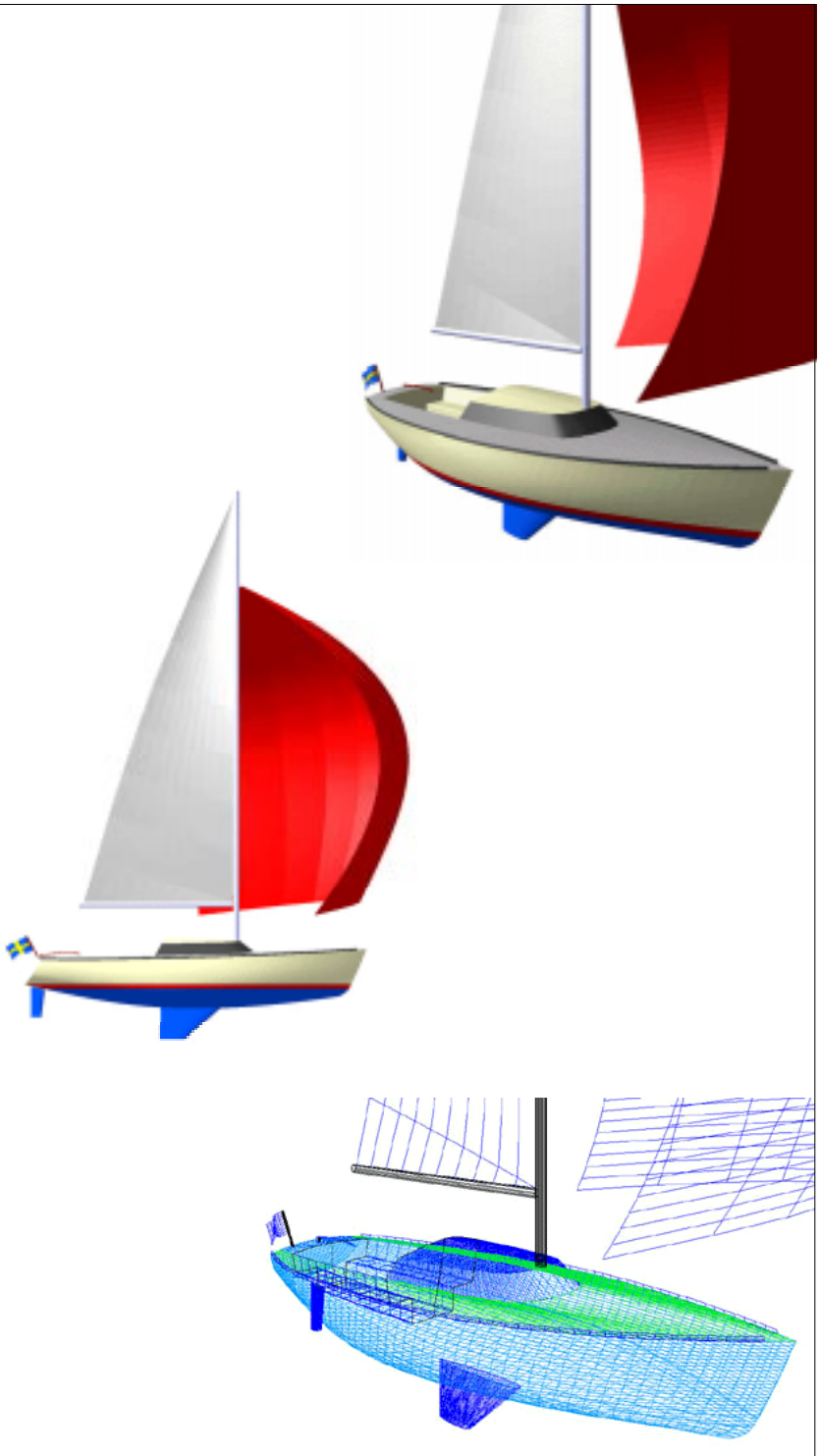
MCnurbs Creator



User's manual 1.0

by
Claes Lundström

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Introduction

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

Uses of MCnurbs.

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 or later. It requires at least 3-5 MB of additional RAM compared to standard MiniCad minimum set-up. At least 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.

Some basic conventions.

Since Nurbs surfaces are not a generic part of MiniCad we have had to use a number of work arounds to make them work. You will not always be able to use the standard tools and methods available 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 Creator elements are not generic drawing elements and are therefore not "live" objects in the same sense as for example a rectangle which can be resized at any time. In order to update a MCnurbs Creator object, you have to double-click on the MC-nurbs command in the palette. This command automatically recalculates the model based on the locations of the ruler points and the settings inserted in the worksheet.

Another difference is that you can only have one "living" MCnurbs Creator surface in the drawing at a time (note that a MCnurbs Creator surface may consist of anything between 1 and up to 32000 MiniCad 3D polygons). To be able to interact between different MCnurbs Creator 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 small text files (usually about 17K each).

MCnurbs Creator objects all have a direction and this is an essential feature. The direction (of the control rulers) can either be horizontal or vertical, and be aligned along the Front/Back, Top/Bottom, or Right/Left (Side) views. This direction can easily be changed by rotating/flipping the object and/or changing the data in the MC-nurbs info worksheet.

Two basic object creation methods can be used. The first method resembles Extrude in MiniCad, and connects the 3D spline rulers using 3D polygons. It allows you to extrude closed cross sections shapes such as tubes. The second method is Nurbs based, allowing you to create smooth 3D mesh surfaces, 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 of MiniCad in the sense that it can not create closed objects, or objects with overhangs. The panels can however be oriented in either the Front/Back, Top/Bottom, or Right/Left (Side) views.

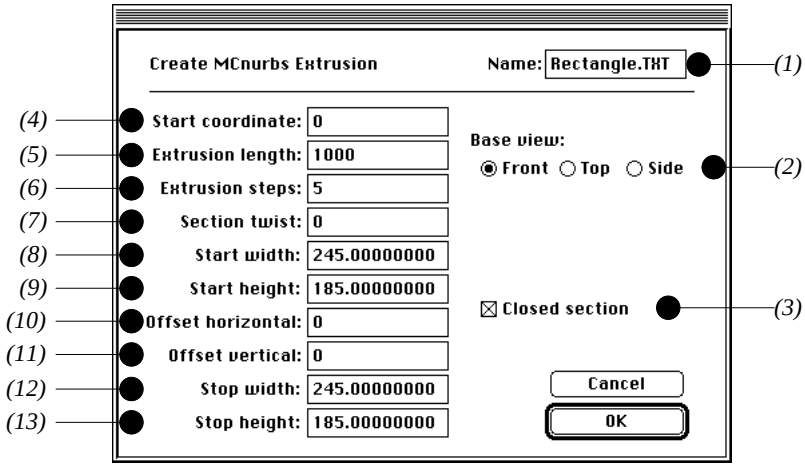
New Extrusion command

The New Extrusion command in MCnurbs Creator differs from the ordinary MiniCad Extrude and Multiple Extrude commands in the sense that it allows you to create extrusions with variable cross sections, offsets, and with smooth transformations between the control cross sections, using 3D spline based rulers.

An example.

Start by drawing a 2D rectangle. Select it and use the [menu => Tool => Convert to Polygons] command to convert it into a 2D polygon (the command only works with lines and polygons).

Select the polygon. Double-click on the New Extrusion command in the MC-nurbs command palette. The following dialog box occurs:



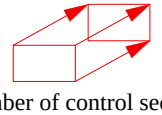
1/ Name the surface. The name is used as default when saving the panel.

2/ Select the Front, Top or Side view as the main extrusion direction.

3/ Close Section is X-ed for creating a closed cross section, which is the case for a rectangle and a circle but not for a line.

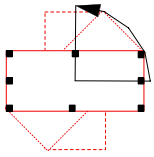
4/ The Start Coordinate is where you start the extrusion. In the Top view it is represented by the Z coordinate, in the Front view by the Y coordinate, and in the Side view by the X coordinate.

5/ The length of the extrusion.



6/ The Extrusion Steps field states the number of control sections to be used. Note that the number of control sections is not the same as the final number of extrusion steps. The extrusion steps are controlled in the MCnurbs Info worksheet. Use as few control sections as possible (you need at least one). Note that it is easy to add and delete control sections later on.

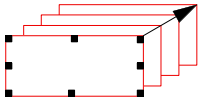
7/ The Twist field controls the rotation of the control cross sections. A 90° rotation distributed over three cross sections is applied in such a way that the first cross section is not rotated at all, the second is rotated 45° and the third is rotated 90°. The center of rotation is located at the physical center point of the polygon. Note that a cross section can not be rotated more than 180° per cross section step.



Adding a twist to cross sections

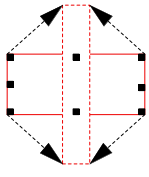
8-9/ As a default the start width and height are the same as the original dimensions. If you set the dimensions to some other value, the start section will be re-scaled to that size. The Start fields apply to the start of the extrusion, whereas the Stop fields (12&13) apply to the end.

10-11/ The Offset fields allow you to move the cross sections horizontally along the extrusion. If you set the Horizontal Offset value to 200 units and use three cross sections, the first section will not move at all, the second will move 100 units, and the third 200 units. In the Top view the Horizontal value will change the X value and the Vertical will change the Y value. In the Front view it will affect the X and Z coordinates and in the Side view it will change the Y and Z coordinates.



Adding an offset

12-13/ Works in the same way as the start fields, but applies to the last cross section of the extrusion. If the dimensions differ from the start dimensions, the difference will be evenly distributed along the extrusion.



Changing start and stopp cross section dimensions (8-9 and 12-13)

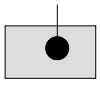
How many control sections do I need?

One section is useful if you want to copy and place sections manually later on. Two sections will create a straight line between the sections. Three sections are required for creating a smooth curve and may be enough for generating a semi-circular shape. Four sections are required for a distorted semi circular shape or an S-shaped extrusion. As a rule it is recommended to use as few control sections as possible. Note that it is very easy to add more cross sections later on. Just select a cross section and then press the Option key while dragging the generated copy sideways along the general direction of the surface. This method can also be used for adding a single new control point along one of the rulers. Rulers may have between 1 and 256 control points, and do not have to have the same number of control points as other rulers in the surface.

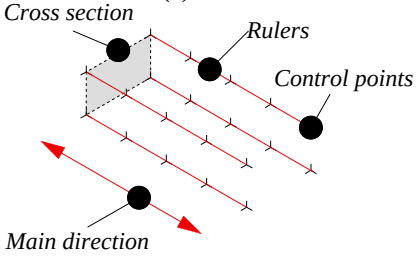
New Extrusion command

When you press the OK button a MCnurbs Creator panel framework will be created according to your specifications. Below is an example showing a rectangle using five control cross sections. Select the 2D polygon (1). Generate the model foundation using the New Extrusion command (2). The red lines created represent the control rulers. Note that you may have to rotate the view to see it as indicated below. The 3D locus points represent the control cross sections. The red lines show how the cross sections connect into a 3D spline. All 3D locus points along a certain ruler belong to the same class called R01, R02, and so on. Up to 64 rulers can be used. Create the MCnurbs Creator model by double-clicking on the MCnurbs command (3). When you are done with the model you can save it by double-clicking on the Save... command to store the model on your hard disk for future use. To convert the model into a standard MiniCad object unaffected by the MCnurbs Creator command, double-click on the Reset... command. A dialog box occurs where the options are to save the model, keep the MCnurbs Creator model on the screen (located in the 'None' class), and keep the control points on the screen (in the 'None' class). The same thing can be achieved by selecting the model and setting the class to 'None' (or some other class not used by MCnurbs Creator).

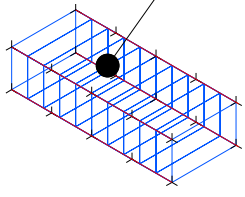
Cross section (1)



(2)

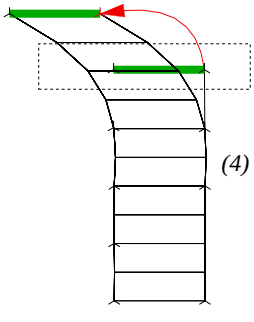


Double-click on MCnurbs to build the model (3)

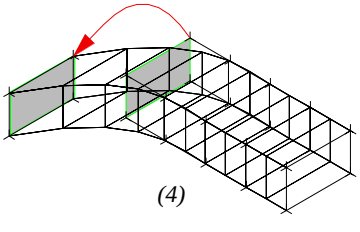


Deforming the model.

Select all 3D loci in one of the cross sections and drag them upwards and sideways and double-click on the MCnurbs command to update the model (4). Experiment with the cross sections. In the example (5) some sections have been moved upwards, rotated and re-scaled. The best way to re-scale a cross section is to select all Loci in the section, group it, resize it as a group in pretty much the same way as a 2D rectangle, and then ungroup it again. Note that you can move each control locus individually. You can increase the resolution of the calculation by entering 20 instead of 10 in the field B-15 in the MCnurbs Info worksheet. Double-click on the MCnurbs command to update the model. The only important rule is that you have to maintain the main basic direction of the model. EXPERIMENT!!!



(4)



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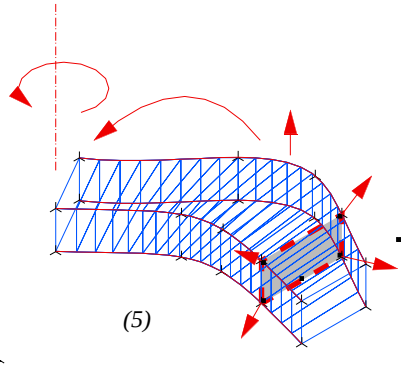
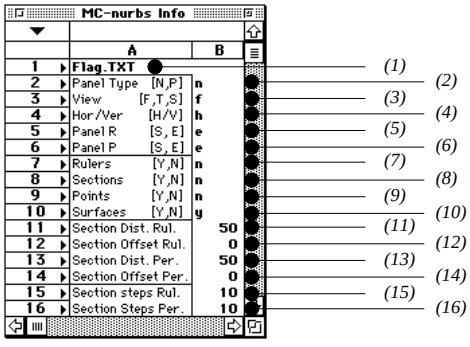


(5)

MCnurbs Info Worksheet

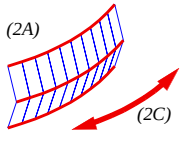
Using the Worksheet.

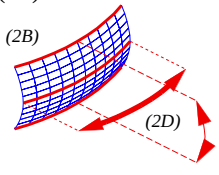
The MCnurbs Info worksheet is used for controlling the behaviour of MCnurbs Creator surfaces. You can at any time modify the surface by simply change the settings in the worksheet, and double-click on the MCnurbs command to update the surface.

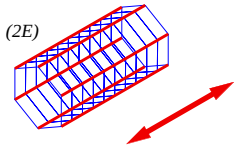


1/ The name field states the name of the surface object used as the default name when saving.

2/ Two kinds of methods for skinning the sections can be used, Panel (P) or Nurbs (N) . The Panel method (2A) connects the control rulers by a single row of 3D polygons whereas the Nurbs method (2B) creates curves perpendicular to the ruler direction as well. The Panel method has one main direction (2C) whereas the nurbs method must also follow a secondary direction perpendicular to the main direction (2D). Nurbs surfaces can for this reason not be used for creating closed surfaces, unless you sub-divide the model into smaller units. The panel method can handle closed shapes as long as it follows a general direction (2E).







3/ Main direction view.

4/ Use a vertical or horizontal main direction (relative to the main view)

Below are some examples illustrating the main view and direction. In Fig 1 it is pretty obvious that if you see it from the Front view, the surfaces are distributed in a row horizontally, so a valid setting is to set the Direction View to Front and the Main Direction to Horizontal. This is also true for Fig 2 where you see the same model from above. As long as the main direction left to right is true, seen from the Front view, the setting is valid. Fig 3 illustrates that the setting is also valid from the Side view. Fig 4 shows an example where the Front view is not valid, but the Side view is OK. The trick is to figure out a valid Main direction view, and if it runs horizontally or vertically from that view.

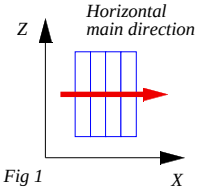


Fig 1

Front view

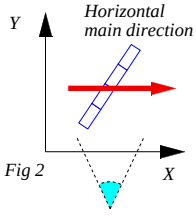


Fig 2

Front main direction view, seen from above

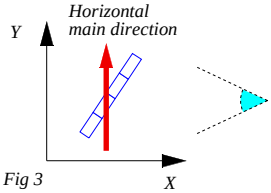


Fig 3

Side main direction view, seen from above

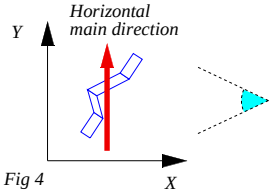
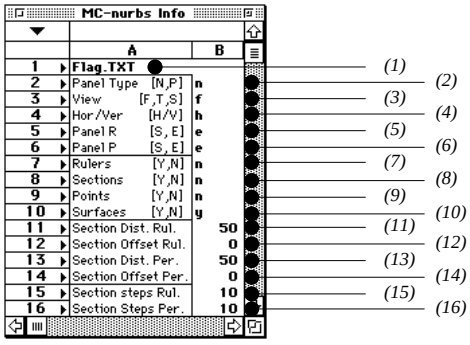


Fig 4

Side main direction view, seen from above

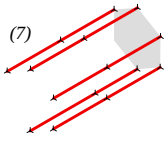


5/ Distribute the cross sections along the control rulers at fixed section distances (S) or distribute the sections evenly along each ruler (E). The fixed distances are controlled by field no. (11) and the evenly distributed distances with field no. (15).

6/ This field does the same thing as field (5) but perpendicular to the rulers. It only applies to the Nurbs method. The respective control values are located at field (13) and field (16).

7, 8, 9, 10/ These fields control what is visible on the screen after a MCnurbs calculation. The choices are (Y) for yes, or (N) for no. Any combination of visibility may be used. The red Rulers (7) indicate how the control points along a ruler are being connected. The green Sections (8) indicate how the cross sections are connected. The Points option (9) places 3D Locus points at each calculated point (useful for creating a Terrain model). The Surface option (10) creates a 3D polygon mesh to skin the model (blue lines) and is used for creating the final model.

(7)



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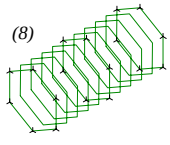
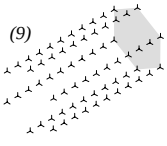


(9)



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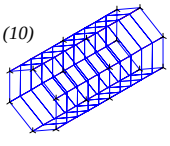
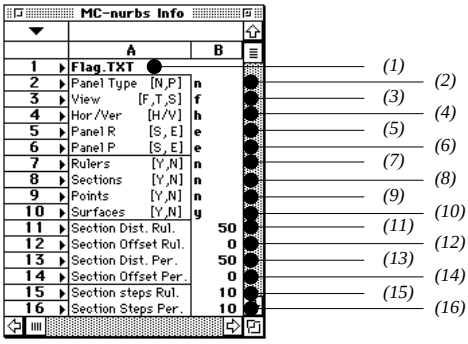
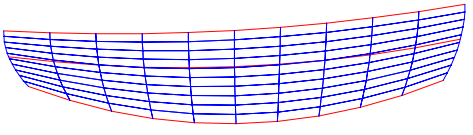


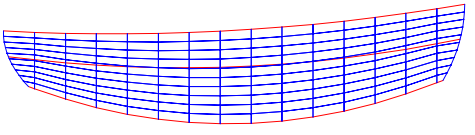


11, 12, 13, 14/ These fields control the fixed section distances along the rulers (11) and perpendicular to the rulers (13). The sections may be slided along the rulers by changing the values in the (12), and (14) fields. The fields (13), and (14) only apply to the Nurbs method.

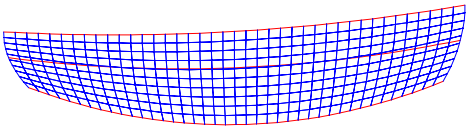
15, 16/ These fields states the number of cross sections to be used when using the Even distribution method (E at field (5) and/or field (6)). Field (16) only applies when using the Nurbs method.



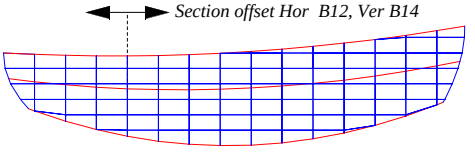
Even distribution horizontally (B5) and vertically (B6)
Hor. steps 10 (B15) ,ver. steps 10 (B16)



Section distribution horizontally (B5) and even vertically (B6)
Hor. section distance (B11) ,ver. steps 10 (B16)



Even distribution horizontally (B5) and vertically (B6)
Hor. steps 40 (B15) ,ver. steps 10 (B16)

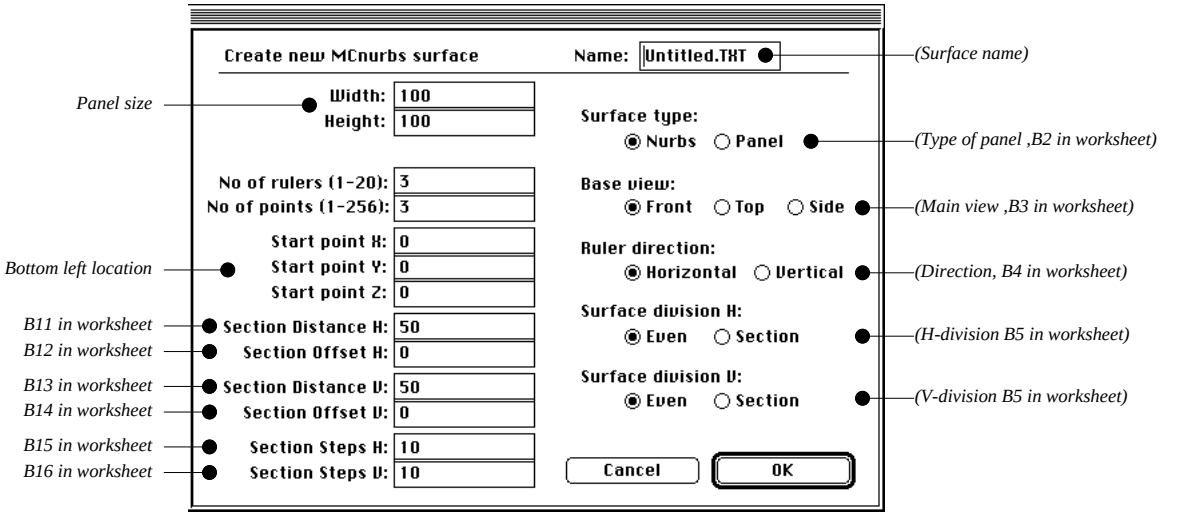


Section distribution horizontally (B5) and even vertically (B6)
Hor. section distance (B11) ,ver. distance (B13)

New Surface command

Using the New Surface command.

The New Surface command is essentially used for creating a flat rectangular surface with a specified number of rulers and control points. Such a surface can easily be modified by dragging one or some control points in some direction (any 3D direction is valid). To create a new surface using the New Surface command you simply double-click on it. If you have a previous active surface on the screen you will be asked if you want so save it as MCnurbs Creator file, if you want to leave the previous 3D loci on the screen (belonging to the 'None' class), and if you want to leave the current surface on the screen (belonging to 'None' class). After this the following dialog box occurs:



Enter the proper values in their respective fields. Note that you need at least three rulers and three control points to be able to use the surface as a Nurbs surface (Two rulers or points will create a straight line connection). If possible, try to use as few rulers and points as possible because an excessive number of such elements will lag the MCnurbs calculation substantially, and may cause the panel to be more difficult to control. Don't worry about starting with too few control points or rulers. It's easy to add extra points afterwards. Be sure to consider all options and try to come as close as possible to what you need. Click on OK to generate the surface. A series of 3D locus points will be generated, connected by red lines, the control rulers. The rulers indicate how the control points connect. The connected points all belong to the same class (ruler), called R01, R02, R03, and so on. You can use up to 64 rulers (R64) and between one and 256 points per ruler. The number of points per ruler can be set individually, and you can place the point essentially anywhere on the surface. It is however recommendable to keep the rulers in tidy rows to avoid overlapping rulers. To add a new point (or points), select a point (or a number of points), press the Option key and drag the selected control points along the ruler. To add a new ruler you select some control points from an existing ruler, press the Option key and drag the copies perpendicular to the rulers, and place the new points in the class immediately above the currently highest indexed ruler class in the class list. As always, double-click on the MCnurbs command to update the model. Note that the direction rules described on page 4 always applies.

New Sweep command

Using the New Sweep command.

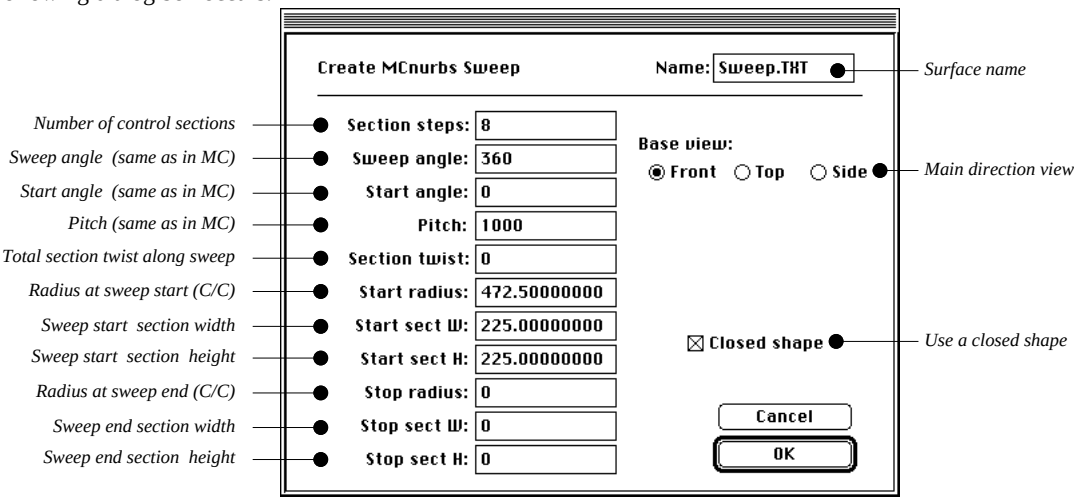
The New Sweep command allows you to create spline based sweeps. It does not replace the MiniCad Sweep command, and is not as accurate when creating a circular shape. It does however provide a method for creating variable cross sections, rotating cross sections, variable sweep radius, variable pitch along the sweep path. The transformation can be both linear and free form.

Direction of a Sweep.

How do you define a direction in a circular shape? The answer is that the direction is upwards / downwards along the sweep center line. To function, MCnurbs Creator sweeps need to have at least a very small pitch (pitch means the same thing as in the standard MiniCad Sweep command). To run a MCnurbs sweep properly the control points have to be placed in an ascending or descending order, cross section for cross section. If not, strange things may occur. Examples of risk areas are when applying a section twist, changing the section height (the same direction as the rotation axis), and using a non uniform pitch, all in combination with a modest pitch. The problem will not occur if you follow the ascending/descending direction rule. It is obvious when the problem occurs and where it is located. If so, try dragging the misplaced cross section to a safe location and double-click on the MCnurbs command to recalculate.

Creating a MCnurbs Creator Sweep.

Draw a 2D object. Convert it into a 2D polygon when required. Add a 2D Locus point as a sweep center point (same as in MiniCad Sweep). Double-click on the New Sweep... command. The following dialog box occurs:



Some comments.

How many control sections should I use? In a 360° sweep a good suggestion is eight sections if the sweep is reasonably symmetrical. This means one control cross section per 45°. Always use at least four steps. Consequently, a 720° sweep requires sixteen steps, whereas a 90° sweep requires four steps.

The twist field states the total rotation angle along the sweep. You can not rotate the cross section more than 180° per control cross section. If needed, add more control sections. The Stop and Start radius fields state the distance between the center of the polygon to the locus. The Width and Height fields scales the cross sections from the center point of the polygon. If the respective start and stop values differ, the Sweep command distributes the transformation evenly along the cross sections.

Creating your own MCnurbs Creator surface

Creating your own MCnurbs Creator surface.

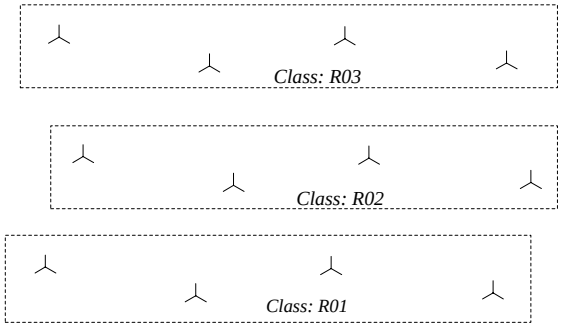
Is it possible to define a surface based on an existing surface or by importing surveyors coordinate points? Yes, of course. The New Surface, Sweep, and Extrusion commands are just tools to help you define MCnurbs surface calculations. This is how it's done:

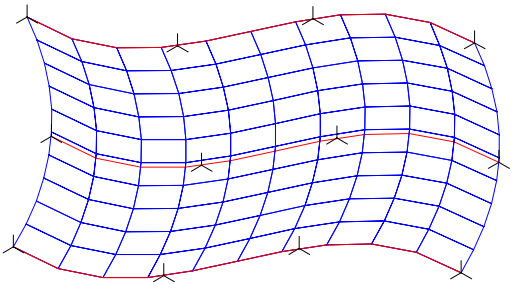
1/ Draw some 3D locus points. If you have an existing surface you can place them at strategic corner points in the polygon mesh. If possible, avoid using excessive numbers of points and rulers because it will substantially decrease the performance of MCnurbs Creator, and may cause curves that are difficult to control.

2/ Select the 3D loci row by row and place them in the respective MCnurbs ruler classes starting at R01, followed by R02, R03, and so on. Note that each ruler may have between 1 and 256 points and a maximum of 64 rulers.

3/ Prepare the MCnurbs Info worksheet so that it is consistent with the surface to be generated, and with a suitable resolution.

4/ Double-click on the MCnurbs command to generate the surface.





Reusing 3D loci from connecting surfaces.

A good example of where it is convenient to use the manual surface creation method is when you want to create a surface that connects to a previously created surface. If you keep the 3D loci along the connecting edge of the previous surface, and re-use them in the new surface you will get an identical connecting 3D ruler. The two surfaces will then match one another.

Writing custom macros that generate MCnurbs Creator surfaces.

You now know what MCnurbs Creator surfaces really consist of. MCnurbs Creator does in fact require very few and simple drawing elements (some 3D loci placed in the right classes). It is therefore quite easy to write your own macros generating custom designed surface elements. Give it a thought. You may find it rewarding.... If you come up with something brilliant, please let us know.

Open, Save, and utility commands

Using the Open and Save commands.

Why does MCnurbs Creator need its own Open and Save commands? The reason is that MiniCad does not support the data Nurbs data type. This means that MCnurbs Creator has to simulate such surfaces using existing object types. One result of this is that the surfaces are not 'live' objects in the same way as for example a rectangle which can be rescaled at any time, even if there are more than one rectangle available in the drawing. In MCnurbs Creator, only one 'live' surface can be active at a time, even though you can have any number of surfaces available in the drawing. To be able to interact between several 'live' surfaces you have to store each surface as it's own file on your hard disk when you do not use it. This may seem complicated, but you have to remember that each surface may consist of up to 32.000 3D polygons. It is also useful to be able to reuse a surface at any time from any document where MCnurbs Creator is installed.

Saving a surface.

To save a surface, the drawing must contain a 'live' surface, and the MCnurbs Info worksheet has to be active on the screen. The saving procedure works as you would expect. Note that suggested default name in the Save dialog box is the same as in the A1 name field in the MCnurbs Info worksheet. As always, it is good practice organizing the saved surfaces to make it easy to find them, especially if you use MCnurbs Creator extensively.

Opening a surface and resetting the previous surface.

Opening a surface is also a fairly standard procedure. There are however a few things to consider. The most important thing is to decide what to do if you already have a 'live' MCnurbs Creator surface in the drawing. Below are some methods to handle the presently active surface before opening a new surface.

#1/ Save the model before opening a new surface. Move the surface and any control points to the 'None' class, and delete the unwanted parts of the objects. Open the new surface.

#2/ Use the Reset command in the MCnurbs palette. The command moves the currently active surface and it's controls to the None class and/or deletes it, and saves current surface settings to a file on your hard disk (if chosen).

#3/ Run the Open command. It will automatically detect if you have an active model in the drawing.

Show / Hide controls commands.

These two commands allow you to quickly make the control ruler classes (R01, R02,...) visible and invisible which is convenient when rendering the model. Note that the MCnurbs command still works even if the controls are invisible. This may be confusing if not noted.

Add / Delele required classes.

These command adds and deletes the required classes used by MCnurbs. Useful when importing the MCnurbs Info worksheet and MCnurbs command palette into a new drawing using the MiniCad Resources palette. Double-click on the Add required classes command and start modelling.

Reset Origin.

This is a small utility that resets the 2D origin to its original position so that it aligns with the 3D origin. If these two origins do not align it appears that the Sweep and Extrude commands generate an offset when you run it.

Calculate Cross sections command

The Calculate sections command.

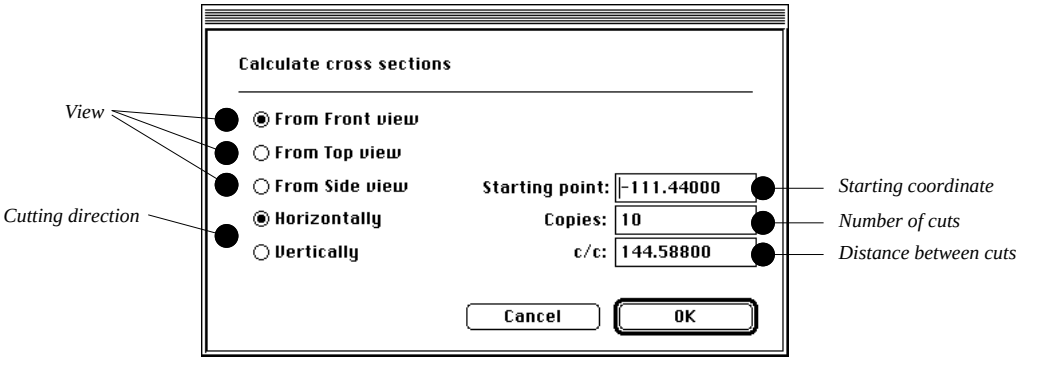
The Calculate sections command is used for calculating a number of cross section lines through the model. The calculation can be done horizontally or vertically seen either from the Front, Top or Side views. The command uses the four sided polygons generated by MCnurbs Creator located in the MCnurbs-Temp class. As a rule it works best when you set the Nurbs panel setting to Even both horizontally and vertically. Make sure to hide the control rulers and cross section before starting the calculation. Since the calculation calculates straight lines between the polygon lines, the result will be better if the model has a comparatively high resolution. Do not use an excessive number of cuts because this is a comparatively slow command mainly caused by MiniCad's somewhat slow functions when reading data into the calculation unit.

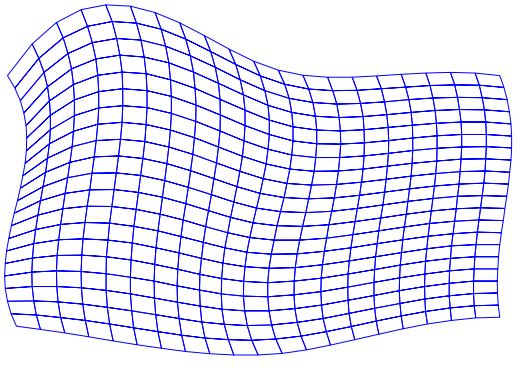
Using the command.

1/ Place all surfaces you want to include in the calculation into the MCnurbs-Temp class.

2/ Consider which view and direction to use. The command assumes that you want to cut from the lowest coordinate value in the calculation direction. Write down the coordinate of some other location if you want to start somewhere else.

3/ Double-click on the Calculate sections command in the MCnurbs command palette. A dialog box prompting you to ungroup the model occurs. Select OK. The following dialog box occurs:





Using previously stored surfaces

Using previously stored MCnurbs Creator surfaces.

An advantage with the Save and Open commands is that you can store and retrieve previously used surfaces, not only in the drawing where it was first created, but also in other drawings. Below is an example where most of the parts of a the boat can be imported into the currently active drawing.

1/ Set the drawing scale to 1:50 and the units to mm.

2/ If you do not have the MCnurbs Creator commands and worksheet in the active drawing, import them using the Resource palette. Make sure that both items are active in the drawing. Run the Add Required classes command in the MCnurbs command palette.

3/ Double-click on the Open... command and select the Hull.TXT file.

4/ Double-click on the MCnurbs Creator command to generate the surface.

5/ Double-click on the Open... command and select the Deck.TXT file. When asked, keep the hull surface, do not save the hull model, do not save the control point.

6/ Double-click on the MCnurbs Creator command to generate the surface.

7/ Repeat step 5 & 6 for the following items: Keel.TXT, Rudder.TXT, Transom.TXT, Adeck.TXT, Well.TXT, Flag.TXT, CabnSide.TXT, CabinTop.TXT, MainSail.TXT, Spinaker.TXT, Tillar.TXT, Rail.TXT.

8/ Draw the remaining elements (Mast, Boom, Flagpole, Front and rear bulkheads), and mirror copy the required elements to the other side.

Some comments.

In the example above we did not save the control points because they where not required to generate the model. A useful technique is however to keep some of these points when creating a connecting surface. The joint between the hull and the deck have one edge in common and could for this reason share control points along that edge. If this is done the connecting spline ruler will of course be identical in both cases. This illustrates the technique:

1/ Create the hull surface and save it.

2/ Use the Reset... command to make the hull surface inactive. Keep the hull surface and the control points on the screen.

3/ Select the control locus points along the sheer line and place them in the R01 class. Copy some control locus points, place them along the center line of the hull, and place them in the R02 class.

4/ Change the direction view to Top and the surfacel type to Panel.

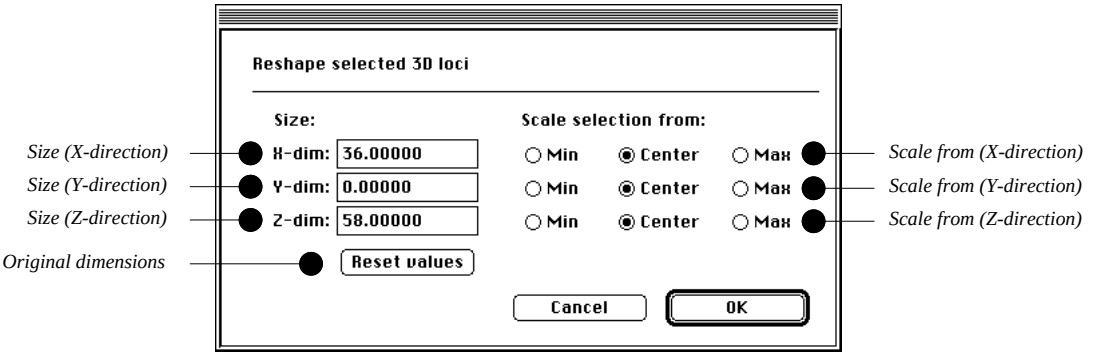
5/ Double-click on the MCnurbs Creator command to generate the deck surface. The two surfaces will now fit very well together because they share the same control points along the sheer line.

Reshape command

Using the Reshape command.

The Reshape... command provides the 3D dimensions of a 3D enclosure box surrounding any number of selected 3D Loci, and allows you to change/scale this box (and it's contents) by entering new dimensions individually in the X, Y, and Z directions. It also allows you to scale the box individually from the left, center or right corners in each direction.

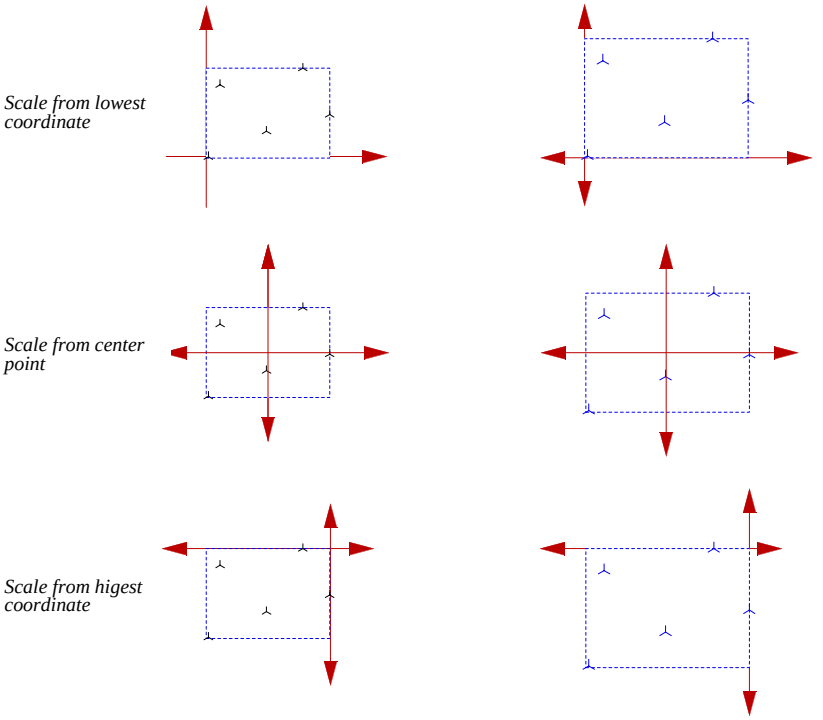
1/ Select any number of 3D loci.



2/ Double-click on the Reshape... command in the MCnurbs command palette.

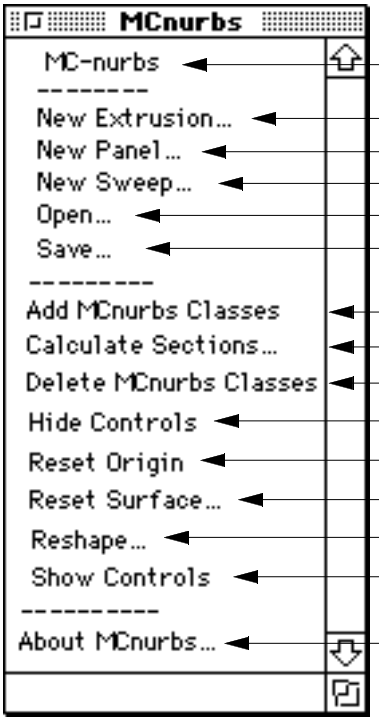
3/ Enter the new sizes of the enclosure box, and where to scale it from.

4/ Double-click on the MCnurbs command to update the surface.



MCnurbs command palette tools

Below is a summary of the commands in the MCnurbs command palette, including references to the relevant pages in the manual. All commands are activated by double-clicking on them. Commands ending with three dots will display a dialog box for entering parametric values. The About MCnurbs... command will display the serial number, all relevant addresses to Lundström Design, and to whom this particular copy is licenced. The license number and name of the licensee can also be found by pressing any key while double-clicking on the MCnurbs command.



The command that builds and rebuilds the active surface

Extracts extrusion data from 2D polygons and lines (5-7)

Creates a basic flat but deformable surface (11)

Extracts sweep data from 2D polygons and lines (12)

Opens MCnurbs Creator surfaces stored on your hard disk or disk drive (14)

Saves MCnurbs Creator surfaces on your hard disk or disk drive (14)

Adds the required classes used by MCnurbs Creator (14)

Calculates 2D cross sections based on a MCnurbs Creator surface (15)

Deletes the classes used by MCnurbs Creator (14)

Hides the 3D loci used by MCnurbs Creator to generate surfaces (14)

Resets the 2D origin to the default location and aligns it with the 3D coordiantes (14)

Moves a surface and it's controls to the None class and/or deletes it (14)

Scales any number of selected 3D loci as a group (17)

Makes the 3D loci, used by MCnurbs Creator to generate surfaces, visible (14)

Displays your serial number, and the name of the license owner (18)

Troubleshooting.

MCnurbs Creator is normally quite forgiving, but it is important to follow some basic rules to make it work. If not, you may end up generating all sorts of strange and unexpected shapes. If this happens (and it will, sooner or later), here are some suggestions how to fix it.

1/ Check that the view in the MCnurbs worksheet is reasonable.

2/ Check that the direction is reasonable in the MCnurbs worksheet.

3/ Having two 3D loci very close to one another may cause some pretty wild fluctuations. If so, try moving one of the locus points to provide some space in-between the loci.

4/ As a general rule, use as few 3D loci as possible. Using an excessive number of points may cause the surface to behave in a nervous way, and may cause unwanted fluctuations in the surface. The problem is essentially the same as when you use too many control points in a 2D Spline or Bezier curve. To reduce the problem, delete any 3D loci that does not really add something to the shape, and use the remaining points to control the surface.

Some other possible problems.

To work properly, MCnurbs Creator always needs to have access to the MCnurbs command palette and the MCnurbs Info worksheet. If these items are available in the currently active drawing, be sure to make them active by selecting them from the Windows menu.

Importing the command palette and worksheet into the currently active document.

1/ Locate a document where the commands and worksheet are located, using the MiniCad Resources palette.

2/ Select the MCnurbs commands and MC-nurbs Info Worksheet, and press the Import button.

3/ Return to the currently active drawing and open the command palette and worksheet from the Windows menu.

4/ Double-click on the Add MCnurbs Classes command in the MCnurbs command palette to add the required classes. Start drawing.

Macintosh and Windows communication.

MCnurbs Creator is a cross platform application using the same code for both platforms. This also applies to the file format used for storing surfaces. Files are stored in Text format and can be used on both platforms. As always it is best to use the built in Mac to PC file conversion included in the MacOS operating system to perform file conversions. Macs typically read PC files without doing any visible job at all. Mac user should however follow the requirements for file names used in the PC world. This means that you should restrict file names to only eight characters and using the suffix .txt (e.g. filename.txt). The same applies to MiniCad documents which have the suffix .mcd (e.g. Filename.mcd). MCnurbs Creator automatically handles the linefeed difference found in text files.