

# Woodturning Design Helper

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This document describes the web app **Woodturning Design Helper**. This web-based software runs in your internet browser and can therefore run on any computer and tablet. If you can access the internet, you can also directly get access to **Woodturning Design Helper**.

Get access to my home page with the following link; <https://www.johndistefano.com.au>

and select

## Woodturning Design Helper

by clicking the goblet icon.

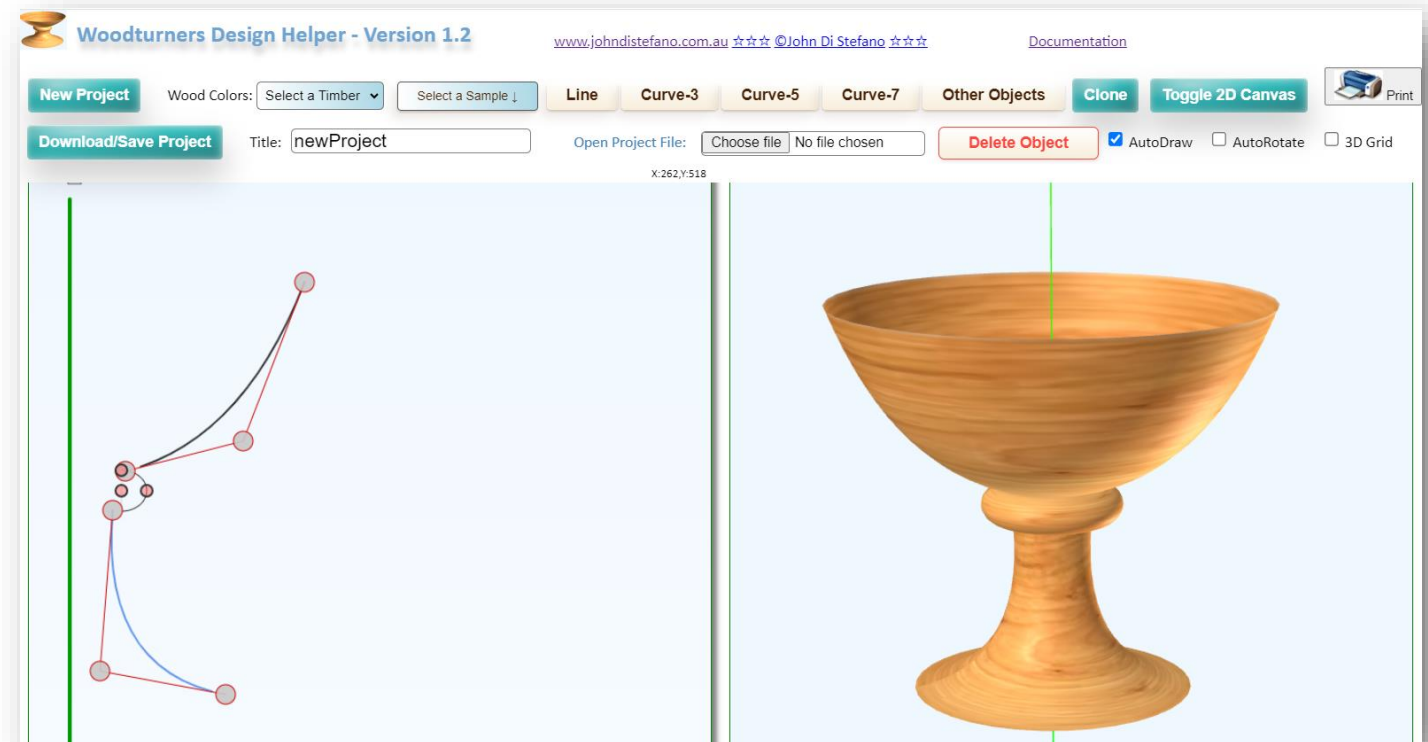
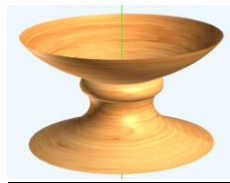
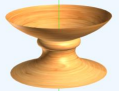


Figure 1 WoodTurning Design Helper Main Window

**Woodturning Design Helper** has been designed to be very easy to use. Add a curve, a pommel, a bead or any of the available design objects by clicking the appropriate button at the top of the main window. The working canvas, left of screen shows the 2-dimensional (2D) objects you are using in your design. The objects can be dragged to position and resized with the mouse. As you move or resize the object on the left canvas the right canvas will display a 3-dimensional representation. The goblet icon above was created in this way using two curves and one bead element.



The main design window with the simple goblet design is shown in Figure 1. At the top of main window are the various buttons and other elements giving access to all the features in **Woodturning Design Helper**. Each of the available design objects in **Woodturning Design Helper** are explained below.

## Buttons



The buttons at the top of the main window expose various 2-dimensional design geometries (objects) that provide the basic building blocks for your design. These are explained below.

## Curves

There are three curves represented by the three curve buttons. Curve-3 represents a three-point curve, Curve-5 a five-point curve and Curve-7 a seven-point curve. These curves can be used to form complex 3D surfaces of almost any shape. A few examples are given below.

Click the Curve-3 button to display the three-point curve. The three-point curve is shown in figure 2

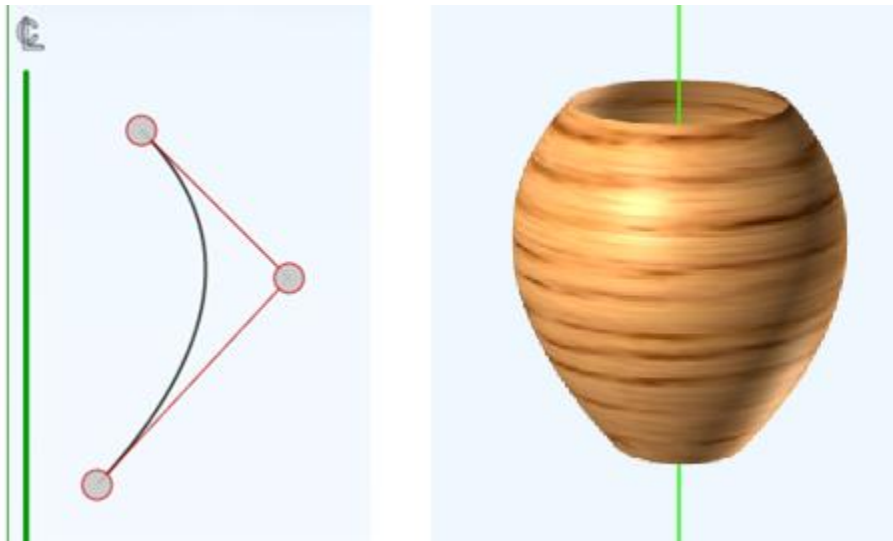
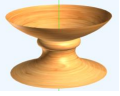


Figure 2 Three-point Curve with its 3-dimensional representation.

The 3-points drawn as three small red circles and joined by straight lines form the control points of the curve. These control points can be dragged by using the mouse left button to change the shape of the curve. As you do this the 3D representation changes to reflect the curve.



Similarly, the 5-point curve contains five control points (red circles that can be dragged and therefore can represent a more complex shape.

See figure 3.

By dragging the first and last point of the default curve you can convert the curve dramatically as seen in figure 4.

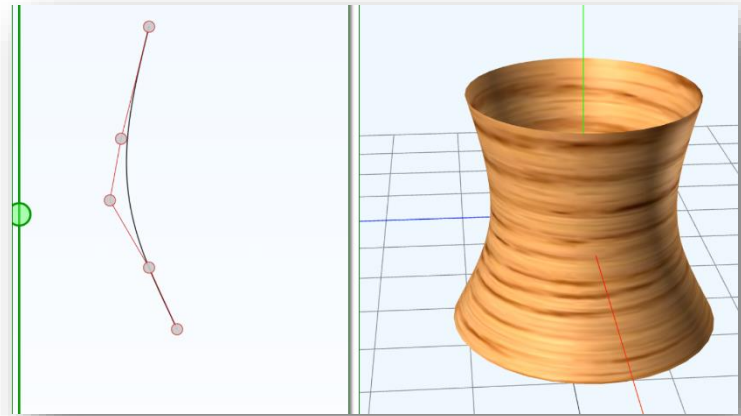


Figure 3 Five-point Curve

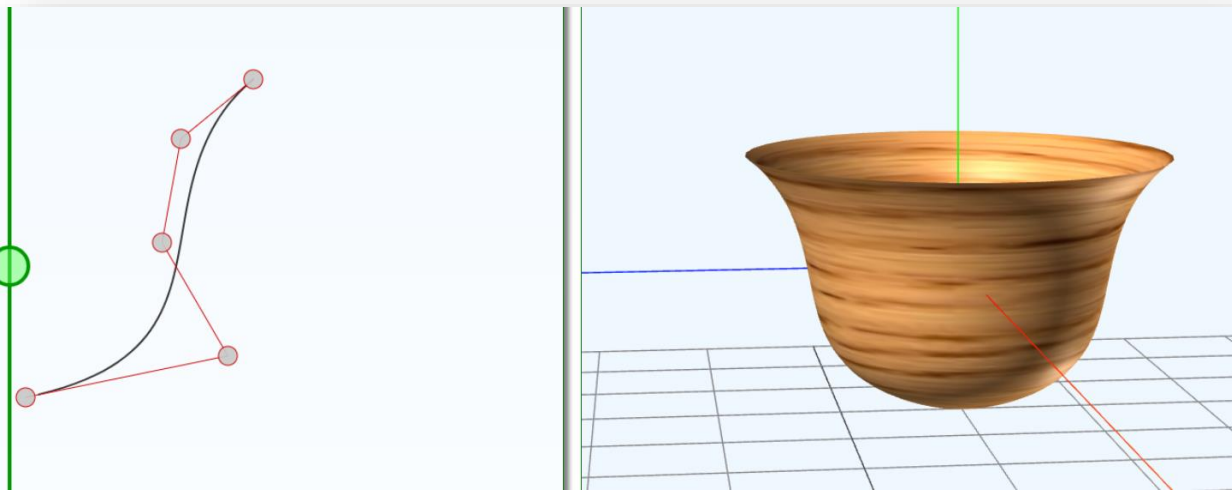
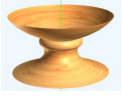


Figure 4 Changing the curve by dragging the first and last point.

The S-shaped curve represents a bowl shape. You can imagine creating the 3D representation by rotating the 2D curve about the green-coloured axis line to the left of the working canvas. This is precisely what **WoodTurning Design Helper** performs in the background to render the 3D model.



## Line

The **Line Button** draws a line with control points at the end of the line. The angular positioning of the line is important as it can represent many different 3D objects.

See Figure 5.

Again, imagine rotating the line about the central green axis a full  $360^{\circ}$  rotation. The result is the 3D rendering on the right side of figure 5 - from a cylinder for a vertical line to cones for angular lines to a disc for a horizontal line.

Before I describe the use of all the **Other Objects** button which gives access to the bead, cove, fillet, etc. let me demonstrate how to design a bowl. A bowl is an important object for woodturners. We woodturners turn many bowls; the bowl is the iconic object of all woodturners and there is an infinite number of different shapes.

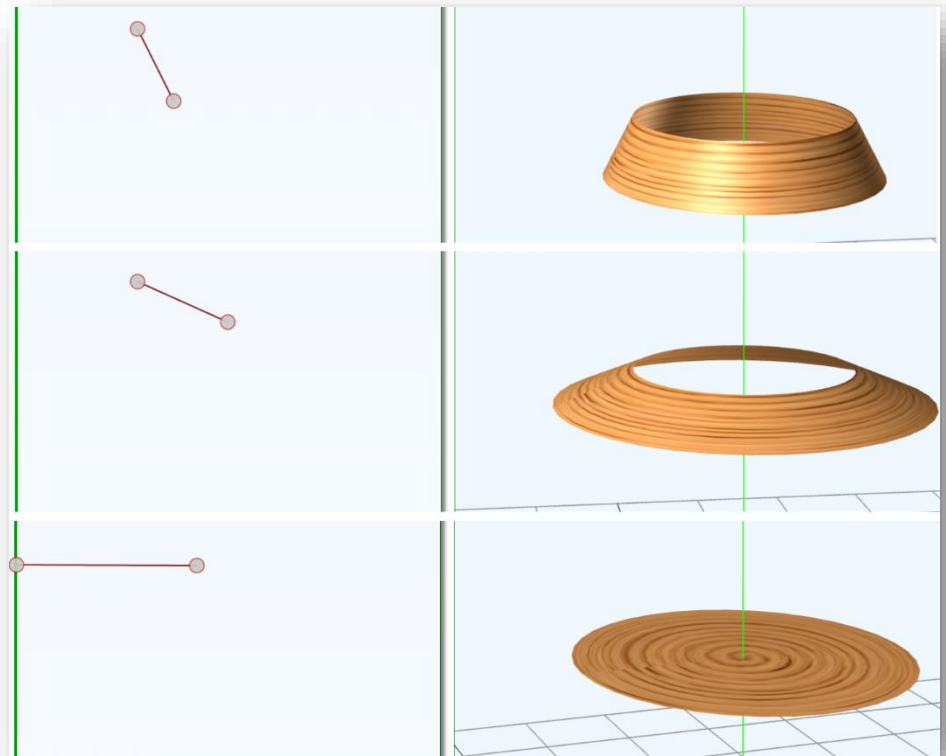


Figure 5 Angular positioning of Curve-2 geometry and 3D representation

Let us begin with a blank screen.

If there is some design or partial design on the screen click the **New Project** button to clear the canvas, both left and right.

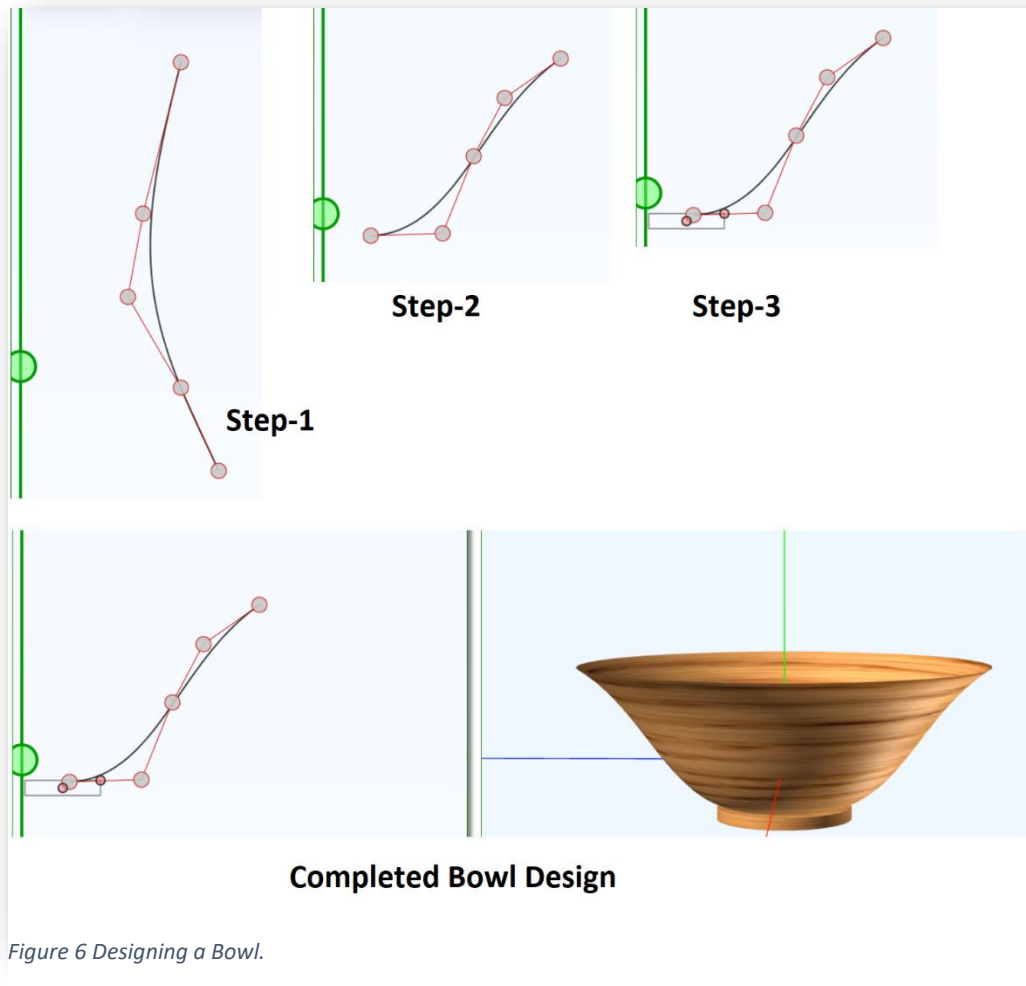
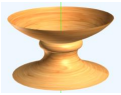
Now, click the Curve-5 button. This displays the 5-point curve. Drag one or more control points as follows.

**Using the mouse;**

1. position the mouse cursor over the point you wish to drag (anywhere in the small red circle)
2. depress the mouse left button and drag the mouse to the desired location
3. release the mouse left button

Do the above to alter the position of as many points as required. For example, see the three steps in figure 6.

Next, click the **Other Objects** button and then click the fillet button to add a fillet (represented by a small rectangle in the 2D working canvas). The fillet has two control point. The central point (small red circle in the centre of the fillet) is for dragging the fillet to a new position. The second control point at the top-right corner of the fillet is to resize the fillet.



Drag the fillet to a position below the curve, as shown in figure 6 step-3.

As we perform the manipulations described above the 3D image on the right is recreated at every step until we have the final design as shown at the bottom of figure 6.

The 3D image can be rotated and zoomed as follows;

With the mouse cursor over the right canvas;

1. Press and drag left mouse button to rotate model.
2. Press and drag right mouse button to translate or move the model.
3. Use the mouse scroll wheel to Zoom the model.

## Other Objects Button

The **Other Objects** button exposes various objects generally seen in spindle turning projects but some have uses in turning project generally.

For example, the fillet (3<sup>rd</sup> button) and the plinth (4<sup>th</sup> button) could be used as the base of a bowl design.

Each of the objects in figure 7 is explained below.

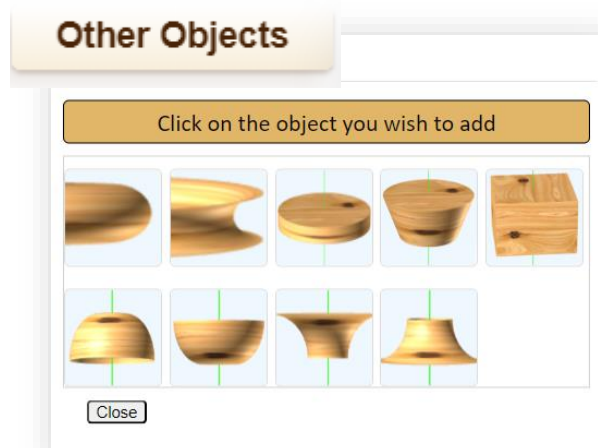
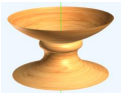


Figure 7 Other Objects



## Bead

A bead refers to a small, rounded, convex shape or profile that is typically created on the surface of a turned piece of wood.



The bead is one of the fundamental decorative elements in woodturning. It is generally used in spindle turning projects such as in a goblet or a turned table leg.

When you click on the bead button the bead shape is dropped onto the canvas (working canvas) and looks as in the figure below.

The semi-circular shape has three control points. The central point is for moving the position of the bead, the other two points are for resizing the bead and turn it into a semi-elliptical shape.

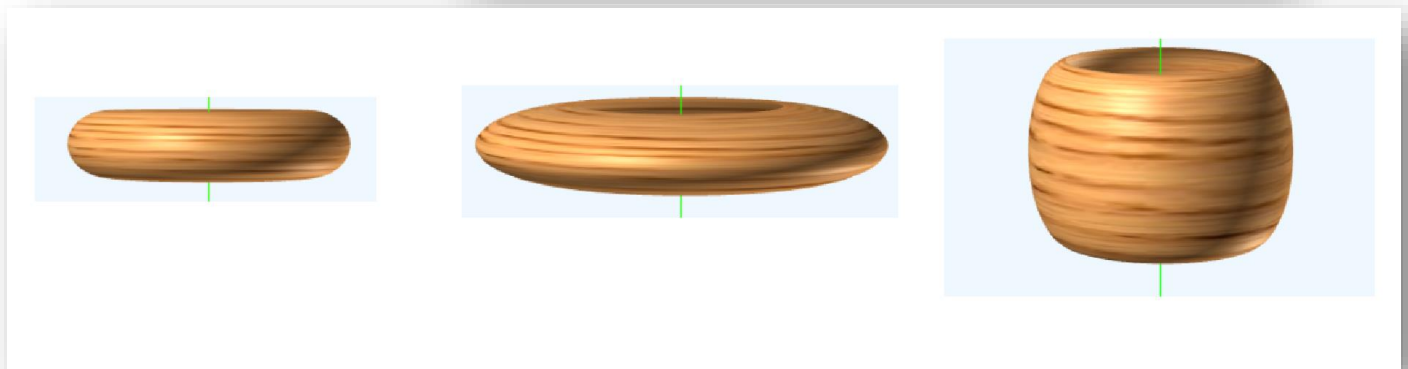
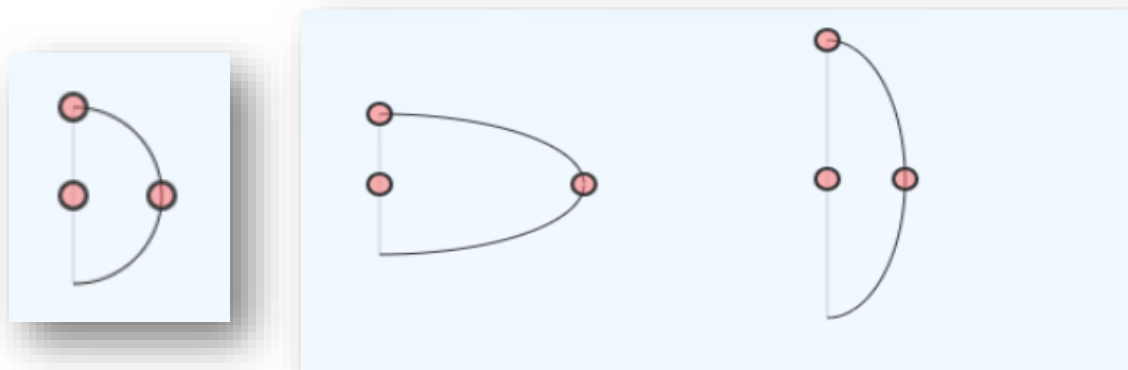


Figure 8 The bead

The three bead shapes correspond to rings of various ovoid shape (oval-shaped). As you change the shape of the bead by dragging the top control point or the right control point the new 3D model is rendered.

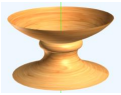
There are also buttons for half bead shapes. Use the following buttons if those shapes are required.



## Cove

A cove refers to a concave, inward-curving shape that is typically turned into the surface of a spindle or other turned object. It's one of the fundamental shapes created in woodturning, alongside beads, fillets, and other forms.





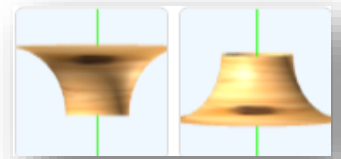
The cove can be thought of as the opposite shape to the bead. Its shape is defined as shown in figure 9.



Figure 9 Cove

Similar to the bead the cove has a central point for moving it around the canvas and two other control points for resizing and/or modifying the shape.

There are also buttons for half cove shapes. Use the following buttons if those shapes are required.



## Fillet

The fillet is a very simple rectangular shape with only two control points as follows.

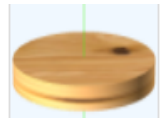


Figure 10 The Fillet

Drag the fillet to the required position using the central control point. Resize with the other control point.

Figure 10 shows two fillets. The thicker fillet produces the thicker 3D disc. The thinner fillet produces a thinner disc but with a larger diameter. How come?

The diameter of these objects is controlled by the distance from the green centre line and as the shape is rotated about that central green line it will result in the larger diameter disc. The green line can be shifted left and right by dragging its control point (green circle). Not shown in figure 10. If this is done all objects on the working canvas will be affected and the 3D model rendered will be immediately updated.

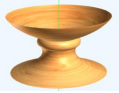


Figure 11 shown the effect produced when we shift the centre line a little to the right.

All objects are reduced in radial size.

You can understand this by thinking about the distance from the right side of the fillet to the centre line being equivalent to the radius of the corresponding 3D object.

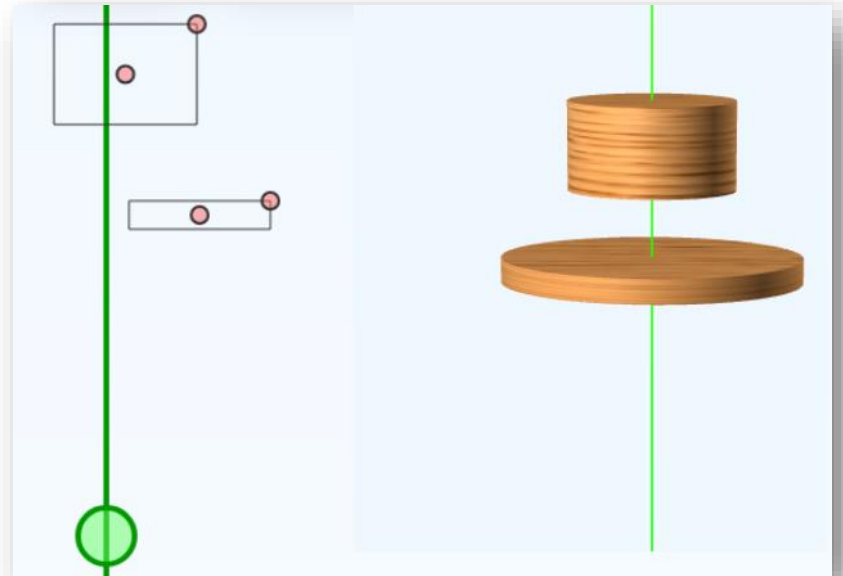


Figure 11 Shifting the centre line

## Plinth

In woodturning, a **plinth** typically refers to a base or platform that supports or displays an object. For example, in a turned candlestick or lampstand, the plinth might be the lower part or base, providing stability and a decorative foundation.



The plinth can take various shapes depending on the size of the base line in relation to the top. The various shapes and its 3D representations are shown below.

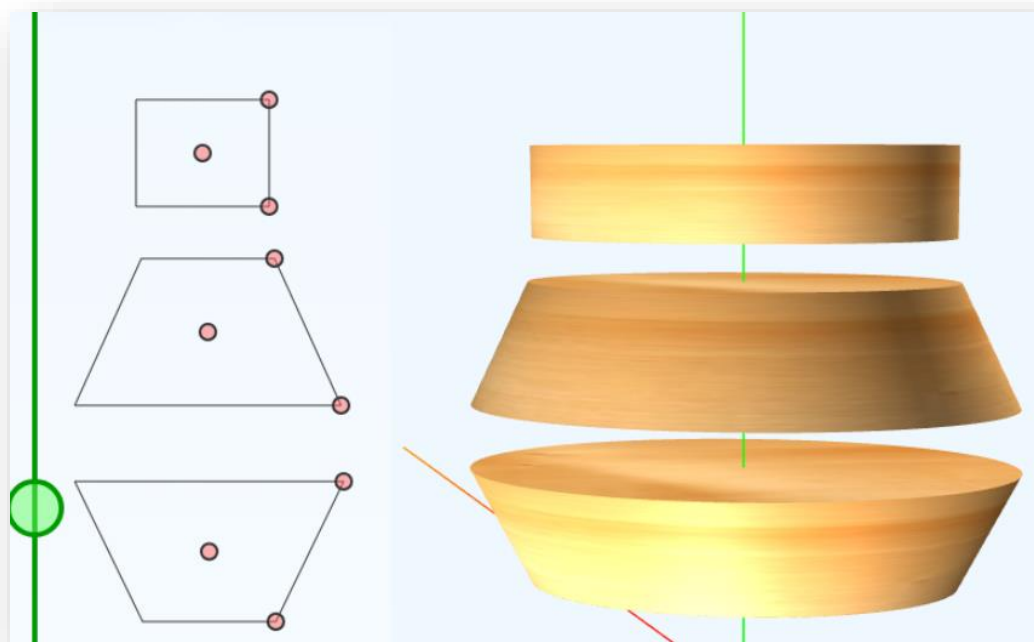
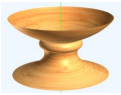


Figure 12 The Plinth

Figure 12 shows the default plinth and two others whose top and bottom dimensions have been dragged to a different size.

The central control point allows you to drag the plinth around the canvas so that it can be located exactly where required. The other two control points allows resizing of the plinth.



## Pommel

The pommel is usually a squared section of a spindle that transitions into a turned or rounded section. In some cases, the pommel is accentuated with decorative elements such as beads or fillets. These can enhance the visual appeal and make the transition between the square and turned sections more graceful.

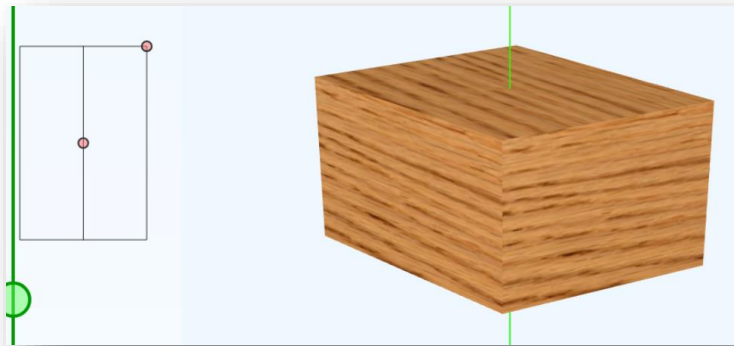


Figure 13 The Pommel

Use the central control point to move the pommel into position. Use the other control point to resize.

Finally, to give some idea of what you can quickly achieve using **Woodturning Design Helper** I have placed six objects, including two curves, a cove, a bead and two plinths to create figure 14.

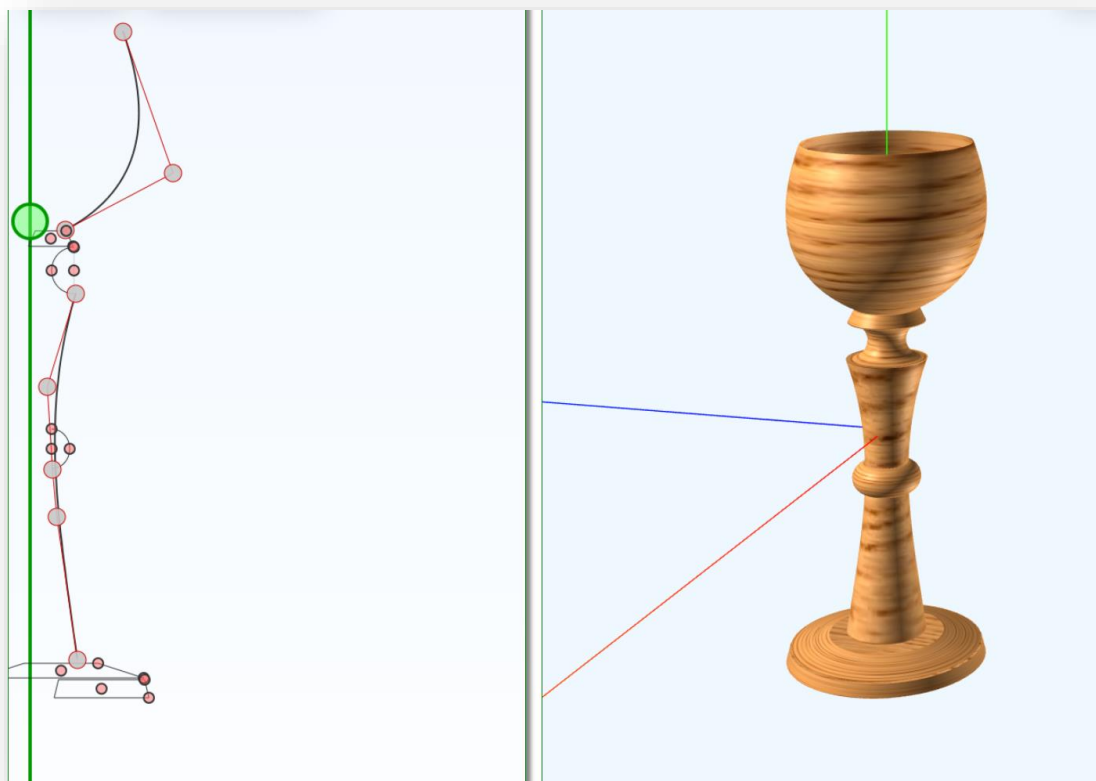
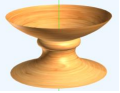


Figure 14 Putting some of the objects together.

Once you have finished your design, it can be printed and saved.



## Toggle 2D Canvas

Toggle 2D Canvas

In addition, we can generate a 2D representation of the project as shown in Figure 15 by clicking the toggle button. The working canvas and the 2D canvas lie in the same position, one above the other. The toggle button switches the position of these two canvases.

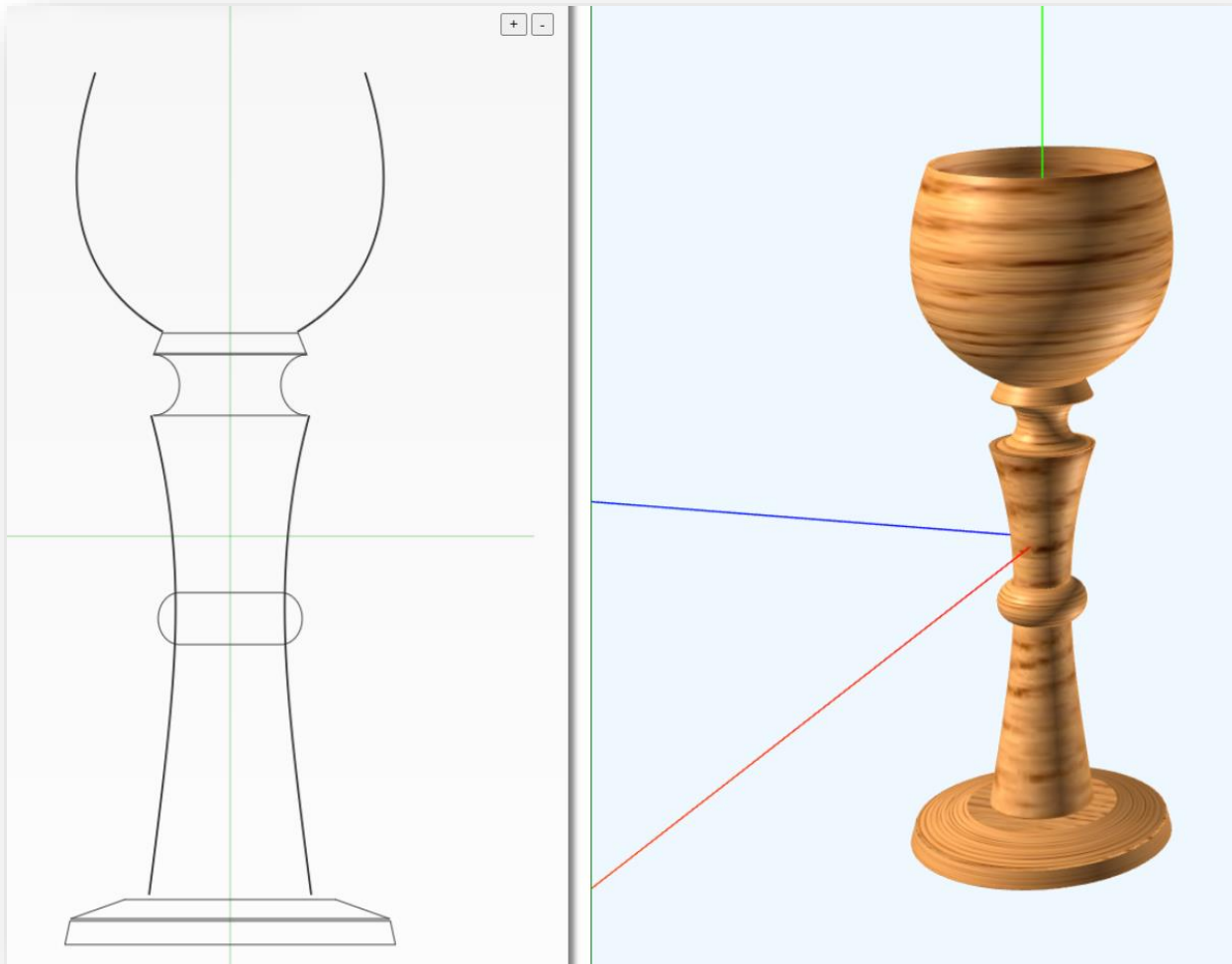


Figure 15 Toggling the working canvas and the 2D canvas.

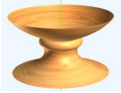
## Cloning an Object

Cloning an object is a very efficient way of reproducing an object and its size.

If an object has already been resized or its shape altered and you require another copy of that object use the clone button. Ensure the parent is the current object by clicking on any of its control points and then click the clone button to create a new copy.



Figure 16 Cloning objects



In figure 16, the three beads of the stem were designed by adding and resizing the top bead and then cloning the next two so that the size of the three beads are identical.

## New Project Button

A rectangular button with a teal-to-white gradient and rounded corners, containing the text "New Project" in white.

The New Project button clears all canvasses and prepares for a new project. You should at all times enter the project name of a new project in the title box.

Title:

This should be a meaningful name as this is the name which will be used when downloading or saving the project to your local drive.

## Saving a Project

A rectangular button with a teal-to-white gradient and rounded corners, containing the text "Download/Save Project" in white.

When you leave **Woodturning Design Helper** the project is saved automatically and restored when you next return. This is not the same as actually saving your project. Treat this automatic saving feature as temporary only. You should always save your work permanently by clicking the Download/Save button.

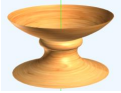
## Loading a Saved Project

Click the **Choose File** button to load a saved project. The project is displayed on the working canvas and the 3D representation rendered.

Open Project File:

You can now modify the current design by moving objects around to new positions or resizing the objects.

There are no dimensioning capabilities in **Woodturning Design Helper**. If you wish to add dimensions do so manually on a printout.



## Printing Your Project

Use Print button to print the project. Before anything is sent to the printer a preview is displayed and an associated dialog box will allow you to set various parameters.



See figure 17.

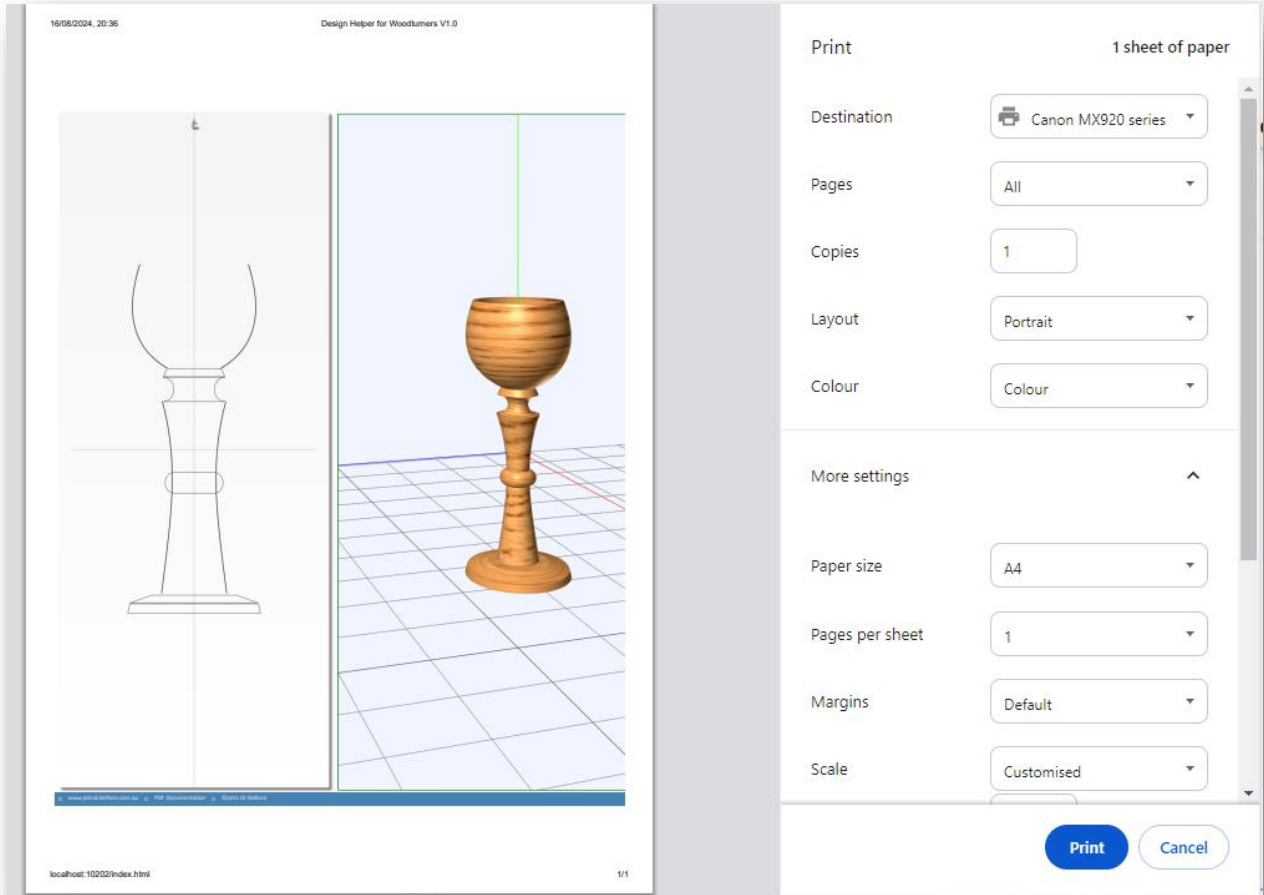
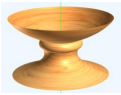


Figure 17 Print preview and dialog.

In the dialog box, in destination, you will normally see your printer listed but there are other options as well-such as saving to PDF. This might be useful sometimes if you wish to send a friend your new design. Most of the time you will not need to change any of the given settings.

If you are satisfied with the preview, click the blue print button to send the project to the printer.



## Timber Colours

The 3D canvas is rendered using the current timber colour.

The full list of timber names is shown in the timber drop box, shown in figure 18.

Click on a different timber to render the 3D canvas with a different timber.

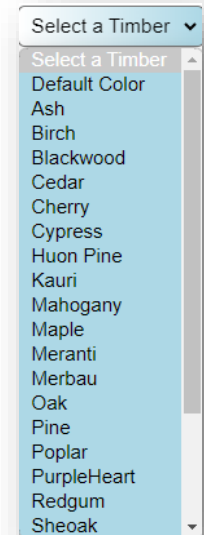


Figure 18 List of Timbers

## Sample Projects

Sample projects may be useful when learning to use **Woodturning Design Helper**. Sample projects can be loaded onto the canvas by clicking on the desired item in the sample list provided. See Figure 19.

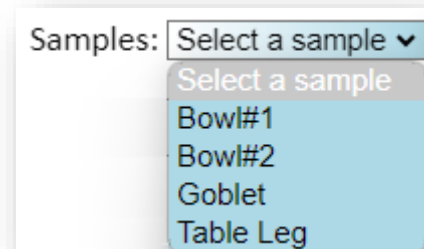
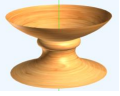


Figure 19 Sample Projects

Figure 20 shows sample bowl#2. Only two objects were required to design this bowl.



Figure 19 Sample Bowl#2



## Deleting Objects

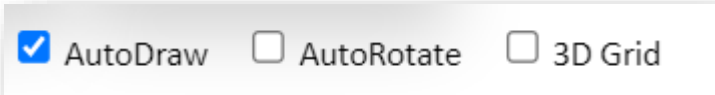
If you have added an object to the canvas and you later not require the object you can remove it from the canvas. To delete an object, first click on any one of its control points to ensure the object you wish to delete has focus. Then click the delete object button.



Delete Object

## 3D Model Options

The **AutoDraw**, **AutoRotate** and **3D Grid** options control aspects of the 3D model.



AutoDraw  AutoRotate  3D Grid

If set, the AutoDraw option will automatically draw or update the 3D model as objects are added to your design. If AutoDraw is turned off the 3D model is not updated.

When AutoRotate is set the 3D model will rotate continuously.

If the 3D Grid is set a grid or floor is drawn below the model.

## Moving Curves Around the Canvas Using Arrow Keys

All of the objects other than the three curves have central control point for moving the object around the working canvas. The three curves do not have a central control point by which they can be moved. Instead, the curves and indeed all objects, can be moved around the canvas by using the arrow keys.

For example, to move a three-point curve, as a unit;

1. Click any one of its control points to ensure it has focus.
2. Press one of the arrow keys to move the object in the desired direction.

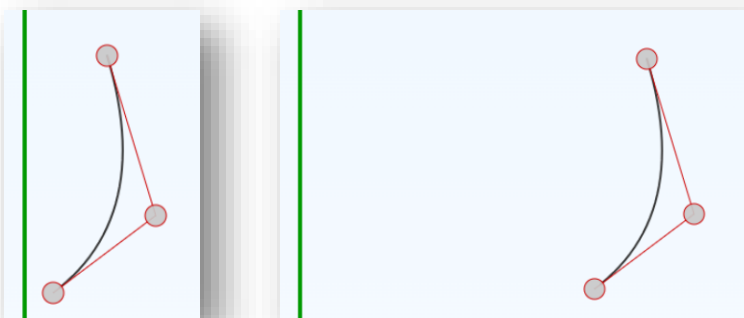


Figure 21 Moving the three-point curve to the right using the right arrow key.

*End of Documentation*

**Woodturning Design Helper**

