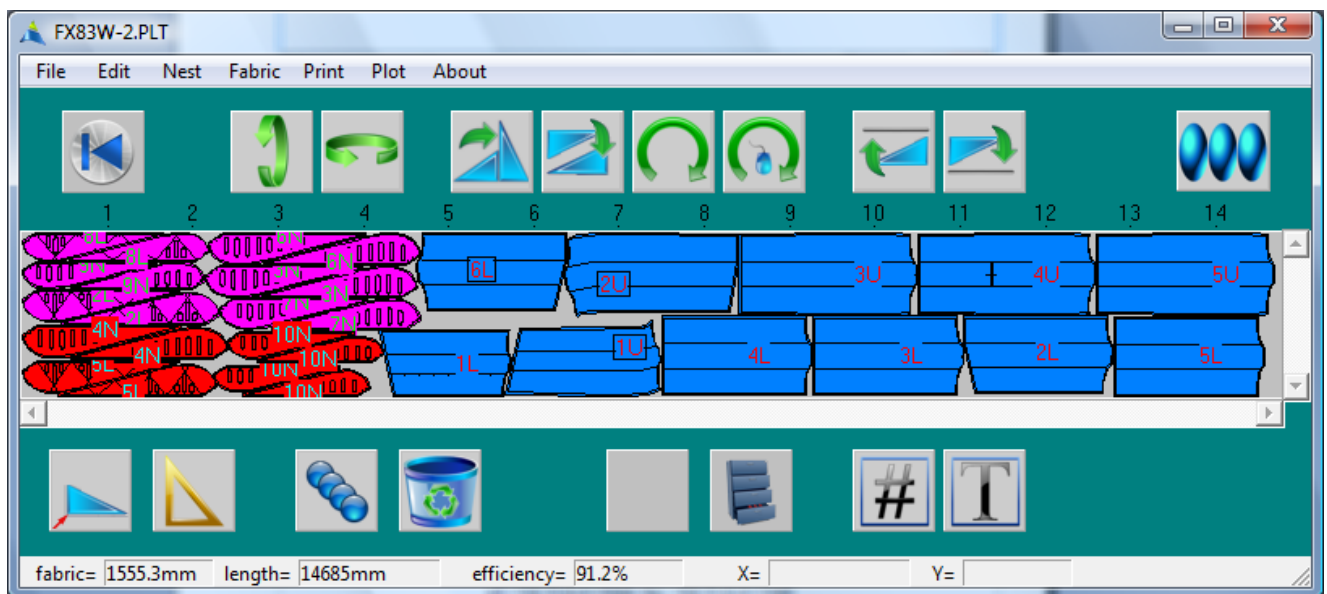


PanelMaker 3 & Nesting 3 Manual



Armstrong-White Automation (NZ) Ltd

© Armstrong-White Automation (NZ) Ltd
22 Kereru Grove, Greenhithe, Auckland 0632, New Zealand.
ph +64 9 413-7642 fax +64 9 413-7643
info@prosailcutter.com
www.prosailcutter.com

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Dongle



The dongle is a small USB connector that plugs into a USB port on your computer.

For many ProSail machines, the dongle is required for the software to run.

However with the ProSail plotter mkIII or the ProSail digitiser, the dongle is an optional extra and is not supplied as standard. With these machines the software will run so long as the data cable from the machines are plugged into the computer (the machine does not need to be turned on, just the data cable plugged in).

Introduction	4
Units	5
Nesting	6
Fabric	14
Plotting.....	21
Shaping : Panel Mode	30
Shaping : Curve Mode	46
Shaping : Seam Mode	50
Scaling.....	53
Divide	54
Hardware.....	57
Calibration	59
PVC Joins.....	52
Test Hardware	63
DXF Import.....	65
HPGL Extended Import ..	70
Export.....	71
Nesting Menus	72

Introduction

This manual covers both the Nesting software and the PanelMaker software. If you do not have the PanelMaker software please disregard the sections of this manual relating to Shaping, Scaling and Divide. The Nesting software is included with the PanelMaker software or as an extra module for other ProSail software.

Nesting

The Nesting software is used for arranging (nesting) panels on the fabric. Panels can be moved around, flipped and rotated. There is also a semi-automatic compaction facility.

If connected to a ProSail plotter or plotter/cutter it will drive the machine.

DXF and HPGL files created by other CAD software such as CorelDraw and AutoCad etc can also be read (if that module is enabled).

PanelMaker

PanelMaker is a 2D design program where 2D panels (patterns) can be generated and modified. There are 3 basic modes to PanelMaker :

Panel Mode



Considers the global dimensions of the panel.

Curve Mode



Considers the local shape of individual curves in the panel.

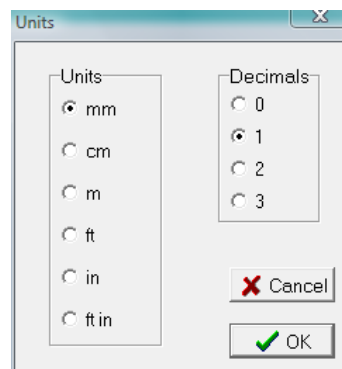
Seam Mode



Considers the seam widths around the panel.

Additionally panels can be scaled up or down, reflected to allow for symmetry, and divided into smaller strips.

Selecting **Units** from the **File** menu :



This dialogue determines the current units and decimal places displayed in all of the dialogues throughout the program.

Although numbers will be displayed in these units they can be entered in any of the above units. For example if you want to enter 1.5 feet into a dialogue, you can enter 1.5f or 1.5' or 1f6i or 1'6". Then after pressing the Enter key it will be converted to the current units you selected in the Units dialogue. e.g. 457.2mm

If the current field is already displayed in the units that you want then when you enter a new number there is no need to add the units letters after the number. Just type the number.

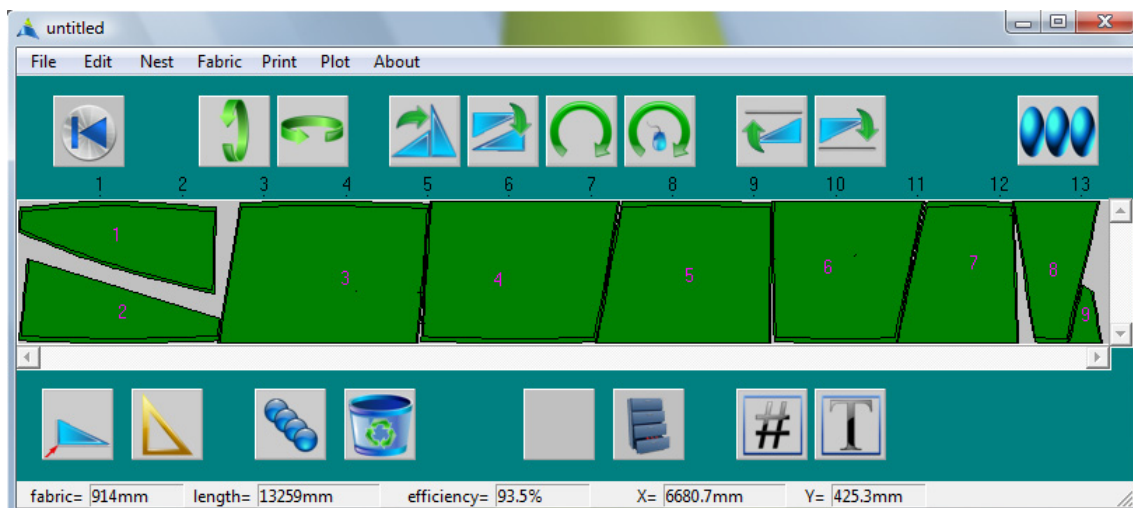
Most dialogues have a % button that toggles between % and the current unit when you click in it.

If for example mm is displayed in the % button then fields in the dialogue will be displayed in mm.

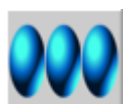
If however % is displayed in the % button then some fields will be displayed as a %. Then if you enter a number into these fields it will be assumed to be a % unless you add the units letters to the end of the number.

Some examples

<u>entered</u>	<u>converted</u>
4.2f	1280.2mm
1.4m	1400.0mm
4.2f - 7mm	1273.2mm
10i	254mm
100+10.7	110.7mm

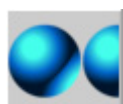


The Nesting Window shows the panels on the fabric. The icon near the top far right of the screen has two modes that govern the display of the Nesting Window :



In this mode, the view of the panels is distorted horizontally so they can all be seen on the screen.

Clicking on this icon will produce a dotted rectangle inside the Nesting Window. Using the mouse, position this rectangle at a location you wish to zoom in on. If you want you can change the zoom scale by typing a number on the keyboard between 1 and 5. Then click the mouse to zoom that rectangle. The icon will then look like the following :



In this mode, the view of the panels is drawn undistorted. The horizontal and vertical scroll bars around the Nesting Window can be used to move around the nesting lay to see all the panels.

Clicking on this icon will revert to the mode above so all the panels can be seen on the screen.

fabric= 914mm length= 13259mm efficiency= 93.5% X= 6680.7mm Y= 425.3mm

(x,y) coordinates of the mouse cursor on the fabric. **x** is the distance along the table. **y** is the distance across the table. (0,0) corresponds to the bottom left corner (Home).

length = total length of fabric required.

efficiency = (total panel area) / (length x fabric).

Nesting

Click on a panel to highlight it. To re-position a panel, click on it, and with the mouse button still down drag it to the required location. To highlight several panels, either hold the Shift key down while clicking on them or click the mouse outside a panel and with the button still down drag a dotted rectangle around the desired panels.

Another way to select a panel is to use the left or right arrow keys on the keyboard.

The following icons apply to the highlighted panel(s) :



Flip the highlighted panel(s) vertically. A flipped panel will have a rectangle drawn around its panel number to identify it is on the other side of the fabric. This may be important if the fabric has a different texture on each side.



Same as above except flipped horizontally.



Permanently remove the highlighted panel(s).



Duplicate the highlighted panel(s). If **Rename after Duplicate** is ticked in the **Preferences** dialogue from the **Nest** menu, the duplicated panels will have a new number. Otherwise they will have the same number.



Highlight all panels of this colour. To first display a colour in this icon, click the mouse in any panel. This icon will then become the colour of that panel.



Will display a dialogue where the panel(s) number can be entered. If you don't want the panel(s) to have a number, enter 0.



Will display a message asking for the panel(s) text to be entered. The Text will be plotted next to the panel number in a seam. Note that if you enter too much text, it may appear off the edge of the panel.



Will remove the highlighted panels and save them to a specified file. These files can later be read by selecting **Open** from the **File** menu.

Rotation



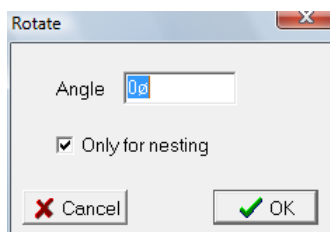
Rotate the highlighted panel(s) clockwise by 90 degrees.



Rotate the highlighted panel(s) clockwise by 180 degrees.



Rotate the highlighted panel(s) clockwise by the specified angle (-ve for anticlockwise). The following dialogue will appear :



If **Only for nesting** is is ticked, the panel is rotated on the Nesting Window but not in the Shaping Window of PanelMaker. This is probably the most useful mode especially if a panel has been digitised and you don't want its (x, y) coordinates rotated in the Shaping Window. The rotate 90 and rotate 180 icons use this method.

With this method the cumulative angle the panel has been rotated is remembered and is displayed in this dialogue. Setting the angle to zero will rotate the panel back to its original orientation (the same orientation seen in the shaping window).

If **Only for nesting** is not ticked, the panel is rotated in the Shaping Window as well as on the Nesting Window.

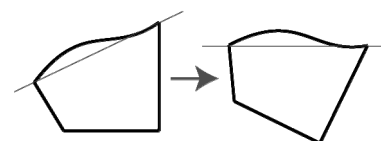


Rotate the highlighted panel visually using the mouse.

Click and release the mouse button on this icon to display a dotted line drawn between the centre of the panel and the mouse. Move the mouse to a location on the screen (away from the panel), then click the mouse and (with the mouse button still down) drag the mouse to rotate the panel. When the mouse button is released the panel will have been rotated. The further from the panel you do the dragging, the more control you have.



Rotates the highlighted panel(s) so the end points on the top curve becomes parallel with the fabric edge.



Rotates the highlighted panel(s) so the end points on the bottom curve becomes parallel with the fabric edge.

Compaction : method 1



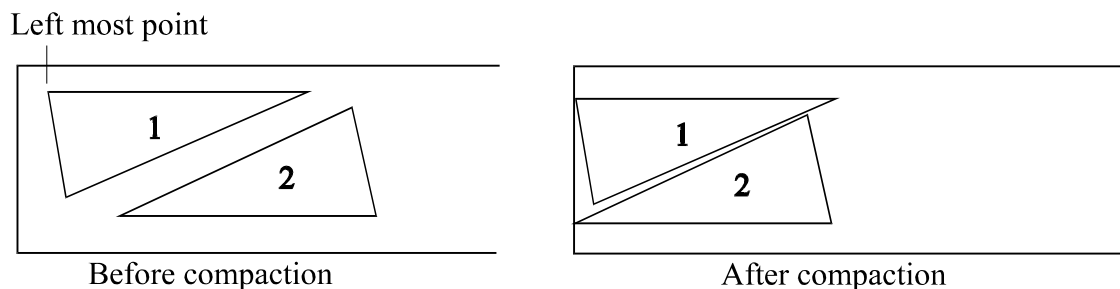
Compacts all panels towards the left. The vertical position of the panels is not changed.

When you click in this icon, the software imagines all the panels are down the far right of the screen. It then moves one panel at a time as far as possible to the left until it either hits the left of the screen or another panel. The order in which it chooses the panels depends upon each panel's left edge. First it compacts the panel which has the left most left edge. It moves this panel as far to the left as it can. Then the next panel with the left most left edge is pushed as far to the left as possible. This is repeated until all panels have been compacted.

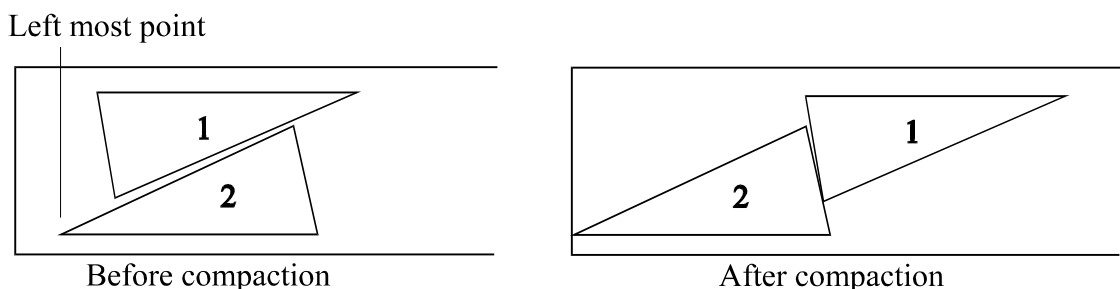
It is up to you to arrange the panels in the desired left to right order before clicking the compaction icon. The compaction icon does not care if a panel overlaps other panels at the time you click the icon. It only cares about the left edge of each panel.

In the following example the panels are in the correct order before compacting.

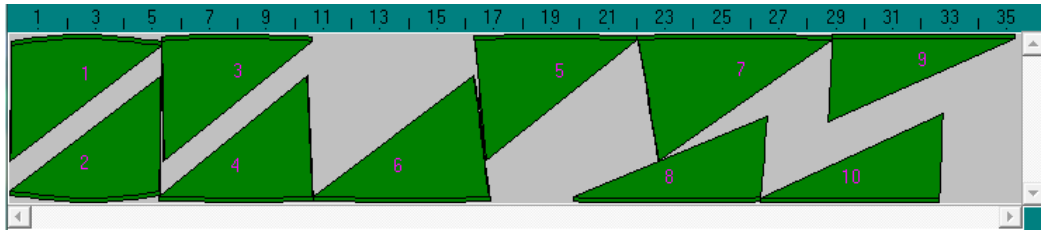
i.e. The left edge of panel 1 is to the left of the left edge of panel 2 :



In the following example the panels are not in the correct order before compacting :

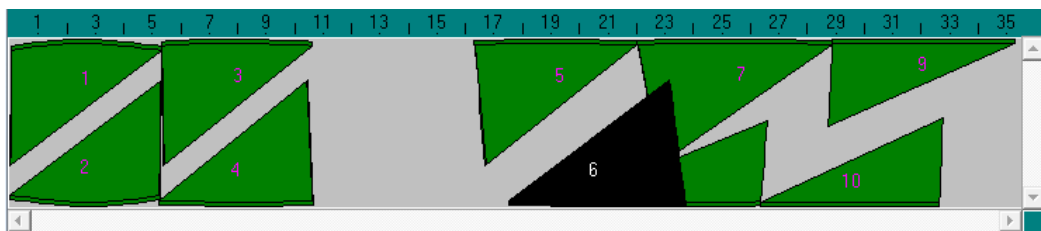


The following example is a nesting lay of panels that have been compacted using the compaction icon. However panel 6 has ended up in the wrong place.

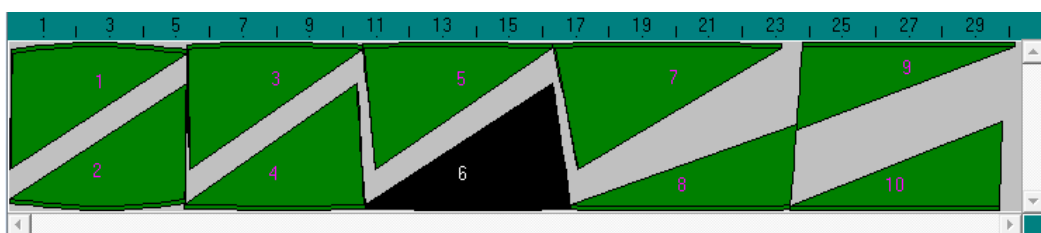


To solve this we need to move panel 6 until its left edge is to the right of the left edge of panel 5 but before the left edge of panel 8. (*alternatively we could have moved panel 5 so it is in front of panel 6*). It doesn't matter if panel 6 overlaps panel 8. The nesting software is only interested in each panel's left edge. If you want to see a vertical line showing the left most edge of a panel when you drag it, click the right button on the mouse rather than the left button when you drag the panel. Another useful feature of using the right button is that it makes sure the panel does not move vertically when you drag the mouse.

Note : if you want a panel to be hard up against the edge of the fabric, make sure you move the mouse toward that edge. The nesting software won't allow you to push the panel off the fabric.



Now click on the compaction icon :



Reset Compaction: Often you might arrange panels to have the correct left edge before clicking the compaction icon. However after the compaction the order may change. This would indicate that if you click the compaction icon again it would then give a different result.

To prevent this happening, the software remembers the order of the panels before its first compaction and uses that order each time you compact. If however you later drag a panel it will recalculate that panels order based on its new left edge.

However because the software is using this combination of original panel positions and new panel positions to determine the order in which panels are compacted it can start to behave unpredictably if panels are repeatedly shifted and then compacted. To solve this problem, periodically select **Reset Compact** from the **Nest** menu.

Compaction : method 2

Panels may also be compacted individually. While holding down the Ctrl key on the keyboard, click in and drag the panel you wish to compact. As usual a dotted outline of the panel is drawn as you drag. However when the panel intersects another panel, the dotted outline attaches itself to that panel and does not move until you have moved away. If you release the mouse, the panel will stay in that position hard up against the other panel. Panels can be compacted in any direction with this method. e.g. Useful for compacting rectangles vertically.

Compaction : method 3

Panels may also be moved and compacted using the arrow keys on the keyboard. Hold down the Ctrl key and click any of the four arrow keys to move a highlighted panel in that direction. The panel will stop moving when it hits another panel.

Adding panels

When you select **Open** from the **File** menu, the current panels on the Nesting Window are replaced with the panels from the file you are opening. If instead you select **Add** from the **File** menu the panels in the file you are opening will be added to the end of the current panels on the Nesting Window. These files will be highlighted and hence if you wish can easily be renamed with a letter next to their number by clicking on the **T** icon.

Multiple files can be selected in the Open or Add dialogues by holding down the shift or Ctrl key on the keyboard while you click on the file. This is a quick way to add several files to the nesting screen.

Copy to.

Sometimes you want to save a copy of the nested panels to a different place (for example a memory stick to take to another computer). You could use **Save As.** from the **File** menu but you will have to change the directory each time you do this between this new directory and the directory you normally save your files. Also after saving, the software will think any changes have been saved and will not prompt you to save the file to its normal place later.


To get around these problems use **Copy to.** from the **File** menu.

Separating Colours

To separate panels of different colours (fabric) into separate files :

(i) Click on one panel of a given colour to make the following icon that colour.

(ii) Then click on this icon  to highlight all panels of this colour.

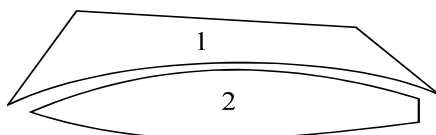
(iii) Then click on this icon  to save all those highlighted panels into a file.

Enter a suitable file name. If a message comes up telling you that the file already exists and asks you if you want to overwrite it, either say **Yes** and overwrite it or say **No** and then use a different name.

Repeat the above process until there are only panels of one colour left on the Nesting Window. They can then be nested and plotted. To plot the panels we previously saved, select **Open** from the **File** menu and open one of those files, nest and plot. Continue until all panels have been plotted.

Group/Ungroup

Sometimes it is useful to link panels together so they act as though they are one panel on the Nesting window. i.e. So they compact, flip, rotate etc as one panel. For example, if the following two panels are grouped together they will not be separated after clicking the compaction icon (which otherwise they would have been) :

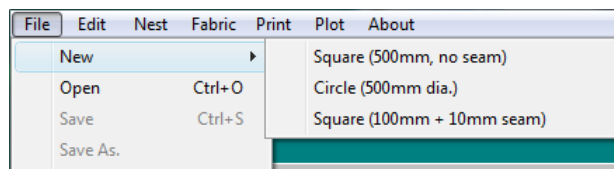


To group panels together, highlight the desired panels and select **Group** from the **Nest** menu.

To ungroup panels, click on any one of the panels in the group and select **Ungroup** from the **Nest** menu.

New Panel

Selecting **New** from the **File** menu to replace the current nesting panels with one of the following :



Square (500mm, no seam)

is a simple 500mm x 500mm square panel. This is quite useful as a starting point for creating a new panel.

Circle (500mm dia.)

is a simple circle with a 500mm diameter.

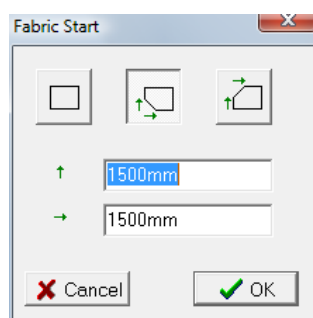
Square (100mm+10mm seam)

is a 100mm x 100mm square with a 10mm seam all the way around it. This is often used with plotter/cutters to test the distance between the pen and the knife. See the Calibration chapter.

Fabric Start



Displays the following dialogue allowing you to define the starting edge of the fabric for fabric that has been cut at an angle. After selecting **OK** to this dialogue, select the compaction icon to re-compact the panels to the new starting edge of the fabric.

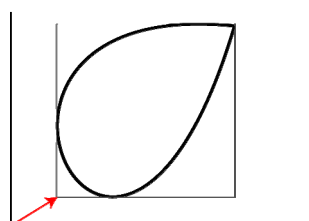
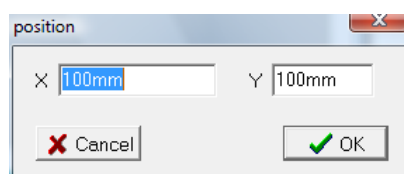


This icon will restore the fabric to a rectangular edge.

Panel Origin

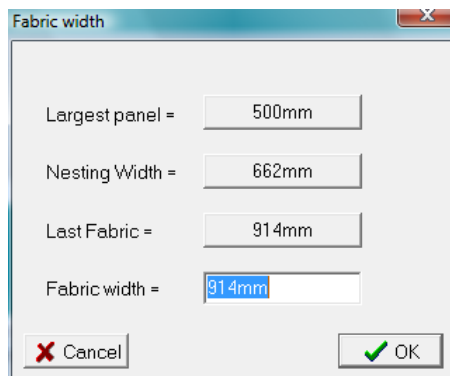


Displays the following dialogue for specifying the lower left coordinates for an imaginary rectangle enclosing the panel.



Fabric Width

Select **Width** from the **Fabric** menu :

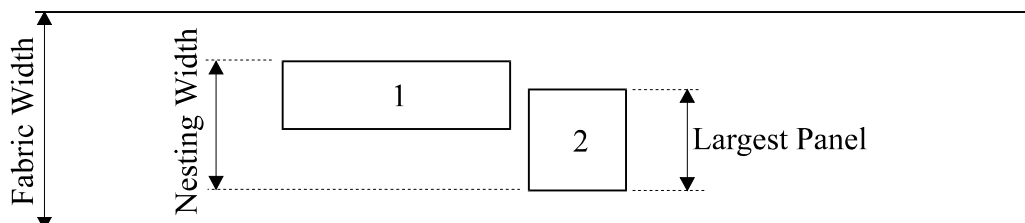


Enter the fabric width the panels are to be nested on. Alternatively, you can click the mouse on any of the following three buttons to use that width :

Largest panel : The width of the largest panel in the file. Hence this is the minimum possible **Fabric width** that can be used. Clicking in this button will place this value in the **Fabric width**.

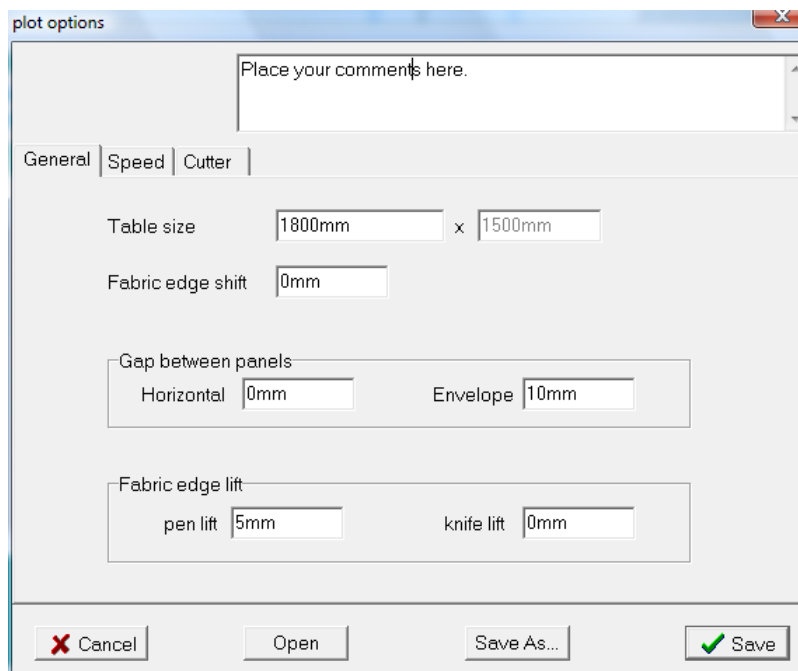
Nesting Width : The width of the nested panels. A **Fabric width** less than this will necessarily shift the panels vertically to keep them on the fabric.

Last Fabric : The last **Fabric width** the panels were saved on.



General

Select the **General** tab from **Plot Options** from the **Fabric** menu :



Comments

The large edit field at the top of the window is useful for saving any comments regarding the particular fabric.

Table size

The maximum plottable length on the table. Usually set at 100%.

Gap between panels When using the compaction icon (see Nesting chapter) panels are pushed close together. How close together is specified by **Gap between panels**. A value of at least 10mm is recommended if using a cutter. Anything smaller and than this and the resulting strip probably won't be held down hard enough by the vacuum. There are two methods of specifying this gap : **Horizontal** or **Envelope**.

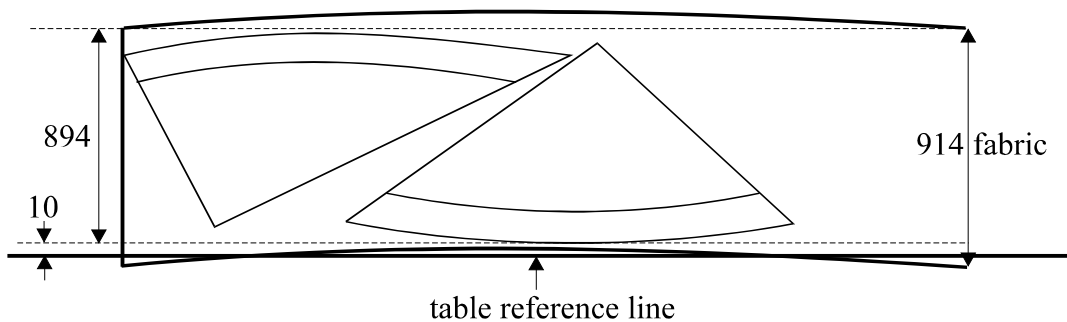
(i) If a **Horizontal** value is specified this value is the gap between the panels measured horizontally on the screen (i.e. parallel with the fabric).

(ii) If an **Envelope** value is specified (most common), the gap between the panels is measured at 90 degrees all the way around the panel. The **Envelope** method is usually the best method since it produces an even gap all the way around the panels. This is particularly important when using a plotter/cutter where you don't want the blade to come too close to another panel. The **Horizontal** method will produce a much smaller gap between radial panels due to the angle of the panel sides to the horizontal. Please note that to enforce either method you need to re-compact the panels. A **Horizontal** and **Envelope** value may be specified together if a combination is desired. Otherwise, usually one is specified and the other is zero. Note : If the Cntrl Compaction facility is used, only the **Envelope** method is considered.

Since the straightness and width of fabrics vary over their length, it may be necessary to take measures to allow for this and also to prevent the pen from catching on the edge of the fabric.

Method 1

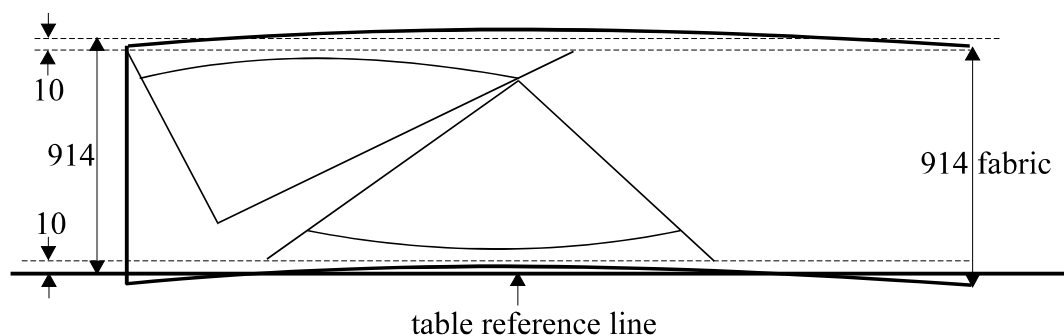
Tell the nesting software that the fabric is smaller than it actually is. For example you may be using fabric that is 914mm wide but you tell the nesting software that the fabric is really 894mm wide by specifying 894mm in the **Fabric Width** dialogue. Hence we are wasting 10mm of fabric each side. The fabric should be laid so the edge of the fabric averages the reference line marked on the table (some inside and some outside the line). We then need to tell the software to shift its plotting 10mm (50% of 20mm) in from that reference line. This is done by setting **Fabric edge shift** in **Plot Options** to 10mm :



The dotted lines relate to the boundary of the Nesting Window on the computer screen.

Method 2

The second method is to tell the nesting software the fabric width is the actual width of the fabric but also tell the plotter not to plot or cut when it gets to within say 10mm from the edge of the fabric. This is done by specifying 914mm in the **Fabric Width** dialogue and specifying 10mm for **pen lift** and **knife lift** in the **Plot Options** dialogue :

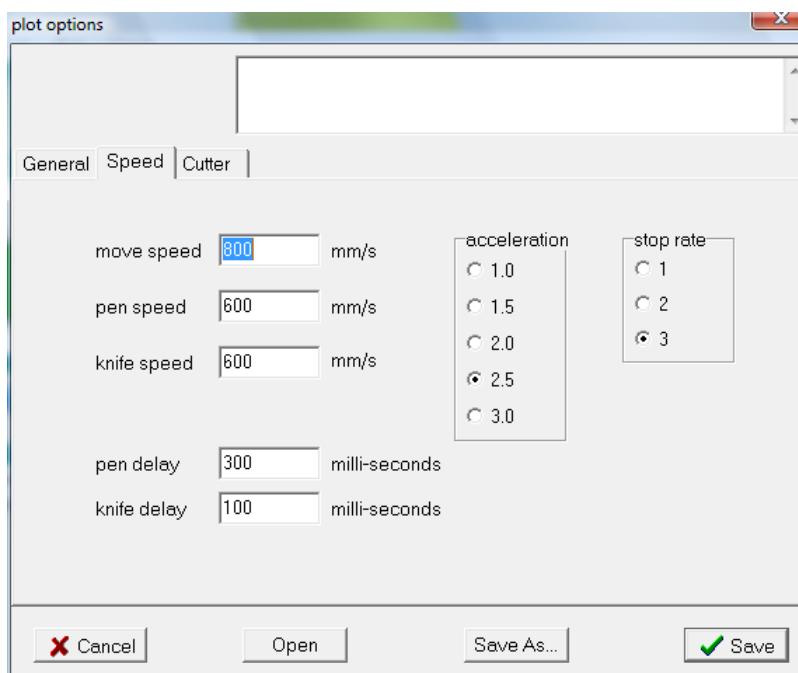


This method does not waste material and since the lines it does not draw are usually only seam lines it is not so important to plot them. One exception to this rule is for panels that come from a cross-cut sail. In this case the straight edge of each panel will only be approximated by the curved edge of the fabric.

The **Fabric edge shift** method is of course the more accurate method and is recommended if you have a cutter since all the cutting is then done for you. Despite the inaccuracies of the **pen lift** method it is still popular with Sailmakers especially for cross-cut sails. Note that when using one method, the other value is usually zero. e.g. **Fabric edge shift** of 10mm and **pen lift** of 0.

Speed

Select the **Speed** tab in **Plot Options** from the **Fabric** menu :



move speed Speed the plotter will move when the pen and knife are up.

pen speed Speed when the pen is down. Pen speeds depend upon the fabric being used and the type of pen. For example for Kevlar you will probably need to reduce the **pen speed** to prevent the pen from jumping as it goes over the fabric.

knife speed Speed when the knife is down.

pen delay Time in milliseconds the plotter waits for the pen to go up or down after giving it the signal to go up or down. If for example the pen is taking too long to come down, the plotter may start moving before the pen has come down or may continue plotting for a short time before the pen has come up. Hence to allow more time for the pen to go up or down, specify a larger **pen delay**.

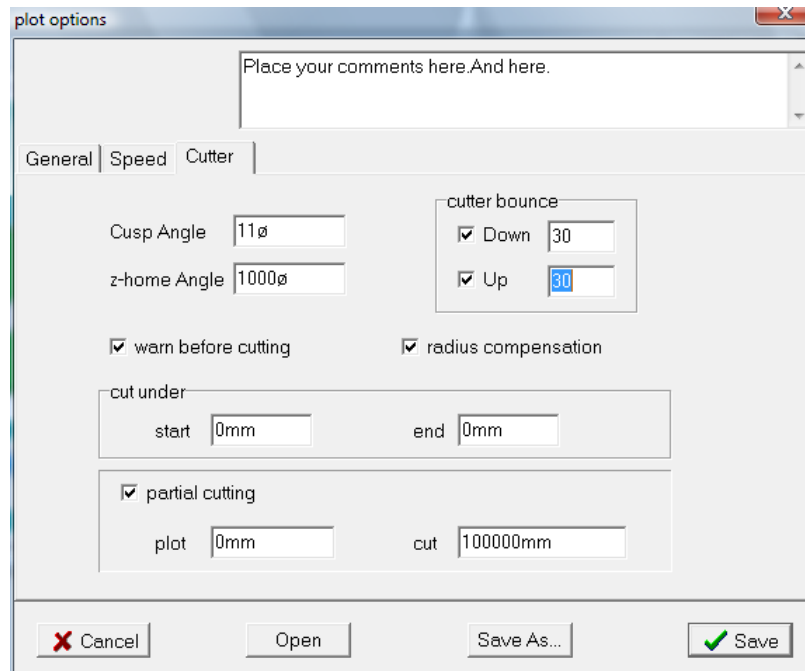
knife delay Similar to pen delay but for the knife.

acceleration Defines how quickly the plotter gets up to speed. 3 is the highest acceleration, 1 is the lowest. It is not recommended that both speed and acceleration are both set to their highest level. Doing so risks the possibility of the plotter stalling.

stop rate Defines how quickly the ProSail plotter/cutter comes to a stop after pressing the stop button. 3 is the quickest stop.

Cutter

Select the **Cutter** tab in **Plot Options** from the **Fabric** menu :

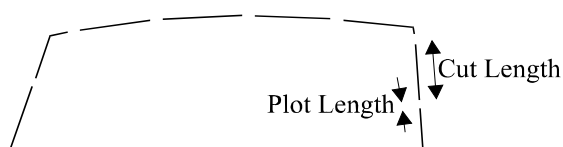


Cusp Angle Largest angle that can be cut by the cutter without having to lift the head. If an angle on a panel is greater than this, the knife will be lifted, rotated and lowered again. If **Cusp Angle** is set too high, the cutter blade may break. If it is set to low the cutting head may have to go up and down many times while cutting some curves.

z-home Angle Cumulative angle of rotation that the cutter z-axis will rotate before it will automatically does a z-axis homing cycle. That is to say after the cutter head has rotated by this amount it will check its position to make sure it is in the correct direction. The smaller this angle the more often the cutter head does this check. For a cutter mkIII, this can be kept very large. For a cutter mkI or II it should typically be about 1000.

cutter bounce Used by the ProSail plotter/cutter to reduce how hard the cutter head comes down and hence increase the life of the plastic table surface. If **cutter bounce** is ticked and a non-zero value is entered, the cutter head will not come down so hard. The more you increase the value, the softer the head will come down. However, over a certain value, the head will come down hard and then go up again and then down again. (*The method used by **cutter bounce** is to send the signal for the head to go down, then after a delay equal to the cutter bounce value you have entered, a head up signal is given which slows the downward movement. This is then following after another delay by the down signal again to continue the downward movement*). The optimal value will vary from machine to machine but around 30 seems to produce a soft movement for most machines.

- warn before cutting** Plotter/cutters first do plotting and then cutting. If **warn before cutting** is ticked, a message will be displayed before cutting asking you if you want to start cutting.
- radius compensation** When cutting circles or part circles the pizza-wheel blade tends to be steered outward by the plastic table surface. Ticking **radius compensation** will try to adjust for this by over steering the blade inwards slightly. This is only an improvement, it does not solve the problem which of course is a physical limitation relating to the length of blade that is cutting into the plastic.
- cut under** If using a plotter/cutter with a rotary blade, it will over cut the start and finish of lines because of the length of the blade in the plastic. If needed this can be reduced by entering a value for **start** and **end**. e.g. If you find the cutter over cuts by 5mm at the start of a line and 4mm at the end of a line, you might try entering 4mm for **start** and 3mm for **end**.
- partial cutting** This is very rarely used. If **plot** is non-zero, the external cut lines of the panels will be cut in sections. The length of each section will be equal to **cut** and the gap between each section will be equal to **plot**. This is useful for example if you want to roll up the panels after cutting and send them to another company.



Fabric Files

The **Fabric** menu contains all the information regarding the fabric being used, namely the information in the **Plot Options** and **Width** dialogues. Although this information can be saved in different files many people often just use the one default file called "Untitled.pst".

If you want to save different files with different fabric information in them e.g. different Speeds or Pen Lifts for different fabrics, use the **Save As** button in the **Plot Options** window to save the current fabric in a different file. Then when you want to open a particular fabric select **Open** in the **Plot Options** window.

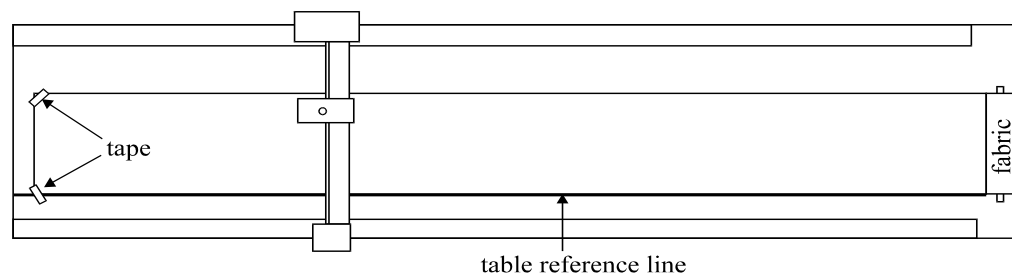
Plotting

Lay the fabric out and tape it to the table. Masking tape is good for this. Usually it is sufficient just to tape the cloth at the start of the table. If using a cutter some people prefer to tape the entire side of the cloth to prevent air escape from the vacuum. Use the reference line on the table nearest you to lay the fabric to.

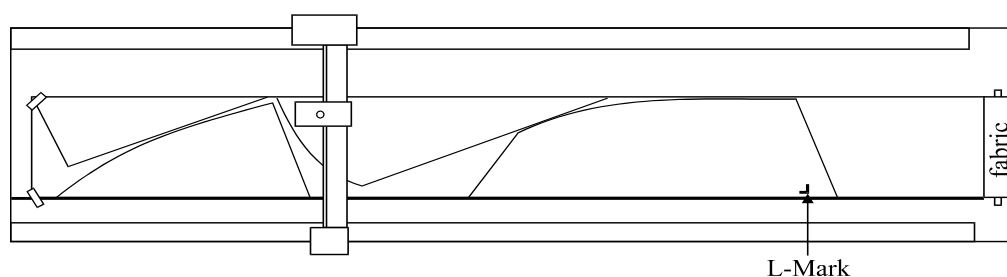
Cloth Bow : Because most fabric has a bow in it, it is recommended that you try to average the cloth edge on the line so at some places the cloth edge is inside the reference line and at others it is outside.

Cloth Curl : If using a cutter with fabric that has a tendency to curl, it is recommended that the roll of fabric is turned upside down to prevent the edges from curling up and possibly catching on the cutter.

Vacuum : If using a vacuum table it is important to cover the remainder of the table that is not being used. Any holes that are left uncovered will dramatically reduce the power of the vacuum.



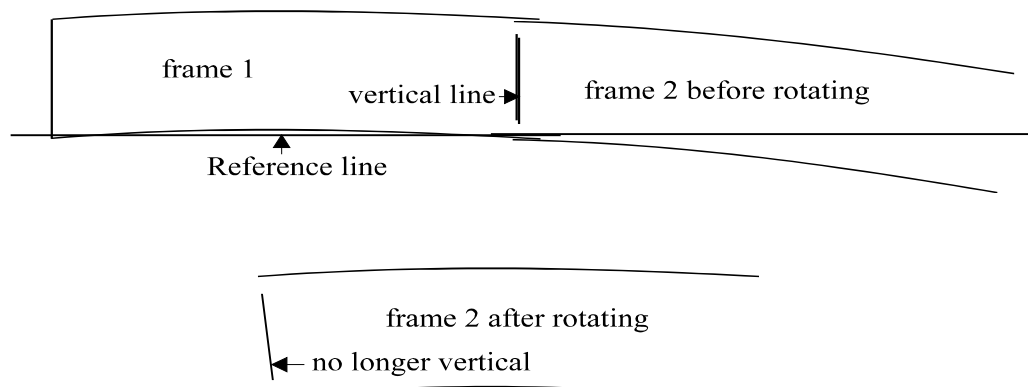
After telling the plotter to plot, the plotter will plot the first table lay (frame). If there is more than one frame the plotter will draw an **L-Mark** down the end of the table and a dialogue will appear on the screen asking you if you want to "continue next frame?".



Pull the fabric down the table until the **L-Mark** drawn on the fabric lines up with the start line on the table. The corner of the **L-Mark** needs to be a specified distance up from the table reference line. This distance (typically 10mm) is specified by **L-Mark** in the **Hardware** dialogue from **Setup** from the **Plot** menu. A pin through the fabric to lineup with a preset **L-Mark** hole on the table is a convenient way to do this.

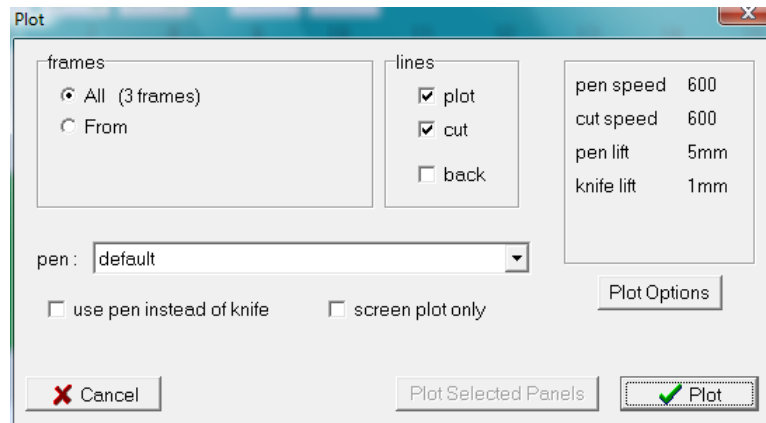
It is quite acceptable to push the plotter by hand if you find it is in the way. Tape the cloth down again and when ready select **Yes** to the dialogue to continue the next frame. The plotter will now plot the next frame.

Although **Edge-Shift** and **Pen Lift** explained in the chapter titled "Fabric" can largely adjust for fabric bow, there still exists a problem when lining the fabric up for the next frame. Namely a line drawn directly across the table down the end of the table will no longer be directly across the table when the fabric has been pulled to the front of the table. This is because by pulling the fabric along the table and lining it up to the reference line on the table again, you in effect need to rotate the fabric slightly to keep it on the reference line.



However, this effect is not so important if **Plot complete panels only** is ticked in **Preferences** from the **Plot** menu.

Select **Plot** from the **Plot** menu :



To plot all the panels for all frames (tables) make sure the **All** radio button is selected and click the **Plot** button.

If you only want to plot some of the frames click the **From** radio button and enter the frame number for the first frame and the frame number for the last frame you want plotted. They can be the same number. The distances to the right give the position along the cloth that plotting will start and end. You can compare these with the ruler drawn on the Nesting Screen. Then click the **Plot** button.

Plot Selected Panels This is an alternative to the **Plot** button. It will only plot the panels that are selected (black) on the nesting screen.

lines This determines which type of panel lines are sent to your machine. If **cut** is ticked, all lines that are defined as cut lines (for example all external lines in a panel are cut lines by default) will be sent to your machine. This is unrelated to whether your machine is a plotter or a plotter/cutter. For example if you have a plotter (not a cutter) and want the external panel lines to be plotted, you need to make sure **cut** is ticked.

Normally both plot and cut are ticked but sometimes you may want to redo just the plotting or just the cutting and so only one would be ticked.

Tick **plot** if you want panel plot lines (most internal panel lines are probably plot lines) to be sent to your machine.

Back is a special case and is described on the next page. Normally it is not ticked.

screen plot only If ticked, selecting **Plot** or **Plot Selected Panels** will only plot the panels on the screen. It will not send the information to your machine. This can serve as a useful check and is often used.

use pen instead of knife If ticked, any lines that will normally be cut will instead be plotted. This is useful if for example there is a problem with the cutting mechanism on the cutter.

Plot Options Displays the Plot Options window for changing speeds etc (see the Fabric chapter).

Plotting on both sides

On rare occasions you may want to plot on both sides of the fabric. To do this you must first tell PanelMaker which lines/text are on the back of a panel. This is done in the shaping window by selecting a line/text and selecting **plot back** in the popup menu. See chapter titled "Shaping : Panel Mode".

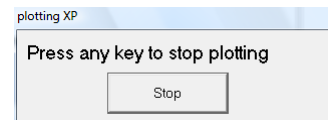


First we plot the back lines/text by turning the fabric over and rather than placing the fabric on the usual reference line on the table, place it on the reference line on the other side of the table (i.e. the line indicating the maximum plotting width). Select **Plot** from the **Plot** menu and tick **back**. It doesn't matter if **plot** and **cut** are ticked. Then click the **Plot** button. The plotter will now plot only those lines marked as **plot back**. When the plotter has finished, turn the fabric over and place against the normal reference line. Select **Plot** from the **Plot** menu again. You will notice that **back** is no longer ticked. Make sure **plot** and **cut** are ticked and then click the **Plot** button to plot and cut out the panels.

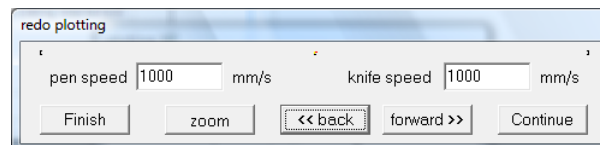
Stopping

If the plotter has a stop button, press the stop button to quickly stop the plotter.

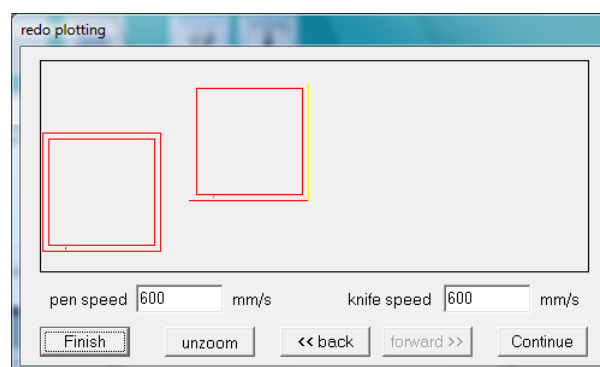
If using a ProSail plotter or cutter you can also stop them by either clicking the mouse on the Stop button on the screen or pressing any key on the keyboard.



When it has stopped, a message will be displayed on the screen asking you if you wish to continue plotting. If you select **Yes**, the following window will appear :



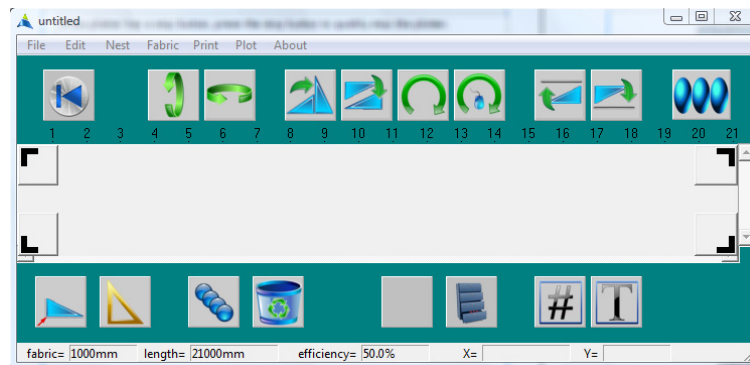
Clicking the **<<back** button will scroll back through the lines that have been plotted. As you scroll, the desired line is highlighted on the nesting screen. To see its location better click on the **zoom** button to see the following :



Click **Continue** to continue plotting from the highlighted line. You can also change speeds at this time if you wish.

Move To

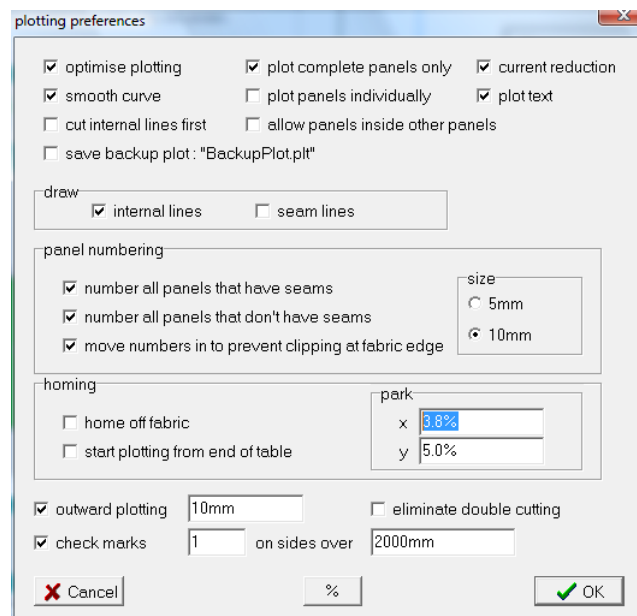
Select **Move To** from the **Plot** menu. This is an alternative to pushing the machine by hand. There are four buttons identifying the corners of the table. Clicking one of them will make the machine move to that corner. Pressing the Esc key on the keyboard will cancel.



Accuracy

At the end of plotting a frame, the ProSail plotters and cutters test to see that they have come back to the exact position they are supposed to. If they have not, a message will be displayed stating the accuracy giving figures for X, Y (and Z if applicable). On rare occasions this may occur as a result of resonance that can not be avoided. More commonly it will occur if the plotter is bumped or has caught the fabric or hit something on the table. If the inaccuracy keeps occurring then there is a problem and you should contact Armstrong-White Automation (NZ) Ltd telling them exactly what numbers were displayed for each of X, Y and Z. Also select **Bug Report** from the **About** menu. This will create a file called "bugger.dat" that can be e-mailed to us.

Select **Preferences** from the **Plot** menu :



optimise plotting

After plotting or cutting a curve, the plotter will move to the next nearest curve to plot or cut. If not ticked the plotter may choose a curve that is a long way from where it currently is. Hence **optimise plotting** is usually ticked.

plot complete panels only see next page.

current reduction

Used only on the ProSail plotter MkII. It reduces the current to the motors when they are moving at slow speed to reduced any resonance. It is usually turned on.

smooth curves

see later.

plot panels Individually

If ticked, the plotter will totally plot and cut each panel before it moves on to the next panel. This might cause problems with the pen catching if using a cutter and the cloth curls up after cutting. If not ticked, a plotter/cutter would first plot all panels, then cut all panels.

plot text

If ticked, the plotter will mark any text that has been created using the text shaping facilities described in the chapter titled "Shaping : Panel Mode".

cut internal lines first

If ticked, the plotter will cut any internal cut lines before it cuts the boundary of the panel.

allow panels inside other panels

If ticked, the software will not prevent you from plotting if one panel is totally inside another. Normally you would want to be warned of this.

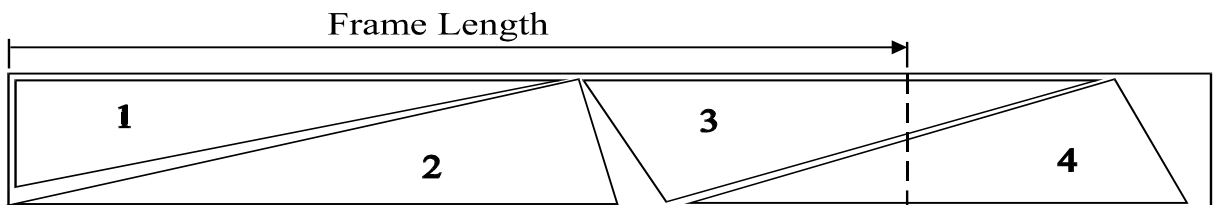
save backup plot : "BackupPlot.plt"

If ticked, the software will automatically save a copy of the current nesting panels before plotting. It will be saved as BackupPlot.plt and can be opened as a normal nesting file later if for example something goes wrong while plotting.

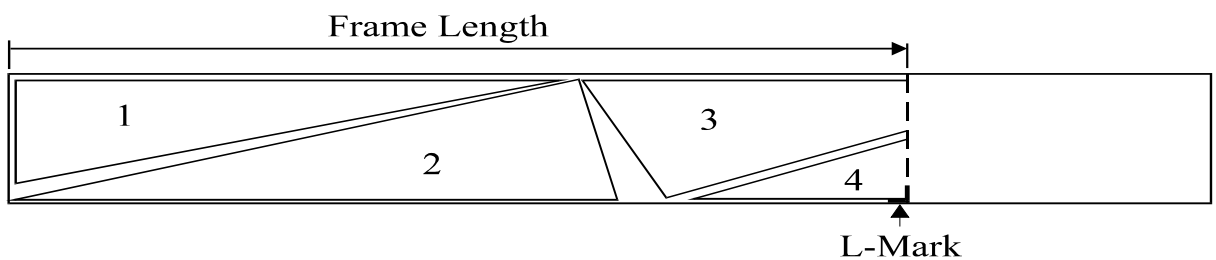
Plotting

Plot complete panels only If ticked, the plotter will only plot a panel if it completely fits within the current table lay.

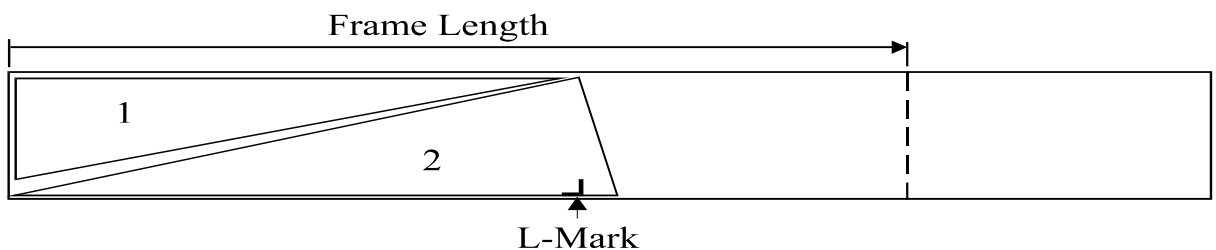
Consider plotting the following panels that do not fit totally inside the table :



If **Plot complete panels only** is not ticked, only panels 1 and 2 will be completely plotted with panels 3 and 4 only partially plotted. An **L-Mark** will draw drawn at the end of the table which will be the start of the next table lay. With this method, you will need to be very careful in lining up between table lays :



If **Plot complete panels only** is ticked (most common method), only panels 1 and 2 will be plotted. An **L-Mark** will be drawn to mark the start of the next table lay. This method is more accurate since you do not need to be so careful lining up the lines between table lays. However there may be more table lays required :



In the special case of a panel being longer than the table size, the panel will automatically be split regardless of whether **Plot complete panels only** is ticked or not.

smooth curves Sometimes curves on panels may not be as smooth as they should be and are made up from a relatively small number of flats. This is often the case when reading panels from other CAD programs using HPGL or DXF. If **smooth curves** is ticked PanelMaker will smooth these curves out by adding extra points on the curve. If you want the curve to be plotted as a set of flats, then turn **smooth curves** off.

Draw :

- internal lines** If ticked, the plotter will plot (or cut) all internal lines inside the panel. Seam allowances are not considered internal lines.
- seam lines** If ticked, the plotter will plot all seam allowances.

Panel numbering :

The following 4 items determine how the panel numbers are plotted on the panels. If you don't want the numbers plotted turn off all 3 check boxes :

number panels that have seams

If ticked, the plotter will draw panel numbers on all panels that have a seam and they will be drawn inside the seam.

number all panels that don't have seams

If ticked, the plotter will draw panel numbers on all panels that do not have a seam.

move numbers in to prevent clipping at fabric edge

If ticked, numbers will be moved in from the edge of the panel if needed to prevent pen lift (see the "Plot Options" dialogue) from clipping them.

size

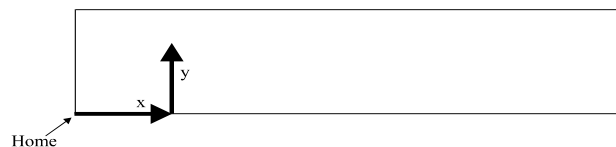
The size in mm of the panel numbers.

homing :

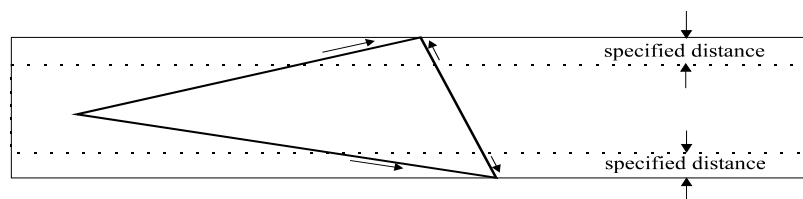
home off fabric If ticked, the plotter will first move to the far side of the table width before homing. The idea is to keep the pen off the fabric during homing down the length of the fabric. This can be useful if the fabric has a tendency of curling up.

start plotting from end of table Not commonly used, but if ticked, the plotter will first go to the end of the table and start plotting from that end first. For this to work you must also have **optimise plotting** ticked.

park After plotting a table lay the plotter will come to a stop. The position it stops at is specified by **park**. **X** is the distance down the table from Home. **y** is the distance across the table. Often people specify a large **y** so the pen and knife is away from the fabric when the fabric is being pulled down between table lays.

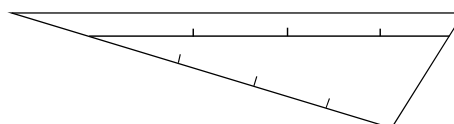


Outward plotting If ticked, the plotter will always make sure the pen and knife are moving outward toward the edge of the fabric for lines that are within the specified distance from either edge of the fabric. This prevents the edge of the fabric from possibly being pulled in by the pen or knife. However it does take the plotter longer since it needs to do extra moves so its plotting/cutting can be in this direction.



eliminate double cutting If ticked, horizontal and vertical lines on adjacent panels that touch will be cut only once. Useful if rectangles are nested close together. Note : This does not apply to angled lines or curves.

check marks If ticked, the plotter will draw the specified number of evenly spaced check marks on all panel sides that are over the specified length. These can be used as an aid in sticking panels together :



Shaping : Panel Mode

Select **Shaping** from the **Edit** menu or double click on a panel on the Nesting Window to display the Shaping window. This window has three modes depending upon which of the following three icons is selected :

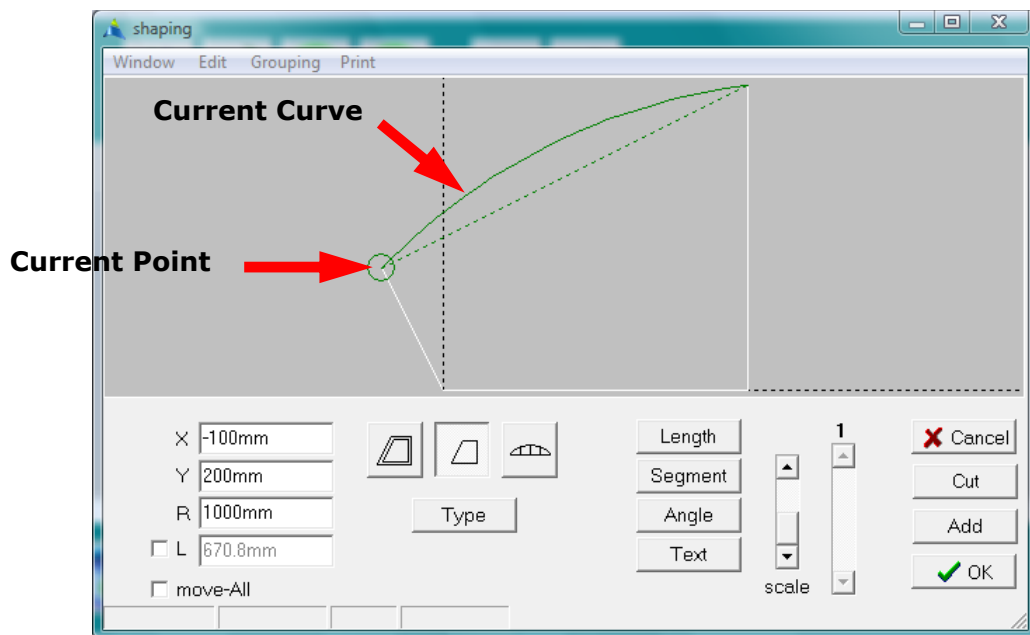


Panel Mode

Shows the panel sides and any internal curves for the current panel.

The **X** and **Y** coordinate displayed corresponds to the "Current Point" which is encircled. To select another point click the mouse near it. These points are always in global coordinates.

The curve which is green corresponds to the "Current Curve". To make a different curve the Current Curve click the mouse near it.



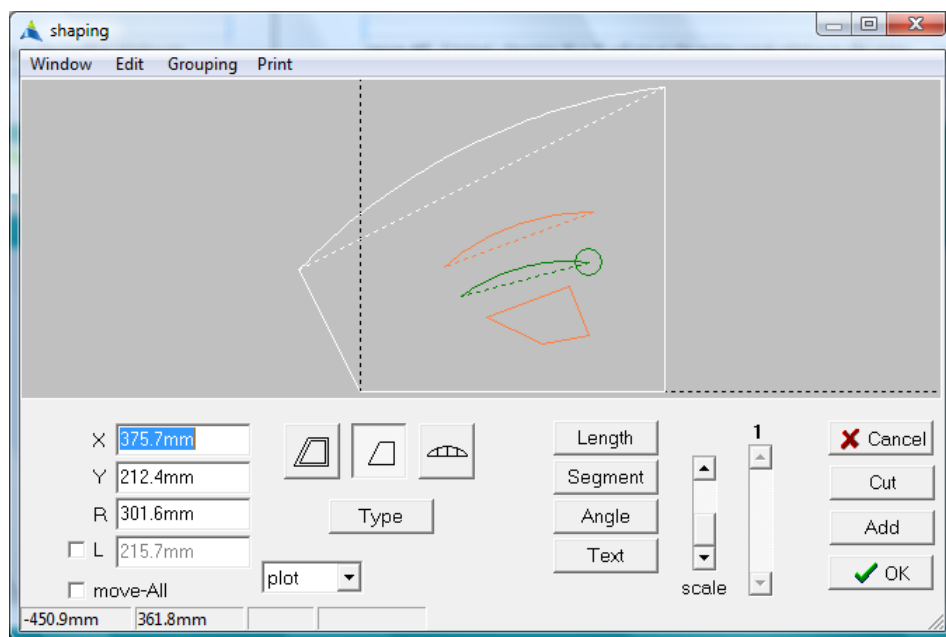
X, Y : There are two ways to change the **X** or **Y** value of the Current Point :

- (i) Type in a new **X** or **Y** value using the keyboard. Then hit either the Tab key or Enter key on the keyboard to recognise the change. The Enter key will keep you in the same field. The Tab key will take you to the next field. Before entering a value into a field you need to make sure that field is highlighted. If it isn't hit the Tab key on the keyboard until it is highlighted or double click in the field.
- (ii) While holding the Ctrl key down on the keyboard click the mouse as close as possible to the Current Point and with the mouse button still down drag the point to the desired location.

Shaping : Panel Mode

- R** If the Current Curve is an arc, a radius can be specified.
- L** Displays the straight line length between the ends of the Current Curve. If **L** is ticked, a new length can be entered here.
- move-All** If ticked, changing **X** or **Y** will move the entire panel relative to the origin. i.e. Rather than moving that point, the entire panel is moved so the Current Point is at that location. In the case of the Current Point being on an internal curve (rather than the panel itself), only the internal shape the Current Point is part of will move.


IMPORTANT : It is important to note that although the points can be placed at any location, they should not be changed to the extent that the panel folds over itself. Even though it may look correct on the screen the panel will have been inverted and will cause problems in PanelMaker. If you hold down the right arrow key on the keyboard, the Current Point should move around the panel in an anticlockwise direction.



You can select multiple internal curves by dragging a rectangle around them or holding down the shift key on the keyboard and clicking in them (in a similar way to selecting multiple panels on the nesting screen).

All operations : dragging, scaling, deleting, copying, rotating, duplicating, changing curve type or pen type will apply to all selected curves. In the picture above, the orange and green curves are all selected. Although there are several selected curves, there is still only one Current Curve and one Current Point which are green.

Shaping : Panel Mode

 Adds a new curve. After clicking **Add**, a horizontal and vertical line appears at the mouse location. Also the following dialogue is displayed showing the default curve type to be added. If this is not the type you want, click the mouse on the desired type before proceeding. If its already the desired type, there is no need to click on it.



Adds a cross. Click the mouse at the desired position on the panel.



Adds a circle. Click the mouse at the desired position on the panel.



Adds an internal curve. Click and release the mouse at the desired start of the curve and then click and release again at the desired end of the curve.

To add several internal curves that are connected (e.g. to make a window) : Hold down the Shift key on the keyboard before the first click of the mouse. Then with the Shift key still down, click the mouse at the desired locations. Before clicking the last point, release the Shift key.

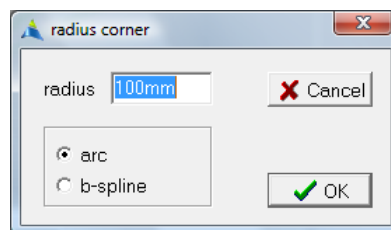
To produce a closed set of curves, the last point should be close to the first. All these internal curves can later be shaped in Curve Mode.



Adds another side to the panel or another side to an internal set of connected curves. Click the mouse near an end point of a curve to add another curve at that point.



Adds a radiused side to the panel. Click the mouse near an end point of a curve to display the following dialogue asking for a **radius** and a choice of either an **arc** or a **b-spline** :



If **arc** is selected, an arc of that **radius** will round off the corner. If **b-spline** is selected, a b-spline of approximately that **radius** will round off the corner. Unlike an arc a b-spline has the advantage of adjusting its shape so it remains tangential to the sides if their angle is later changed. However a b-spline is not a true arc and hence not perfectly circular.

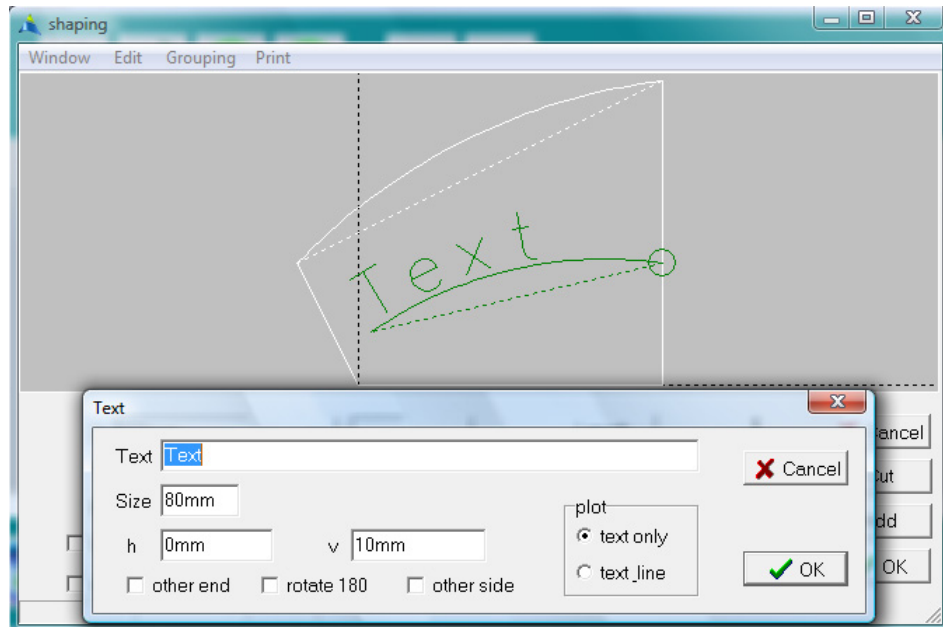


Adds an internal curve with text on it. This is the same as selecting a curve and then clicking the **Text** button (see next page).

Shaping : Panel Mode

Text

Displays the following dialogue for adding (or changing) text to the current curve. Hence to add text you must first have a curve. However optionally these curves do not need to be plotted.



- Text** desired text.
- Size** height of text.
- h** start distance along curve.
- v** distance out from curve.
- other end** if ticked, **h** is the end distance from the end of the curve (*rather than start distance*).
- rotate 180** rotate text by 180 degrees.
- other side** text is on the other side of the curve.

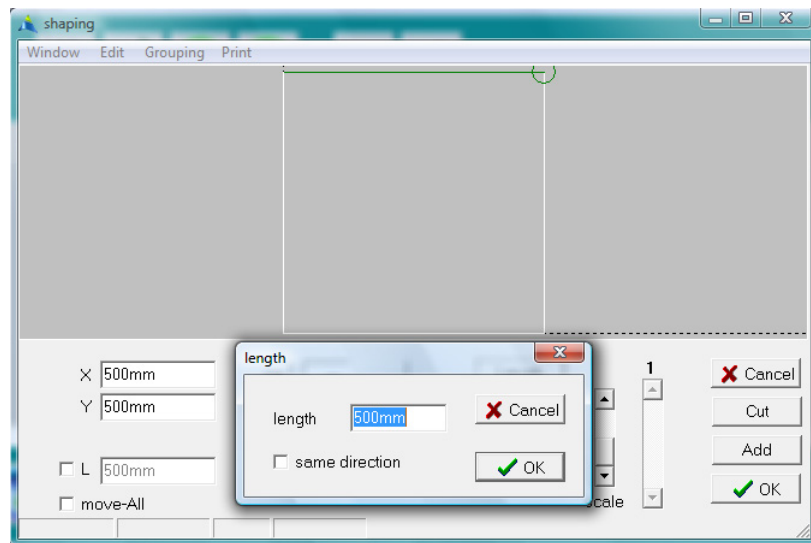
If **text only** is selected (most common) only the text will be plotted, the curve it is attached to will not be plotted even though it appears on the computer screen. If **Text & line** is selected both the text and the curve will be plotted.

The plotting of text can be turned on or off using the **plot text** check box in the **preferences** dialogue from the **Plot** menu.

Shaping : Panel Mode

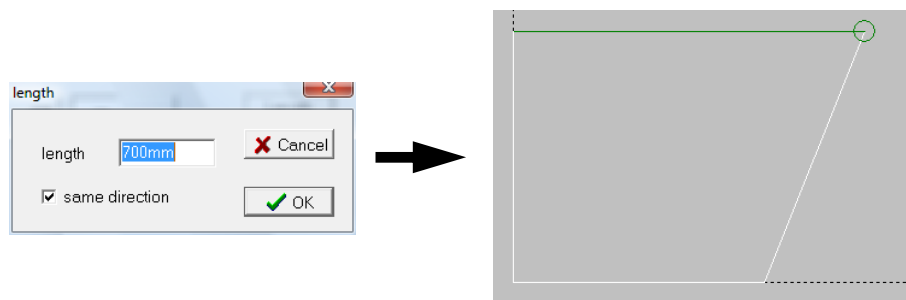
Length

Displays the following dialogue where the desired **length** of the Current Curve is specified :

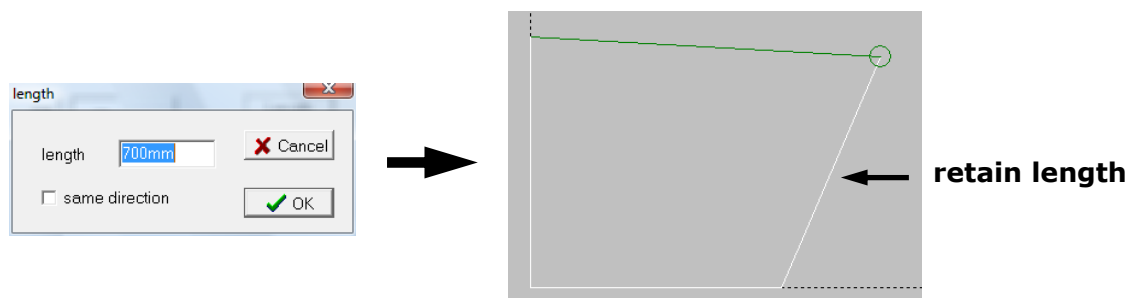


The Current Point is moved to the required location so the straight line distance between each end of the Current Curve is equal to **length**. The actual girth around the side (if the side has shape) can be seen in Curve Mode if required.

If **same direction** is not ticked, the Current Curve will remain parallel to its current direction :

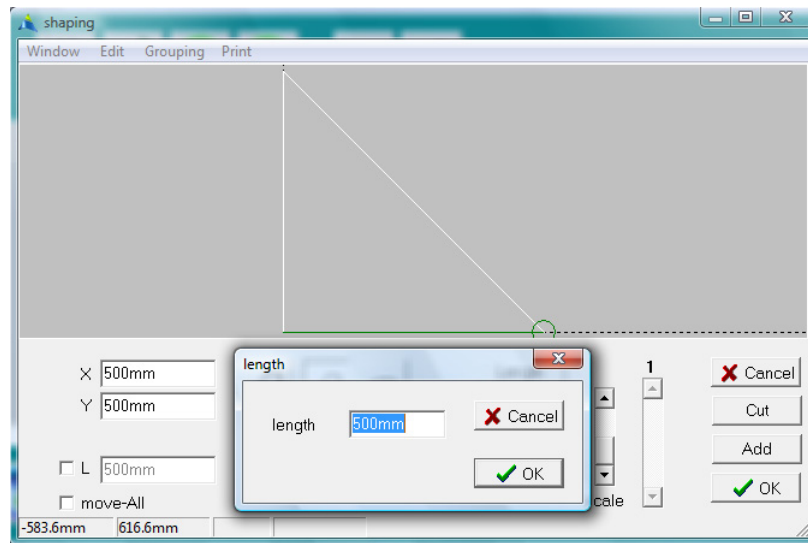


If **same direction** is not ticked, the angle of the Current Curve will change in order to preserve the length of the curve adjacent to the Current Point :



Shaping : Panel Mode

Select **New Panel** from the **Window** menu :

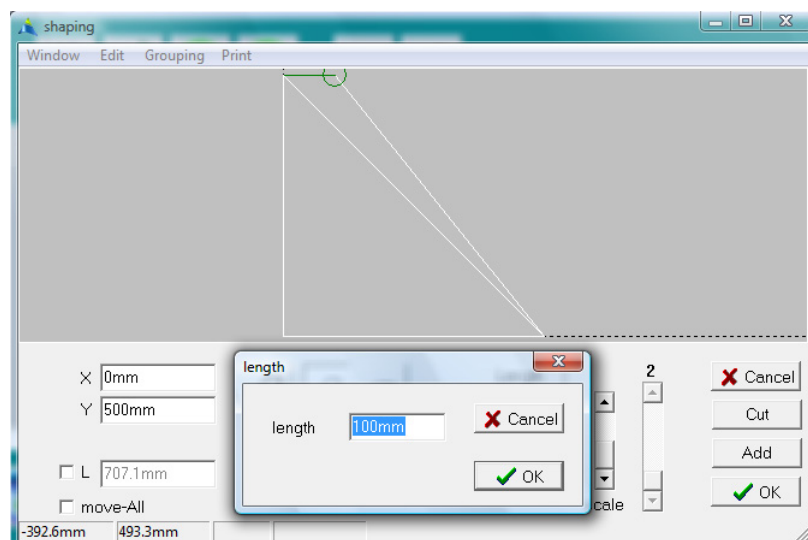


This will create a new panel (initially a triangle). PanelMaker will then prompt you for the length of the sides. After this it will optionally add more triangles to the shape. Using this method you can define the shape of any panel.

For example if you can measure the sides of a 4 sided panel and one diagonal measurement, the corners of the panel can be generated using this facility. Any shape on the sides can later be added in Curve Mode.

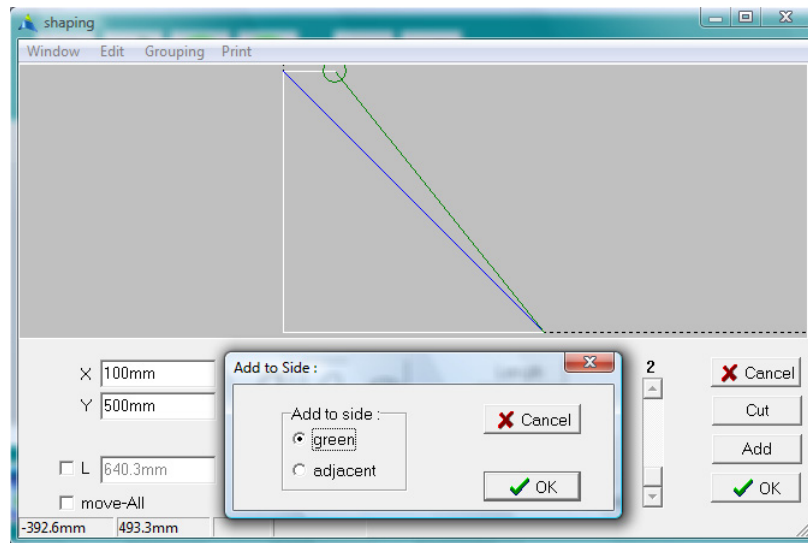
This facility can also be used to develop a 3D shape (such as a canopy on a boat) into a 2D flat panel by breaking it up into triangles and measuring their lengths.

After selecting **New Panel**, enter the desired **length** of the bottom side of the triangle and click **OK**. Next the same dialogue will appear for the vertical side of the triangle. Enter that length and click **OK**. Then the length for the diagonal will be requested. After that length has been entered PanelMaker will split the diagonal up into two sides asking for the length of each in turn :

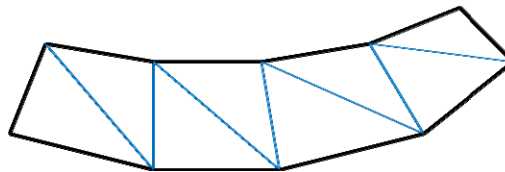


Shaping : Panel Mode

After the length of these two sides have been entered PanelMaker will display the following dialogue :

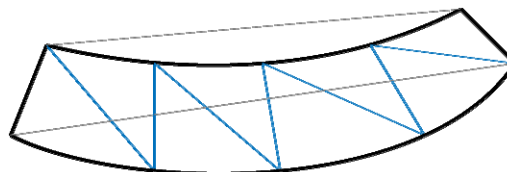


With this dialogue you specify which side of the encircled corner is split into another two sides. This process will continue until you select **Cancel** to the above dialogue. The resulting panel will look something like the following :



Note : the diagonals used to develop the panel are drawn in blue (**plot back** mode). This means they are visible but will not be drawn by the plotter.

The **Segment** button (see next page) can then be used to smooth the top and bottom curves of the panel. In summary you would click on the **Segment** button and then click **max. Increase All curves**. Then for the top and bottom curves click on the **Type** button and make them spline curves to make the panel smooth :

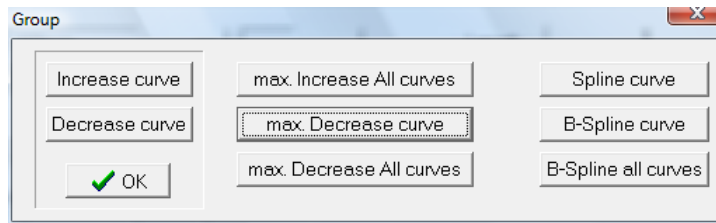


See also **Develop Panel** from the **Window** menu.

Shaping : Panel Mode

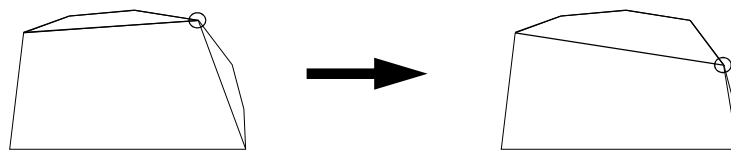
Segment

In PanelMaker, panels are made up of curves which in turn are made up of a set of Adjustment Points. **Segment** changes the distribution of these Adjustment Points into different curves. Clicking the **Segment** button displays the following dialogue :



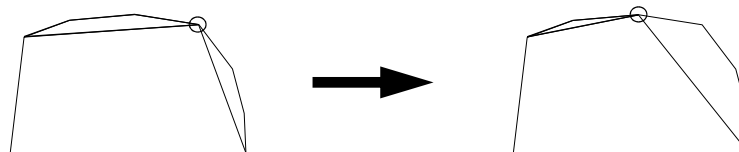
Increase curve

Each click of **Increase curve** will increase the Current Curve by taking the next Adjustment Point from the adjacent curve.



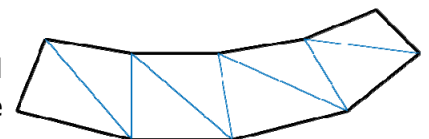
Decrease curve

Each click of **Decrease curve** will decrease the Current Curve by removing the current point from it.



The **Segment** facility can be combined with the **New Panel** facility (on the previous page) to create a panel using triangular lengths. For example the following panel could be generated using the **New Panel** facility where the top and bottom line segments are individual curves.

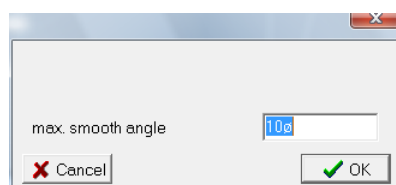
Then use the **Increase curve** button in the **Segment** dialogue to combine the points on the top as one curve and then click the **Spline curve** button to smooth it. The same can be done for the bottom.



However a quicker way would be to click the **max. Increase All curves** button.

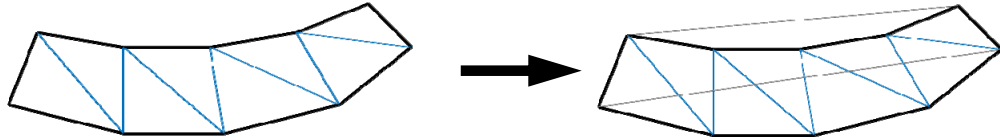
max. Increase All curves

Automate the Increase curve method for all curves based on a specified **max. smooth angle**.



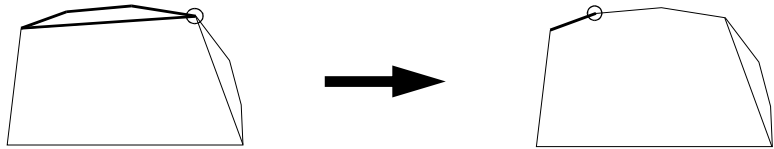
Shaping : Panel Mode

With **max. Increase All curves** PanelMaker looks at the angle between all adjacent lines. If this angle is less than **max. smooth angle** it will assume these two lines are part of a curve. Otherwise it will assume they are separate lines forming a corner. The trick is to specify a **max. smooth angle** that is large enough to combine the segments you want combined but small enough to not include the corners.



max. Decrease curve

Fully reduces the Current Curve into flat segments. This is the same as repetitively clicking the **Decrease curve** button.



max. Decrease All curves

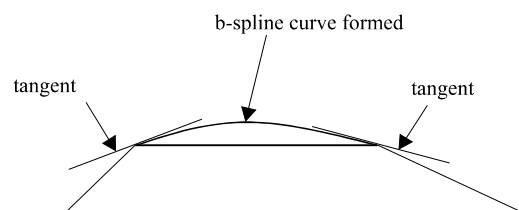
Fully reduces all curves to individual segments.

Spline curve

Turns the current curve into a spline curve. This is the same as clicking on the **Type** button and clicking on the spline icon.

B-Spline curve

This is not commonly used but can be useful in special situations. If a curve is simply a straight line (i.e. a point at each end) as it would be if **max. Decrease curve** was used, **B-Spline curve** will make the curve into a b-spline curve with an angle (tangent) at its ends. PanelMaker will choose the angle of these tangents based on the length of each adjacent side. The greater the length of the adjacent side, the closer the tangent will be to parallel with that adjacent side. If all three sides are the same length the tangents will equally bisect the corners.

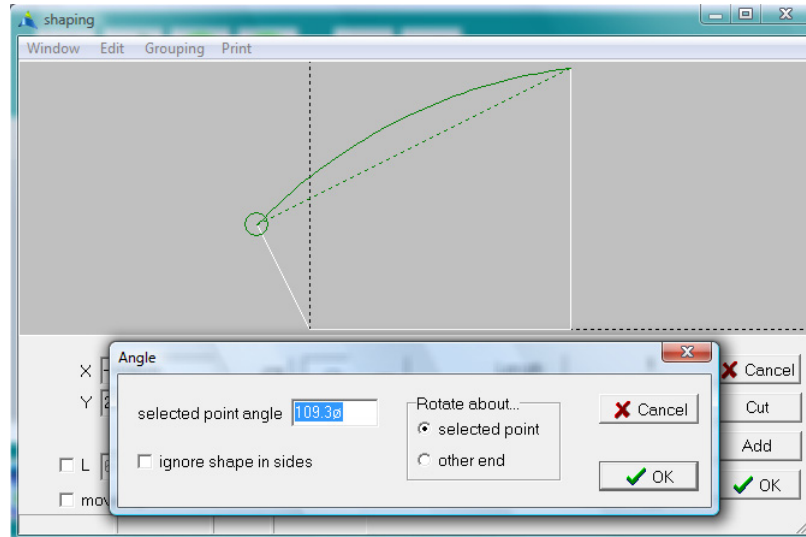


B-Spline all curves

Again not commonly used. Makes all the straight line curves in the panel into b-splines as above. This is useful for smoothing a panel. Curves other than straight line curves will remain the same.

Shaping : Panel Mode

Angle The angle of a corner can be specified. Highlight the desired point (you also need to consider which side of the point you want highlighted as this will be the side that is rotated). Then click on the **Angle** button to display the following :



The angle specified is the internal corner angle of the selected point. It includes the amount of shaping in the adjacent sides. However if you tick **ignore shape in sides** it will not include this shape in the angle.

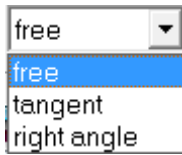
If **selected point** is ticked, the other end of the highlighted curve will move to achieve the specified corner angle at the selected point.

If **other end** is ticked the selected point itself is moved to achieve the specified corner angle at the selected point.

Variations :

- (i) If you have selected an internal curve and the selected point is not joined to any other curves, the angle specified is the angle to the horizontal.
- (ii) If rather than specifying a corner angle, you want to rotate the selected curves by a specified amount (or the entire panel), select **Rotate** from the **Window** menu.

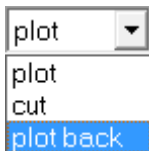
Slope continuity



Line segments and B-splines with one or more Adjustment Point can be made to be tangential to or at right-angles to its adjacent curve at the Current Point. Even if the panel shape is changed the curve will adjust to retain these angles.

- free** Current Curve will have no angle constraints at the Current Point (most common).
- tangent** Current Curve will be tangential (parallel) to its adjacent curve at the Current Point.
- right angle** Current Curve will be at right angles to its adjacent curve at the Current Point.

Plotting style



Defines the plotting style of the Current Curve

- plot** Current Curve will be plotted.
- cut** Current Curve will be cut rather than plotted.
- plot back** Current Curve will be marked as being on the opposite side of the panel. It will normally not be plotted or cut by selecting **Plot** from the **Plot** menu. To plot or cut it you need to tick the **back** check box in the **Plot** dialogue. See the chapter titled "Plotting" for more detail.

Another use for **plot back** is if you want to keep a record of a curve but don't want it plotted. You can later change its style to **plot** or **cut** if desired.

Type See "Shaping : Curve Mode" chapter.



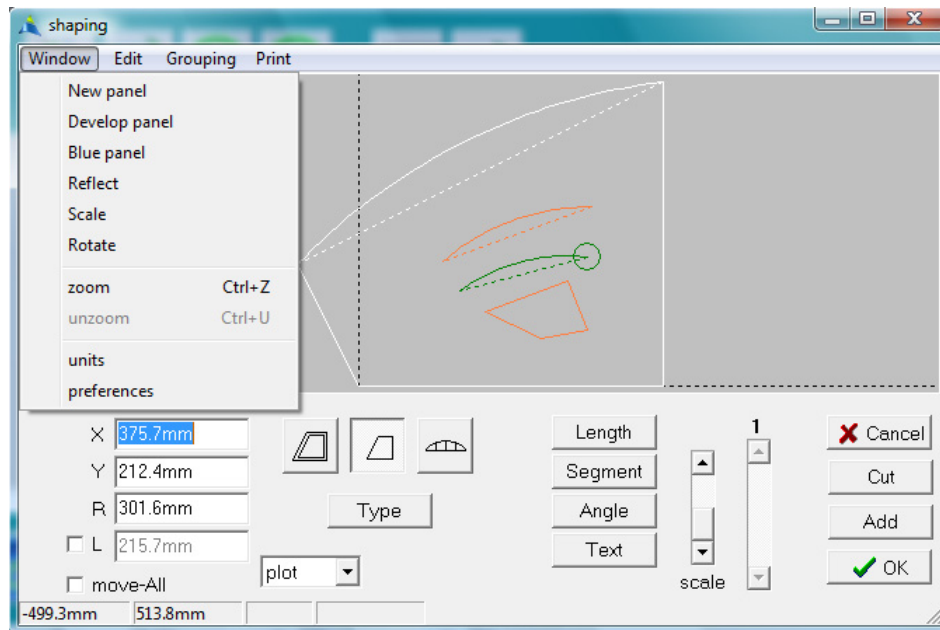
Loops through all the panels. The current panel's number is displayed above it. Other ways to loop through the panels is with the mouse wheel or using the Page Up or Page Down keys on the keyboard.

To enter the Shaping window at a desired panel double click on that panel in the Nesting Window or highlight the panel then select **Shaping** from the **Window** menu.



Visually scales the curves for clarity of viewing. Most useful in Curve Mode for shallow curves. Note that this is only a visual effect and does not change the shape of the panel.

Window menu



New panel

See **New Panel** earlier in this chapter.

Develop panel

Useful if rather than starting with an initial triangular panel you want to add to an existing panel (e.g. maybe you left **New Panel** before finishing and now want to continue).

The current curve will be split into two curves. The process will then continue as described with **New Panel**.

Blue panel

Turns a normal panel into a blue panel. A normal panel has a boundary around it and usually some internal curves. A blue panel on the other hand does not require an external boundary. DXF or HPGL panels are read as blue panels if they do not have an external boundary. Sometimes blue panels are useful when you don't want the boundary of the panel to be cut.

Reflect

To reflect a panel, first click the mouse on a horizontal or vertical line (either internal or external) on the panel, then select **Reflect**.

Scale

Uniformly scales the selected curves by a specified amount.

Rotate

Rotates the selected curves by a specified amount. If the Current Point is on the boundary, the entire panel including internal curves are rotated.

Shaping : Panel Mode

Zoom Ctrl Z

Zoom in on a particular part of a panel. A horizontal and vertical line will be displayed at the mouse location. Move the mouse to the area you want to zoom in on. Click and hold down the left mouse button and drag the resulting selection box to encompass the area you want zoomed. When the mouse button is released, the selection box will be zoomed to fill the entire window.

A quicker way to zoom without having to go to the **Window** menu is to hold down the Ctrl key on the keyboard and with it still held down press and release the Z key on the keyboard. Then release the Ctrl key.

Note: there are two modes when dragging the selection box. Either the click of the mouse will correspond to one corner of the selection box or the click will correspond to the centre of the selection box. To swap between these two modes, press and release the Ctrl key while the selection box is visible.

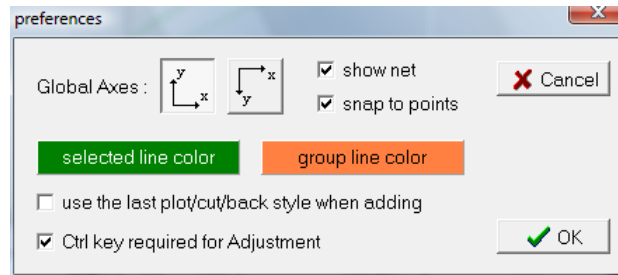
Unzoom Ctrl U

Restore the view to normal scale. A quicker way to unzoom is to click on the scale scroll bar.

Units

See Units page at the beginning of this manual.

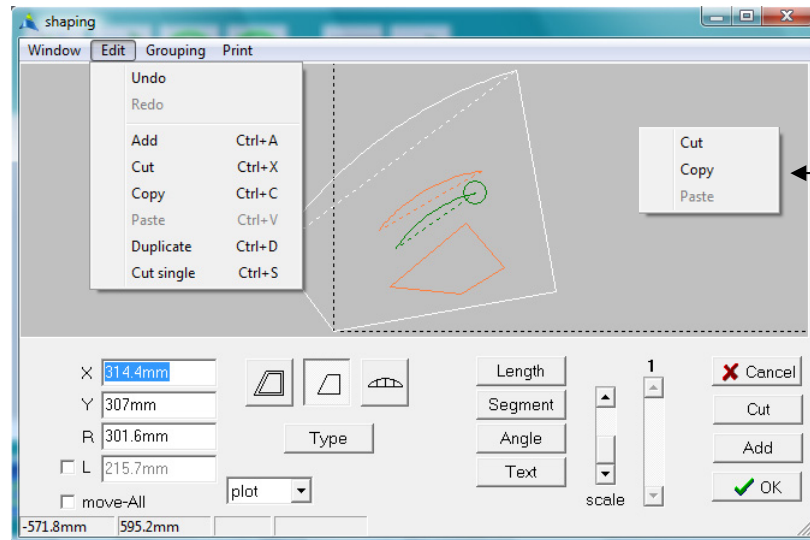
preferences



- Global Axes** Determines the direction of the global Y-axis : up or down.
- show Net** Draw the Net for B-Spline curves in Panel Mode. This Net may be dragged if the scale scroll bar is at the bottom. i.e. a scale of 1.
- snap to points** Makes dragging and adding of points in Panel Mode snap to horizontal and/or vertical positions of other points when the vertical and/or horizontal position of the mouse is similar. This is very useful for lining up curve end points, crosses, circles and for producing horizontal and vertical lines.
- selected line color** This is the colour of the "current curve".
- group line color** This is the colour of any addition curves that might be selected.
- use the last plot/cut/back style when adding** If ticked, any curves that are added will be of the same style as the last added curve.
- Ctrl key required for Adjustment** If ticked, you need to hold down the Ctrl key on the keyboard in order to drag the end of a curve with the mouse.

Shaping : Panel Mode

Edit menu



A popup Edit menu is also available by right clicking in the window.

Undo

Undoes the last change you made in shaping. You can keep undoing repeatedly until all the changes you have made have been undone.

Redo

Cancels the last undo. You can keep redoing repeatedly until all the undoes have been cancelled.

Add Ctrl A

See Add earlier in this chapter. This is the same as clicking the **Add** button.

Cut Ctrl X

Removes all of the selected curves. This is the same as clicking the **Cut** button.

Copy Ctrl C

Copies to memory all of the selected curves so they can later be pasted.

Paste Ctrl V

Pastes any previously copied curves. These curves can also be pasted to other panels if desired.

Duplicate Ctrl D

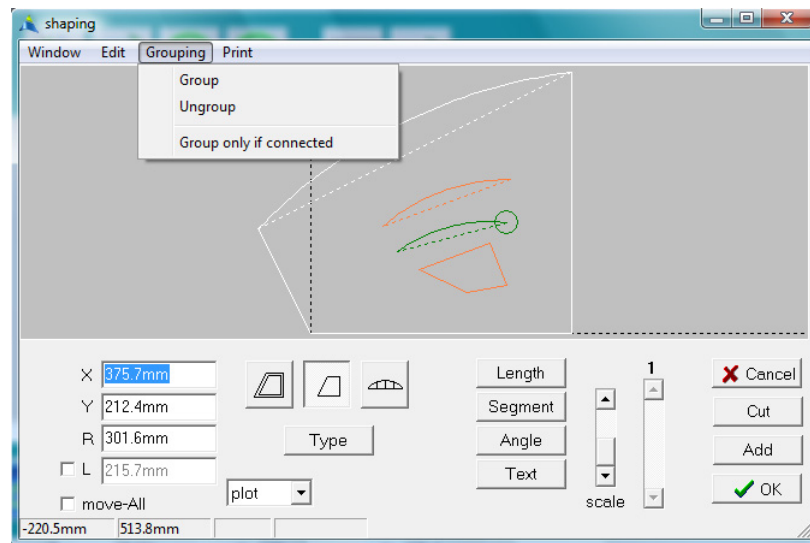
If duplicating internal curves, **Duplicate** is similar to using **Copy** and **Paste** except it remembers the distance between where the original curves are and where you have moved the duplicate curves to. The next time you use **Duplicate**, it will use this same distance. This is useful for creating a line of evenly spaced objects. First duplicate one, move it the desired distance from the original and then repeatedly duplicate.

If duplicating the side of a panel, **Duplicate** will simply add another side with the same shape.

Cut single Ctrl S

Same as cut except it only removes the Current Curve regardless of how many other curves are also selected.

Grouping menu



Group

If several curves are selected, **Group** will turn them into one entity. After grouping, clicking in any one of these curves will select all of them.

Ungroup

Ungroups all selected curves so they can be selected individually. It also upgroups any selected curves that are joined. In the above picture the 4 sided shape would turn into individual curves that you can move apart. If you want to keep connected curves grouped together you could select all curves in the panel and click on **Group only if connected**.

Group only if connected

Of the selected curves it will group together only those curves that join to each other.

Print menu

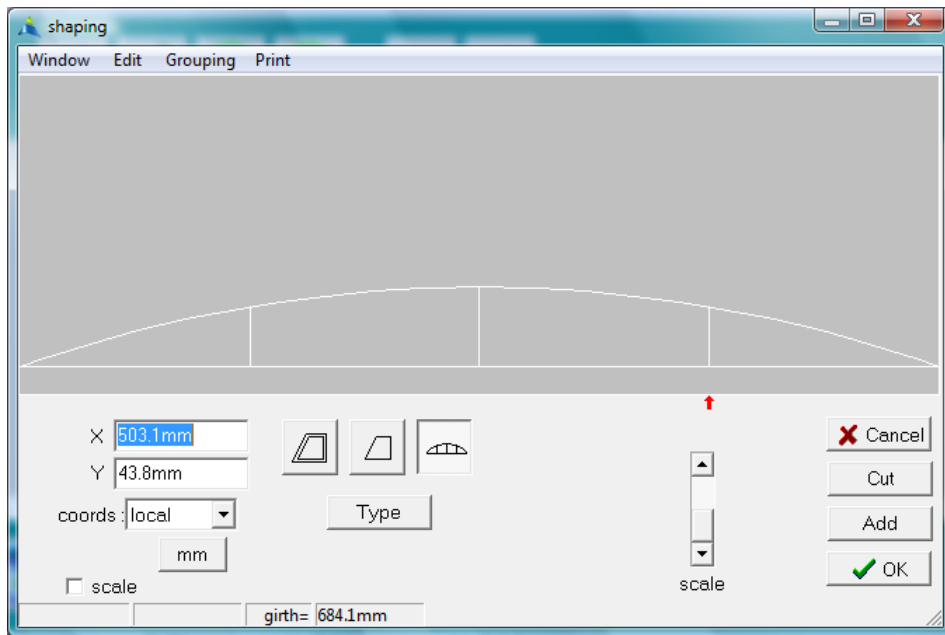
Prints the current panel picture.

Shaping : Curve Mode

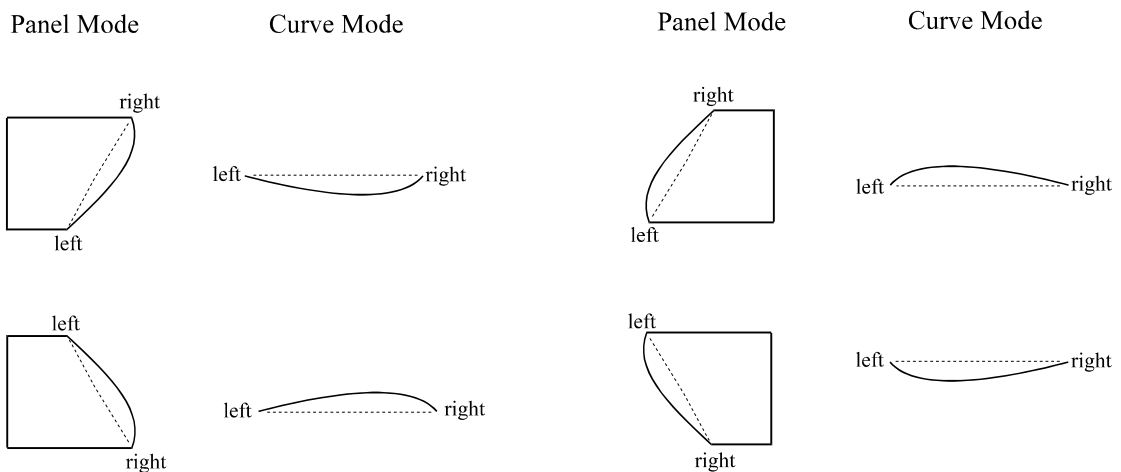


Curve Mode

Displays the Current Curve in local co-ordinates. You can enter Curve Mode either by clicking on this icon or double clicking near the dotted line connecting the ends of a curve in Panel Mode.



The relationship between Panel Mode and Curve Mode is summarised by the following examples. The left end of the curve in Panel Mode always corresponds to the left of the curve in Curve Mode :

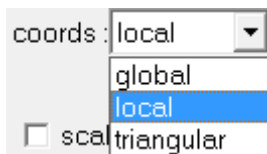


Shaping : Curve Mode

To select an Adjustment Point and display its **X** and **Y** position, click anywhere near the Adjustment Point (preferably significantly above it so as not to accidentally move it). There are three ways to change an Adjustment Point's **X** or **Y** :

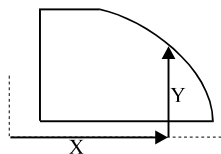
- (i) Click on an Adjustment Point and with the mouse button still down, drag it to the desired location. The point will only move vertically. To move it horizontally as well, hold the Ctrl key down on the keyboard while dragging.
- (ii) Click on the red arrow and drag it horizontally to change **X**.
- (iii) Type the desired **X** or **Y** value using the keyboard. Then hit the Enter or Tab key on the keyboard.

move-All If ticked, changing the **Y** value for one Adjustment Point will uniformly change the values for all the Adjustment Points. Useful for scaling curves up or down.

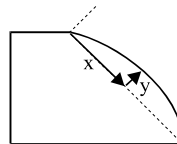


There are 3 different coordinate systems.

global : X and Y are relative to the origin in Panel Mode.



local : X and Y are in local coordinates across the curve (most common).



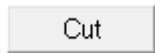
triangular : Similar to local coordinates except LHS and RHS is used rather than X and Y.



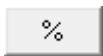
Shaping : Curve Mode



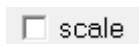
Adds a new Adjustment Point to the curve. After clicking **Add**, a vertical line appears at the mouse location. Move it until it is approximately where you want and click the mouse button. If the exact required **X** value is known, it can then be entered through the keyboard.



Removes the highlighted Adjustment Point.



Toggles the **X** and **Y** display between % and absolute units (e.g. mm). Both **X** and **Y** are expressed as a % of the straight line length between the ends of the curve.



If ticked, changing **Y** (or dragging an adjustment point) will scale the entire curve. Note : the **Y** value initially needs to be non-zero for this to work.

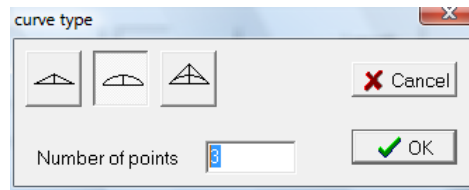
girth = This is the length measured around the curve. Hence this is greater than the straight line length between the ends of the curve.

The vertical position of the curve in the window can be moved with the mouse if desired. This is often done if the curve is hollow and hence falls below the viewing rectangle. To move the curve, click the mouse very close to the horizontal line drawn between the ends of the curve and with the mouse button still down, drag the curve up or down. When in the required position release the mouse button. Note that this does not change the shape of the curve, it is only a visual tool.

Shaping : Curve Mode

Type

The Type dialogue determines the nature of each curve :



Click on one of the following icons to change the curve type :



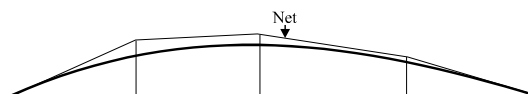
Curve is made up of line segments. i.e. Made up from a set of connected straight lines :



Curve is a Spline. This is an efficient way to produce a smooth curve. A special case applies if there is only one Adjustment Point in which case the curve is an arc. In Panel Mode this arc will have a radius field that can be changed.

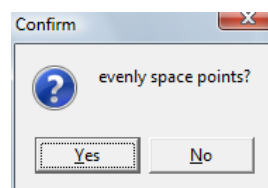


Curve is a B-Spline. B-Splines produce nice looking curves. However unlike Splines, the Adjustment Points don't lie on the curve. The straight lines connecting the Adjustment Points are called the B-Spline Net. One useful feature of B-Splines is that the ends of the Net are tangential to the ends of the curve. Hence the Slope Continuity set to **Tangent** in Panel Mode can be used on a B-Spline curve to force the curve to blend smoothly into its adjacent curve.



Number of points Number of Adjustment Points required.

If only the number of points is changed the points will automatically be evenly spaced in X. If however the curve type is changed the following dialogue will be displayed asking if you want the points to be evenly spaced :



Shaping : Seam Mode

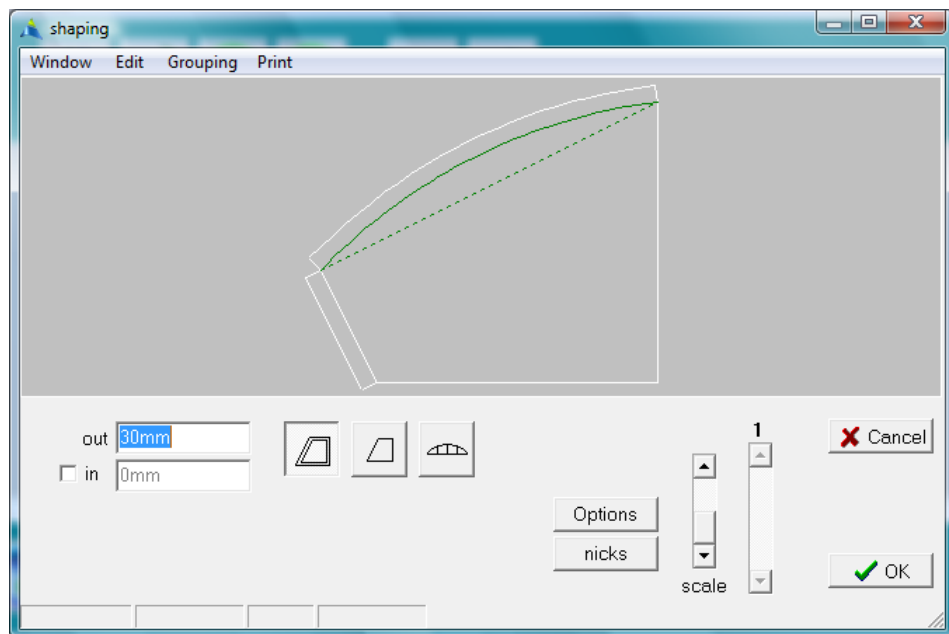


Seam Mode

Displays the seams on the sides of the panel.

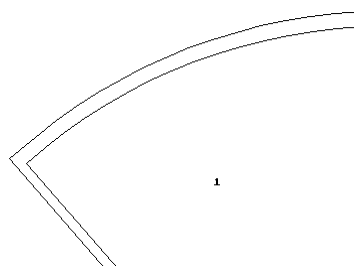
out is the seam added to the outside of the panel size defined in Panel Mode.

in is an additional line drawn inside the panel size. **in** is useful for example if you want to plot a line inside the panel that the outer seam edge will fold to. **in** can also be -ve if desired. In order to change a value of **in**, it must be ticked. If you are not likely to want to change a value of **in**, it is recommended you remove the tick to prevent them from accidentally changing.



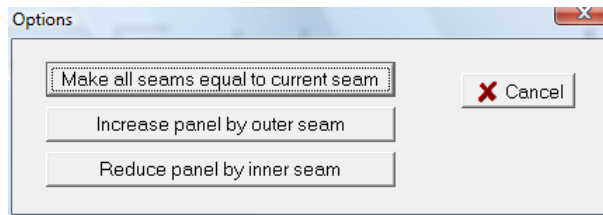
To highlight another side, click the mouse near it or use the left or right arrow keys on the keyboard.

Note : The ends of the seams are only drawn in Seam Mode as 90 degree corners. This is just a display method to allow the scale scroll bar to work in a predictable way. The above panel will actually be formed as follows :



Shaping : Seam Mode

Options Displays the following dialogue :



Make all seams equal to current seam gives all the sides of the panel the same seam as the currently highlighted side.

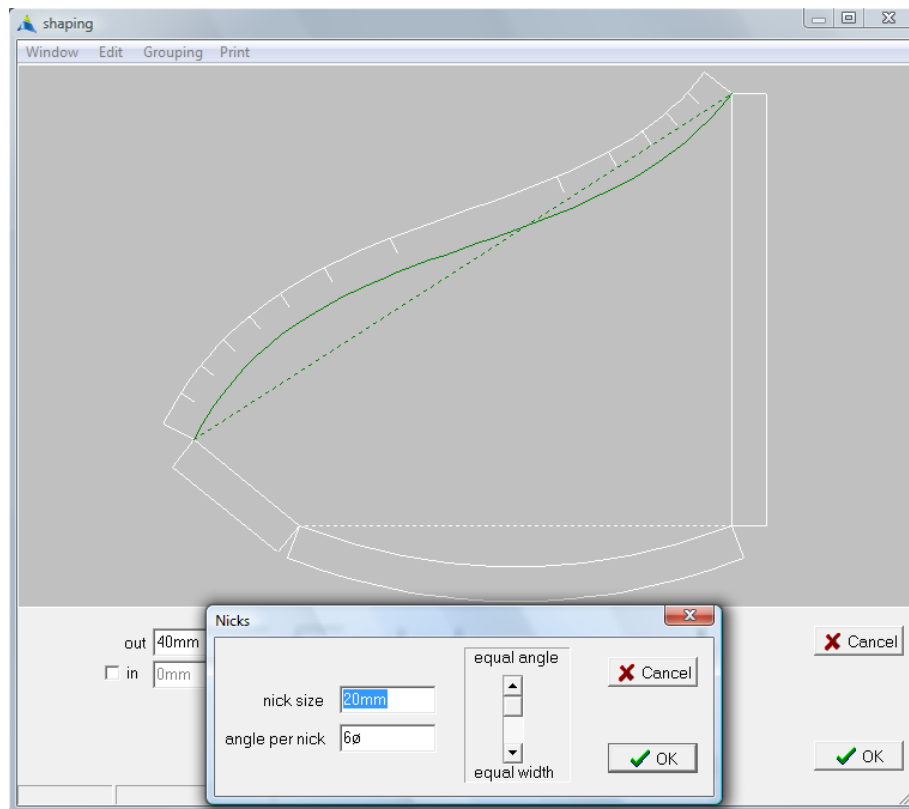
Increase panel by outer seam removes the outer seams around the panel but will increase the size of the panel to take its place. Hence the overall panel will stay the same size but will have no outer seam line.

Reduce panel by inner seam removes any inner seams around the panel and decreases the panel size by that amount.

Shaping : Seam Mode

nicks

Sometimes it is necessary to fold a seam on the edge of a panel (a turnover seam). However if the seam width is large and/or the panel has a large amount of shape on it (as is often the case with the outside edge of an awning) it is difficult to fold the material without it creasing. A solution is to cut small nicks periodically along the seam.



nick size : Width of nicks. This can be entered as a percentage of the seam width if desired.

angle per nick : This determines the number of nicks on that curve. If the curve has a cumulative angle change along its length of 20 degrees and **angle per nick** is 5 degrees, then 4 nicks will be placed on that curve.

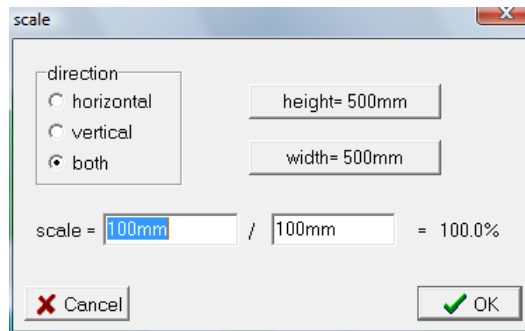
The scroll bar lets you adjust how the nicks are distributed along the curve. With the scroll bar at the bottom they will be evenly spaced along the curve. With the scroll bar at the top the nicks will be spaced based on angle so they will bunch up in tighter regions of the curve.

Regardless of where the scroll bar is the total number of nicks will be determined solely by **angle per nick**.

Once you have defined nicks for one curve, you can easily copy this to other curves in this panel or to other curves on other panels by using copy and paste (right click the mouse to display the popup menu).

Scaling

Highlight the panels you want to scale on the nesting window and select **Scale** from the **Edit** menu to display the following dialogue :



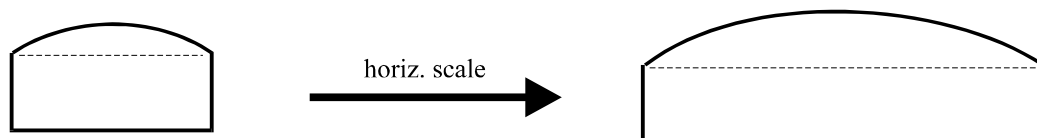
Panels may be scaled horizontally (**horizontal**) or vertically (**vertical**) or evenly in both directions (**both**).

The **Scale** is calculated from the top number divided by the bottom number. The reason for doing it this way is so you can compare a current dimension on a panel with the desired.

Example 1) : If the width of the panel is currently 500.0mm (as per the dialogue shown above) and we want the panel to be scaled evenly until the panel width is 750mm : Click the **width= 500mm** button to place this value in the bottom number. Then type 750mm in the top number. PanelMaker will divide the two numbers to produce a scale of 150%. Click **Ok** to scale the panel by this amount.

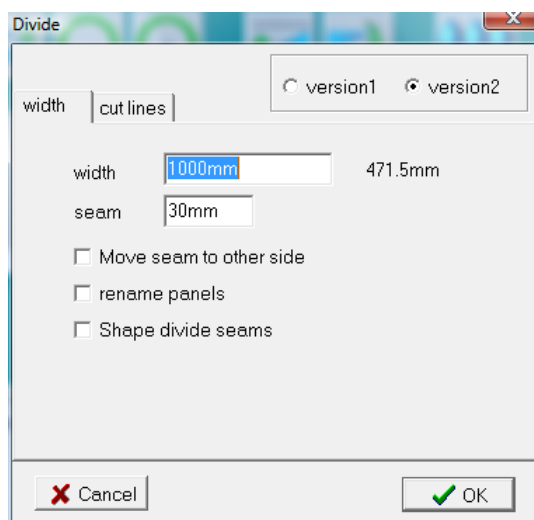
Example 2) : To make a panel 20 larger, type 120 in the top number leaving 100 in the bottom number giving a scale of 120%.

Note : If scaling horizontally or vertically, circles will not become ellipses but will remain circles. Also all curves will retain exactly their same % shape. This means that even if a panel is scaled horizontally it will change size vertically if there is a curve on the top or bottom of it (as shown below)

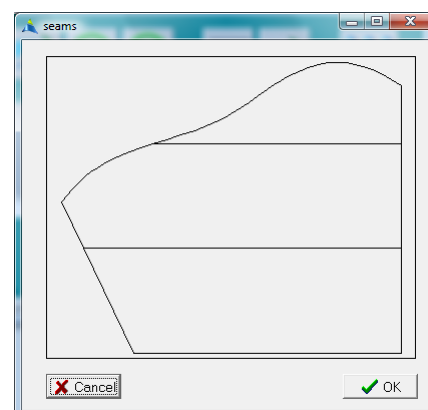
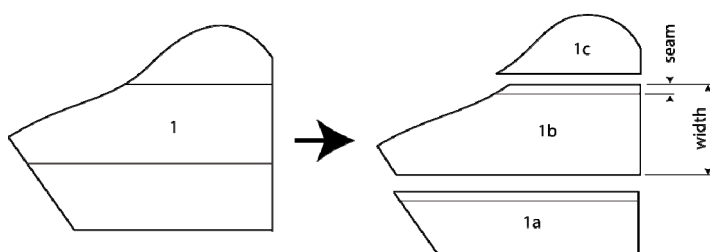


Dividing a panel(s) based on a width

Highlight the panel(s) you want to divide on the nesting window and select **Divide** from the **Edit** menu. If the **width** tab is selected the panel will be divided starting from the bottom up based on **width** and **seam** :



Version 2 should normally be selected since it is the most advanced version. However if there are some problems try **version 1**.



Note that panel 1c is not to the full width. If you want panel 1c to be to the full width and panel 1a to be smaller, rotate the panel by 180 degrees before dividing. If you want the seams to run at a different angle, rotate the panel by that angle before dividing.

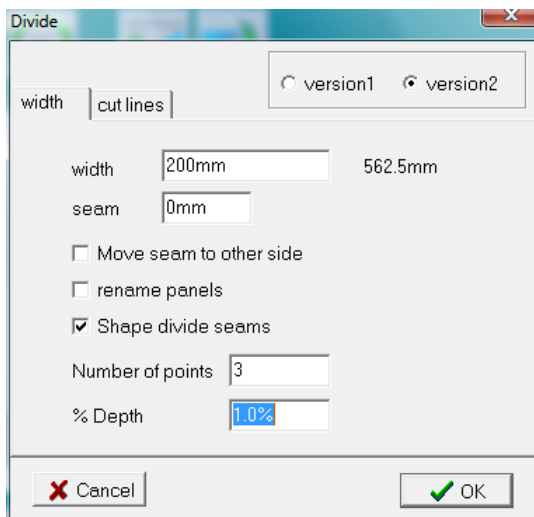
If you desire the seam to be placed on the other side of the panels, tick **Move seam to other side**.

If **rename panels** is ticked, the divided panels will have an extra letter placed after their name. Otherwise they will just be the same name as the original panel.

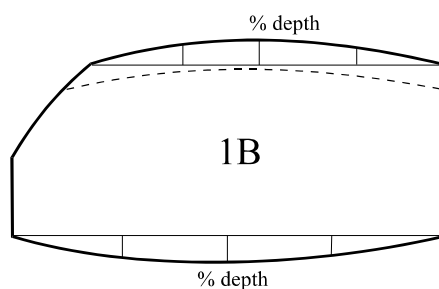
Divide can be used to slice a large shape such as a large flat cover into panels of a specified fabric width. Use PanelMaker to first generate the full size of the cover (the triangular co-ordinate system in Curve Mode can be useful for this) and then use **Divide** to create the panels. After Dividing, it is sometimes more efficient to rotate every 2nd panel by 180 degrees before compacting them.

Divide

If a small amount of shape is required on each of the seams, this will be done automatically if **Shape divide seams** is ticked :



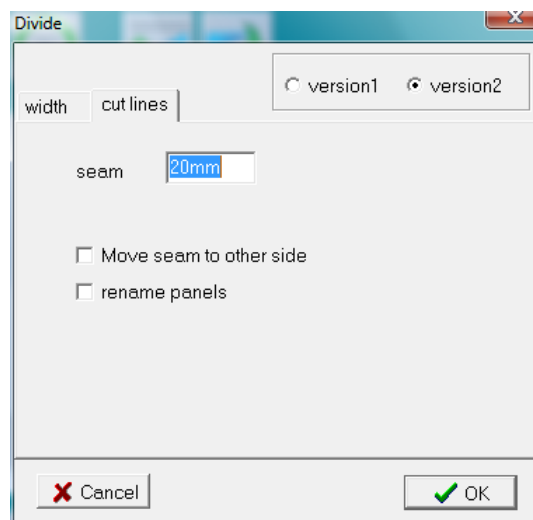
A spline curve with the same shape as an arc will be placed on the top and bottom of each panel with a **% Depth** as specified. Hence the longer the panel side, the greater the actual depth of the curve. The spline will have the **Number of points** specified which can be used for adjusting the shape in PanelMaker later. Note that this will increase the width of the panel and hence the **width** specified will need to be smaller than the fabric width to allow for this.



Dividing a panel(s) based on defined curves

First you need to create lines that you want the panel divided along. Go to the shaping window of PanelMaker and add internal lines in the usual way by using the **Add** button. These lines must completely cut the panel. Namely both ends of the lines must be outside the panel. Then mark these lines as "cut" lines.

As many lines can be created as you wish. Leave the shaping window, highlight the panel(s) and select **Divide** from the **Edit** menu. If the **cut lines** tab is selected, the panel(s) will be divided along these lines.



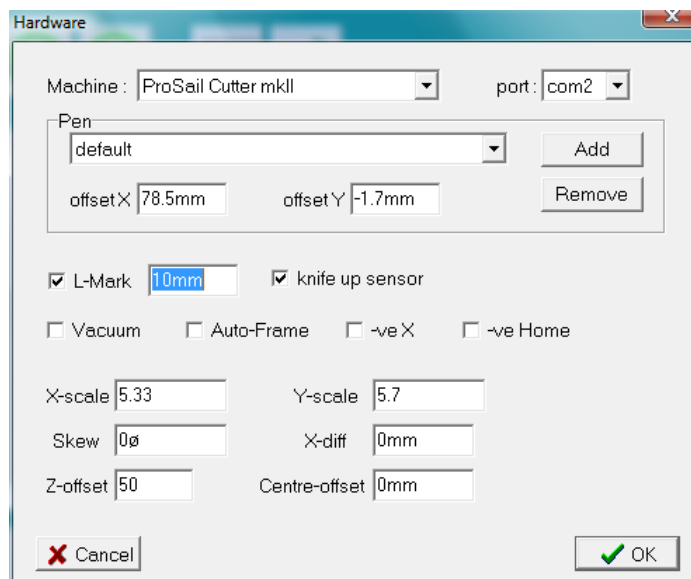
Version 2 should normally be selected since it is the most advanced version. However if there are some problems try **version 1**.

A seam is added to one side of each cut line. The side it is added to depends upon the direction used to create the cut line. If the cut line was created by dragging from left to right for example, the seam will be placed below the line. However if **Move seam to other side** is ticked, the seam will be on the other side.

If **rename panels** is ticked, the divided panels will have an extra letter placed after their name. Otherwise they will just be the same name as the original panel.

If desired a cut line can also be a shaped curve. The only requirement is that the ends of the curves end outside the panel.

Select **Hardware** from **Setup** from the **Plot** menu :



This dialogue defines the hardware of the plotter. Some of the values will probably never need changing directly. Some of the values like **x-scale** etc will be automatically changed during the calibration process.

Machine This is set for your plotter and can not be changed.

Port This is the communication port on your computer that the plotter is connected to. To find out what **com** ports your computer has, go to the Windows Device Manager. Depending upon your version of windows you can get to the Device Manager by going to the windows "Start" button, select "Control panel" and then double click on "System". Then click on "Hardware" and "Device Manager". Then double click on "Ports (COM & LPT)".

Pen Because different pen sizes will have a different distance between their centre and the cutting blade, it is useful to store these different values for different pens. Then when you go to plot you can select the pen you will be using in the plotter.

The **Pen** section stores this information. For each pen there is an **offset X** and an **offset Y**. **Offset X** is the distance between the centre of the pen and the cutting blade in the direction of the table. **Offset Y** is difference between the pen and blade in the direction across the table (this will be close to zero).

Click **Add** to display a dialogue where you can add another pen with its own name and x, y offsets. You can store up to 20 pens.

When using **Shift Cutter** in the **calibration** dialogue from **Setup** from the **Plot** menu, the software will automatically adjust these offsets for the pen you select.

To accurately test if **Offset X** and **Offset Y** are correct for a given pen, plot a **square with a seam** (**New** from the **File** menu). This should have a seam width of 10mm all the way around it. If not you can adjust **Offset X** and **Offset Y**.

L-Mark Distance from the edge of the plotted boundary that the L-Mark is drawn.

Knife up sensor If ticked, the software will look at the sensor on the cutting head to get confirmation that the head is up or down. In this way it is able to warn you if the head is not behaving as it should. If there is a fault with the sensor this can be temporarily turned off.

Vacuum, Auto-Frame Not used.

-ve X If ticked, will place Home (0,0) at the opposite end of the table. Hence the cloth is loaded from the other end of the table. However the plotting on the table is necessarily reversed from the display on the screen. For that reason it is not recommended.

-ve Home If ticked, will place Home (0,0) at the opposite side of the table. Hence the cloth is loaded from the other side of the table. However the plotting on the table is necessarily reversed from the display on the screen. For that reason it is not recommended.

x-scale,

y-scale These are the number of instructions the software needs to give the plotter for it to move 1mm. These numbers are automatically calculated when the plotter is calibrated using **XY Scale** in the **calibration** dialogue from **Setup** from the **Plot** menu. It is unlikely you would ever change these directly. Change with care!

Skew Tells the software how to adjust for the angle of the plotting arm not being exactly 90 degrees to the table. This number is automatically calculated by using **Skew** in the **calibration** dialogue from **Setup** from the **Plot** menu. It is unlikely you would ever change this directly. Change with care!

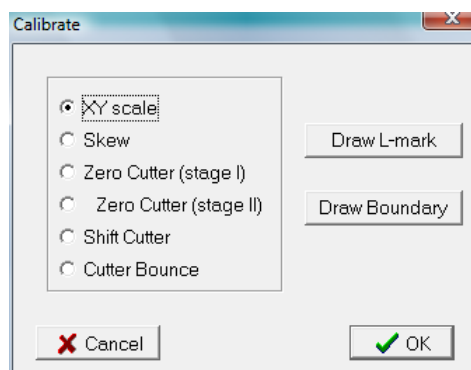
X-diff Adjusts for any difference in length between the belt on one side of the table and the other side for a plotter/cutter. This number is automatically calculated after using **XY Scale** in the **calibration** dialogue from **Setup** from the **Plot** menu. It is unlikely you would ever change this directly. Change with care!

Z-offset This is the value you entered while using **Zero Cutter** in the **calibration** dialogue from **Setup** from the **Plot** menu.

Centre-offset This was automatically calculated after using **Shift Cutter** in the **calibration** dialogue from **Setup** from the **Plot** menu. It is unlikely you would ever change this directly. Change with care!

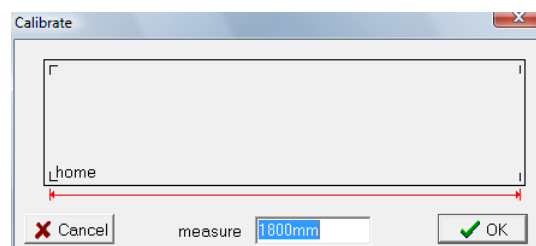
Calibration

Select **Calibrate** from **Setup** from the **Plot** menu. This calibrates the ProSail plotters and cutters to allow for stretch in the belts and table movement. It needs to be done when the machine is first installed and periodically afterwards (every few months is recommended).



XY scale

This calibrates for tension in the X and Y belts. Place a pen in the plotter and click **XY scale** and then click **OK**. The plotter will draw some marks on the table. After drawing them you will need to measure between them with a tape measure and enter those measured values into the resulting dialogue. The software will then calculate new **x-scale** and **y-scale** values in the **Hardware** dialogue to adjust for belt tension. It will then return you to the Calibration dialogue. If you run **XY scale** again (the marks will probably have moved slightly) and measure between the marks they should now exactly equal your **Table Size** in the **Plot Options** dialogue from the **Fabric** menu.



Skew

This adjusts for the arm of the plotter not being at exactly 90 degrees to the table. The cutter could also become out of skew if one of the cogs over the rails slips. Click **skew** and then click **OK**. The plotter will draw some marks on the table. After drawing them you will need to measure between them with a tape measure and enter those measured values into the resulting dialogue. In particular you need to measure the diagonal measurement very accurately. The software will then calculate a new **skew** value in the **Hardware** dialogue to adjust for the angle of the arm. It will then return you to the Calibration dialogue.

Zero cutter

This adjusts the homing angle of the cutter blade on the ProSail plotter/cutters. This is very important and must be done as accurately as possible. A small inaccuracy in this angle can result in blades blunting very quickly on fabrics like Kevlar. The operation of **zero cutter** depends upon the version of cutter that you have. See next page.

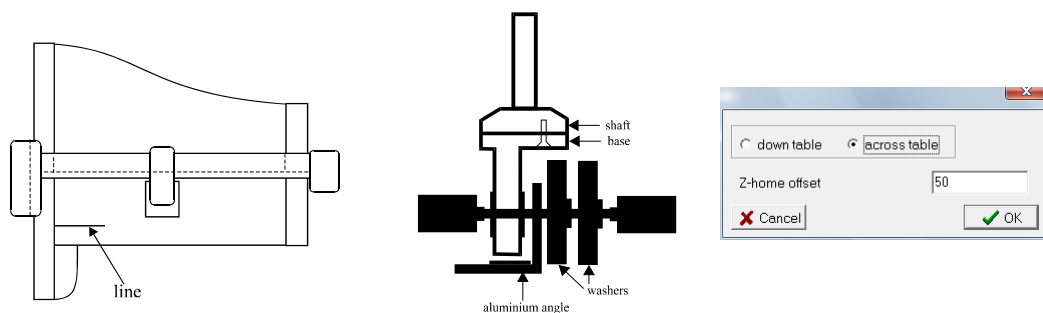
Zero Cutter for cutters MkI & MkII do the following :

Click on **Zero Cutter (stage I)** and then click **OK**. A dialogue will be displayed asking for a number. After entering a number and clicking **Ok**, the cutter head will rotate to the corresponding number. Continue this process with different numbers until the blade is pointing directly down the table. The blade will rotate approximately 0.3 degrees for each unit of number entered. When happy, click the **Esc** button to permanently store this number. To judge if the blade is straight down the table, it is recommended you take the blade off the cutter shaft, place a straight edge to the shaft face and reference this to a straight line drawn down the table.

To test (and improve) the accuracy of the blade direction select **Zero Cutter (Stage II)** and **OK**. First it will ask you for the position down the table and then position across the table you want to conduct the test. It will then do a plot and cut line. A window will then appear asking you how you want the angle of the cut line adjusted. It will continue to do test plot and cut lines (each time moved across the table by 5mm) until you are happy the two lines are parallel.

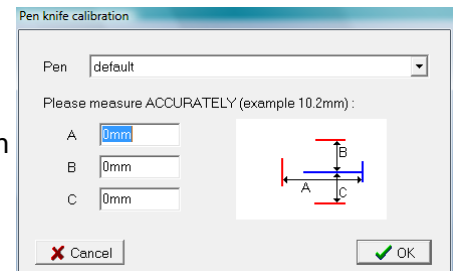
Zero Cutter for the cutter MkIII do the following :

Draw a line (at least 300mm long) near the front of the table at 90 degrees to the channel rail (see picture below). Using a set-square against the channel rail is the best way to draw this line. Mount the supplied 160mm aluminium angle to the blade holder as shown below. Do not over tighten. Note that the inner washer has its large flat side against the angle for rigidity. Move the head of the cutter so it is over the top of the 90 degree line you drew on the table. Turn the cutter shaft so the aluminium angle is roughly parallel with this line.



Click on **Zero Cutter** and then click **OK**. Click **ok** to the message dialogue. The next dialogue asks for a **Z-home offset**. Make sure "**across table**" is selected. After clicking **ok**, the blade will rotate and the head will come down. Then compare the blade angle with the line on the table (you can move the cutter if you wish to help visibility). The current angle of the face can be changed by entering a new number in this dialogue and clicking **ok**. The blade angle will rotate clockwise by approximately 0.1 degrees for each unit entered. E.g. If the face is 10 degrees from the line, add or subtract 100 to the current number and click **ok**. Repeatedly change this number and click **ok** until the angle is parallel with the line on the table. When happy with the direction, click the **Esc** button. The software will now return you to the Calibration dialogue. Remove the aluminium angle and the large washers (the inner washer orientation has changed). Also note the spring washer which is very important.

- Shift Cutter** To adjust for the distance between the pen and the blade, select **Shift Cutter** and **Ok**. It will ask you for the position down the table and then position across the table you want to conduct the test. It will then plot a cross and cut 3 short lines and ask you to measure the distance between the plot and cut lines. You need to be very accurate with these measurements (e.g. 9.7mm is better than 10mm). After doing this the software will return you to the Calibration dialogue. For Shift cutter to be accurate there must be no mechanical slop in the cutter. If there is it will be necessary to plot a small square with a seam as described at the bottom of this page.
- Cutter Bounce** This reduces how hard the cutter head comes down and hence increase the life of the plastic table surface. It is explained in the **Fabric** chapter. The calibration dialogue can be used to test different values for Cutter Bounce. To do this, click on **Cutter Bounce** and then click **OK**.
- Draw L-Mark** This draws the position of the L-Mark at the front of the table. This is the position on the table the L-Mark on the fabric should be dragged to between frames. The value used for **L-Mark** is entered in the **Hardware** dialogue.
- Draw Boundary** This draws the maximum plotting size of the plotter on the table. In particular the table reference line the fabric needs to be laid against.



As a final check after calibrating it is often useful to plot a small square with a seam. To do this, select **New** from the **File** menu and select **Square (100mm + 10mm seam)**. Position the resulting panel in a position on the nesting window to do a trial cut. Load some paper on the table in this position and tape it down.

Select **Plot** from the **Plot** menu.

Make sure that both **plot** and **cut** are ticked.

Make sure that both **use pen instead of knife** and **screen plot only** are not ticked.

Click the **Plot** button to start plotting.

The machine should plot the inner part of the square and then cut the outer part of the square. There should be an even seam width of 10mm around this panel.

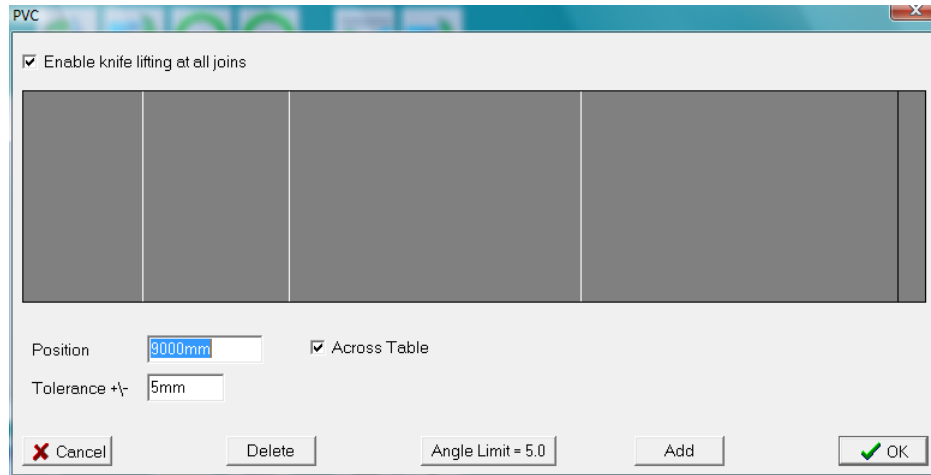
If the seam width varies along one side it would indicate that **Zero Cutter** is not correct.

If the seam width is wider on one side of the square compared to the adjacent side, adjust the **offset X** and **offset Y** values in the **Hardware** dialogue (select **Hardware** from **Setup** from the **Plot** menu) by a small amount until the seam width is the same all around the panel.

If the seam width is too large or too small on all sides it would indicate that **Shift cutter** is not correct.

PVC Joins

Select **PVC Joins** from **Setup** from the **Plot** menu. This is used to prevent the cutter blade on the ProSail plotter/cutter from catching on the joins in the PVC table top.



If **Enable knife lifting at all joins** is ticked the cutter will lift the blade if it is about to cut a line (or part of a curve) which is within **Tolerance** from one of the PVC joins and at an angle less than **Angle Limit** to that join.

Use **Add** to add more joins.

Use **Delete** to delete the selected join.

Click on a join to select it.

If the selected join is across the table, **Position** is measured from the front of the table boundary (which was drawn on the table by **Draw Boundary**).

To make a horizontal join, remove the tick from **Across Table**. **Position** is then measured up from the lower boundary line (cloth load line which was drawn on the table by **Draw Boundary**).

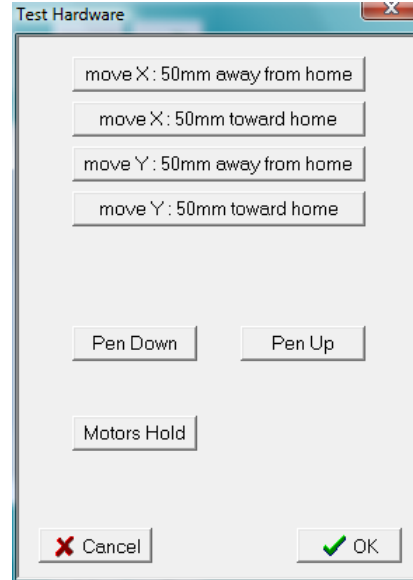
To change the **Angle limit** for all the joins click on the **Angle Limit** button.

Test Hardware

Select **Test Hardware** from **Setup** from the **Plot** menu. This is used to help diagnose problems with the ProSail plotters or plotter/cutters. This dialogue tests the signals going to the plotter from the computer :



Plotter/cutter



Plotter

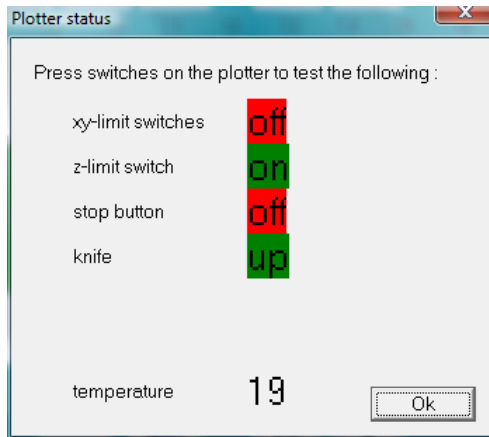
Clicking any of these buttons should perform the associated operation. First make sure that the arm and head are sufficiently away from any limit switches. i.e. push the machine back from the front of the table and the head to the middle of the arm. Pay particular attention to the direction of travel to make sure it is correct when doing these tests.

Motors Hold is useful for testing if there is any mechanical slop in the machine. After clicking **Motors Hold**, all 3 motors will hold hard (*2 motors for a plotter*). If you then physically try pushing the arm or head, there should only be a small movement that bounces back when you stop pushing. If there is too much or it feels like something is loose, check all the belts and pulleys to see if there is some mechanical slop. Of course if you press too hard, it will overcome the power of the motors and the machine will move (but don't worry, this does not harm the machine).

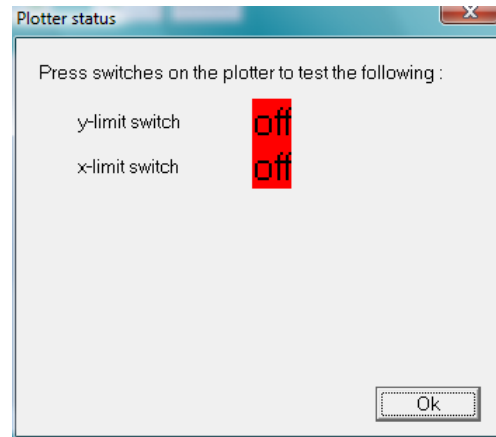
*(**Fan On** and **Fan Off** are only for the cutter mkIII and controls the fans inside the controller box. There is also a fan in the power box but it is always on).*

Test Hardware

When finished, click **OK** to display the next dialogue which tests the signals coming from the plotter to the computer :



Plotter/cutter



Plotter

The **xy-limit switches** box should say **on** when you physically press either the x-limit switch at the back of the cutter over the channel rail or the y-limit switch at the back of the cutter head.

The **z-limit switch** relates to the limit switch inside the cutter head itself (remove the cover on the cutter head to see and press it).

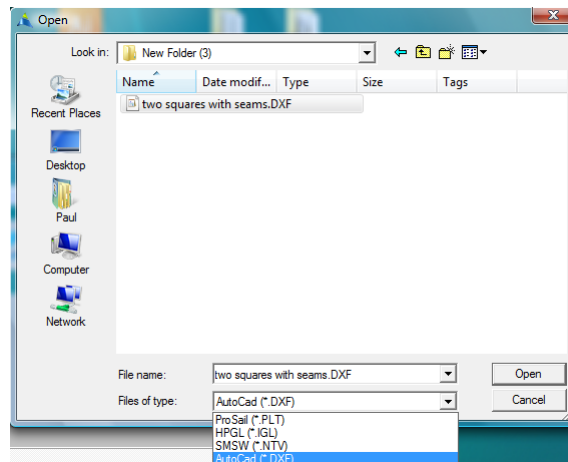
Knife should say **up** when the head is up and **down** when you physically push the head down by hand.

(temperature is only displayed on the cutter mkIII and shows the temperature of the controller drives).

DXF Import

DXF is a very popular file exchange format between CAD programs. An example of a program that will save in the DXF format is AutoCad. In fact most CAD programs can save/export in this format.

To import a DXF file, select **Open** from the **File** menu and select "AutoCad (*.DXF)" for **File of type** :



DXF files are simply a collection of lines and text. Each line and text also has a colour and a layer. However the DXF format does not contain any information to identify panels. Hence it is the job of the DXF Import software to try to determine which lines define a panel. The following dialogue is where you tell the software how to do this.

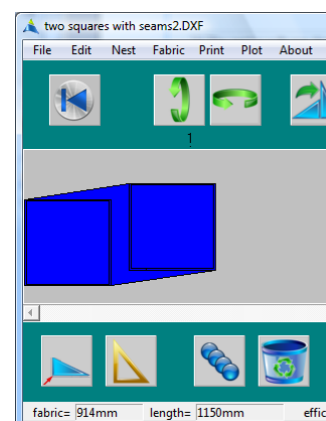
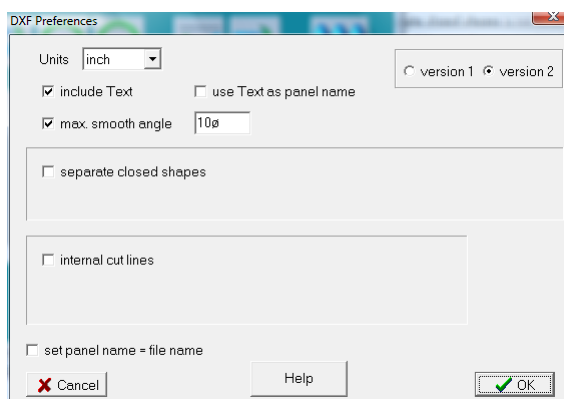
There are 2 ways to read DXF files depending upon whether **separate closed shapes** is ticked or not.

If **separate closed shapes** is NOT ticked :

The file will be imported as one complete drawing.

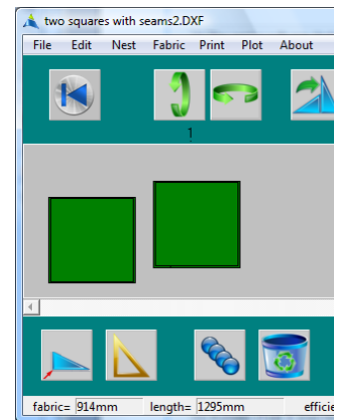
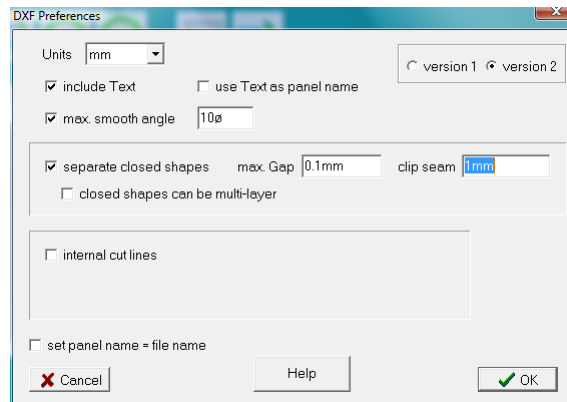
A non-plotting envelope is placed around the drawing so it behaves as one panel. This envelope is only there to allow you to select the drawing with the mouse. It is ignored by the plotter and by other panels which can be compacted against the drawing inside this envelope. To identify that this panel has a non-plotting envelope around it, the panel will be coloured blue.

You can nominate which lines are cut lines by ticking **internal cut lines** and specifying a **colour** or a **layer**. Use the **View Layers** or **View Colours** button to see the layers/colours in the file. You can then select one by double clicking on it.



If **separate closed shapes** is ticked (most common)

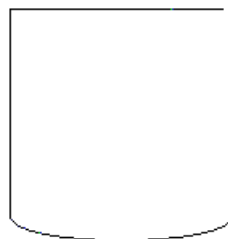
Any closed shapes in the DXF file will be made into separate panels.



Closed shapes are shapes that you can entirely trace with your finger from a start point back to the same point (assuming any gaps in the outline are within the **max Gap** value specified in the dialogue) :

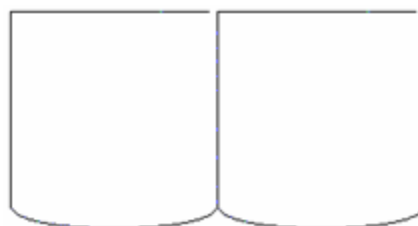
- (i) Without lifting your finger (unless it is less than **max Gap**).
- (ii) And without back-tracking over any part of the shape your finger has already been.
- (iii) And without crossing any part of the shape your finger has already been.

Each of these closed shapes will become the outline of another panel.

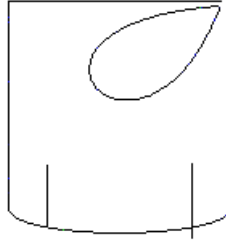


*This example would cause problems if the gap at the top right is larger than **max Gap**.*

Keep **max Gap** as small as possible. Usually 0.1mm is enough. If it is too large, lines that are closer than **max Gap** to the closed shaped (including other closed shapes) will become part of it.



*Closed shapes must not touch each other. They must be at least **max. Gap** away from each other. This example would be seen as a single panel.*



In the above example lines inside closed shapes (including any other closed shapes that completely fit inside) will become internal lines for that panel. To allow for any internal lines that might slightly cross outside closed shapes, you can specify a **clip seam** allowance. This is an imaginary seam around the outside of each closed shape. Any lines within this seam will be considered to be inside the closed shape.

You can nominate which of these internal lines are cut lines by ticking **internal cut lines** and specifying a colour or a layer.

Click **view colours** or **view layers** to see the colours/layers in the file. (It is not necessary for the panel outline to be this colour/layer since the outline will always be cut).

If any closed shapes comprise different coloured/layered lines, **closed shapes can be multi-colour/layer** will need to be ticked. Otherwise it should not be ticked.

If there are any lines left over that don't fit inside closed shapes (including **clip seam** allowance), they will be placed inside an extra panel (blue panel) with a non-plotting envelope around it.

If some of the closed shapes cross over themselves, they will still be considered a panel but the panel will be coloured red.

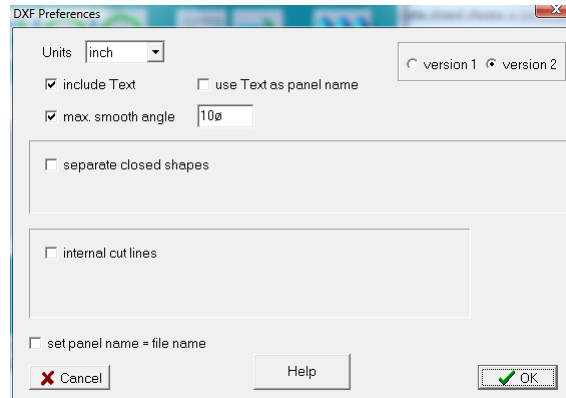
Hence if a blue panel or red panel(s) are generated you will know that there was a problem with some lines.

Problems importing closed shapes

If the importing software fails to recognise closed shapes :

- 1) Make sure the distance between closed shapes is at least **max. Gap**.
- 2) If the distance between any internal lines and its closed shape is less than **max. Gap**, make the internal lines a different colour/layer from their closed shape and turn **closed shapes can be multi-colour/layer** off. Of course the closed shape will need to be of one colour/layer.

If it is not possible to change the above, reduce **max. Gap**. The smallest value for max. Gap is 0 - but this requires the closed shapes to be perfectly closed without any gaps.



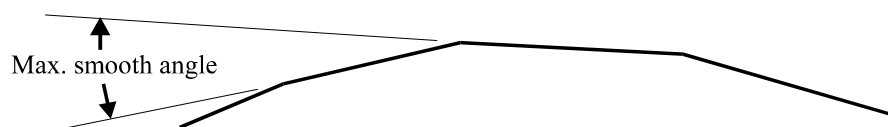
Units : DXF files are usually saved either in inches or mm. If you find after reading the DXF file it is too small or too large try changing **Units**.

Version 1, version 2 : This is the version of the Importing software. **Version 2** should normally be selected since it is the most advanced version. However if there are some problems with **version 2**, you might try selecting the older version : **version 1**.

include Text : Click this if you want the text/numbers in the DXF to be read. Sometimes DXF files contain a lot of extra text that you don't want to read.

use Text as panel name : Tick this if your DXF file has the name of the panel inside each panel. This will allow you to see the name of the panel on the nesting screen. If however the panels have more text in them than just the panel name, this should not be ticked.

max. smooth angle : Often DXF files approximate curves as a series of straight line segments and are hence read by the importing software simply as straight line segments. However if after reading these files you want to edit the shapes it is more useful if these straight line segments are identified as a curve. If **max. smooth angle** is ticked the importing software will look at these lines and decide whether some of these should be part of a curve or remain as distinct line segments. It does this by looking at the angle between adjacent lines :



If this angle is less than **max. smooth angle** it will assume these two lines are part of a curve. Otherwise it will assume they are separate lines forming a corner. The angle you specify will depend upon the CAD software you saved the file from. Some CAD programs don't save many points on their curves and hence you need to specify larger values for **max. smooth angle**. However the larger the value, the more likely the importing software is to incorrectly interpret a corner as a smooth curve.

DXF Import

Set panel name = file name : If multiple DXF files need to be added together (perhaps one panel per file), multiple files can be selected in the open file dialogue by holding down the **Ctrl or Shift keys** and clicking the desired files.

To select all files in the folder, first click on one and then press **Ctrl-A**.

If **set panel name = file name** is ticked, the panels in each file will be given the same name as the file it is read from. This is useful if **separate closed shapes** is off and multiple files are opened at once.

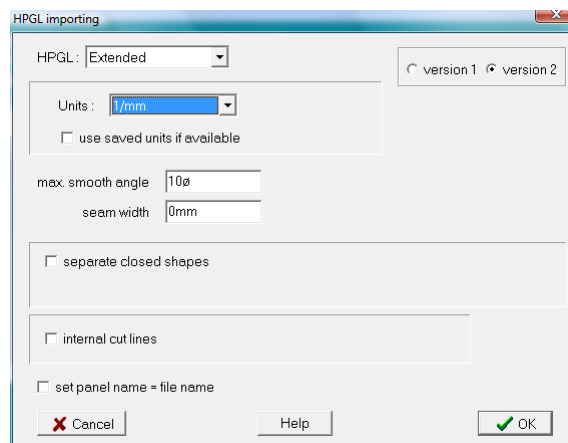
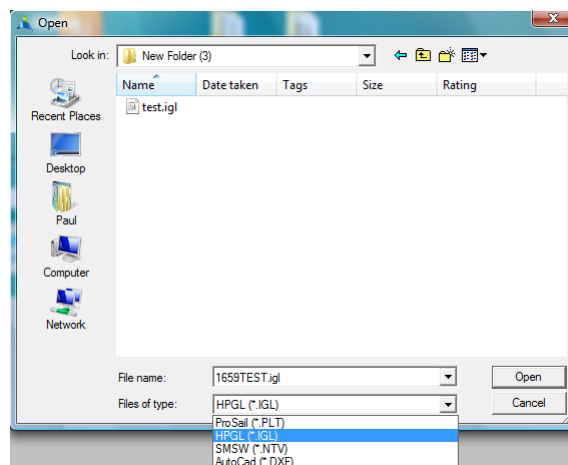
HPGL Extended Import

Although not as popular as DXF, HPGL is still a common format.

Some CAD programs will not save/export in the HPGL format directly. Rather you need to set up an HPGL printer (do this with Add Printer in the MS-Windows Control Panel) with output set as a file. Hence when you tell your CAD program to print to this printer it will create an HPGL file on disk. This is the method AutoCad uses.

To import an HPGL file you need to first rename the extension of the file. Initially the extension will probably be ".plt". This needs to be renamed to ".igl".

Then go to the nesting software and select **Open** from the **File** menu and select "HPGL (*.IGL)" for **File of type** :

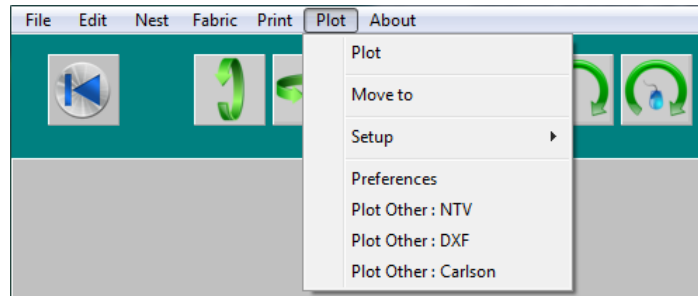


HPGL files are read in a very similar way as DXF files. Hence please refer to the previous chapter regarding DXF Import.

The differences are :

- 1) There are no layers in HPGL files, only colours.
- 2) Any **unit** scale can be used. **1016/inch** is the most common. If **use saved units if available** is ticked, the software will look to see if the hpgl file has the units specified in the file. If it does it will use those. Otherwise it will use the units you specify.

Plot Other



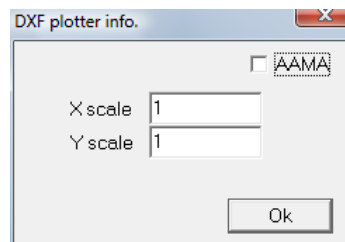
These optional export modules allow you to create files of a different format required by other CAD software.

Plot Other : NTV

This format is used by PlotterPilot, Dimension Sailcloth and others.

Plot Other : DXF

This is probably the most common CAD format. Most CAD software will read this format.



X scale and **Y scale** are the scale used by the importing software. A value of 1 corresponds to inches. 25.4 will correspond to mm.

Tick **AAMA** if the importing software requires the AAMA format.

Plot Other : Carlson

For use with a Carlson plotter.

Nesting Menus

File

- New** : Create a new square or circular panel.
- Open** **Ctrl O** : Open an existing panel file.
- Save** **Ctrl S** : Save the changes made to the current panels.
- Save As.** : Save the current panels with a new name.
-
- Copy to.** : Save a copy to a different directory (usually to an external device like a memory stick or network).
-
- Add** **Ctrl A** : Add an existing panel file to the current panels.
-
- Units** : Display the Units Preferences dialogue.
- Preferences** : Display the general preferences dialogue.
-
- Quit** **Ctrl Q** : Leave PanelMaker.

Edit

- Shaping** **Ctrl F** : Enter the Shaping Window.
-
- Scale** : Scale the highlighted panel(s) up or down.
- Divide** : Divide the highlighted panel(s).

Nest

- Group** : Group the highlighted panel(s) together.
- Ungroup** : Ungroup the highlighted panel(s).
-
- Colour** : Change the colour of the highlighted panel(s).
-
- Reset Compact** : Reset compaction memory.
-
- Preferences** : Display the Nest preferences dialogue.

Fabric

- Plot Options** **Ctrl V** : Displays the Plot Options dialogue.
- Width** **Ctrl W** : Width of fabric.

Print

- Offsets** : Print panel offsets for hand plotting.
-
- Screen** : Print the window.

Plot

- Plot** : Start plotting.
-
- Move To** : Move the plotter to a corner of the table.
-
- Setup** : Calibrate and test dialogues for the Plotter.
-
- Preferences** : Display plotting preferences dialogue.

Digitise

- Digitise** : Connects to the ProSail 2D digitising machine.
- Triangulate** : Goes to the optional Triangulation module for manual digitising.

About

- About** : Display information about software version etc.
- Bug Report** : Creates a problem report file that can be e-mailed to Armstrong-White for problem support.
- Check Preferences** : Check all preferences for unusual settings.