

Glyphs Handbook



June 2012

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Minor updates:

12 Aug 2012: Corrected wrong shortcut on p. 43 (thanks @clauseggers)

3 Jul 2012: Corrected 'pipe' on U.S. keyboard on p. 42 (thanks @composerjk)

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1 Edit View

1.1 DRAWING PATHS

1.1.1 Freehand Outlines

Create paths with the Draw or Primitives tools. When the Draw tool  (shortcut P) is active, click to create straight lines, or click and drag to create curves. Move the curve point by holding down the space bar. Close the outline by clicking on its first node.

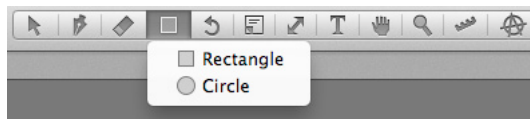
Nodes in smooth connections will appear as green circles. A smooth connection can either be a curve (an on-curve point in line with two surrounding off-curve points) or a tangent (an on-curve point in line with another on-curve point and an off-curve point).

In order to draw a corner, hold down the Option key while dragging. Corner points are marked by blue circles. Points in a corner connection are not kept in line, so you can move them independently from each other.

Handles (Bézier control points, off-curve points) control the curvature of the path segment and are displayed as grey circles.

1.1.2 Primitives


Glyphs offers rectangles and ovals as built-in primitive shapes. Click and hold the Primitives tool to choose between the two shape options.



Click once on the canvas to create a primitive by entering its measurements with the keyboard. Or click and drag to draw it directly into the Edit area. Hold down shift for a perfect square or circle.

1.2 EDITING PATHS

1.2.1 Select Tool

Click and drag with the Select tool  (shortcut V) to select nodes and handles inside a rectangle. Hold down the Shift key to extend or reduce the selection. Note that, unlike most editors, Glyphs allows you to select multiple handles independently of the nodes.

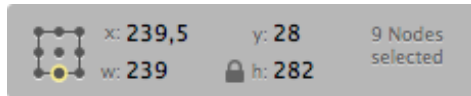
Move the selection using the mouse or the cursor keys. This also works if more than one handle is selected. Moving nodes will move the attached handles even if they are not selected. Hold down the Option key to move only explicitly selected points. When moving a handle while holding down the Option key, its angle will be preserved. Convert between smooth connection and corners by double clicking or selecting the node and pressing Return.

Option-clicking a line segment converts it into a curve segment, i.e. adds handles. To convert a curve back into a line segment, select and delete one or both handles.

Tip: Quickly add handles by Option-clicking on the outline between two nodes.



1.2.2 Scaling and Rotating

The attributes of the selection are shown in the grey info box (View > Show Info):




Tip: In all number input fields throughout the application, you can use the up and down cursor keys to increase or decrease the value. Simultaneously holding down the Shift key gives you increments of 10.

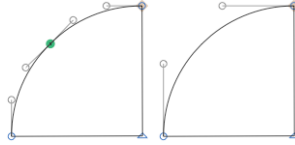
When more than one node is selected, you can scale or move the selection by changing the numbers for its position (x and y) and its dimensions (w for width, h for height) in the info box. Set the transformation origin with the nine reference points on the left. Close the lock symbol to scale width and height proportionally. Open the lock to distort the selection, i.e. scale width and height independently from each other.

You can also rotate and scale your selection with the Rotate tool  (shortcut R) and the Scale tool  (shortcut S). Click to set the transformation origin, click and drag to rotate or scale, respectively. Hold down the Shift key to rotate in steps of ninety degrees and scale proportionally.

More path transformations are possible via the Palette. See the Palette chapter for further details.

1.2.3 Deleting Nodes



Simply select a node and hit the Delete key to delete the node. Alternatively, you can use the Erase tool  (shortcut E). Glyphs will keep the path closed and try to reconstruct the path segment without the node:

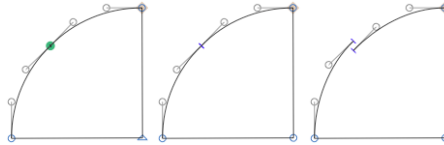


Tip: A quick way to get rid of a path segment between two nodes is to insert a point with the Draw tool (P) and immediately Option-delete it.

Hold down the Option key to break the path, i.e. remove the node and both path segments surrounding the node.


1.2.4 Opening and Closing Paths

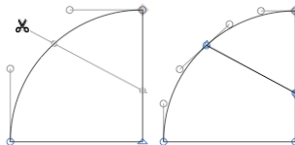
With the Draw tool , click on a node to open the path in the position of the node. Open path endings are marked by perpendicular blue lines. You can now drag them apart with the Select tool .



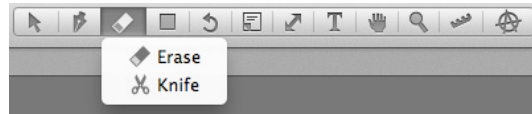
To close the path again, simply drag the open line endings onto each other using the Select tool.

1.2.5 Cutting Paths

With the Knife tool  (shortcut E), click and drag a line across a path, to cut the outline into two separate outlines. Glyphs will close the two resulting paths along the cutting line.

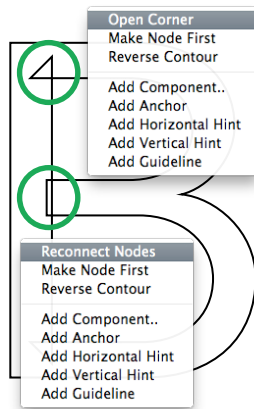


To activate the Knife tool, click and hold the Erase tool. Choose Knife from the pop-up menu.



1.2.6 Resegmenting Outlines

In order to segment a closed path, select two nodes and select Reconnect Nodes from the context menu. To open the context menu, right-click or Ctrl-click. If only one node is selected, the Open Corner command becomes available instead. It works in a similar fashion. Resegmenting your outlines this way allows to edit the path segments independently from each other. It also makes interpolating easier.



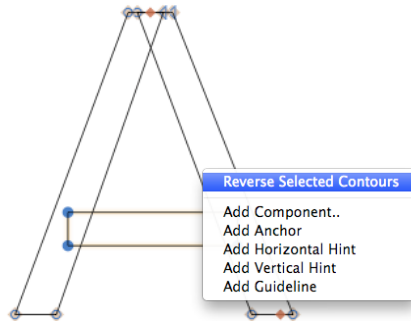
1.2.7 Controlling Path Direction

The starting point of a path is displayed as a triangle, indicating the path direction. Again, green and blue denote a smooth connection or a corner, respectively. You can make any on-curve node the first node by selecting it and picking Make Node First from the context menu.

Tip: a quick way to get your counters right is to draw both inner and outer shapes, and hit Cmd-Shift-R (Correct Path Direction).

All outer paths need to run counter-clockwise, while counters must be turned clockwise. You can change a path's direction by selecting it and choosing Reverse Selected Contours from the context menu. Use the Reverse Contours

from the Layer menu to switch all paths in a glyph. If you pick the Correct Path Direction command from the same menu, Glyphs performs an informed guess and finds the right path orientation for all contours in the selected glyphs. This will also rearrange the contour order and reset the starting points of all paths to the top right nodes.



For interpolation, path order, starting points and path directions need to be compatible and consistent throughout all font masters.

1.3 GUIDELINES

1.3.1 Magnetic Guidelines

If you drag nodes across the canvas, red lines will appear, indicating when you are aligned with other nodes or a vertical metric.

1.3.2 Local and Global Guidelines

To add a guideline, right- or Ctrl-click to open the context menu and choose Add Guideline. A horizontal blue line appears. You can activate it by clicking the little circle on it, alter its position by clicking and dragging the circle. Double click it to turn it perpendicular to its original orientation. Click and drag a guideline close to its circle to rotate it.

To turn it into a global guideline, i.e. a guideline that appears in all glyphs throughout the master, right- or Ctrl-click the circle and choose Make Global Guideline from the


context menu. The guideline will turn red. To make it local again, cut and paste it. Pasted guidelines will always be local.

When a guideline is selected, you can also enter values for its position and its angle in the grey info box. By default, a guideline will be set relative to the left sidebearing. However, if you change the alignment of the guideline by clicking on the Alignment icon in the info box, the guideline will stay fixed relative to the right sidebearing. This is useful for slanted guidelines if they are global or when the right sidebearing is changed.

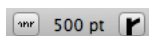
With the Measurement checkbox, you can turn it into a measurement guideline. For more details on measurement guidelines, see the Measuring section in this chapter.

1.4 GLYPH DISPLAY

1.4.1 Zooming

There are many ways to zoom in and out in Edit View. If you are on a MacBook or have a trackpad to your disposal, you can use pinch and stretch gestures. Or hold down the Option key and use a scroll gesture or the scroll wheel of your mouse. Or activate the Zoom tool  (shortcut Z) and click in the canvas to zoom in, Opt-click to zoom out, click and drag across an area that will be zoomed to fill the window.

Or you can use the zoom commands from the View menu: Zoom In (Cmd-plus) and Zoom Out (Cmd-dash). Zoom to Active Layer (Cmd-zero) will maximize the area between ascender and descender in the window. Zoom to Actual Size (Cmd-Opt-zero) will zoom one unit to the size of one pixel on the screen.




Or you can use the zoom buttons in the bottom right corner of the window. Alternatively, you can set the zoom value numerically by entering a point height in the field between the buttons. The value specifies at which size 1000 units will be displayed. Since Mac OS X assumes a screen resolution of

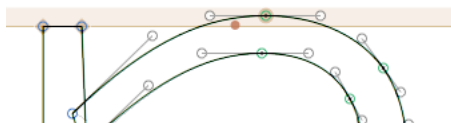
72ppi, one point corresponds to one actual screen pixel, so if you enter a value of 1000, one unit will zoom to one pixel.

1.4.2 Panning

You can use trackpad panning gestures. Use the wheel of your mouse to scroll vertically, hold down shift to scroll horizontally.

Alternatively, you can switch to the Hand tool  (shortcut H) and drag the canvas around. As long as you are not in text mode, you can hold down the space bar to temporarily switch to the Hand tool.

1.4.3 Nodes in Alignment Zones



Nodes located exactly on a vertical metric line (see the Font Info chapter for further details) are highlighted with a beige diamond. Inside an alignment zone (see Font Info), the highlighting assumes the shape of a circle. This helps controlling the position of nodes even at small zoom scales.

1.4.4 Anchors and Clouds

Letters built from components, so-called compound glyphs, are handled in a special way. Accented or marked letters, built from a base letter and a mark, automatically inherit the spacing from the base glyph. The mark is positioned according to the anchor positions. The accented letters are always in sync with the base letter, even if spacing or anchor positions are changed.

Anchors are added to most glyphs automatically with the Set Anchors command from the Layers menu (Cmd-U). If you hold down the Option key, Glyphs will delete all anchors in the selected letters and reset the built-in standard anchors.

Once you have anchors in your letters, all you need to do is to refine their position. An anchor in the base glyph is connected with the anchor in the mark glyph by sharing the same name and additional underscore prefix, e.g. a ‘top’

Pro User Tip: If you want to control which marks are associated with which base glyph, create a copy of GlyphsData.xml in ~/Library/Application Support/Glyphs/Info/ and edit the anchors and accents attributes. You will find the XML file in the Package Contents of the Glyphs application. Drill down to Contents/Frameworks/GlyphsCore.framework/Versions/A/Resources.

anchor in the base glyph and a ‘_top’ anchor in the mark are used to place the mark glyph in the compound glyphs.

Select an anchor in the base glyph to get a preview of the most common accents that may attach to this glyph. Similarly, select an anchor in the mark glyph and this accent is shown on all other glyphs in the same edit view.

Sometimes you need more than one ‘top’ anchor. This is the case for Arabic ligatures and Vietnamese letters. In this case, add an underscore and a number or a suffix to the anchor name, e.g. ‘top_viet’ or ‘top_1’, ‘top_2’ and so on. Then, in the compound glyph, select the mark, and via the anchor symbol in the grey Info panel, select to which anchor the mark component should attach. The anchor symbol becomes visible if there is more than one anchor that fits.



When building letters from several base glyphs, the components are set next to each other using the spacing and kerning for this combination. For example when building a fraction out of one.numr, fraction and two.dnom, the fraction will look as if the letters were typed individually.

1.5 BACKGROUND

The background layer is useful for storing a path temporarily. Filters may use the background as backup layer in order to work non-destructively. To activate the background, choose Edit Background from the Layers menu (Cmd-B). The window display will darken slightly to indicate that you are in the background layer.

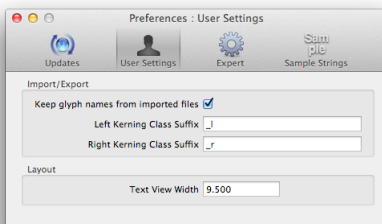
Layers > Selection to Background (Cmd-K) replaces the current content of the background with the active selection; this works in reverse when the background is active. Simultaneously holding down the Option key (or pressing Cmd-Opt-K) adds the current selection to the background without clearing it first.

Via Layer > Assign Background, you can put another font in the background layer of all selected glyphs.

1.6 ENTERING TEXT

The Edit View also acts as a simple text editor, and as such allows you to edit your glyphs in the context of a whole word or even sentence.

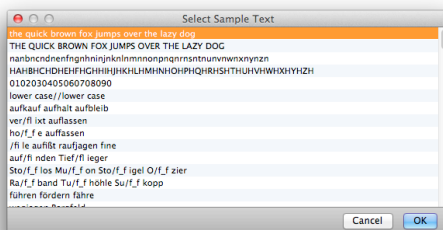
The Edit View is limited to a certain width. You can set the maximum width in the application preferences. Select **Glyphs > Preferences**, switch to **User Preferences** and edit the **Text View Width** value accordingly.



1.6.1 Sample Texts

You can edit and store any number of sample texts in the application preferences. Select **Glyphs > Preferences** and then switch to the **Sample Text** tab. You can also enter individual glyph names if you escape them with a leading slash and a trailing space, e.g. 'H/adieresis mmer' will result in 'Hämmer'.

To make an Edit tab display any of these texts, choose **Edit > Select Sample Text (Cmd-Opt-F)**. In the appearing dialog, use your arrow keys or click on a line to pick the sample text and hit **Return** or click the **OK** button afterwards.

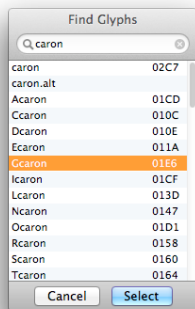


1.6.2 Text Tool

Select the Text tool (shortcut T) to switch to text mode and start typing. You can enter multiple words, complete sentences, even line breaks. You can copy and paste text into and from the Edit tab. The arrow keys, the Edit commands and OS X Application Services work as they would in any Mac app.

Edit > Add Placeholder (Cmd-Opt-Shift-P) inserts a placeholder for the current glyph. Placeholders are dynamically replaced by the currently selected glyph.

To insert a glyph that you cannot or do not know how to type with the keyboard, choose Find from the Edit > Find submenu (Cmd-F). In the dialog that appears, enter the name or a part of the name of the glyph. The dialog will show a list of glyphs whose name contains the text you entered. Select the glyph you want and hit Return or click the Select button to insert it into your sample text.



1.7 MEASURING

Glyphs offers several ways to determine coordinates and measure distances between points and curves.

1.7.1 Info Box

The grey info box (View > Show Info) always displays info relevant to the current selection. If there is exactly one node selected, its coordinates will be displayed.

x: 119 y: 360

Select a handle (off-curve point, Bézier control point), and the info box will also carry its delta values (x and y difference to the on-curve point) and the total length of the handle (distance to the on-curve point).


x: 132 y: 520 Δx: 13 Δy: 160 L: 160,53

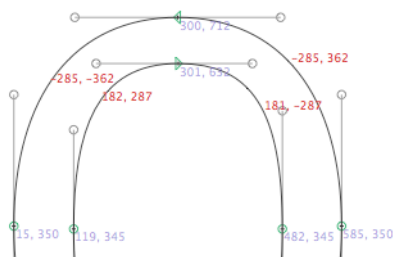
If you select more than one point, be it on- or off-curve points, the info box will display the width and the height of the box defined by the current selection. To measure a stem or

bowl width, select two nodes that indicate the width and see what the info box displays next to 'w:'.



1.7.2 Measurement Tool

Switching to the Measurement Tool  (shortcut L) allows you to see all coordinates at once.



The blue numbers are the x and y coordinates of the on-curve points, the red numbers are the x and y delta values between the on-curve points. These values help you check the symmetry of your curves.

Clicking and dragging draws a ruler that displays precise measures between all of its intersections with outlines. At the end of the ruler, its angle is displayed.

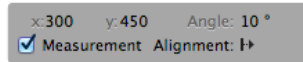


You can always temporarily activate the ruler by simultaneously holding down Ctrl, Option and Command.

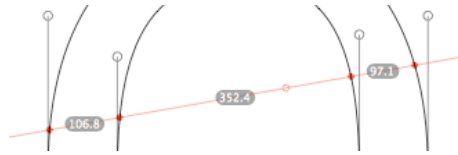
1.7.3 Measurement Guidelines

Any guideline, even a global guideline, can be turned into a measurement guideline. Simply select the guideline by clicking on its selection handle and activate the Measurement check box in the grey info box. You can set the angle of the measurement guideline by selecting it and either grabbing it

close to the selection handle or setting the angle numerically in the info box.



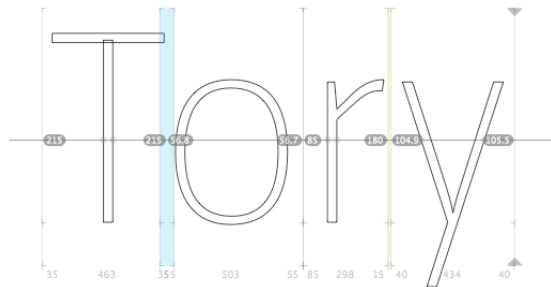
Similar to rulers, the measurement lines will display the distance between their intersections with outlines. Contrary to rulers, they do so as long as guidelines are shown, no matter which tool is active.




1.7.4 Measurement Line

Activate measurement mode by choosing Show Measurement Line from the View menu (Ctrl-Opt-Cmd-M). The measurement line will display the sidebearings at a given height, ignoring the shape of the glyph at other positions. You can alter its height by Ctrl-Opt-Cmd-clicking or Ctrl-Opt-Cmd-dragging.

Thin grey lines indicate the widths of the glyphs. The numbers displayed indicate the distance between the left or right sidebearing to where the measurement line first crosses the glyph outline. Negative kernings will be displayed light blue, positive kernings yellow.



1.8 ANNOTATING

The Annotation tool  (shortcut A) allows you to add simple notes and correction marks to your drawings. Once you activate the tool, the grey info box (View > Show Info) will turn into a little palette holding a range of annotation tools.

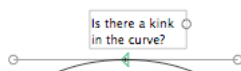


1.8.1 Annotation cursor

The first tool on the Annotation palette is a simple edit tool for annotation marks. It allows you to activate, move and resize existing annotations. Once an annotation mark is activated, you can delete it by pressing the Delete key.

1.8.2 Annotation text

The second tool from the left is a simple text tool. Activate it by clicking on the T button and then click anywhere on the canvas to add a text box. Double click on the text and start typing. When you're finished, just activate the next tool you want to work with. You do not need to acknowledge the text entry.



The handle on the right controls the width of the text box. The height of the box always automatically adjusts to the length of the entered text.

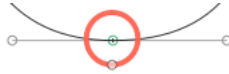
1.8.3 Annotation arrow

The third tool on the Annotation palette allows you to put red arrows on the canvas. The handle on the arrow stem controls the rotation of the arrow.



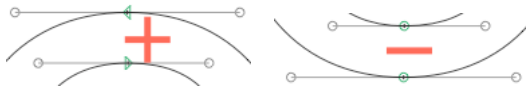
1.8.4 Annotation circle

The fourth tool puts red highlighting circles on the canvas. The handle at the bottom of the circle controls the diameter.



1.8.5 Plus and Minus annotations

Many designers use plus and minus signs to indicate that a counter, a bowl or a stem needs to be thickened or thinned, respectively. Click on the plus or minus button and then on the canvas to add the symbols to the editing area.



1.9 PREVIEWING AND TESTING

1.9.1 Previewing Masters

The edit view already is a preview of the master(s). It always previews the anti-aliased outlines and the kerning of the currently selected font master.

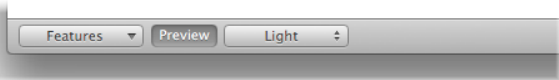
1.9.2 Previewing OpenType Features

You can apply features for previewing through the menu at the bottom left. You may need to recompile the features before they are available in the pop-up list. Glyphs can only show a preview of substitution features. Positioning features are not supported.

1.9.3 Previewing Interpolated Instances

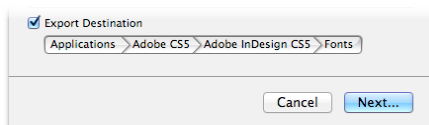
Click on the Preview button next to the Features pop-up. The window content will be sectioned vertically, the Edit view at the top, the Preview at the bottom. Pick an instance from the instances pop-up next to the Preview button to see a live interpolation of the respective instance in the Preview area. Drag the separator line to adjust the size of the Preview line.

You can double click a letter in the Preview to make the Edit view center on it. Custom parameters are ignored.



1.9.4 Previewing in InDesign

For a complete preview including things like positioning features and menu ordering, just pick File > Export and choose the Fonts folder inside the InDesign application folder as Export Destination. The font becomes immediately available in InDesign. Any previously saved instance of the font in this folder will be overwritten.



1.10 EXCHANGING OUTLINES WITH ILLUSTRATOR

1.10.1 Preparation

Find the right scale for the drawing in Illustrator. One point in Illustrator corresponds to one unit in Glyphs. An element that is 1000pt high will end up at a height of 1000 units in Glyphs.

To get the right scale, first draw a rectangle with the height of the capital letters in Glyphs, copy and paste it into an Illustrator artboard and scale the drawings to fit the size of the box.

Alternatively, you can start in Illustrator and set the artboard to a height of 1000pt. Both ascender and descender should fit inside these 1000 points.

1.10.2 Set the Page Origin

If you set the page origin to the intersection of base line and LSB, the paths will have the right position.

In Illustrator up to Version CS4, set the origin of the page by dragging the cross in the top left corner between the rulers. In Illustrator CS5 or later, set the origin of the page in the Artboard Options.

1.10.3 Copy the Paths

Copy and paste the outlines. A dialog may appear, preventing you from pasting something far outside the bounds of the letter. It will move the path next to the origin, i.e. the intersection of base line and left sidebearing.

2 Palette

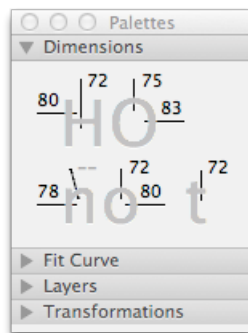
2.1 PALETTE WINDOW

You can invoke the floating Palette window from the Window menu, or hit the shortcut, Cmd-Opt-Shift-P. The Palette has four sections. You can collapse or expand them by clicking on their title or the triangle next to it. If you butt the window against the left or right edge of your screen, the window zoom (click the green zoom button or choose Window > Zoom) will save space for the Palette.

Most Palette transformations work in both the Font and the Edit View. In the Edit View, they work on paths, a complete glyph, or even multiple glyphs.

2.2 DIMENSIONS

The entries in the Dimensions section have no effect on any font parameters. They serve as a cheat sheet for your design process. You can enter values for a couple of crucial measures in your current layer.



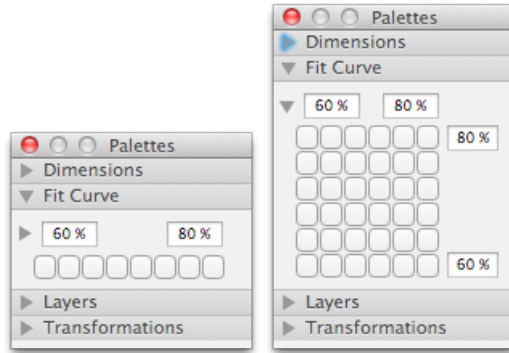
2.3 FIT CURVE

The Fit Curve panel helps creating curves with matching curvatures. In most instances, the collapsed (i.e. single line) view is enough. Select percentages by setting the left field to the minimum value and the right field to the maximum value. The buttons in between interpolate between the two values. Alternatively, you can press Ctrl-Opt-1 through 8.

The numbers describe the percentage length of the handle. The distance from the curve point to the intersection of the

handles equals 100 percent. 57 percent give you an elliptic curvature.

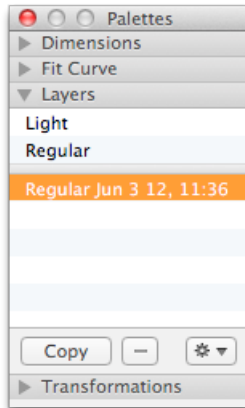
For finer tuning, click the little triangle to expand the Fit Curve panel into two dimensions. In that case, the first handle on each curve segment is controlled by the x axis, while the second one is controlled by the y axis.



Click one of the little buttons to alter the curvature of the selected curve segments. Click the same button to adjust other curve segments (e.g. in other letters of the same font) accordingly. This way, you can achieve matching curvatures in different curves.

2.4 LAYERS

Glyphs differentiates between two sorts of layers: font masters and regular layers.



Font masters are needed for interpolating instances. All glyphs in a font will always carry all font masters set in **File > Font Info > Masters**. In the **Layers** section of the Palette, master layers are displayed above a separator line.

Regular layers are displayed below the separator. They are stored on a per-glyph basis. You can have any number of layers in a glyph. Use them for keeping variations of the respective glyph.

2.4.1 Working with Layers

Font masters cannot be edited through the Palette. They are controlled via the **Font Info** window.

Select an available master from above the separator and click the **Copy** button to create a new layer. A copy of the master will appear below the separator line, carrying the name of the master and the creation date. Double click the layer name to edit it.

To delete a layer, select it and click the minus button below. To exchange it with the glyph layer that is used as an interpolation master, click the gear button and select **Use as Master** from the menu that pops up.

2.4.2 Switching Glyph Shapes

In a Multiple Master font with a weight axis and no other axes, you can let Glyphs exchange layers with masters automatically for a range of weights. For this to happen, create layer copies of all masters. Set each layer name to the name of the corresponding master, followed by a space and a number in brackets, e.g. 'Light [70]' and 'Regular [70]'. For instances with weight values above the bracketed number, Glyphs will use these layers as masters.

A common usage example is the vertical bar that crosses down through the dollar sign. In bolder variations of the glyph, most designers choose to split it in two and reduce it to whatever extends below and above the s-shaped part of the sign. Keep the light variations as masters and put the bold variants into the bracketed layers.

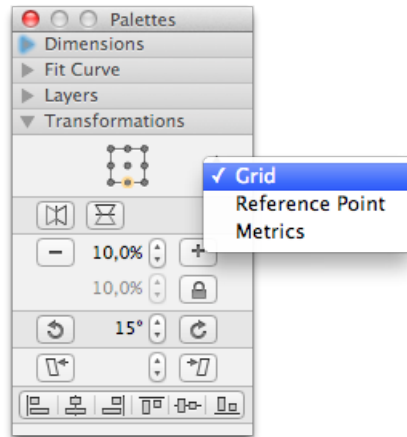


This 'bracket trick' only works for simple set-ups. If you want to exchange glyph shapes in more complex set-ups, you can use separate glyphs and rename them at export with custom parameters in the respective instances. See the Font Info section for more details.

2.5 TRANSFORMATIONS

The bottom section of the palette is reserved for basic path transformations. First, you need to select a transformation origin. This can either be Grid point calculated relatively to the selected paths, a manually set Reference Point, or one of the Metrics taken from the entries in the Masters section of

the Font Info, such as baseline, (half or full) x-height and (half or full) cap height.



Once you have set the transformation origin, you can, from top to bottom:

- mirror horizontally or vertically
- scale by percentage values, the lock will keep proportions
- rotate counterclockwise or clockwise by degrees
- slant left or right by degrees
- align the selected paths to each other

The align buttons only work on complete paths, no matter if they are partially or fully selected. If you want to align individual points or segments, you need to use the grey Info panel and either set the width (W) or the height (H) value to zero.

3 Filters

3.1 FILTERS MENU

Glyphs has an expandable plug-in interface. The plug-ins can contain filters, tools, panels and file formats. You can apply filters to the active layer in the edit view, or to any number of selected layers (with the text tool), or in the font view. The following filters come with Glyphs.

3.2 HATCH OUTLINE

Creates hatched letters. Distance, width and angle of the hatch-lines can be chosen. Glyphs always uses the background path as source. If there is no path, Glyphs will put a copy of the current path into the background. Alter the appearance of the hatching by changing the background path and applying the filter once again.

3.3 OFFSET CURVE

Changes the thickness of stems horizontally and / or vertically. Open paths will be expanded into closed outlines.

3.4 REMOVE OVERLAP

Removes overlaps of selected paths. If no paths are selected, the filter will be applied to all paths of the selected letter(s).

3.5 ROUND CORNERS

Apply this in order to round all selected corners. To only round the outside corners, simply select nothing. Use the Visual Corrections option to adjust the radius of different corner angles and create a more consistent appearance.

3.6 TRANSFORMATIONS

3.6.1 Transform

Use Transform to horizontally and vertically move, scale and tilt glyphs. Fix the origin when scaling and tilting. Tilt without optical correction by choosing Slant, or with optical correction with the Cursify option. Cursify requires correctly set vertical and horizontal stems (see also Font Info > Master).

3.6.2 Background

Use Background to interpolate between front and background paths. The paths need to be compatible.

3.6.3 Metrics

Use Metrics to set the width or the sidebearings of a letter. With the Relative option, the values will be added or subtracted.

4 Font View

4.1 VIEWING GLYPHS

By default, a new font contains uppercase A-Z, lowercase a-z and space. You can choose to view different excerpts of your glyphs by selecting categories, languages or filters from the left. Alternatively, you can enter a search term in the search field at the bottom right of the window (Cmd-F). By clicking on the magnifying lens, you can choose to search for unicodes instead of glyph names.



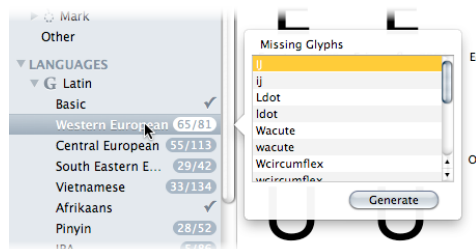
With the slider next to it, you can control the zoom level of the displayed glyphs.

The three numbers to the left indicate (from left to right) how many glyphs are selected, how many are currently displayed, and the total number of glyphs in the font file.

4.2 ADDING GLYPHS

There are several ways to add new glyphs:

- Font > New Glyph (Cmd-Opt-Shift-N) adds an empty glyph called 'newGlyph'.
- Font > Duplicate (Cmd-D) duplicates the currently selected glyph(s).
- Font > Add Glyphs (Cmd-Shift-G) opens a window where you can insert a list of glyph names. As far as information about components is available, the glyphs will be built from them.




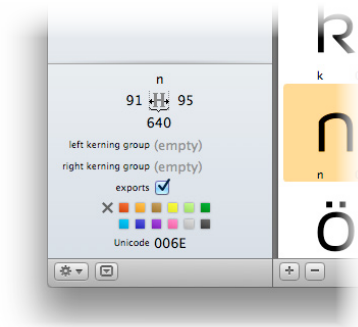
For the complete list of recognized glyph names, choose Glyphs Info from the Window menu.

- Some entries in the sidebar of the font view have a number badge. Right-click or Ctrl-click it to get a list of all glyphs missing in this category. Select one or more glyph names,

or hit Cmd-A to select all of them, and click Generate to add them to your font.

4.3 GLYPH PROPERTIES

Select some glyphs and click on the second button  at the bottom left of the window, and the Glyph Properties will be displayed. Some of the properties can also be accessed through the context menu.



4.3.1 Name

The glyph name can be accessed and changed only if exactly one glyph is selected.

4.3.2 Width and Sidebearings

The widths as well as the left and right sidebearings can be accessed and changed for any number of selected glyphs at once. Changing the width only affects the right sidebearing.

4.3.3 Kerning Groups

You can set kerning groups for a range of glyphs, see the section on Spacing and Kerning for further details.

4.3.4 Exports

The glyph will appear in the exported font only if this radio box is checked. Use this for keeping glyph variations for later use.

4.3.5 Color Label

For easier sorting and filtering, or simply for keeping oversight, you can mark glyphs with one of ten predefined colors. The colors have no effect on the exported font.

4.3.6 Unicode

The Unicode is determined by the glyph name, which means that you cannot set the value directly. Thus, the displayed Unicode is read-only.

4.3.7 Note

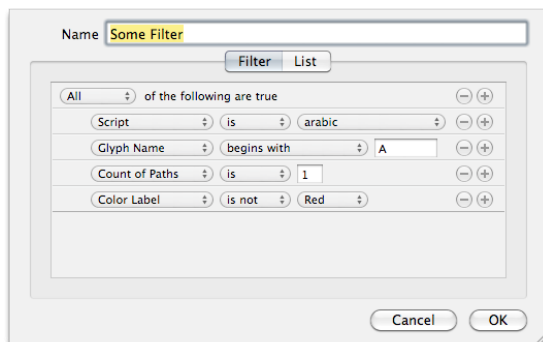
In list view, you can display even more properties as columns. Just right click on the columns headers and tick off the columns you want to see. You can use them as sort key. Switch between ascending and descending sorting by clicking on the column title.

4.3.8 Read-Only Properties in List View

The following properties can only be accessed in List View, they are read-only and only useful for sorting glyphs:

- Unique Glyph ID (corresponds to the glyph order in the font; you can only change this by setting the Custom Parameter 'glyphorder')
- Character (i.e. the Unicode character as represented by the OS X system font Lucida Grande)
- Script (e.g. 'Latin', 'Greek', 'Cyrillic')
- Category (e.g. 'Letter', 'Number')
- Subcategory (e.g. 'Uppercase')
- Last Changed (i.e. date and time of the last manipulation of the glyph)

4.4 FILTERING AND SORTING



Filters can help you get an overview of the glyphs in the font. There are predefined letter, type and language categories. In addition, you can define your own filters, e.g. query filters, similar to smart playlists in iTunes, or simple list filters. You can add a Filter with the button in the lower left corner. Set up the query with these properties:

- glyph name
- script (e.g. Latin or Arabic)
- count of paths (in the first master)
- compatibility of masters
- whether the glyph exports or not
- whether the first master has components or not
- color label

Once you have set up a couple of filters, you can apply more than one filter by holding down the Cmd key and clicking the Filter names.

4.5 NAMES AND UNICODE

4.5.1 Naming and Renaming Glyphs

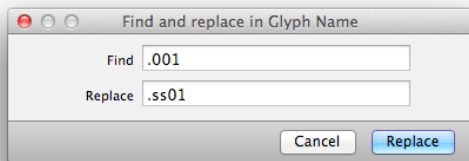
The glyph name appears below the glyph in grid view, or in a separate column in list view. You can edit a glyph name by clicking once into the name. Glyphs will automatically convert entries like 'ä' or 'uniooE4' to its own naming convention (which is, for the Latin part, loosely based on the Adobe Glyph List Specification), i.e. 'adieresis' in this case. A dialog will appear if you try to use illegal characters like space in a glyph name.

For more information about the
Adobe Glyph List, see
[http://sourceforge.net/
adobe/aglfn/home/Home/](http://sourceforge.net/adobe/aglfn/home/Home/)

For a list of built-in glyph names, choose Glyph Info from the Window menu. Glyphs will automatically assign Unicodes and can even build OpenType features based on the glyph names.

If you need variations of glyphs, extend your glyph names with dot suffixes, like 'n.sc' for a small cap n, or 'five.sups' for a superscript five. See the appendix of this manual for a list of recognized suffixes.

You can search and replace in the names of selected glyphs via Edit > Find > Search and Replace (Cmd-Shift-F). If you leave the Find field blank, then whatever is entered in the Replace field will be appended to the names of all selected glyphs.



You can copy the names of selected glyphs through the context menu. The names will be copied as a slash-delimited line of plain text, e.g. the names of a, ä, b and c will be stored in the clipboard as: '/a/adieresis/b/c'.

4.5.2 Readable or Nice Names

Glyphs contains a glyph info database that holds information about, names, Unicode, components, anchors and the like.

Not all glyphs that are defined in the Unicode database have official glyph names. For these, one would typically use names like 'unio42F' or 'afii10049', which are hard to memorize. Instead, Glyphs uses the Unicode description and appends a script suffix, e.g. 'CYRILLIC CAPITAL LETTER A' becomes 'A-cy'.

To name ligatures, the names of the components need to be joined with an underscore. The script suffix will be appended only once (e.g. 'lam_alef-ar'). Variation suffixes are only added once as well. These suffixes define the role of the whole ligature. For instance, a ligature formed of 'lam-ar.init' and 'alef-ar.medi' is called 'lam_alef-ar.init'.

If you set the glyph name, all other values will be set automatically. If necessary, even the name will be changed. Glyphs accepts three different types of input values:

- the actual name, e.g. 'Ia-cy'
- the Unicode value in hex form with a 'uni' prefix, e.g. 'unio42F'
- the Unicode character as typed from the keyboard, e.g. 'Я'

This automatism can be deactivated on a font basis: Go to File > Font Info > Other Settings and check the 'Don't use nice names' option. In this case, however, other automatic functions, like components and feature generation, will not work either.

5 Font Info

5.1 FONT

5.1.1 Family Name

The name of the font family as it will appear in a font menu. Fonts carrying the same Family Name will be grouped in the same Style submenu. You can use a space in the font name, but non-ASCII characters may prevent the font from exporting.

5.1.2 Units per Em

Number of units per em square (UPM). 1000 is the default. Increasing the UPM value improves the representation of subtle details. The OpenType allows values up to 16,000 but values greater than 5000 can lead to problems in InDesign and Illustrator. If you need higher precision, it might be better to deactivate the grid by setting it to zero (see Font Info > Other settings > Grid Spacing).

Click on the double arrow next to the text field to scale the entire font.

5.1.3 Designer and Designer URL

Here, you can enter your name and a URL (including the protocol, i.e. `http://` or `ftp://`), for example:

- Designer: Jessica Doe
- Designer URL: `http://www.jessicadofonts.com/`

The entries correspond to OpenType Name IDs 9 and 12. You can check if the URL was entered correctly by clicking on the circled arrow next to it.

5.1.4 Manufacturer and Manufacturer URL

Here, you can enter name and URL (including the protocol, i.e. `http://` or `ftp://`) of your font vendor, for example:

- Manufacturer: Superfontstore
- Manufacturer URL: `http://www.superfontstore.com/`

The entries correspond to OpenType Name IDs 8 and 11. You can check if the URL was entered correctly by clicking on the circled arrow next to it.

5.1.5 Copyright

A simple copyright notice. Click the circled arrow next to it to have Glyphs fill it in automatically. This will be recorded as Name ID 0.

5.1.6 Version

Glyphs derives the Version string (Name ID 5) from the Version entry.

5.1.7 Date

The creation date of the font. Will set the Creation and Modification dates in the OpenType head table.

5.1.8 Custom Parameters

Use entries to specify more parameters. To add a parameter, click on the green plus symbol, select or type a property, and enter a value. You can use custom parameters to override values set automatically by Glyphs. With most of them, you can directly set values in the various OpenType tables. Glyphs considers a range of possible properties, for instance:

- openTypeOS2WeightClass
- openTypeOS2Panose
- openTypeOS2UnicodeRanges
- openTypeOS2VendorID
- openTypeNameDescription (Name ID 10)
- openTypeNameLicense (Name ID 13)
- openTypeNameLicenseURL (Name ID 14)
- openTypeNameSampleText (Name ID 19)
- openTypeNameWWSFamilName (Name ID 21)
- openTypeNameWWSSubfamilyName (Name ID 22)
- postscriptBlueFuzz
- postscriptBlueScale
- postscriptBlueShift
- postscriptBlueValues
- trademark
- etc.

These names are adopted from the UFO specifications. For details and a complete list, see <http://unifiedfontobject.org/versions/ufo3/fontinfo.html>.

5.2 MASTERS

While information about the designed masters (the input) is set under 'Masters', the 'Instances' tab contains information about each instance that will be generated when fonts are exported (the output). Use the plus and minus buttons to add masters, and the 'Add' button to add any open single-master font as a master to the current font. You can add the font to itself to have two identical masters to start from.

Standard stems and alignment zones are necessary to optimize the font's rendering on screen, where these characteristics may be represented by only a few pixels. Small deviations in the drawing can – after rounding to the pixel grid – result in considerable differences. Stems should have a uniform thickness. Alignment zones help create an even vertical alignment by overshoot suppression. The values entered here are crucial for the autohinting process when the font is being exported.

All values will be interpolated if entered in the same order throughout all masters. You can edit several masters at once after you Shift-click or Cmd-click the master names in the list on the left.

5.2.1 Proportions: Width and Weight

The values in these two pop-ups affect only the toolbar icons. The values for the actual interpolation are set under 'Instances'. For more information about this, see the Multiple Master chapter.

5.2.2 Metrics

The vertical metrics have an impact on the line height, and serve as a guideline in the editing window. Glyphs will calculate the vertical metrics in the OS/2 and hhea tables from these values.

Also, Glyphs is able to find alignment zones (see below) automatically if you first enter correct vertical metrics: ascender, cap height, x-height, descender, perhaps also a smallCapHeight in the Custom Parameters.

When determining these values, ignore the overshoot. So, for instance, if you have the choice between various values for the x-height, say 490, 496 and 502, you want the one closest to your baseline, i.e. 490.

5.2.3 Stems

For an in-depth discussion of hinting, see:
<http://typophile.com/files/hinting.pdf>,
http://partners.adobe.com/public/developer/en/font/T1_SPEC.PDF and
<http://vimeo.com/38364880>.

If you enter good values for your standard stems, the autohinter will find those stems in your letters and put a hint on them. Try to find values as representative as possible, separated by a comma.

For vertical stems, consider the widths of your lowercase and uppercase stems and bowls. It's a good idea to measure the stem width of a lowercase i and an uppercase I, and the distance between the extremum points in the bowls of lowercase c and uppercase C. For horizontal stems, consider the bars of t and E, the upper bowls of o and O, and the thickness your serifs if you have any.

Usually, not more than two stem values (for either horizontal or vertical stems) are necessary. If a few potential values are very close to each other, pick the most representative one, e.g. if you get measurements of 20, 21, 23, 43, 44 and 45 for your horizontal parts in your glyphs, then just enter 21 and 44 as your horizontal stems.

5.2.4 Alignment Zones

An alignment zone must encompass anything that should later be aligned at a low resolution. For instance, the upper edge of the crossbar of t, the upper edge of x and the highest extremum of o, they should be inside the alignment zone for the x-height. However, the size of an alignment zone must not exceed 25 (or -25 for bottom zones), and there must be at least one unit between any two alignment zones.

After you have set the Metrics properly, you can click the grey circle to let Glyphs find the alignment zones for you. It is a good idea to double check if your most important glyphs do end inside the alignment zones.

5.2.5 User Parameters

Click on the green Plus button to add custom parameters for the masters. Numeral values are interpolated if defined for all masters.

5.3 INSTANCES

Use the plus and minus buttons to add and remove instances. You can edit several instances at once after you Shift-click or Cmd-click the instance names in the list on the left.

5.3.1 Style Name

This is the style name as it will appear in InDesign's font menu. You can use a space in the style name, but non-ASCII characters may prevent the font from exporting.

5.3.2 Weight and Width

These settings affect the order of fonts in the font menu. Sorting occurs first by width, then by weight, e.g.:

- Condensed Light
- Condensed Regular
- Condensed Bold
- Light
- Regular
- Bold
- Extended Light
- Extended Regular
- Extended Bold

5.3.3 Style Linking

Microsoft Windows applications support only the basic four styles per font family, i.e. Regular, Italic, Bold and Bold Italic. They are accessed via the 'B' and 'I' buttons in the toolbar. Mac applications can switch to linked Bold and Italic styles via the Cmd-B and Cmd-I shortcuts. Adobe InDesign does the same via Cmd-Shift-B and Cmd-Shift-I. If a font family is not style-linked at all, then each style appears individually in the font menu. In that case, clicking the 'B' or 'I' buttons may create a synthetic Bold or Italic.

Based on these conditions, the following strategy is recommended:

- Italic styles should always be linked to their upright counterparts. They must share the same family name.
- The Bold style should always be linked to the Regular.
- Larger font families require a carefully devised linking strategy.

Linking the SemiBold to the Light is sometimes practiced. If you choose to do so, only the Light will appear in the font menu and many users are unaware that they can access the SemiBold style by selecting Light and then choosing 'bold'. However, if you want to link SemiBold to Light, enter the name of your Light style in the 'Linked style' text field of your SemiBold instance settings and check 'is Bold'.

Some designers prefer a different strategy, according to which only the Bold, Italic and Bold Italic are linked to the Regular. For the rest, only the italics are linked to the uprights with the same name, e.g. Medium Italic is the Italic of Medium. No Bold setting is used furthermore.

5.3.4 Interpolation

The Weight and Width settings apply to the design space spanned between the Masters. For further details, see the chapter on Multiple Masters.

5.3.5 Custom Parameters

The following values are being considered during export.

- TypoAscender
- TypoDescender
- TypoLineGap
- winAscent
- winDescent
- openTypeNameLicense (is given precedence over the same option in Font Info)
- openTypeNameLicenseURL (is given precedence over the same option in Font Info)
- openTypeOS2WeightClass (overwrites all weight settings)
- openTypeOS2WidthClass (overwrites all width settings)

There are some special properties:

- Scale to UPM: scales the font immediately after interpolation to avoid rounding errors.
- Filter: you can apply a filter after the glyphs are interpolated and the overlap is removed. So far, only the 'Round Corners' filter is supported. Add 'Filter' as a property in the left column and 'GyphsFilterRoundCorner; <Radius>; <Visual Correction>' as its value in the right column, e.g. 'GyphsFilterRoundCorner; 30; 1'.
- Remove Glyphs: takes a comma-separated list of glyph names. The glyphs will not appear in the final font.
- Rename Glyphs: takes a comma-separated list of 'oldglyphname=newglyphname' pairs. This is useful if you use glyph alternatives in specific instances.
- InterpolationWeightY: you can specify a different Weight value for interpolating in Y direction.

Pro User Tip:

In complex Multiple Master set-ups, the Bracket trick described in the Layers chapter does not work.

In that case, create copies of the glyphs (e.g. dollar and cent) and add a '.bold' suffix to their name (dollar.bold, cent.bold). In the bolder instances, add two custom parameters. First, use 'Remove Glyphs' for the original glyphs (e.g. 'dollar, cent'). Then add 'Rename Glyphs' to put the .bold glyphs in their place (e.g. 'dollar.bold=dollar, cent.bold=cent'). To be complete, you can use a custom parameter in your lighter weights to remove the .bold glyphs there.

5.4 FEATURES

Glyphs automatically generates most of the common features, click the circled arrow in the corner to initiate that. The feature generator is based on certain name conventions and suffixes. E.g. all letters with names ending in ‘.sc’ are being located in the small caps feature. Letters described with more than one letter name joined by underscores are being recognized as ligatures. Find a complete list of the suffixes in the appendix.

To write features manually, uncheck the ‘Automatic’ checkbox or create a new feature by clicking the plus button at the bottom left. Edit the name of the feature (or class) directly in the list. Glyphs uses Adobe FDK syntax. Find details at http://www.adobe.com/devnet/opentype/afdko/topic_feature_file_syntax.html.

Put all information that needs to stand outside a feature in the prefix. Glyphs will put language systems here. This is a good place for mark classes and OpenType tables like GDEF.

The bottom right area is for notes. In Stylistic Set features (ss01 through ss20), you can use it to set the name of the Set. Type ‘Name:’, followed by the intended description. Alternatively, you can enter the complete featureNames lookup as described in the Adobe FDK syntax.

5.5 OTHER SETTINGS

5.5.1 Grid Spacing

The grid width defines how coordinates get rounded. Standard is the value 1. When set to zero, no rounding will happen. This is useful if you want to keep very fine details, e.g. after applying the Hatch Outlines filter or in detailed dingbat fonts. Higher values are helpful when creating a pixel font.

All tools and all modifications will consequently snap to the grid. You can force all point coordinates of selected glyphs into the grid by choosing Round Coordinates from the Layers menu.

5.5.2 Don’t Use Nice Names

This option prevents the automatic replacement of glyph names. This might be of importance where special workflow requirements apply. The option is set in all fonts imported from OTF files and UFOs that are opened with Glyphs for the

first time. Deactivating this option does not immediately activate the automatic replacement of names. To activate the automatic naming, pick Font > Update Glyph Info. Attention: this may also invalidate the feature code.

6 Spacing and Kerning

6.1 SPACING

Spacing is the process of adjusting the sidebearings to get an even rhythm of the text. There are no fixed rules for adjusting the white space. However, the same shapes should have the same sidebearing, e.g. the D has the same LSB as the H, but its RSB is more like the O.

Easy to memorize: the Ctrl key is located on the left, the Cmd key on the right. The keys are associated with the left and right sidebearing, respectively.

6.1.1 Spacing Shortcuts

There are keyboard shortcuts to change the spacing of a letter. Hold down the Ctrl key and use the left and right Arrow keys to change the LSB. Cmd and arrow keys changes the RSB. Add the Shift key to manipulate in increments of 10 units.

6.1.2 Linked Metrics

Linked metrics work in a very similar way as kerning classes: Put in the name of the glyph you want to link to in the sidebearing field and it will automatically adopt the respective side bearing. Note that this is not updated automatically. You need to select the glyphs that need updates and select Layer > Update Metrics. Or update by clicking in one of the metric fields in the info box and then clicking somewhere else.

You can even enter simple calculations into the sidebearing field. Calculations need to start with an equals sign ('='). For instance, '=n+10' will take the same sidebearing of n and add 10 units, '=n-10' subtracts 10 units, '=g/2' yields half the sidebearing of g, and '=v*2' twice the sidebearing of v.

Use the pipe character ('|', Shift-backslash on a U.S. keyboard, Opt-7 on a German keyboard) to reference the opposite sidebearing. E.g., in the RSB of e, you can enter '=|a' to use the LSB of a as the RSB of e.

6.2 KERNING

Most glyphs fit well next to each other but some pairs need specific adjustments, e.g. T in combination with o. This is where kerning comes into play.

6.2.1 Ways to Kern

To define these kerning pairs, switch to the Text Tool, type both glyphs in the Edit View and place the cursor between

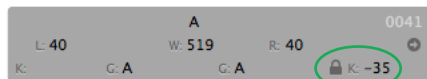
them. The bottom left field (labeled 'K:') in the info box will show the kerning value for this combination. Just set a value there.

Or use the keyboard shortcuts for much greater convenience. Similar to the metrics keys, Ctrl-Opt-(Shift-) Arrow keys changes the kerning towards the letter on the left side of the current letter, while Cmd-Opt-(Shift-)Arrow keys change the kerning with the letter following on the right.

6.2.2 Kerning Groups

Many glyphs look similar and need the same kerning values. Kerning groups capture these similarities and help you reduce the number of pairs that need to be set manually. Kerning then applies not to glyphs, but to groups of glyphs, in the sense of kerning all glyphs that look like an A or like a T etc.

In Glyphs, kerning classes are not edited as glyph lists. Instead, the class membership is defined as a glyph property. For example, put O in the left kerning group field for all glyphs that look like an O on the left (like C, Ccedilla, G, Odieresis and O itself). Add a value to each glyph, even if it remains the only glyph in its group. Switch to the list mode of the Font View for a better overview.



You can introduce exceptions to group kerning by opening the kerning lock in the grey info box. Thus you can have different kerning pairs for 'To' and 'Tö'. Vice versa, keep these locks closed if you do not want any exceptions.

6.3 SAMPLE TEXTS

The predefined sample texts cover the most important combinations in Latin fonts. Select Font > Select Sample Text... (Cmd-Opt-F) and choose a line. Use the Arrow keys to move the cursor and the Enter key to close the dialog. You can define your own texts in the application preferences.

If you want to space a lot of letters, you can use dynamic placeholders in the sample text. Placeholders always show the current glyph. This can come in handy when you step through your glyphs and want to see how each of them looks

Tip: quickly advance to the next glyph by typing Page Up and Page Down (Fn and left and right arrow keys on a MacBook keyboard).

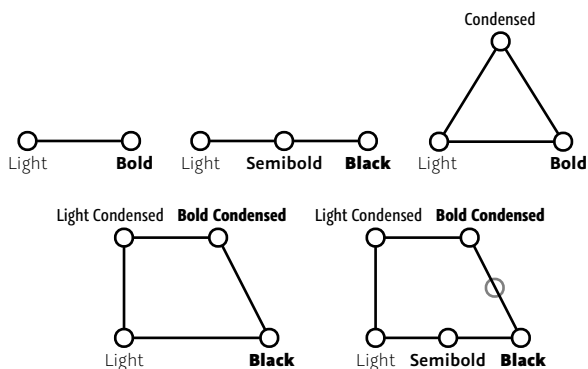
in different situations or as a double letter. Choose Edit > Add Placeholder (Cmd-Opt-Shift-P) to insert a placeholder.

You can color mark the kerning between glyphs in a sample text if you display the measurement line. For more details on this, refer to the Edit View chapter.

7 Multiple Master

7.1 OVERVIEW

With Multiple Masters you only draw the extreme styles of a font family and then interpolate the styles in between. It is not advisable to store all single styles of one family in one file, especially not upright and italic styles. You can interpolate between up to five masters. Glyphs supports the following arrangements:

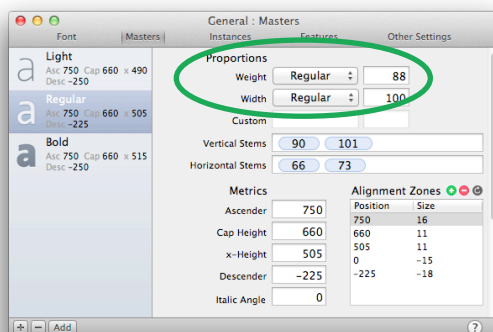


The relation between the masters is defined by their coordinates, i.e. their width and weight properties. In addition, you can define other dimensions. The masters span a design space in which the instances can be placed.

The nodes of the outlines are not automatically linked between the masters. You can insert nodes in one master while all other masters stay untouched. Note that for the final interpolation, the masters need to be compatible, though.

7.2 SET-UP

Defining the coordinates of the masters sets up the design space. For the Weight coordinate, it is recommended to use the stem width of a representative letter such as the n. This makes it easier to define the stem widths of the instances. The Weight coordinate is entered in the text entry field next to the pop-up.



Use the pop-up list to set the name of the master and the icon in the toolbar. This setting is not used for the style of the exported font; it is a rough guideline that allows for convenient buttons. The styles of the final fonts are defined in the instances.

7.3 MERGING TWO FILES

You can merge two or more open files into one Multiple Master File. To do so, activate the lighter font, go to Font Info > Masters and click Add in the bottom left corner. Select the other font in the upcoming dialog and click 'OK'. Repeat this for all files you want to add, then set weight and width for all masters.

7.4 FIX COMPATIBILITY

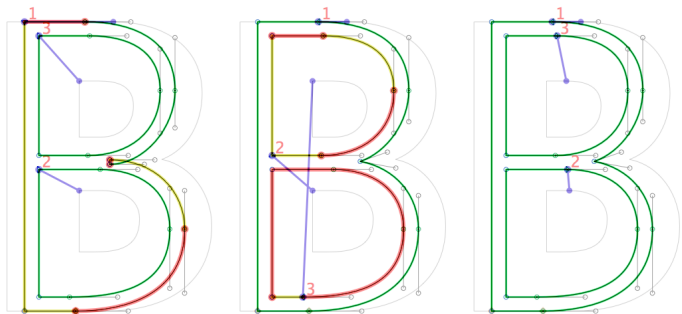
When merging masters, Glyphs does not automatically fix incompatible outlines. If necessary, this can be done manually. Letters with incompatible outlines are marked with a red triangle in the font view and a red stripe in edit view. During editing, it is possible to work with incompatible

paths but for interpolation, they need to be compatible. Specifically, this means that the order of the paths as well as number and structure of nodes must correspond with each other.

View > Show Master Compatibility (Ctrl-Opt-Cmd-N) activates a visualization of the masters' congruency. The red lines connect the corresponding nodes in all masters. If the picture looks as wild as in the first sample picture, then something is fundamentally wrong. The three slightly bigger red numbers indicate the paths' starting points and the path order. Straight blue lines connect the starting points of all masters. When comparing outlines, you always start at the start node of the paths and follow them in the direction that is indicated by the small triangle at the first node.

The colored segments indicate the compatibility of the segments. Red means that there is a line in one master and a curve in the other. These masters will not interpolate at all. Yellow means that the paths are of the same type but have a different angle. They will interpolate but may yield an unexpected result: differences in angles can turn smooth connections into so-called 'kinks', i.e. corners. Green segments are fully compatible.

Example:



Tip: Quickly switch between masters with Cmd-1, Cmd-2 etc.

In the foreground you see colored light master and in background the bold master's paths, displayed in light grey. The foreground has an overlap, while the background has none. Choose Filter > Remove Overlap to get the second picture.

The outlines seem to fit now. i.e. the y have the same number of nodes. The blue lines connecting the starting points in all masters are running across the letter though. The starting nodes have to be at the same position. Either correct that manually by right clicking the node and choosing 'Make node first', or use the command Layer > Correct Path Direction (Cmd-Shift-R) on all masters.

In the third image, the start points are at the same position in both masters and all outlines are green.

7.5 LAYERS PANEL

The Layers Panel shows all layers of the selected glyph. The master layers are shown on top. You can copy them to save a working state. Select the layer in the list and click the Copy button. When clicking an entry in the list, the selected layer is activated in the current glyph only. This is helpful to simultaneously see different layers of one glyph.



To change view between master layers, use the tool bar buttons. Also there is the shortcut Cmd-1, Cmd-2 etc., i.e. Cmd and the number of the respective master.

8 Error Handling

8.1 GLYPH NAMES

The most common source of problems are illegal glyph names. Make sure all your glyph names:

- only contain letters A-Z, a-z, numerals 0-9, underscore ('_'), dash ('-') or period ('.')
- start with a letter (A-Z, a-z),
- have no whitespace characters (space, tab, return etc.), not even at the end,
- contain no non-ASCII characters (like á, è, ß or ü).

Not adhering to these guidelines may yield an error message like 'No File was created. The reason is unknown.'

8.2 FONT NAMES

If your error message only entails a POSIX path to a file called 'FontMenuNameDB', set between brackets ('[/Users/<your username>/Library/Application Support/Glyphs/Temp/<your fontname>/FontMenuNameDB]'), then there probably is an illegal character in the font name or style name. You can use spaces, but as of yet, no non-ASCII characters.

8.3 DUPLICATE UNICODES

In some fonts, two or more letters erroneously carry the same Unicode. If you try to import a font with double encodings, Glyphs will warn you. Selecting all glyphs and choosing Update Glyph Info from the Font menu will usually fix that problem.

The other way around, the situation where one glyph sports two Unicodes, is fixed silently based on the glyph name. The usual suspects for this are Delta and Omega. Delta should only be U+0394, but sometimes also has U+2206, the code for the mathematical increment operator (a.k.a. Laplace operator). Omega, which should only be encoded with U+03A9, sometimes also sports U+2126, the codepoint for the Ohm symbol.

8.4 OPENTYPE FEATURE CODE

If all your features are auto-generated, you can usually fix feature code troubles by re-compiling, i.e. clicking the Compile button in the Feature tab of the Font Info window.

Glyphs tries to pass on any FDK compilation errors in an error dialog. And it also tries to point you to where the problem occurred by reporting the name of the problematic feature and the line number. If it succeeds in doing so, the error dialog will sport a 'Show' button. Click on it and Glyphs takes you directly to the code problem.

The following errors may occur:

Contextual substitution clause must have a replacement rule or direct lookup reference. You probably forgot or mistyped the word 'by' in a substitution feature.

DFLT script tag may be used only with the dlft language tag. You tried using a language tag without a preceding script tag, e.g. somewhere before 'language DEU;', there needs to be a 'script latn;'.

Glyph x not in font. You tried referencing a glyph that does not exist. The error message will tell you which glyph it was looking for in vain. You probably mistyped the name of the glyph, accidentally deleted the actual glyph, renamed the glyph, or forgot to create the glyph in the first place.

Target glyph class in rule doesn't have the same number of elements as the replacement class. You tried substituting a class with a class of a different size. The error dialog will point you to the problematic code line. Make sure the classes are of the same size.

Syntax error. This can have several reasons:

- You are using non-ASCII characters in your code or feature names.
- You mistyped feature commands like 'sub', 'pos' or 'by'.
- You forgot a semicolon at the end of a code line. In this case, the error message will contain 'missing ";"'.
- You forgot a numerical value in a positioning lookup. In this case, the error message will also contain 'missing NUM'.

8.5 OUTLINE COMPATIBILITY

Incompatible outlines should not hinder OTF export. Affected glyphs are simply exported empty. If you get a 'Some glyphs are not compatible and will have no outlines' error message, the font will still be exported. You can find more details about fixing incompatible outlines in the Multiple Master chapter.

9 Import and Export

9.1 FONTLAB

9.1.1 From FontLab to Glyphs

There is a Python script available to export Glyphs files directly from within FontLab. You can download it from github.com/schriftgestalt/Glyphs-Scripts/ Look for a Script called 'Glyphs Export.py'. To install, copy it to this folder: `/Users/[your user name]/Library/Application Support/FontLab/Studio 5/Macros/Glyphs Export.py`. After restarting FontLab, it will become available in the macro toolbar.

If you have the UFO tools installed, you can also export the font as a UFO file and open it in Glyphs. FontLab uses a non-standard format for storing kerning and kerning classes. Glyphs detects this and converts it to its own system. This only works if you have a common suffix for left and right kerning classes, like '_L' for left side and '_R' for right side. You have to tell Glyphs about that in the preferences.

9.1.2 From Glyphs to FontLab

Again, there is a Python script to import Glyphs files into FontLab. You can get it from the same Github repository mentioned above. This time, look for a script named 'Glyphs Import.py' and place it in your FontLab Macro folder.

9.2 ROBOFONT AND OTHER UFO TOOLS

Glyphs can read and write UFO files. Unfortunately, .ufo files cannot contain more than one master. So, File > Export will export a Multiple Master Glyphs font as several UFO files.

10 Appendix

10.1 FEATURE SUFFIXES

If you have separate sets for `c2sc` and `smcp`, you can use `'c2sc'` for uppercase glyph names and `'smcp'` for lowercase glyph names.

liga	<i>Ligature</i>	Join the glyph names of the components with an underscore ('_'). The common ligatures with f, i and l are placed in the liga feature, all others go into dlig. If you want to force a ligature into the liga feature, you can add a 'liga' suffix, e.g. 'f_b.liga'.
dlig	<i>Discretionary Ligatures</i>	Join the glyph names of the components with an underscore ('_'), e.g. 'f_odieresis'.
c2sc	<i>Small Capitals from Capitals</i>	Add 'sc' to the (lowercase) glyph name.
smcp	<i>Small Capitals</i>	Add 'sc' to the (lowercase) glyph name.
sup	<i>Superscript</i>	Add 'sup' or 'superior' to the glyph name.
sub	<i>Subscript</i>	Add 'sub' to the glyph name.
sinf	<i>Scientific Inferiors</i>	Add 'sinf' or 'subs' to the glyph name.
dnom	<i>Denominators</i>	Add 'dnom' to the glyph name.
numr	<i>Numerators</i>	Add 'numr' to the glyph name.
onum	<i>Oldstyle Figures</i>	Add 'osf' (for proportional oldstyle figures) or 'tosf' (for tabular oldstyle figures) to the glyph name.
tnum	<i>Tabular Figures</i>	Add 'tf' (for tabular figures) or 'tosf' (for tabular oldstyle figures) to the glyph name.
pnum	<i>Proportional Figures</i>	Add 'osf' (for proportional oldstyle figures) or 'lf' (for proportional lining figures) to the glyph name.
lnum	<i>Lining Figures</i>	Add 'lf' (for proportional lining figures) or 'tf' (for tabular figures) to the glyph name.
hist	<i>Historical Forms</i>	Add 'hist' to the glyph name.
frac	<i>Fractions</i>	The frac feature is generated from the .numr, .dnom and fraction glyphs. Pre-built fractions are also added: onehalf, onequarter, threequarters, oneeighth, threeeighths, fiveeighths and seveeneighths.

For a complete list of language tags, see: microsoft.com/typography/otspec/languagetags.htm

- locl** *Localized Forms* Add ‘loclXXX’ to the glyph name, where XXX represents the three letter language tag, e.g. ‘loclENG’ for English. There also is a built-in list of glyphs which are added automatically to the feature, e.g. idotaccent, scommaaccent and tcommaaccent will trigger locl substitutions for Turkish, Romanian and a range of related languages.
- ssXX** *Stylistic Set* Add ‘ssXX’ to the glyph name, for example ‘ss01’ or ‘ss12’. Add ‘Name:’ plus the feature’s descriptive name to the feature note at the bottom. This will generate the feature name entries for stylistic set names. Alternatively, you can add the whole featureNames definition to the note.