

CorelDRAW Bezier Curve Drawing and Editing Tools

1. INTRODUCTION

The curve drawing tools in CorelDraw probably the best of any drawing software, in that they allow for quick production of finished work. The ability to customise the interface helps enormously to make the various tools readily and speedily available. However there are some inconsistencies and minor irritations in the interoperation of the tools used to create the artworks and those used to manipulate them. The author would also like to propose some enhancements to the tools to further improve the toolset.

The author assumes that those who would find this article of interest, might also be reasonably expected to have good understanding of the workings of the Bezier and Node Editing toolset within CorelDRAW.

2. UI INCONSISTENCIES

2.1 Switching Node Types

The default node type whilst drawing is a Symmetrical node (there is an argument for making this user definable but this would require a change to the drawing methodology) After placing a node with the Pen and Bezier curve tools, the type of node can be changed at anytime by pressing S or C. S changes the placed node to a Smooth node and C to a cusp. Pressing S on either a Smooth or Cusp node reverts to a Symmetrical node. So S toggles but C does not.

Now it can be argued that changing a cusp node whilst drawing, the least dramatic change will be effected by having it revert to a smooth node not a symmetrical node. This is a minor niggle that causes little delay in drawing for most people.

The major inconsistency here is that these hard coded S and C keys do not work, as expected, with the Shape Tool i.e. as soon as you start editing the curve the methodology changes. These keys now only work when the mouse is released. They also do not operate on more than one selected node.

The right click context menu has options for changing the node type and each menu entry has a speedkey (the underlined letter) associated with it and are activated by a right click followed by a keypress. Here we have the ability to change a cusp to a smooth node without first having to go via a symmetrical node amongst other things. The problem is that these speedkey letters are not the same as previously, indeed they can't be because previously the S key toggles between Smooth and Symmetrical and from Cusp to Symmetrical, but the speedkey default for Cusp is 'p' not 'c'. So these cannot be consistent with the hardcoded keys even if a user were to customise them.

Proposal 1

In order to get some consistency I think we need to go back to 3 hard coded keys for node types. It used to be the case that S stood for Smooth, Y for Symmetrical and C for Cusp. At some point along the way the Y got dropped. I can understand why, its not easy to find on the keyboard without glancing down which sort of disrupts your flow. So what I would propose is the we have A for Asymmetrical (smooth) S for Symmetrical and C for Cusp . These three keys are all in the same small area on the keyboard and A and S especially are adjacent.

Proposal 2

That the hard coding of the three keys A, S and C be carried through to the Context Menus

Proposal 3

That these three keys be hardcoded such that they work with the Shape Tool whilst the mouse button is depressed .

Proposal 4

The keys to change node type should work when more than node is selected

2.2 The Alt key Modifier

Whilst drawing, the Alt key modifier allows for moving the node whilst dragging out the handle of the node i.e. whilst the left mouse button is depressed. Unfortunately if you change the node type to Smooth or Cusp it stops working. This is a particularly useful addition to the toolset, however its not available whilst using the Shape Tool.

Proposal 5

The Alt key modifier , be implemented correctly for drawing tools and made to work for the shape tool.

2.3 Selecting Adjacent Nodes

When selecting multiple nodes the user currently Shift-Clicks them. This runs counter to standard Windows UI procedures which require a Ctrl-Click to select individual items. Shift-Click will select all items between a start and an end point. This function would be very useful in the context of selecting nodes.

Proposal 6

The standard Windows UI methodology should be applied to the selection of nodes and the functionality be extended to allow the selection of nodes between two end points. This would have to work in the direction of the curve, and would only work on individual sub-paths if more than one existed within the object.

2.4 Stacked Nodes

When breaking apart nodes why is it that its the bottom one of the two that you want to move? You have to move the top one out of the way to get at it. The new offset extended node handles don't always show up for the underlying node and also at first glance its not always possible to tell which is for which node. Elsewhere the Alt key is used to 'dig' ie select underlying objects.

Proposal 6

The Alt to 'dig' should be made to work with the shape tool when selecting underlying nodes. Coupled with the Alt key modifier which allow a node to be moved when the mouse has hold of the node handle, this would remove an irritating problem.

2.5 Node Handle Size

For 10 years some of us have been asking for larger node handles. Ageing, or indeed middle aged, users with poor eyes find these too small. In v12 a change was made that reduced the size of nodes, but gave them a 'hover' state which was normal sized. See Fig 1. These very small nodes are difficult to pinpoint when there are a lot of them and even the normal sized nodes and handles are all too easily missed.

Proposal 7

Node handle sizes be customizable by the user, on the basis of +1, +2 +3 increments of size so that those who prefer to have the current node sizes can keep them. See Fig.2.

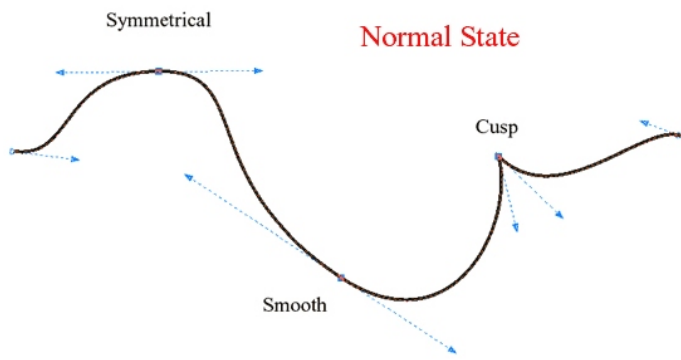


Fig 1. Normal Size Nodes. Not To Scale

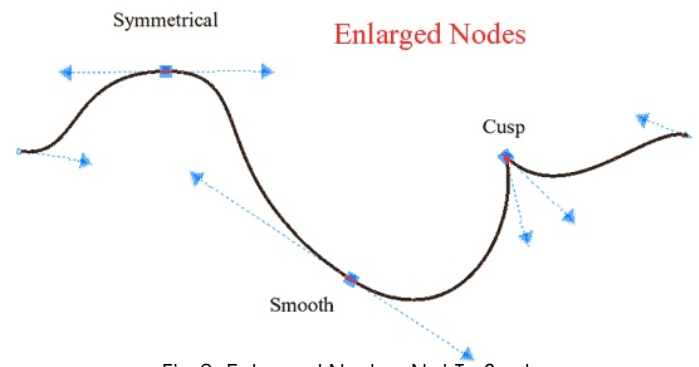


Fig 2. Enlarged Nodes. Not To Scale

2.7 Node Colour Mode

When a curve lies above a coloured object the nodes need to stand out otherwise they are difficult to find. It seems that there are some colours, lime green for example, over which the nodes disappear. See Fig 3

Proposal 8

It would be better if rather than a fixed colour, these nodes could have a colour mode applied to them, (such as inverse, colour add or whatever, I'm not that familiar with all the possibilities), such that no matter what the background colour, the nodes and the dotted curve line would show up.

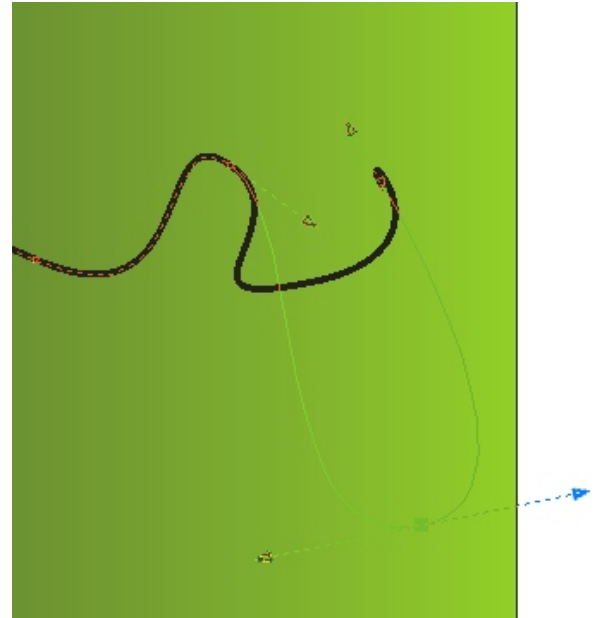


Fig 3. Node Colour Indistinguishable from Background.

2.8 Auto Join

Sub path end nodes are allowed to automatically join with another of the same if the node is 'dropped' by the mouse within a certain distance. This distance is specified as the Autojoin threshold value in Tools/Options/Toolbox/Freehand Bezier. This should have the option to turn it off. This can be very annoying when you are trying to break nodes apart and they keep re-joining.

Proposal 9

It should be possible to set the Autojoin threshold value to 0 pixels which would prevent it occurring.

3. NEW ADDITIONS TO FUNCTIONALITY

3.1 .Deleting The Last Node Whilst Drawing

Its long been the case that Ctrl-Z will delete the last placed node (there is an argument that the backspace key be implemented for this function with the pen tool to make it more familiar for Illustrator users, but personally I couldn't care less!). The last node now displays its handles. It would be very useful to be able to grab one of those handles and move them to change the curve shape on the fly before re-placing the next (just deleted) node.

Proposal 10

After deleting the last node placed, the handles of the penultimate node remain visible. If the mouse grabs one it should be possible to edit the handle placement, (and by using the Alt key modifier, see Proposal 5, move the node). If the user opts not to edit the penultimate node, or after editing, normal drawing should resume .

3.2 Node Colouring

Self explanatory, useful tool to help show which is which.

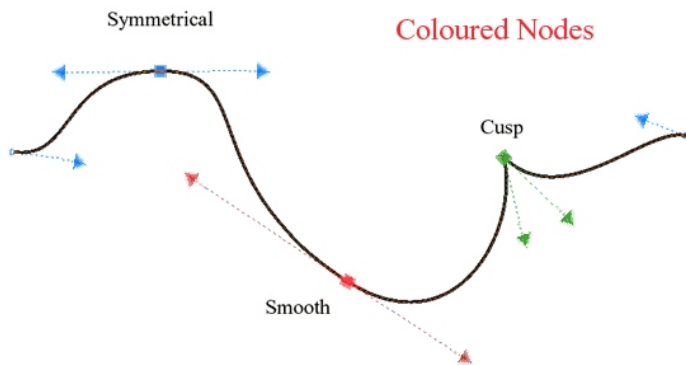


Fig 4. Coloured Nodes. Not To Scale

Proposal 10

Implement node colouring, ideally with user definable colours. This would require a change to the node colour mode in order for the new colours to be visible on a mixed background.

3.3 Marquee Selection of Nodes

Using the Shape tool the Alt modifier allows nodes within a non-regular area to be selected. It would be very useful to be able to select nodes using a polygonal lasso technique

Proposal 11

Introduce a polygonal lasso tool.

3.4 Tangents and Normals

This functionality exists in Draw already in that the snap to object functions can tell you when you have snapped to a tangential point of a curve or a normal point on a curve. The important aspect of the existing function is that it applies to a curve being drawn UP TO another curve. What is needed is the reverse such that you can define the start point on a curve and then draw a tangent or normal away from that point.

Proposal 12

Modify the bezier toolset to allow for draawing tangents and normals away from a start point. Holding 'T' for tangent or 'L' for normal (N gets you the Navigate tool) whilst drawing with the Bezier or Pen tools would be a possibility.

3.5 3 Point Curve Tool

This is a specific implementation of the bezier drawing tool, however it is lacking one particular feature that would be very useful. The ability to create a circle or arc of a circle by defining 3 points. Currently there is no way of doing this other by trial and error. (A macro exists but all snap functionality is disabled whilst using it so it is not especially useful)

Proposal 13

Introduce a means of creating an arc of a circle by defining 3 points. This could be by a modification to the existing tool, whereby the use of the Ctrl key would force the creation of a true circular arc. The implementation would allow for the user to define whether an arc or a full circle would be created.

3.5 Snap to Self.

This isn't specific to bezier curves and node editing but does impact upon it. The ability to prevent a node, when moved, snapping to itself allows for small movements with the mouse, removing the need to resort to nudging.

Proposal 14.

The ability to detect when an object is snapping to itself must be introduced in order for it to be eliminated. Then in the Tools/Options/Workspace/Snap To Objects section a new checkbox should be included for Snap To Self so that the user can disable it to prevent it occurring. There are occasions when snap to self needs to be on, so it must be left to the user to disable this.

3.6 Symmetry In Objects

I was amused to see this illustration, Fig 5, in the Draw help file. The heart shape is really nice and symmetrical isn't it and it sort of implies that CorelDraw can easily produce the shape used as an illustration, which it can't. This shape is difficult to achieve along with star shapes, ovals (if they aren't ellipsoidal), teardrops etc. Those who have to produce them regularly have no doubt developed a few workarounds to achieve this perfect symmetry.

Now within Draw the technology exists, in the form of the Reflect Nodes command which makes nodes on mirrored (but separate) objects behave as though they were linked. What this needs is the ability to apply it to nodes on the same object. This would require that nodes could be 'paired' and linked vertically or horizontally, just as they do now with Reflect Nodes. In order for it to work on a closed object (so that a fill can be applied) it would also need to ability to be applied to both handles of the same cusp node. So in the case of the heart shape Fig 7. below, the two side nodes. The two cusp nodes would need to be 'symmetrical' cusps such that movement of one cusp handle would generate an equal but opposite movement in the other handle, so the 'reflect nodes would be working on the two handles in a mirrored fashion. This type would have a vertical axis of symmetry and there would as a minimum, be a need for a horizontal axis of symmetry also.

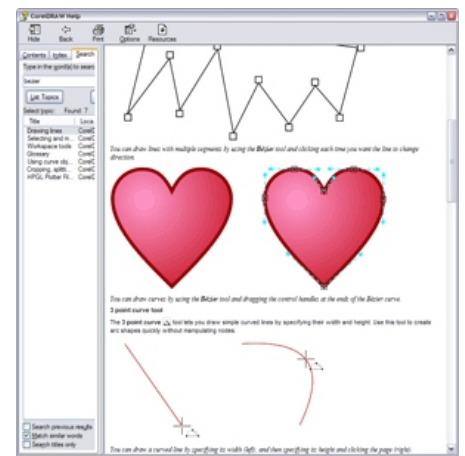


Fig 5. Extract From CorelDraw x4 Help File.

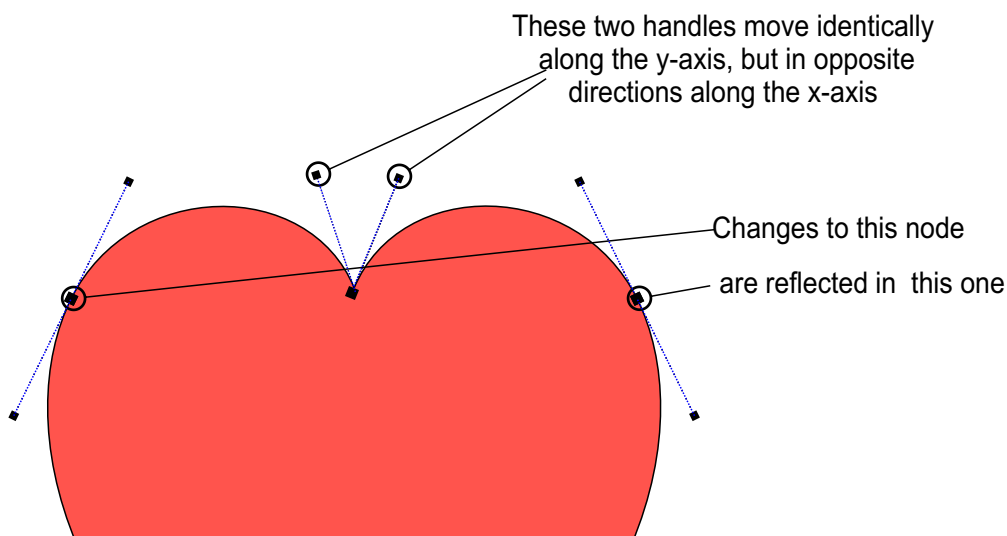


Fig 6. Reflect Nodes on Single Object

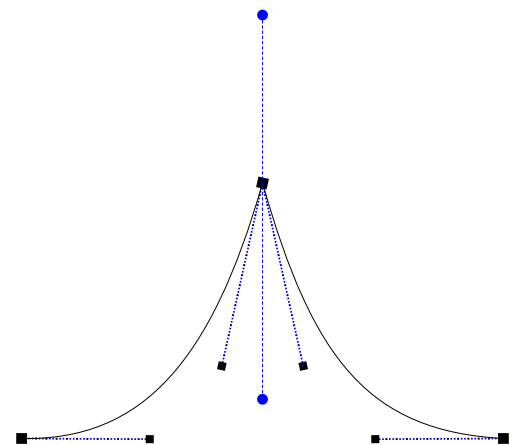


Fig 7. Node With an Axis of Symmetry

Taken to a logical conclusion a cusp node with a definable axis of symmetry would be a very useful extension of this feature. This would allow a node to be reflected off any angle. It would require something akin to Fig 7. in order to manipulate the axis of symmetry.

Proposal 15

The modification of the Reflect Nodes functionality will go a long way to resolve the problem of drawing closed, fillable, regular shapes.

However this functionality is not going to be required if SmartFill is made dynamic, something I have been advocating for many a version. At that point an object can be the product of two independent curves, in this case a master and a clone. Of the two I would much prefer for SmartFill to be extended and improved upon since it has an impact on other drawn shapes as well.

4. AUTHORS COMMENTS

This document represents the authors own experiences using CorelDraw as a line art drawing tool and is to be circulated as a means of stimulating discussion, with a view to reaching a consensus which the planners at Corel will hopefully, use to guide the development of the application. Other users will undoubtedly use the tools differently, though the author would like this to be the stimulus for others to add to, or indeed produce their own ideas for discussion. Much of what is recommended is the tidying up of features introduced and then left unfinished.

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