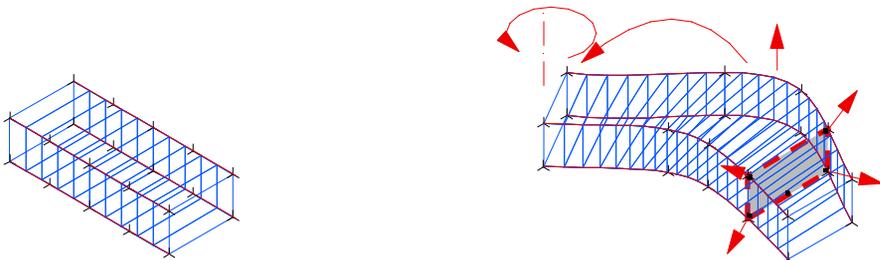
Another difference is that you can only have one "living" MCNurbs object in the drawing at the time (note that a MCNurbs object may consist of up to 32000 standard MiniCad elements). In order to be able to interact between different MCNurbs objects you have to store the components using the Save... and Open... commands in the palette. The components are stored on your hard disk as a small text file (usually about 17K).

Two basic object creation methods can be used. The first method resembles Extrude in MiniCad, and connects the 3D spline rulers by 3D polygons (1). It allows you to extrude closed cross sections shapes such as tubes (2). The second method is Nurb based (3), allowing you to create smooth 3D meshes, and setting the number of intermediate polygons in any way you like (within the given boundaries). This method has the same limitation as the Terrain Modeller in the sense that it can not create closed objects, or objects with overhangs (4). The panels can however be oriented in either the Front/Back, Top/Bottom, or Right/Left (Side) views.



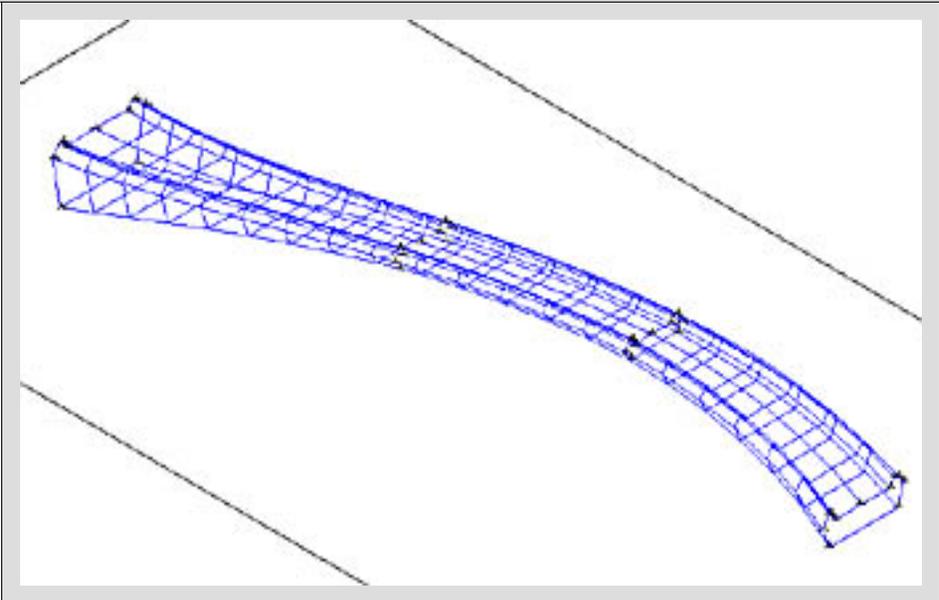
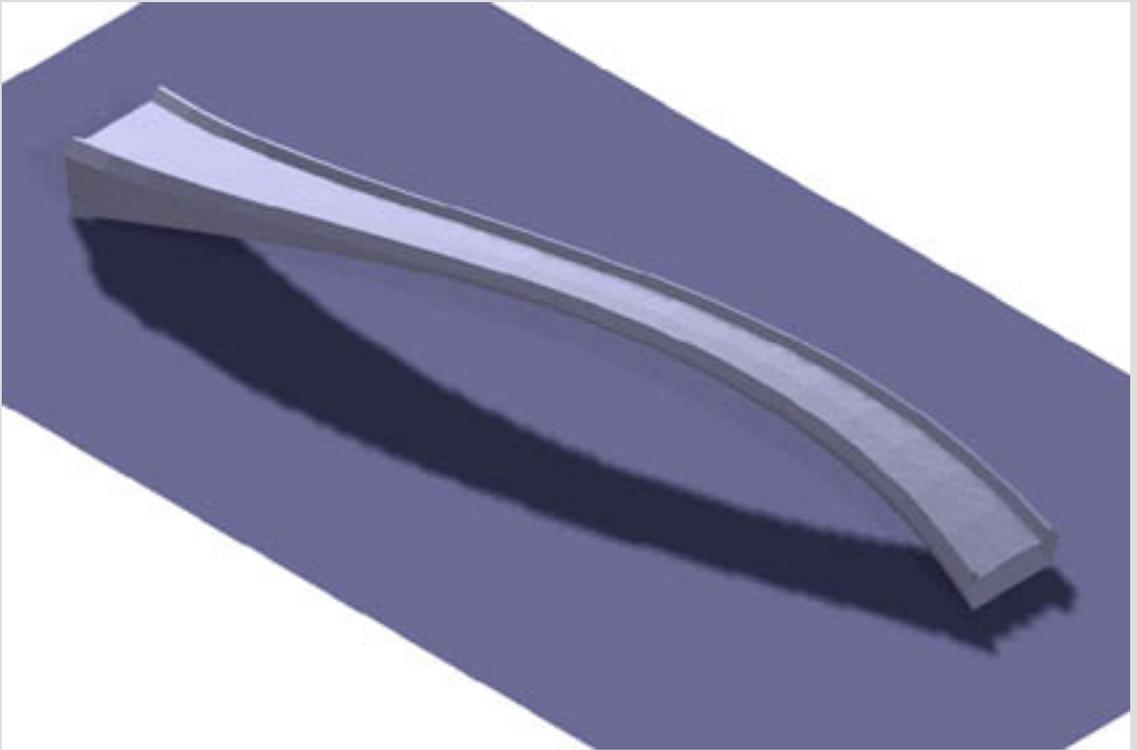
## Working with MCNurbs.

Models can be created by using one of the tools in the MCNurbs palette (New Extrusion, New Surface, or New Sweep), by importing previously stores surfaces, or by simply placing a number of 3D loci in special control ruler classes (up to 64 rulers and each ruler may have up to 256 loci). You then double-click on the MCNurbs macro to generate the panel. Move, rotate, resize, add or delete control points, and double click on MCNurbs to update. That's It!



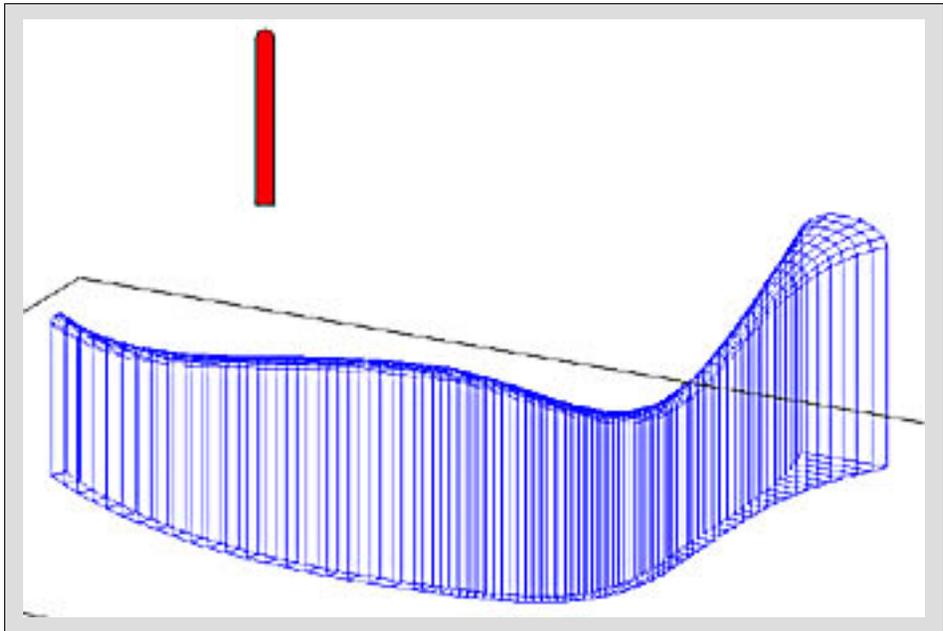
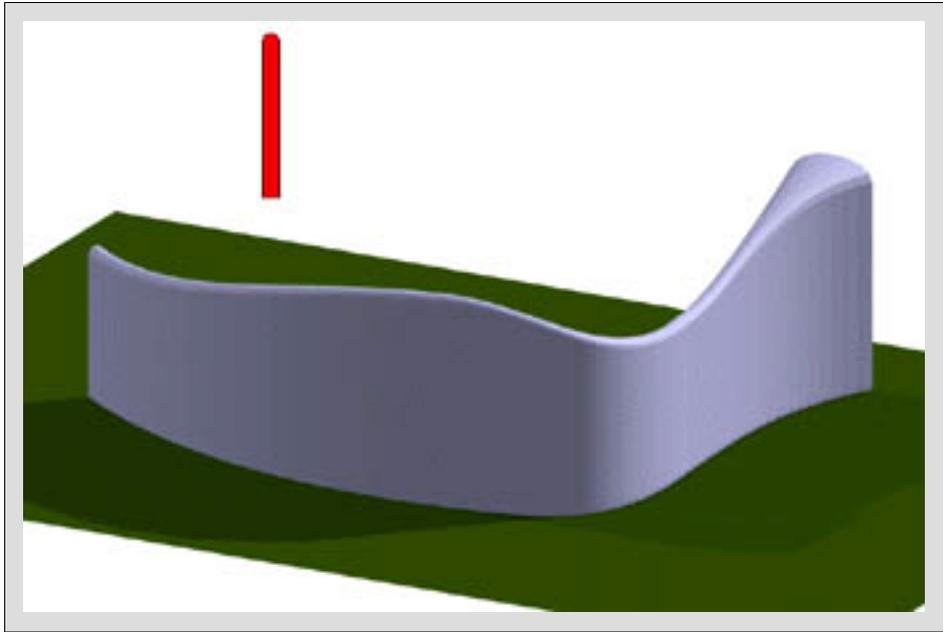
# Bridge

The bridge example below shows how a simple cross section is used to create a smooth transformation. The bridge shape is defined by four control stations all containing variations of the basic cross section. Note that it is individually curved in all three directions. The bridge is S-shaped seen from above and the cross section points are controlled individually. You simply move some points and double click on the MCnurbs macro to rebuild the model.



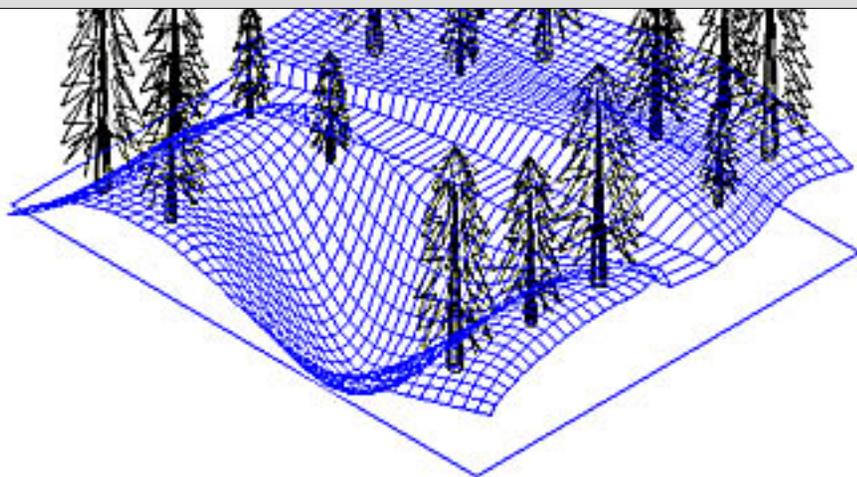
# Wall

Below is an example showing a curved wall, with a curved top, and a variable cross section. Some additional control points along the vertical parts of the wall could of course add double curvature to the wall.



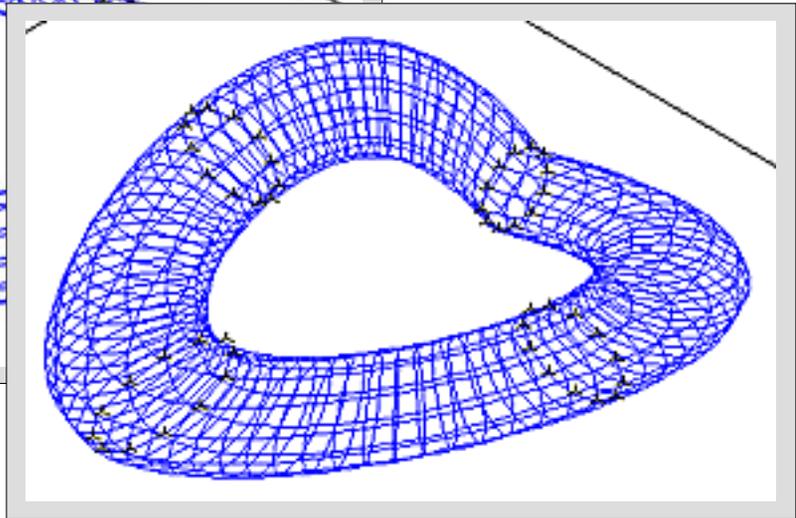
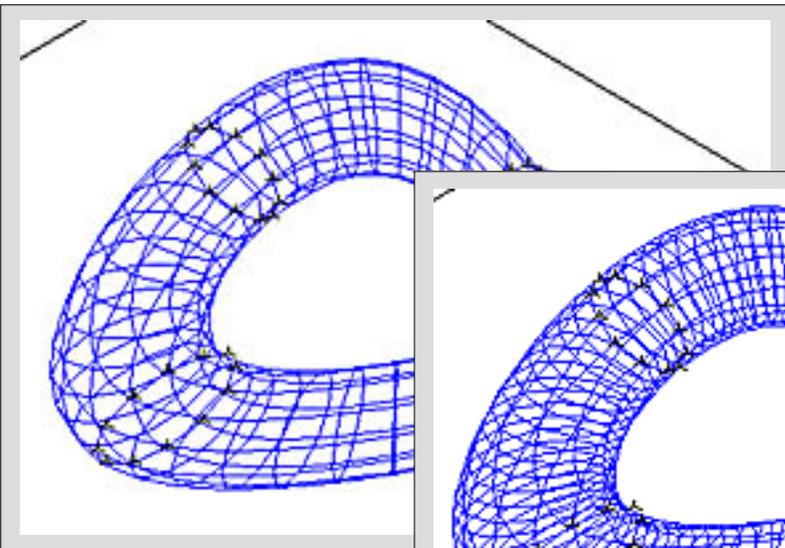
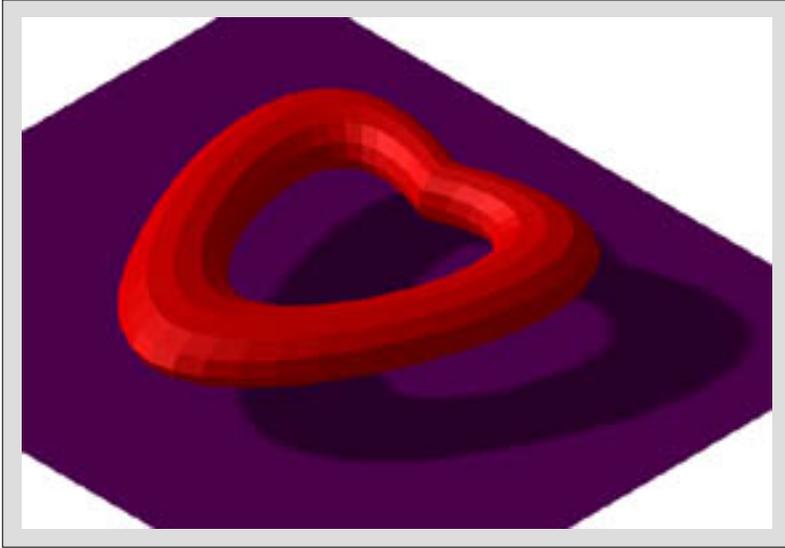
# Terrain model

Below is an example showing how MCnurbs can be used for creating super smooth terrain models with a minimum of control points. The model was generated as three separate panels (the road, plus the panels on both sides). Note that the model is compatible with the Terrain modelling unit in MiniCad.



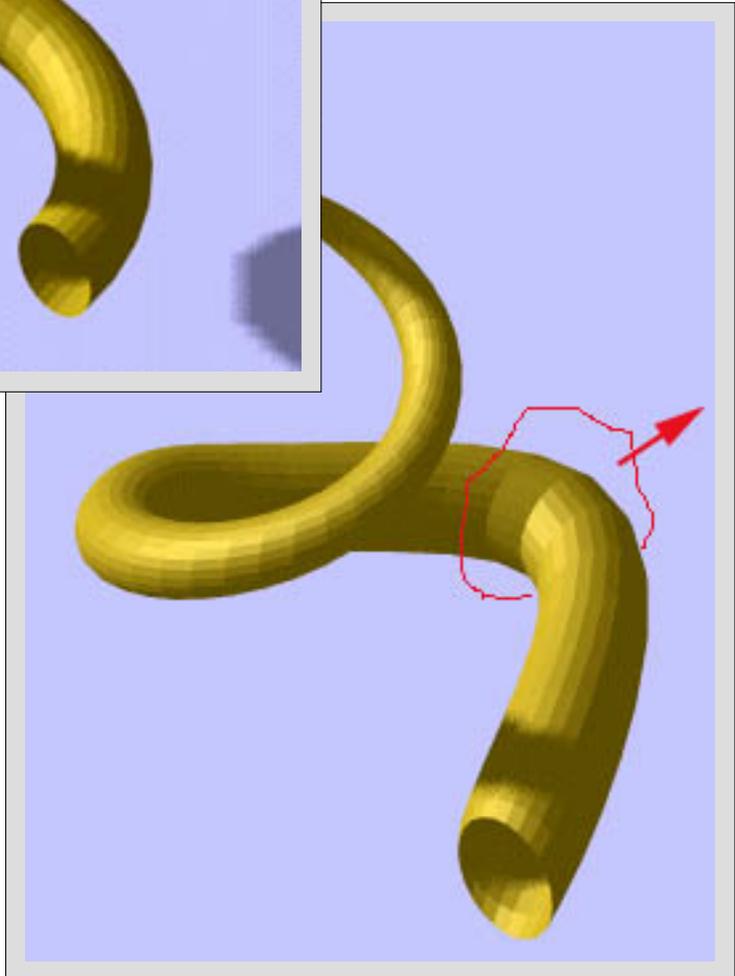
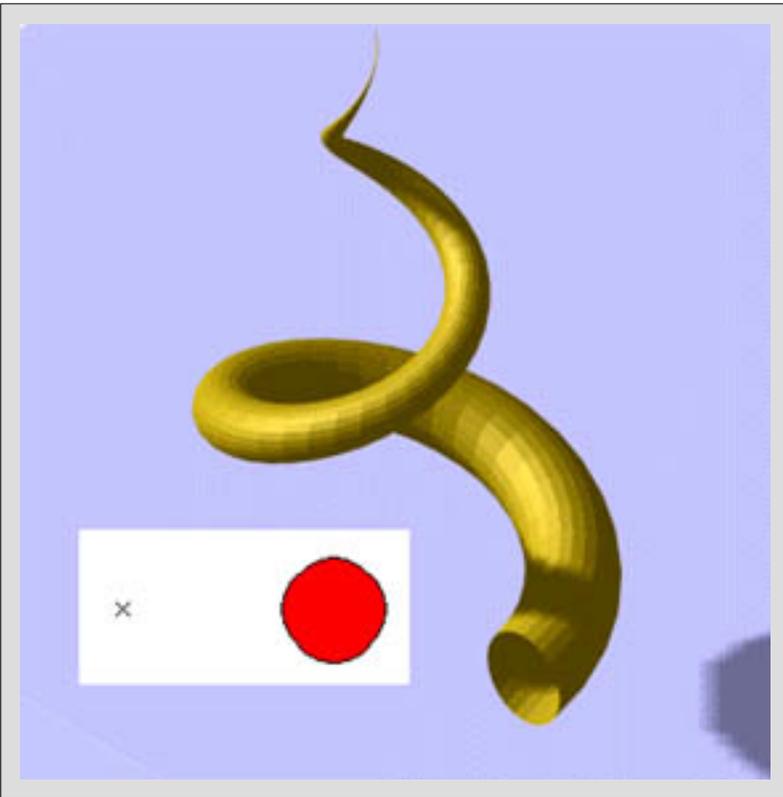
# Heart

Below is an example showing the Sweep function. This Sweep is not intended to replace the ordinary Sweep in MiniCad, but it does provide a number of additional functions such as variable distance to the center line, variable cross sections, variable pitch, rotatable cross sections, and so on. The heart mainly shows the variable cross section function, and the ability to change the number of sweep steps.



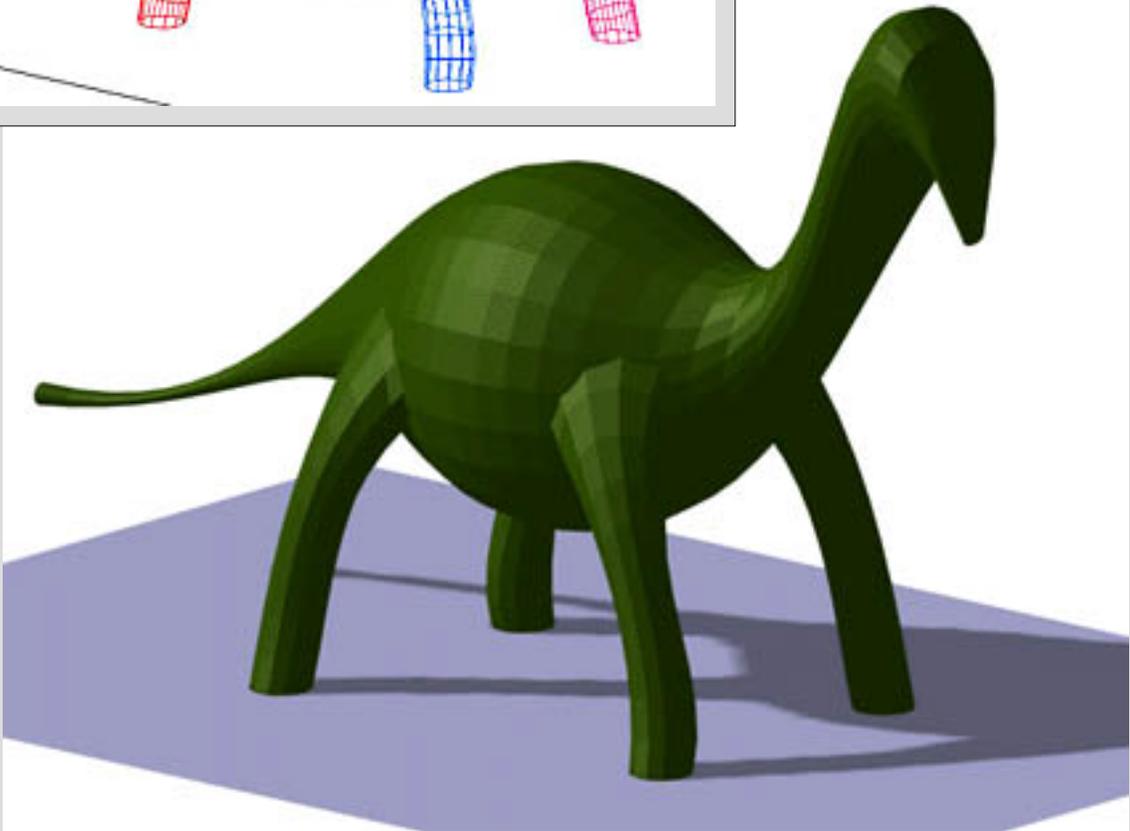
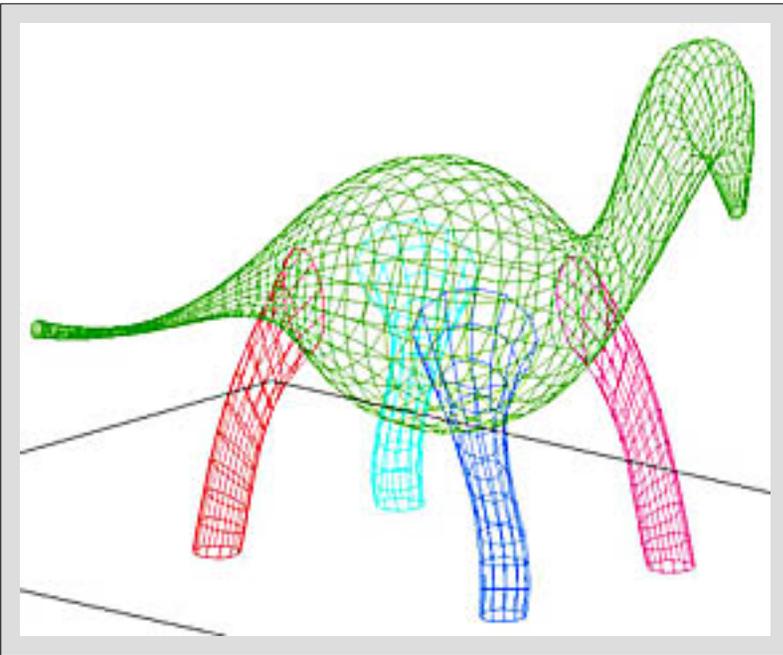
# Sweep

Below is another variation on the Sweep theme. It starts with a circle which gets smaller as the sections rotate and add in pitch height. The example also shows what happens when you select and drag one of the cross sections away from the rest of the model. You get a dynamically variable cross section Sweep.



# Lizard

Below is an example showing the extrusion possibilities in MCnurbs. It essentially consists of five elements, all based on a more or less circular cross section. Each cross section has been modified by dragging it to a suitable location, resized by grouping the cross section and rescaling it (and ungrouping it again). Some of the cross sections have also been rotated to align better into the curves.



# Boat

The boat shows a more complicated model using a number of MCnurbs Creator surface elements. Despite its complexity, it only took two or three hours to create it (including rendering). The following panels were modelled with MCnurbs Creator: Hull, keel, rudder, transom, deck, after deck, well, cabin sides and top, flag, tiller, rails, main sail, and spinnaker. These elements all use about 17K of hard disk space when stored. Each of these elements can generate a 32.000 polygon model which takes up about 2.7 MB on the hard disk. The elements not generated by MCnurbs Creator are the mast (extrusion), the flag pole (extrusion), and the front and rear bulkheads of the well (3D polys snapping to the 3D model).



# Boat 2

