Font Scaling

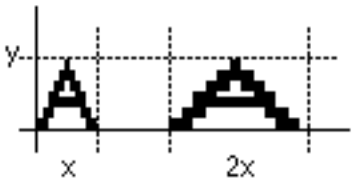
Font scaling is the process of changing a glyph from one size or shape to another. The **Font Manager** can scale bitmapped and TrueType fonts in three ways: changing a glyph's point size on the same display device, modifying the glyph but keeping the point size constant when using a different display device, and altering the shape of the glyph.

The simplest form of scaling occurs when the **Font Manager** changes a glyph from one point size to another on the same display device. If the glyph is bitmapped and the requested font size is not available, there are certain rules the **Font Manager** follows to create a new bitmapped glyph from an existing one; these rules are discussed in the description of Font Rules. If the glyph is an outline glyph, the **Font Manager** uses the original outline for that glyph to create a new bitmap at a different size. The bitmaps available to the **Font Manager** to create all 32 point sizes were 9, 10, 12, 14, 18, and 24 points. A single TrueType outline produces a smoother bitmap in all point sizes.

The **Font Manager** also scales a glyph when moving it from one device to another device with a different resolution: for instance, from the screen to a printer. A bitmap that is 72 pixels high on a 72 dpi screen measures one inch, but on a 144 dpi printer it measures a half inch. In order to produce a figure the same size as the original screen bitmap, the **Font Manager** needs a bitmap twice the size of the original. If there are no bitmaps available in twice the point size of the bitmap that appears on the screen, **QuickDraw** scales the original bitmap to twice its original size in order to print it on the printer.

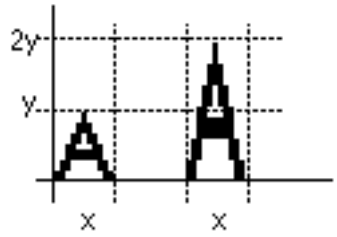
Your application can scale a glyph by stretching or shrinking it, which changes the glyph from a familiar point size to something a little stranger-for example, a glyph that is 12 points high but as wide as a whole page of text. Your application tells the **Font Manager** how to scale a glyph using font scaling factors, which are represented as proportions or fractions that indicate how the **Font Manager** should scale the glyph in the vertical and horizontal directions. The ratio given by the font scaling factors determines whether the glyph grows or shrinks; if the ratio is greater than one, the glyph increases in size, and if it is less than one, the glyph decreases in size. If the font scaling factors are 1-to-1 (1/1) for both horizontal and vertical scaling, the glyph does not change size.

In the following figure, the font scaling factors are 2/1 in the horizontal direction and 1/1 in the vertical direction. The glyph stays the same height, but grows twice as large in width.



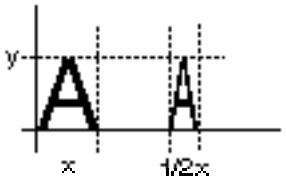
A glyph stretched horizontally

In the next figure, the font scaling factors are 2/1 in the vertical direction and 1/1 in the horizontal direction. The glyph stays the same width, but grows to twice its original height.



A glyph stretched vertically

In the figure which follows, the font scaling factors are 1/1 in the vertical direction and 1/2 in the horizontal direction. The glyph stays the same height but retains only half its width.



A glyph condensed horizontally

If the font scaling factors are 2/2 in both directions, **QuickDraw** draws the glyph at a point size twice that of the original. In the case of bitmapped fonts, **QuickDraw** first looks for a bitmap at twice the size of the original before redrawing the glyph at the new point size.

The **Font Manager** produces better results by scaling TrueType glyphs, because it changes the font's original outline to the new size or shape, and then makes the bitmap. Outlines give better results than bitmaps when scaled, because the outlines are intended for use at all point sizes, whereas the bitmaps are not.