Typeface Classification

There are many classification systems for type, but most are based at least in part on the mid-century work of French typographic historian Maximilian Vox. This book focuses on six of the nine groups proposed by Vox; these categories are defined by both their visual characteristics (stroke contrast, serif shape, stress) as well as their time of historical development.

For example, the Venetian, Garalde and Transitional classifications refer to typefaces designed in the fifteenth, sixteenth and seventeenth centuries. The differences between these categories are, at first glance, relatively subtle – some typographers use the term 'Old Roman' to refer to these styles collectively. However, the three separate classifications are in fact important, since each group defines a specific step within a larger typographic movement: the evolution of letters from written, calligraphic forms to drawn and designed constructions.

Within this subset, perhaps the finest distinction is made between Venetian and Garalde designs. Venetian typefaces have the clearest relationship to pen-formed writing: the oblique axis is severe, the contrast is low and the letter components (serifs, bowls, etc.) display the abrupt modelling of a broad-edge pen. In Garalde typefaces, these hallmarks of calligraphy are softened in favour of new aesthetic influences – the Mannerist and Baroque movements. Garalde typefaces have flowing forms, medium to high contrast and variable widths (the capital letters have wide and narrow oldstyle proportions).

The Transitional period is so named for its chronological position of development, which falls between the Garalde and Didone categories. Transitional typefaces were influenced by rationalist philosophy and Neoclassicism; these movements visually manifest themselves in types that have a vertical (or near vertical) axis, systematic construction and high stroke contrast.

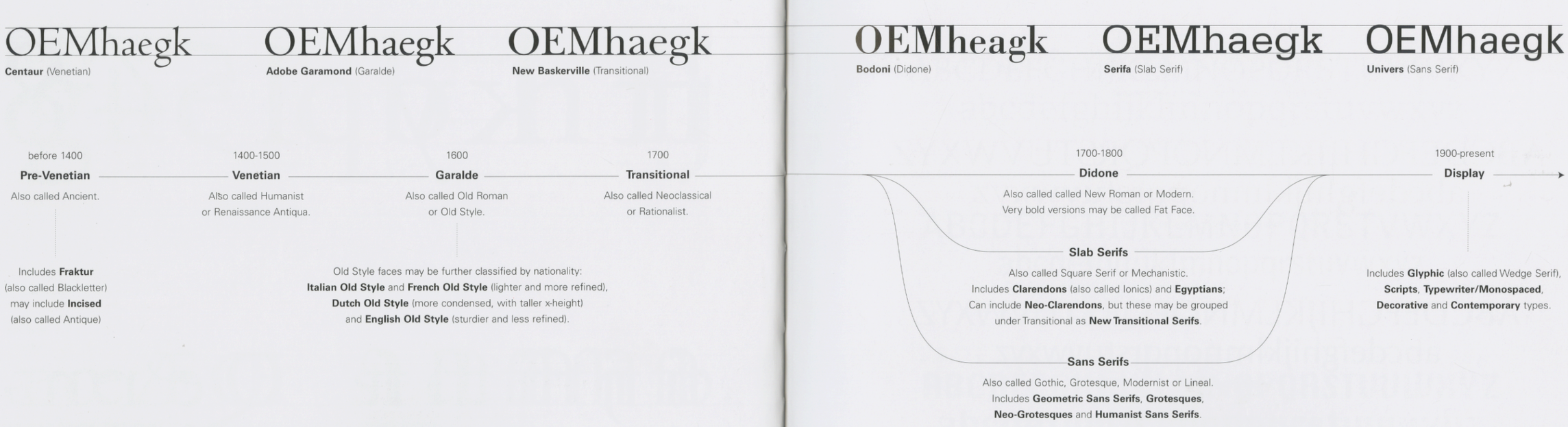
The Didone classification partially overlaps the Transitional category. (The term Didone is a combination of 'Bodoni' and 'Didot' – the major types in this category.) Although Didones were inspired by pre-existing Transitional models – especially Baskerville – both styles were popular in the 1700s and 1800s. However, unlike the analytical Transitional period, Didones reflect the expressive ideals of Romanticism. The Didone style exaggerates key features of the earlier Transitionals: letters are drawn with vertical stress, uniform widths (modern proportions) and extreme contrast.

Chronologically, the Slab Serif category follows the Didone. classification. However, unlike the previously discussed typestyles, Slab Serifs were developed out of commercial necessity. Prior to the nineteenth century, typeface design was almost exclusively orientated toward the production of books. The Industrial Revolution dramatically enlarged the typographic scene; printers (and their entrepreneurial clients) demanded bigger, bolder and more flamboyant typefaces for advertising and display. At first, designers simply made the existing book faces bolder, but this resulted in vulgar forms of limited legibility. Eventually, designers turned to alternative vernacular models of type and developed two forms of Slab Serifs: the earlier unbracketed versions known as Egyptians and the later, bracketed versions known as Clarendons.

The final historical classification is Sans Serif, a category that includes the widest range of subgroups (Grotesques, Neo-Grotesques, Geometric Sans Serifs and Humanist Sans Serifs). The first sans serif designs appeared in the early 1800s; they were literally called 'grotesque' for their shocking, unadorned appearance. However, early Grotesques were largely ignored, due to the popularity of Fat Faces (very bold Didones) and Slab Serifs.

The rise of modernism in the 1920s reversed this trend and brought the previously rejected Sans Serif types into greater use. Modernists favoured sans serif typefaces for their streamlined simplicity and perceived alliance with 'machine age'. In the pursuit of purity, many designers adapted the original Grotesques (which were basically serif faces with the serifs cut off) into Neo-Grotesques of even more systematic construction. The emphasis on unity and rationality naturally led to the development of a geometrically constructed typestyle – Geometric Sans Serifs.

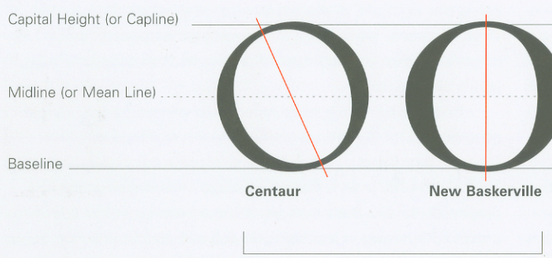
Throughout the twentieth century, a wide range of humanist sans serifs (sans serifs influenced by calligraphic writing and classical models) co-existed with both Grotesques and Neo-Grotesques. The earliest humanist sans serifs (such as Gill and Johnston) had capitals with classical proportions, and lower case letters with calligraphic structures (particularly the a, g and t). Contemporary humanist sans serifs also have humanist structure, but the capital letters are more often modern in proportion for efficiency in text. In general, a sans serif may be considered humanist when the letters have classic structures, wide apertures, angled stroke endings and/or asymmetric bowl weights.



Variables in Type Design

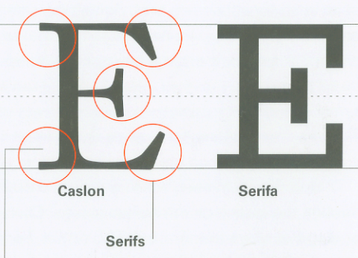
Type design is a subtle activity. It is difficult to substantially alter the shape of a letter without diminishing its legibility. However, within the established forms there are still many possibilities for structural variation.

Font
Strictly speaking, a font is a set of characters in one size and style – for example, Garamond Roman, 12 pts. A typeface is a family of related fonts in a range of sizes – for example, Garamond Roman, Italic and Bold, in sizes 8, 10, 12 and 14 pts. However, most typographers use the terms 'font' and 'typeface' interchangeably.



Centaur | New Baskerville

Stress
The axis at which a letter is drawn; stress may be upright or oblique.



Caslon | Serifa

Serifs
Short lines at the ends of the horizontal and vertical strokes. Serif shapes and sizes can vary considerably (see below).

Bracket
The curved shapes that join horizontal and vertical strokes. Caslon has moderate brackets; Serifa lacks brackets.



Cupped Serif | Rounded Serif | Hairline Serif

ABCDEFGHIJKLMNOPQRSTUVWXYZ
Capitals (also called Majuscules or Upper Case)

abcdefghijklmnopqrstuvwxyz | ABCDEFGHIJKLMNOPQRSTUVWXYZ
Lower Case (also called Minuscules) **Small Caps** (capital letters drawn to match the weight and size of the lower case)

0123456789 | 0123456789
Text Figures (also called Lower Case) and **Lining Figures** (also called Upper Case)

@&* #%^+=÷?ƒ©°µ®†‡¥«¶§ ¢$£™ .,:;“”[…]/- – — ¡!¿?{}‘’
Symbols and **Punctuation Marks** (also called Analphabetic Characters)

à é î š ç ü å ø æ œ fi fl ß ½ ¼ ¾
Accented Latin (also called Diacritical Marks), **Ligatures** and **Fractions**



Univers | Bauer Bodoni

Weight
The overall colour of a typeface. A font usually has at least three weights: Light, Medium and Bold. Additional weights include Book (between Light and Medium), Semi-Bold, Black and Extra Black (also called Super). The mid-weight may be referred to as Roman or Normal (rather than Medium).

x-height
The height of the lower case x; usually between 50–66% of the capital height.

Contrast
The difference between vertical and horizontal stroke thicknesses. Bauer Bodoni has high contrast; Univers has low contrast.

Univers Extra Black (85)
Univers Black (75)
Univers Bold (65)
Univers Roman (55)
Univers Light (45)



Bracketed Serif | Wedge Serif | Slab Serif

Serif Capitals

To facilitate their design, serif capitals should first be organized into large subgroups with similar shapes: circular, triangular or square. Of course, some of the upper case letters require the definition of more complex combination groups. For example, the D, B, P and R are circular-square, while the M, N, K and Y are diagonal-square. Making these (and other) fine distinctions is helpful as an initial step in the creative process, since letters with similar structures can and should be designed as related forms.

Throughout the following section, reference is made to two upper case proportional systems: classic (also called oldstyle) and modern. Classic proportions are historical in origin; they are based on Roman inscriptional models. For both aesthetic and practical reasons, the ancients used divisions of a geometric square for the widths of the capital letters. In theory, the dimensions are as follows: fourteen letters (A, C, D, G, H, K, N, O, Q, T, V, X, Y and Z) are the width of a full square and seven letters (B, E, F, L, P, R and S) are the width of a half square. There are a few exceptional letters with odd widths: the I is narrow, while the M is wide. (The letters U, J and W were later additions to the original Roman alphabet and therefore have no inscriptional model.)

In practice, many typefaces that are described as having classic proportions do not strictly conform to this theoretical model. They have wider and narrower letterforms, but the widths are not exact divisions of a square. Although the true proportions of Roman capitals are beautiful and graceful, they are also somewhat impractical, since they result in wide letters that require generous character spacing. Additionally, true classic proportions produce capitals with uneven colour – the narrow letters are darker than the expanded forms. Finally, classic proportions are not possible for expanded or condensed typefaces, because these characters cannot be drawn with square proportions.

The disadvantages of the classic system led to the creation of the new, 'modern' system at the time of Transitional and Didone development. Modern proportions are based on an objective of achieving even colour; each letter is designed to contain the same amount of negative space. For example, the H is slightly narrower than the O, since its square counters are physically larger. Without the constraint of a specific shape, modern proportions are quite flexible and can be used for normal, expanded or condensed types. Additionally, with its emphasis on even colour, the modern system promotes readability (random changes in letter colour create lighter and darker 'spots' in running text that fatigue the reader).

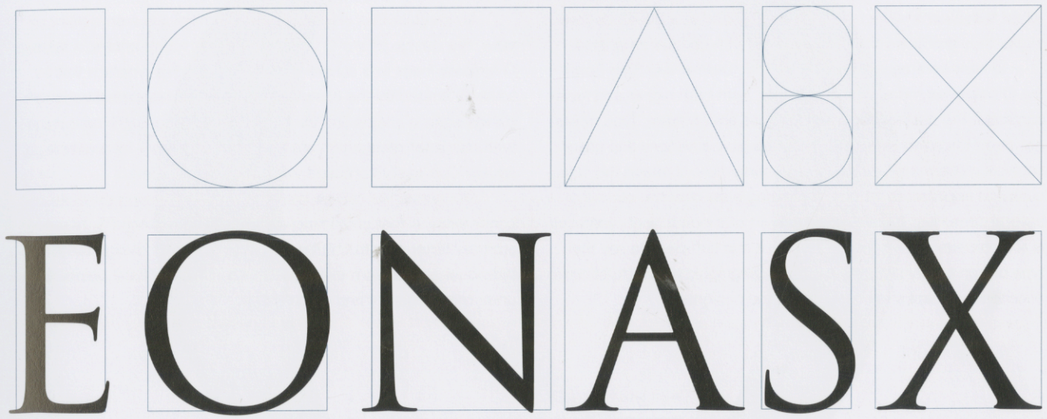
In general, as one might expect, classic proportions are used for Venetian and Garalde typefaces. Transitional typefaces vary; in some, the proportions are more uniform, but in others, the classic widths are clearly apparent. Didone and Slab Serif types almost always have modern proportions.

The upper case letters can be organized into groups with similar design characteristics.

OQCGS	Round forms
BPRDJU	Round-square forms
EFLHIT	Square forms
VAWX	Diagonal forms
MNKZY	Diagonal-square forms

EFHBPRSKXY	Double-story letters
LTXKZJ	Letters with open sides
MW	Extra-wide letters
IJ	Extra-narrow letters

BEFLPRS IJ
UHT MW CDGOQ AVNYZK



Trajan
(Pre-Venetian/Inscriptional)

BEFLPRSIJUHTMWCDGOQAVN



Bauer Bodoni
(Didone)

Serif Capital O

The design of the O has varied greatly over time. In early serif typefaces (such as Venetian and Garalde) the O is almost a perfect circle, with low contrast and angular stress. These attributes stem directly from the early typographic models that were created by professional writers, known then as scribes. Scribes used calligraphic ink pens,with nibs that had broad and narrow flat sides; when these pens were held in the right hand at a 30–45 degree angle, they produced thick-thin strokes with oblique emphasis.

In later serif typefaces (Transitional, Didone and Slab Serif) the O becomes more oval and upright, with both higher and lower contrasts. The reasons for these changes are complex. Type design has been forced to respond to technological advances and philosophical movements; these developments have changed the objectives and applications of type and typography over the course of several centuries. The full development of modern serif typefaces is too complex to summarize here, but it is sufficient to say that type design slowly moved away from calligraphic writing to become a system of shapes that are drawn and designed.

Designing a capital O today involves both objective and subjective rules. First and foremost, the capital O in a serif typeface should always be circular or oval. Rectangular, square, diamond, triangular or 'free' O forms are not legible, since readers of the Roman alphabet have long been conditioned to recognize an O by its symmetry and roundness.

An irregular O is also less desirable from a systems point of view. The design of the O impacts all other round letters; a square O logically leads to a square C, G, Q, etc. Such a typeface will be severely limited by the absence of a basic and essential contrast: curves against angles and uprights. Furthermore, significant issues with character recognition are also likely to arise – for example, a square O is easily confused with the straight-sided D.

Of course, we can be less rigid with the design principle of consistency. A font could have a square O, but a round S. However, arbitrary letter construction diminishes unity in a design system. Individual and random exceptions often become focal points that undermine legibility and readability.



If rectangular and oval forms have the same height and width, the oval form looks physically smaller.



To match the rectangular form, the O must be expanded in height and width. Narrow O forms need more adjustment than wide forms.

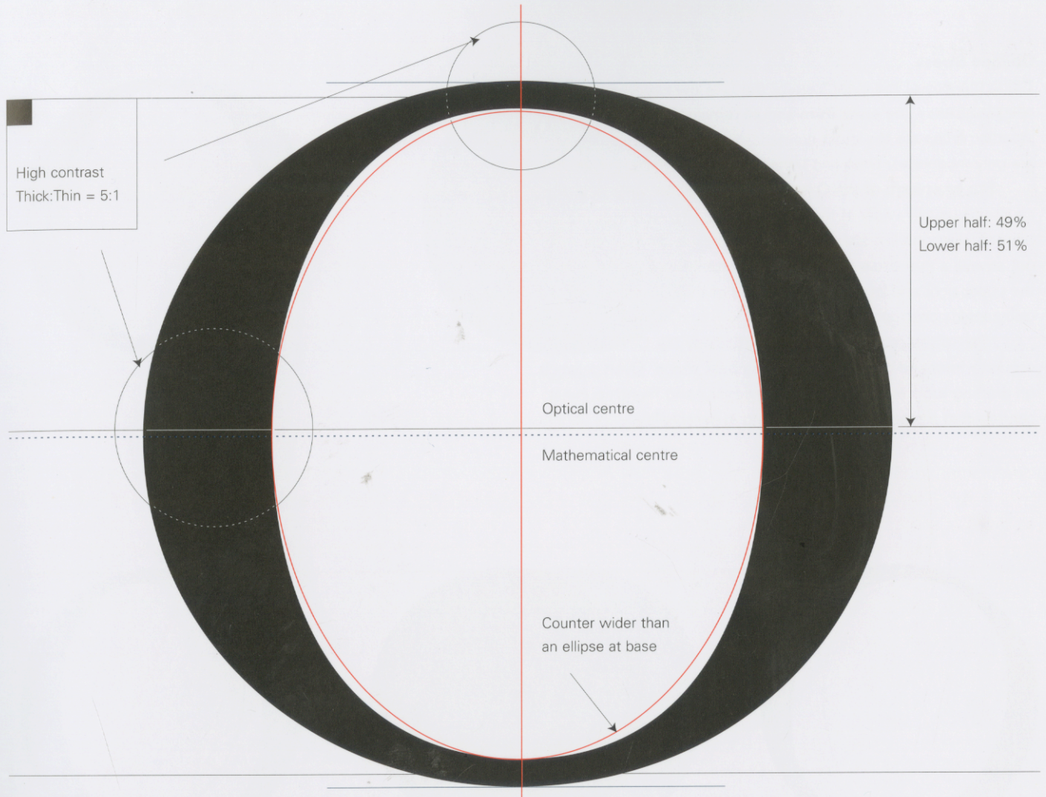
During the chronological development of these five typestyles, the stress of the O gradually becomes vertical.

Venetian
Severe stress, low-medium contrast (~3:1)
Strong calligraphic influence

Centaur **Guardi**

Garalde
Less extreme stress
Low-medium contrast (~3:1)

Garamond **Bembo**



New Baskerville
(Transitional)

Transitional
Vertical or near vertical axis
High contrast (~5:1)

New Baskerville **Janson**

Didone
Vertical axis, very high contrast (~7:1)
Delicate, upright oval form

Bodoni **Bauer Bodoni**

Slab Serif
Vertical axis, low contrast (~2:1)
Bold, squarish form

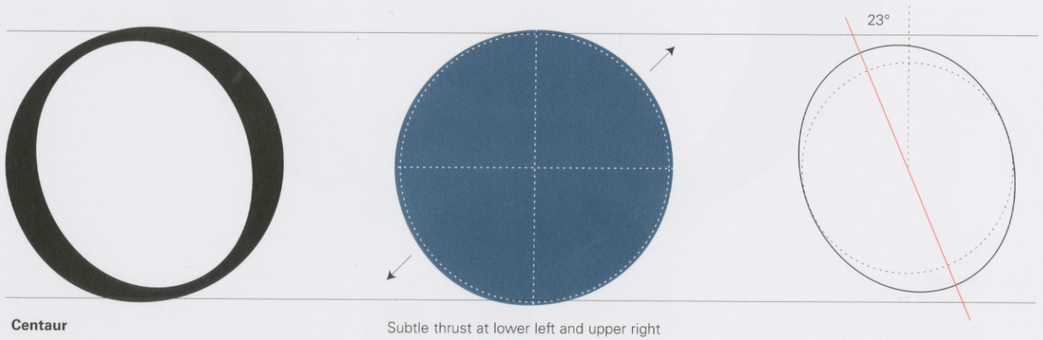
Clarendon **Serifa**

Oblique Stress

Tilting the axis of the inner form of the O is the key to creating oblique stress – the outer form should remain upright. In general, Venetian faces are the most dramatically angled; Garalde faces are only moderately tilted and Transitional faces are almost upright.

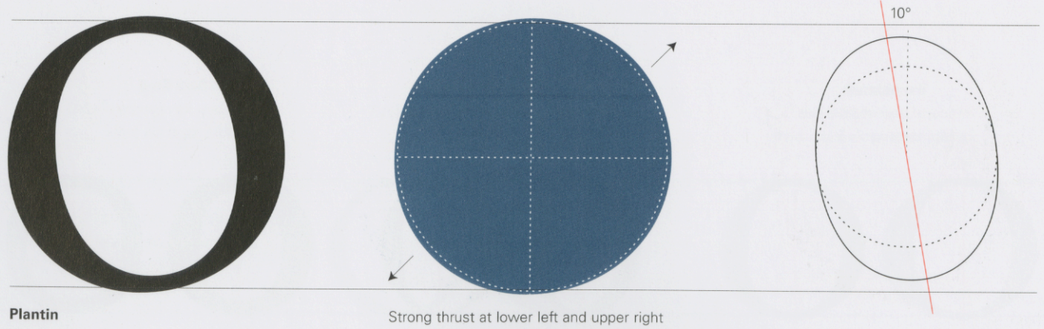
The inner form of the O is not necessarily a true ellipse. The counter is usually wider at the top and bottom to avoid creating a pointed, diamond-like shape. Similarly, the outer form of the O is not always a true circle. There is often a subtle exaggeration at the upper right and lower left – a vestige of the original two-stroke calligraphic construction.

In all of the round letters, but particularly the O, loose but accurate freehand drawing creates the best shape. Overt reliance on drafting tools (such as rulers, compasses and French curves) can result in a mechanical form lacking in personality.



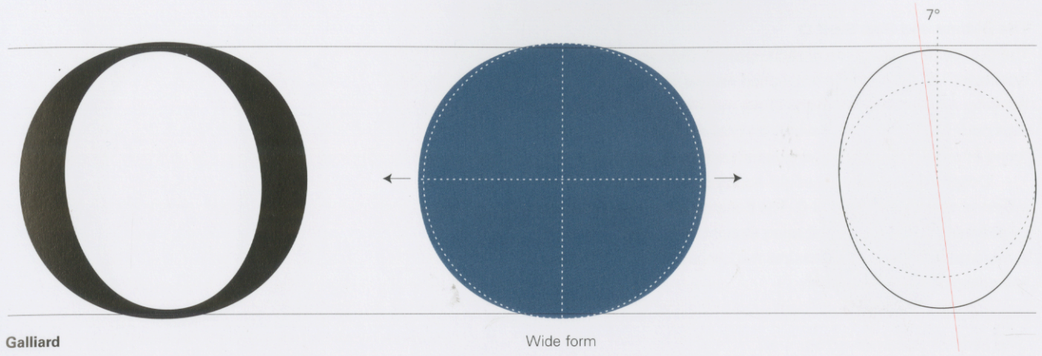
Centaur
(Venetian)

Subtle thrust at lower left and upper right



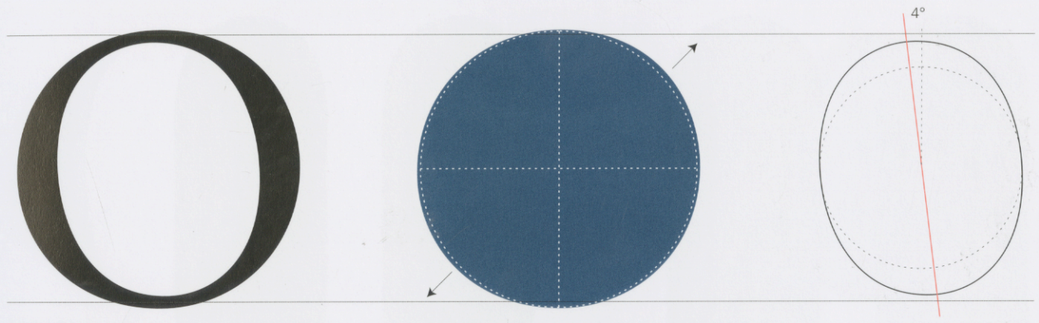
Plantin
(Garalde)

Strong thrust at lower left and upper right



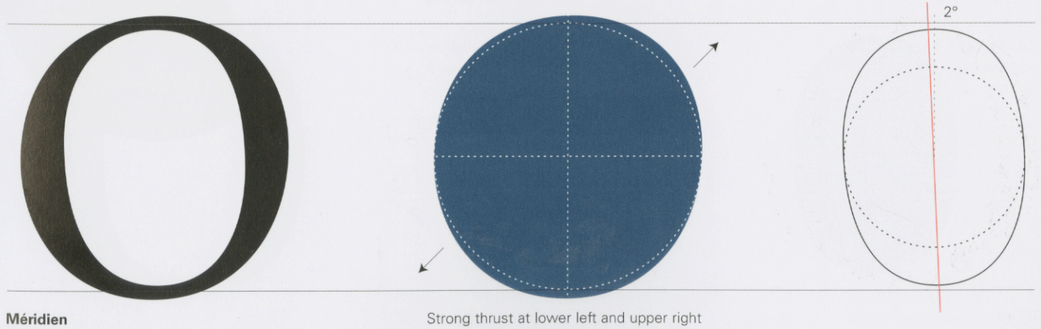
Galliard
(Garalde)

Wide form



Adobe Garamond
(Garalde)

Subtle thrust at lower left and upper right



Méridien
(Transitional)

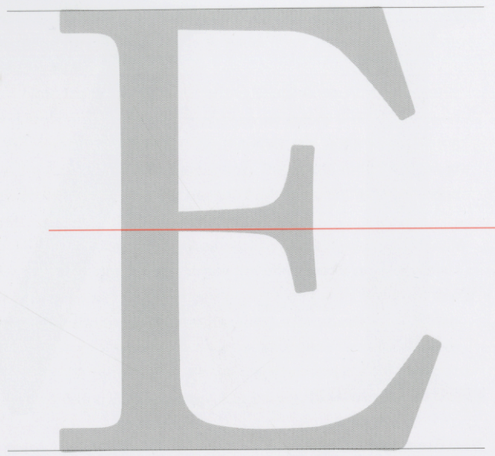
Strong thrust at lower left and upper right

Details of the Serif Capital A

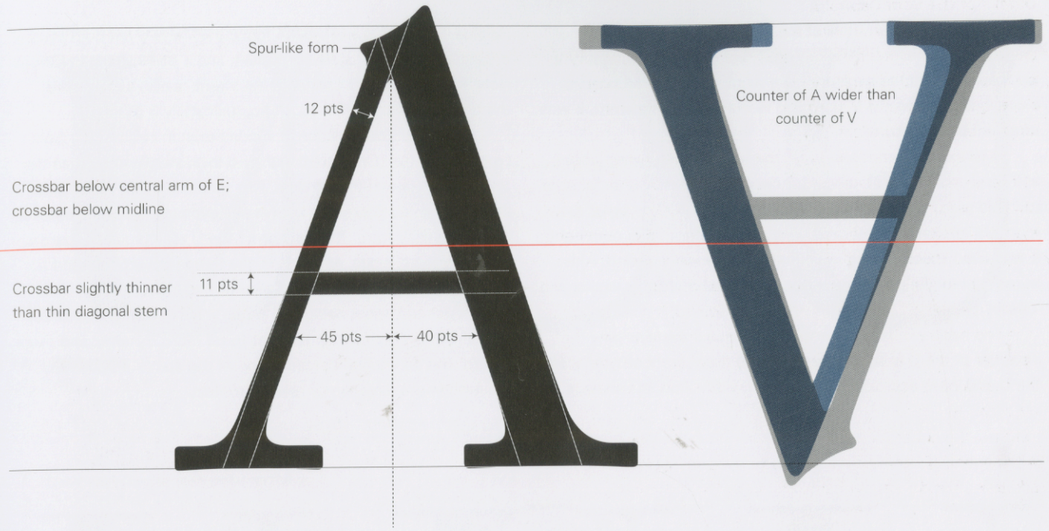
The crossbar of the A should be positioned well below the visual and mathematical centre of the letter. Placement is dictated by concerns for reproduction: the lower counter should be larger than the upper counter, but the smaller triangular form must still be large enough to print clearly, even at small type sizes.

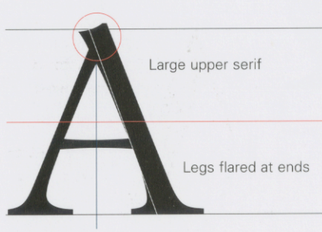
The crossbar of the A is not necessarily the normal horizontal stroke thickness. In Venetian, Garalde and Transitional fonts, the crossbar is often heavier to increase the overall letter colour. However, in Slab Serifs, the crossbar is often lighter to prevent interior congestion. Didones are typically unmodified, since the horizontal is too thin to substantially impact the overall density.

The apex of the serif A is usually unadorned, but it may be finished with a serif in more calligraphic or ornamental fonts. In Venetian and Garalde typefaces, the serif is usually drawn as an extension of the thick diagonal stroke; a spur-like detail may be added to soften the transition. In Slab Serif designs, the upper serif is often a horizontal stroke that rests on the apex of the A like a hat. This style is most suitable for display fonts, since the addition adds density and detail to an already complex area.

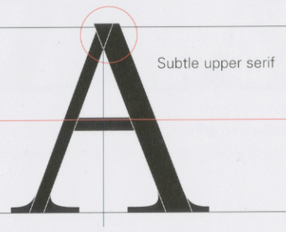


Caslon
(Garalde)

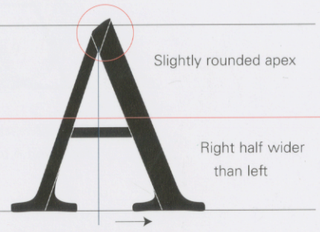




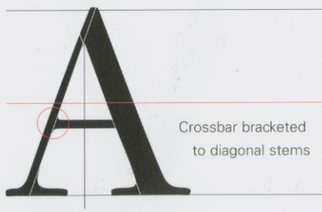
Guardi
(Venetian)



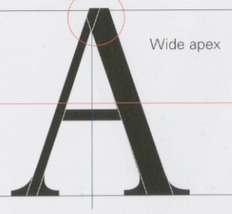
Bembo
(Venetian/Garalde)



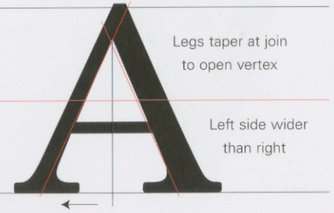
Stempel Garamond
(Garalde)



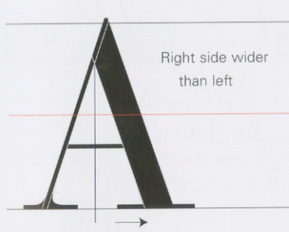
Janson
(Transitional)



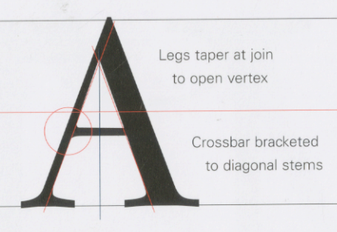
Perpetua
(Transitional)



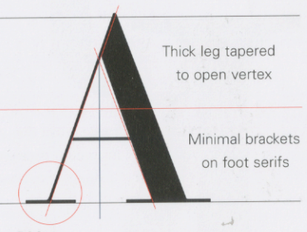
Apollo
(Transitional)



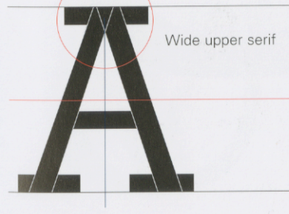
Bauer Bodoni
(Didone)



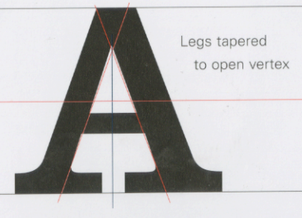
New Caledonia
(Transitional/Didone)



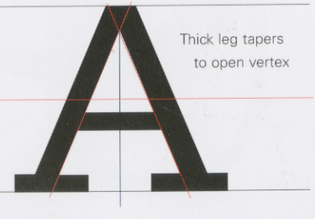
Didot
(Didone)



Memphis
(Slab Serif)



Clarendon
(Slab Serif)



Serifa
(Slab Serif)

Sans Serif Lower Case a and g

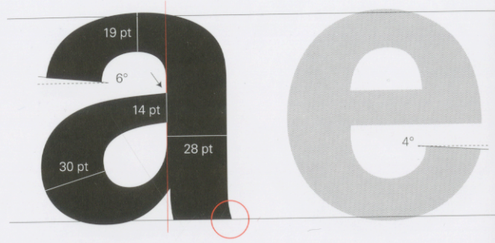
The sans serif a and g may be drawn as traditional humanist forms or simplified one-story letters. From a formal perspective, these options are a choice between unity or variety. The organic humanist forms add diversity to a font, but simplified letters create harmony through consistency.

Historically, the one-story a has been an unpopular design, existing in only a few geometric sans serifs. Perhaps this lack-lustre record is the result of practical difficulties: the one-story a colours unevenly and is less legible, since its form is easily confused with the lower case o.

The standard shape of the sans serif g is more difficult to define. Grotesque typefaces (for example, American Gothic faces) normally have a bicameral g, since they are essentially serif faces with the serifs cut off. However, geometric sans serifs and neo-grotesques typically have a one-story g, because this structure better suits the principle of regularity that informs their design. In humanist sans serifs, the form of the g is somewhat idiosyncratic and unpredictable, but in general, early humanist designs (such as Lucida and Frutiger) have a single loop g, while later humanist types (such as Scala and Bliss) have a double loop.

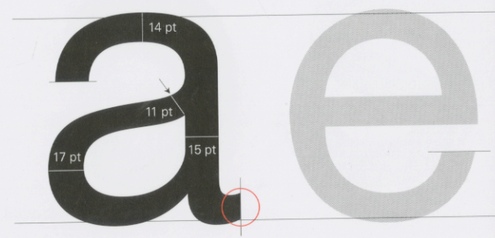
In any case, regardless of typestyle, the sans serif a and g have the same basic structural problem – congestion at stroke intersections. To address this issue, the thin strokes should be reduced at critical junctions. If still more space is needed, letters can be creatively reshaped. For example, stems can be angled or cut away from the bowls. Counters can be shifted to erode adjacent stems. Loops and curved arcs can be drawn as open (rather than closed) paths.

As with all sans serif letters, the specific stroke endings are of particular importance. The angles on the a and g should harmonize with those on the s, c and e. Horizontal, vertical or 45 degree endings are the obvious choice for geometric sans serifs and neo-grotesques, since they are compatible with an upright axis. For grotesques and humanist sans serifs, a wide range of angles may be used to suggest the mechanics of calligraphic construction.



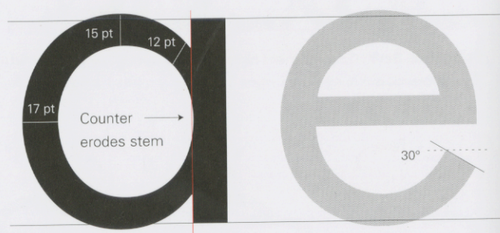
Franklin Gothic
(Grotesque)

Vestigial tail curve

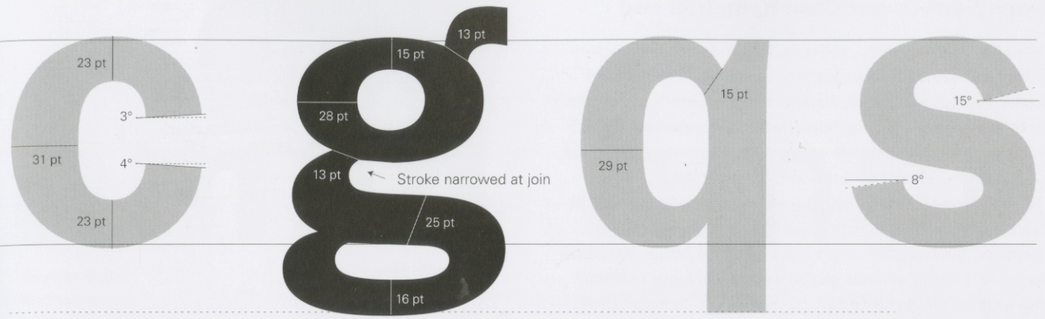


Helvetica Neue
(Neo-Grotesque)

Vestigial tail curve



Futura
(Geometric Sans Serif)







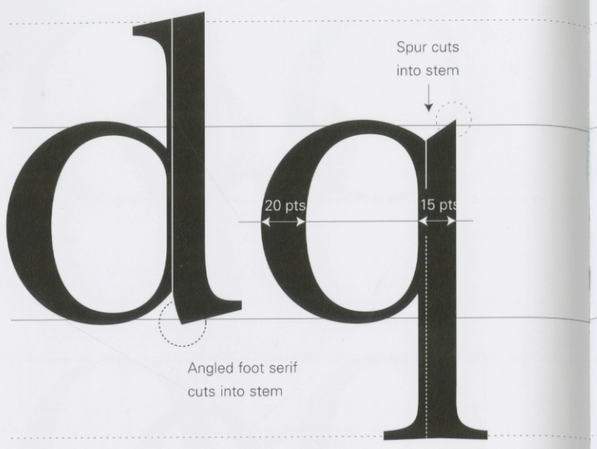
Serif Lower Case d, q, b and p

The d, q, b and p share the same basic anatomy: they each have a bowl and a vertical stem. However, they cannot be constructed by simply overlapping an o with an l – the letters are not rotated and mirrored images of one another.

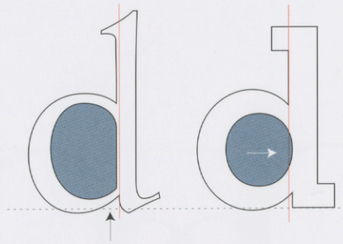
In typefaces with oblique stress, bowl weights reflect the thrust of calligraphic construction. This means that the weights of the d and q fall in different positions from those of the b and p. Furthermore, even when a font has vertical stress, each letter has specific structural elements. The b and q have small pointed spurs, while the d has a foot serif. Furthermore, descender length may vary from ascender height (the d and b are often taller than the q and p, especially in fonts with high x-height).

Despite these differences, however, the combination letters do share a common problem: congestion at the join of the bowl and stem. The two triangular notches (also called reliefs) at the top and bottom of each letter must be large enough to remain clear – even at small type size. To increase the area within the notch, the stem may be cut or angled away from the bowl. The shape of the bowl may also be altered so it meets the stem at a steeper angle. Finally, the thin portion of the bowl may be reduced to less than the normal thin stroke thickness.

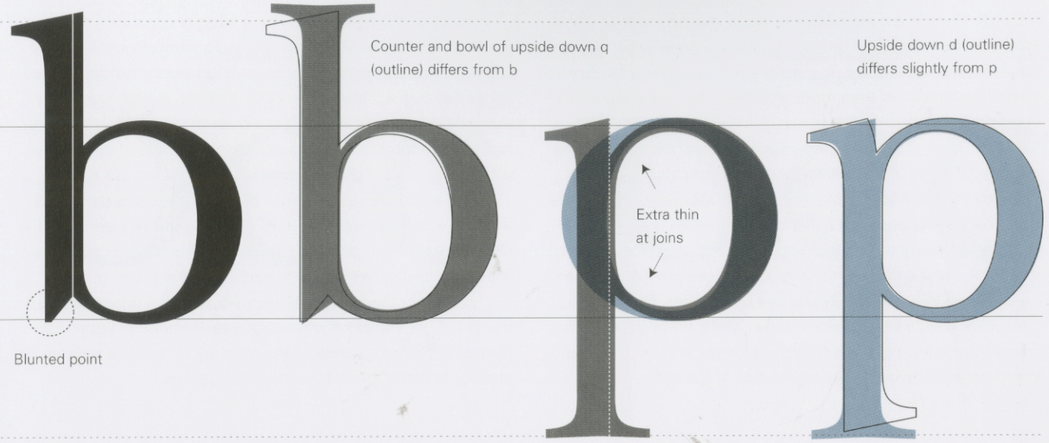
In bold typefaces, the d, q, b and p can sometimes appear uneven, since their vertical stems outweigh the shorter, variable-weight bowls. To correct this problem, it may be necessary to reduce the overall thickness of the vertical stem. Alternatively, the counter of the letter may be shifted to erode the adjacent stem. Of course, counter shifts are viable only when the interior form is round (as in Memphis, shown at right). Since a circular counter lacks a right vertical edge, the illusion of a continuous, even-width upright can be maintained.

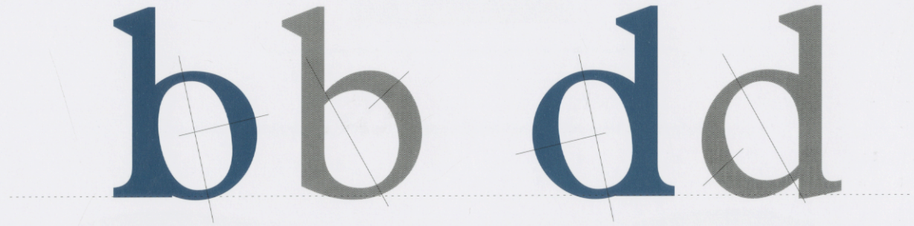


New Baskerville
(Transitional)



Left, Weiss. Lower serif cuts into stem to increase size of lower notch.
Right, Memphis. Circular counter cuts into stem to even colour.





Above, Plantin. The b and d cannot be created by direct overlap of an o and l.
The bowl weights must be shifted, and the overall letter width condensed.

Galliard
(Garalde)



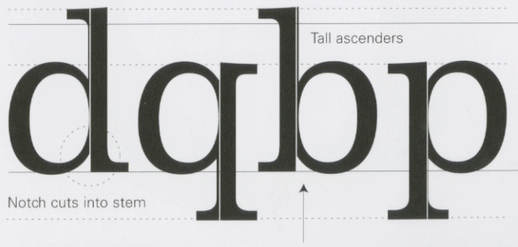
Notch cuts into vertical stem

Bauer Bodoni
(Didone)



Arched upper serif and flat foot serif

Egyptienne
(Slab Serif)



Bowls narrow to less than horizontal thickness at the stem

Serifa
(Slab Serif)



Descenders shorter than ascenders

Sans Serif Lower Case d, b, p and q

The interior form of a letter is often neglected by novice designers, since their focus is on the positive shapes that must be drawn. However, in the sans serif d, b, p and q, counters have equal, if not greater importance to the exterior shapes. All four of these letters have the same negative form: either an oval, circle or a combination straight-round teardrop. Oval and circular counters reinforce unity in the finished typeface, since they mirror the o. Conversely, the teardrop shape adds contrast and variety to the overall font.

Oval counters tend to appear in neo-grotesques, while circular counters usually occur in geometric sans serifs. These round interior forms are not necessarily perfect mathematical circles or ellipses; for greater stability, the bowl may be drawn heavier and flatter at the base of the letter.

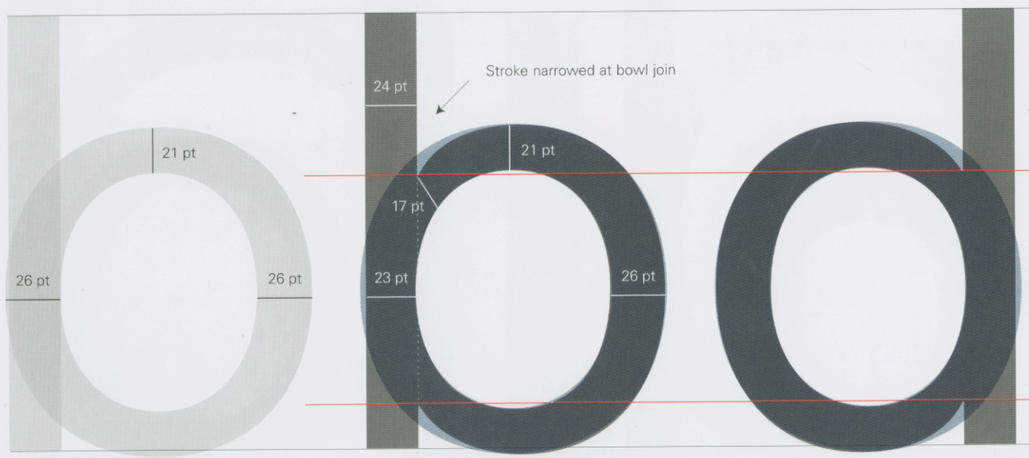
The more complex teardrop counter occurs mostly in grotesques and humanist sans serifs. In these types, the bowls of the d, b, p and q may be weighted at oblique angles – even when the overall angle of stress is vertical. Furthermore, in humanist sans serif designs, the combination letters may have serif-like details, such as sheared points on the b and q.

When designing the d, b, p and q, special attention must be paid to the ends of the letters. For example, if the arms of the upper case E have been rounded or shaped, that form should reappear at the upper or lower ends of the vertical stems. Alternatively, the sheared angles of ascenders and descenders might relate to those in the previously designed capital letters.

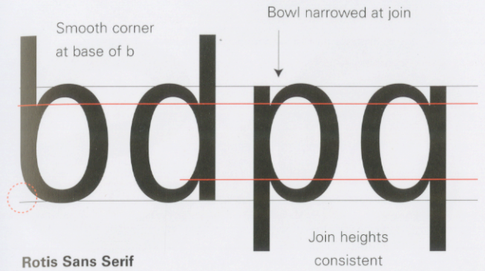
In sans serif fonts, the triangular notches of the d, b, p and q are more problematic than those in serif fonts, because lower contrast reduces the size of the triangular relief, especially in bold or condensed types. Designers may use the two methods of void enlargement discussed previously: the stem can be cut or angled away from the bowl, and/or the bowl stroke can be thinned at the join. Alternatively, reliefs might be eliminated altogether by reshaping the letters without a protruding tail (as in the b and q of FF Strada, shown at right).



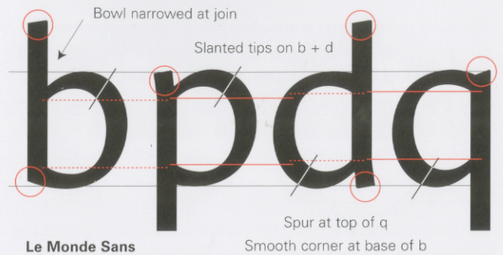
Left, Futura, a geometric sans serif.
Circular counters are shifted to erode vertical stems; bowl strokes are thinned substantially at the joins.



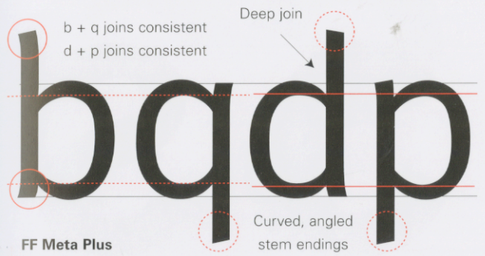
Helvetica Neue
(Neo-Grotesque)



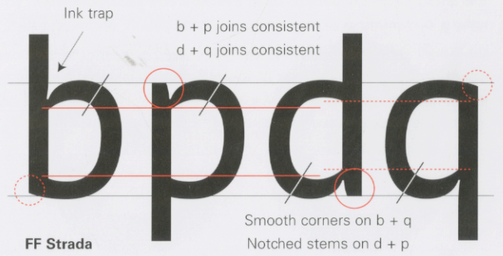
Rotis Sans Serif
(Neo-Grotesque)



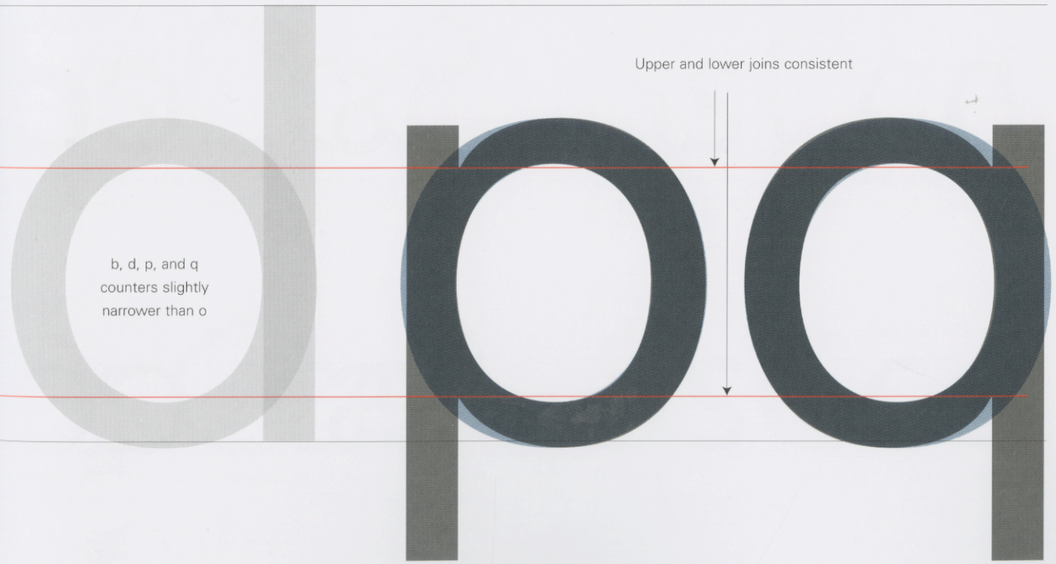
Le Monde Sans
(Humanist Sans Serif)



FF Meta Plus
(Humanist Sans Serif)



FF Strada
(Humanist Sans Serif)



Serif Capital E

The E is a logical letter to design after the O. The E sets several critical factors for the entire font: the proportional system, visual centre, vertical stem width and serif and bracket style.

In terms of proportion, the E is always a narrow letter. In the classic system, the E is roughly the dimension of two stacked squares. In the modern system, the width of the E is based on even colour. Because a rectangular form is visually larger and darker than a round form of equal height, the modern E is slightly thinner than the O.

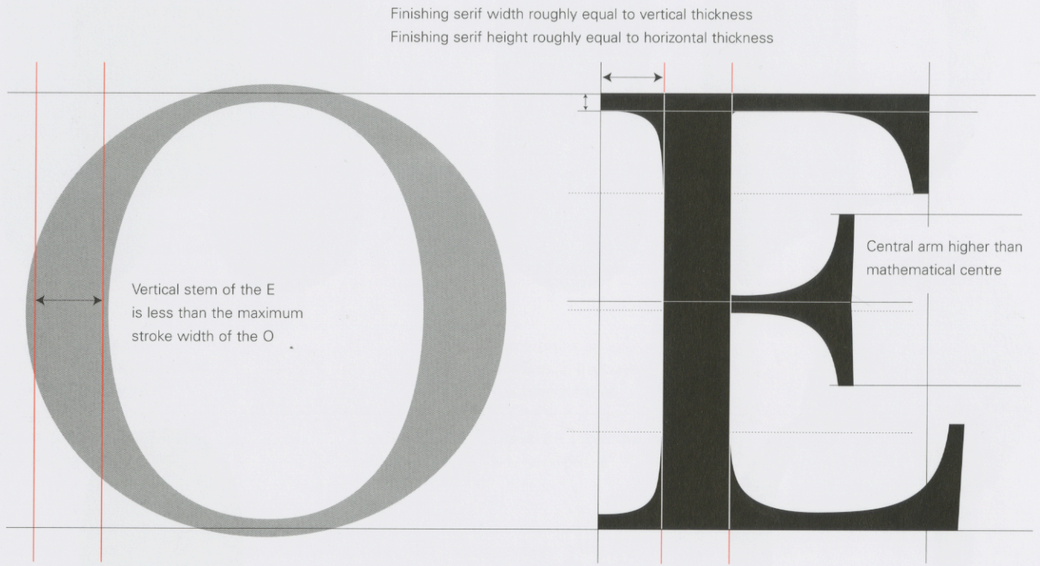
The vertical stem of the E is not as wide as the maximum bowl width of the O. This adjustment is made for optical balance. Because the vertical stem is a consistent parallel stroke, it is physically and visually heavier than the variable stroke of a bowl.

The horizontal arms of the E do not require any adjustment in weight (the thin stroke is a consistent interval throughout the upper case letters). However, the length of the arms varies; the central arm is the shortest, and the bottom arm is the longest. Staggering these arm lengths avoids serif overlap and prevents areas of lighter density within the E.

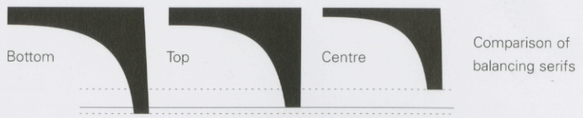
As in the O, the visual centre of the E is slightly higher than the mathematical mid-line. In some typefaces, this asymmetry is exaggerated to create a distinctive visual style. However, this deliberate distortion is not recommended, since it creates a light zone in the lower half of the E. It also complicates the construction of other double-storied letters (such as the B, R, P and X).

The vertical stem of the E has two serifs on the left that are called finishing serifs. The dimensions of these decorative features relate to the thick and thin stroke widths, but they may be drawn smaller or larger to increase or decrease overall colour. In some fonts, the lower finishing serif is drawn longer than the upper serif for greater stability on the baseline.

Each arm of the E ends with a balancing serif (these serifs 'balance' the density of the vertical stem). Since the arms are of different sizes, so are the serifs: the bottom serif is the largest and the centre serif is the smallest. This variation in size improves the stability of the upper case E, since it creates extra weight in the base. The form of these serifs also improves readability, since they lead the eye in the left to right direction of reading motion.



New Baskerville
(Transitional)



Comparison of
balancing serifs

Venetian
Long central arm
Small serifs
Low contrast



Centaur **Berkeley** **Jensen** **Guardi**

Garalde
Medium central arm
Medium serifs
Medium contrast



Bembo **Galliard** **Garamond** **Sabon**

Transitional
Short central arm
Large serifs
High contrast



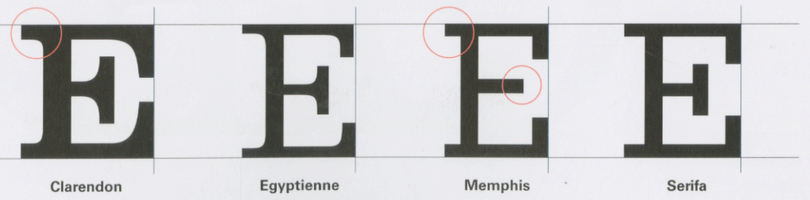
Janson **Bell** **Mrs. Eaves** **New Caledonia**

Didone
Very short central arm
Very large serifs
Very high contrast
No finishing serifs



Bodoni **Didot** **Fenice** **Bauer Bodoni**

Slab Serif
Short central arm
Serifs may be unbracketed
Low contrast



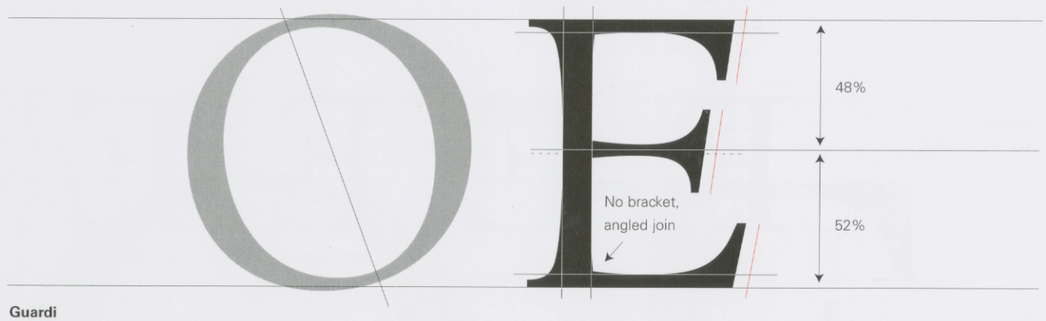
Clarendon **Egyptienne** **Memphis** **Serifa**

Brackets

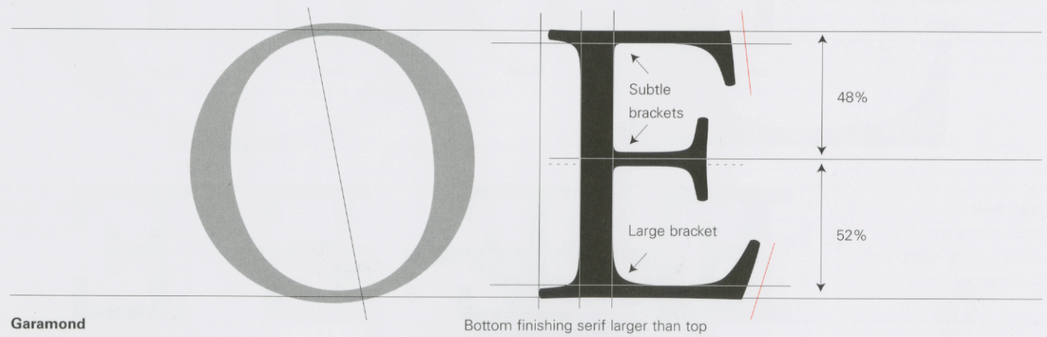
Brackets are curved forms that connect horizontals and verticals in a letter. Brackets are quite useful in type design: they reduce visual tension at the joins of opposing strokes and they help create the illusion of even colour in a letter.

Brackets on balancing serifs of the E must be larger than brackets on finishing serifs or the letter will not colour evenly. The upper interior bracket (from the top arm to the vertical stem) is optional. When it exists, the lower interior bracket (from the bottom arm to the vertical stem) is often drawn larger in order to stabilize the E on the baseline.

Typically, brackets are more subtle in Venetian faces than in Garalde or Transitional faces. In Didone faces, brackets occur only on the balancing serifs of the E. In Slab Serif faces, brackets occur on both the balancing and finishing serifs or not at all.

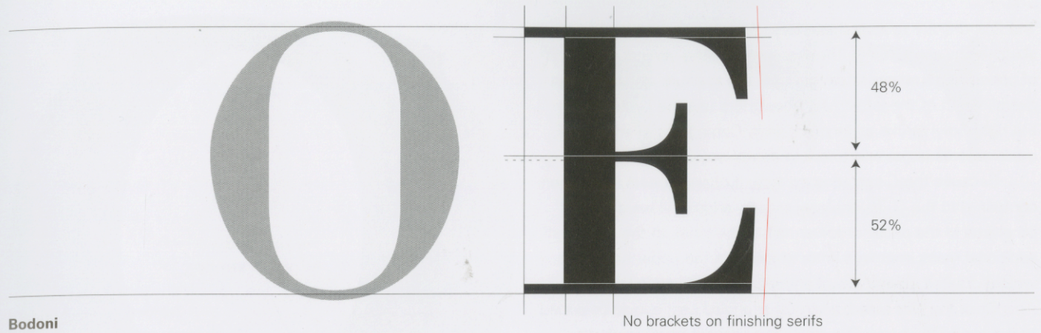


Guardi
(Venetian)



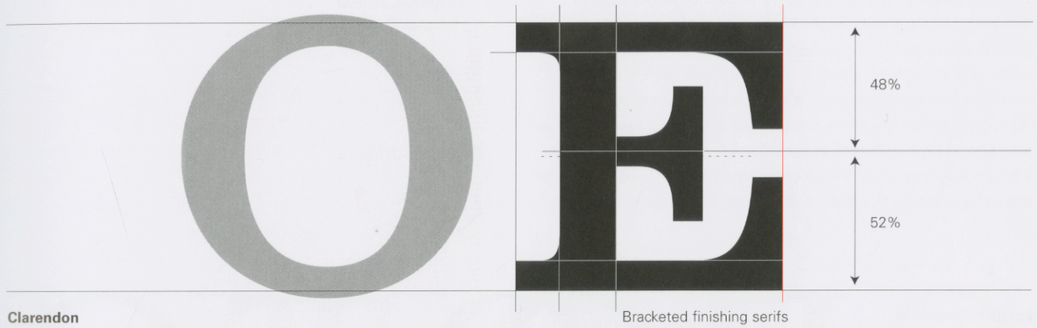
Garamond
(Garalde)

Bottom finishing serif larger than top



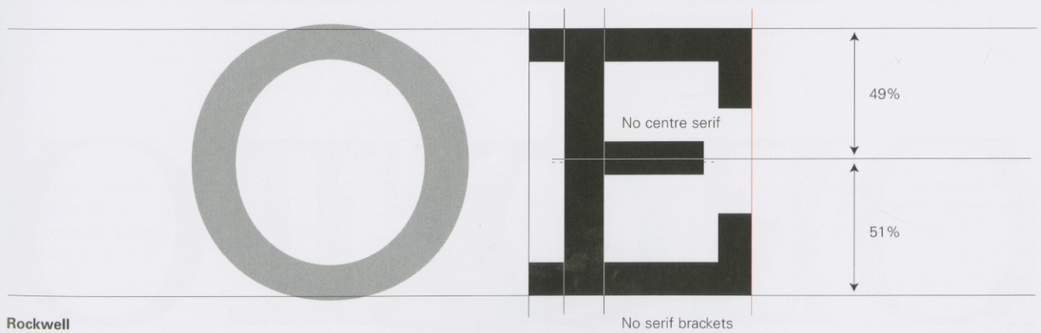
Bodoni
(Didone)

No brackets on finishing serifs
No interior brackets



Clarendon
(Slab Serif)

Bracketed finishing serifs
No interior brackets



Rockwell
(Slab Serif)

No serif brackets

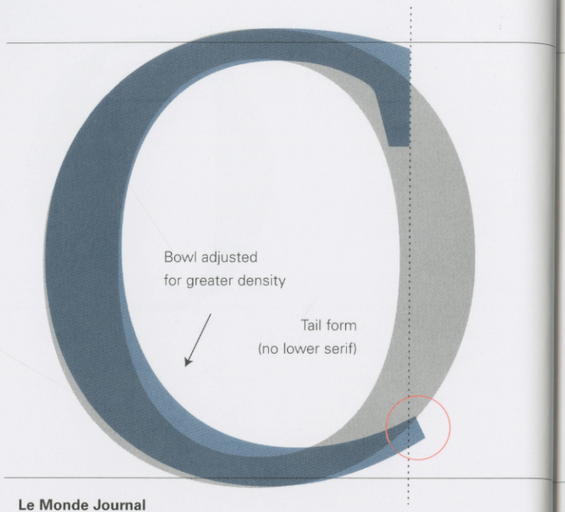
Serif Capital C

The C and O are related characters, since the C can be roughly sketched by slicing an O. The placement of the vertical cut is of critical importance, since it affects the aperture as well as the overall width of the letter. Most designers use the centre of the right bowl stroke as an outer limit. Cutting to the left of this guide creates larger aperture, but narrower width.

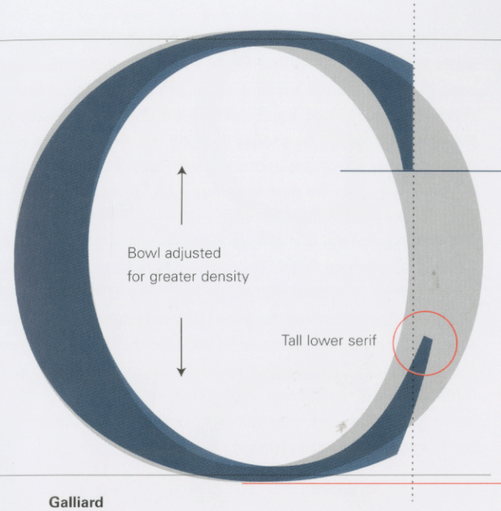
Because the C has an open side, it often appears light when compared to the O. To increase density, additional weight may be placed in the upper or lower half of the bowl. In the lower half, additional mass improves letter stability; in the upper half, extra weight creates greater visual animation and dynamic balance.

Once the O is sliced, a vertical or angled serif should be added to the top of the bowl. This serif (also called a beak) is usually larger than the serif on the uppermost arm of the E (the E serif is too small to counterbalance the heavier weight in the bowl of the C). In some typefaces, the beak is enlarged by the addition of a bracketed or unbracketed spur. In general, this spur aligns to the capital height (or to a point slightly above or below this guide).

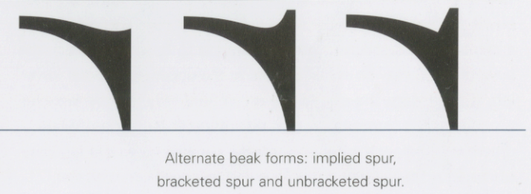
The lower end of the C may be treated as either a static terminal or an extended tail. In the first case, the base of the C is finished with a serif; this serif should be slightly larger than the upper serif for optimal stability. In the second case, the C ends with either an extended serif, a flared wedge, sharp point or blunted tip. When the tail is pointed, the shape and weight of the bowl should be modified to ensure extension past the upper serif. A longer tail more comfortably counterbalances the weight of the bowl, and prevents the illusion of an awkward backward tilt.



Le Monde Journal
(Transitional)

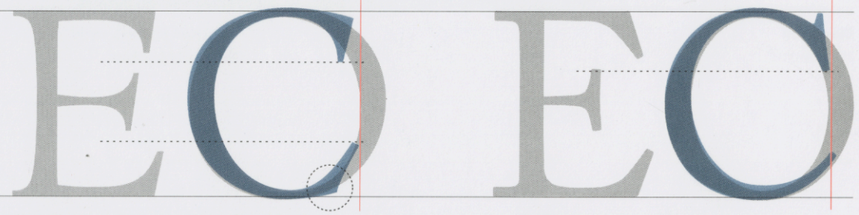


Galliard
(Garalde)



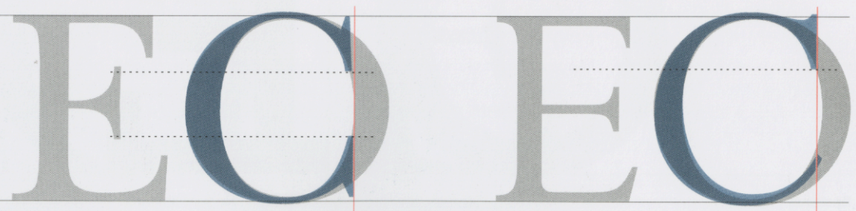
Alternate beak forms: implied spur,
bracketed spur and unbracketed spur.

Venetian/Garalde
Lower serif may
be larger or smaller
than upper serif



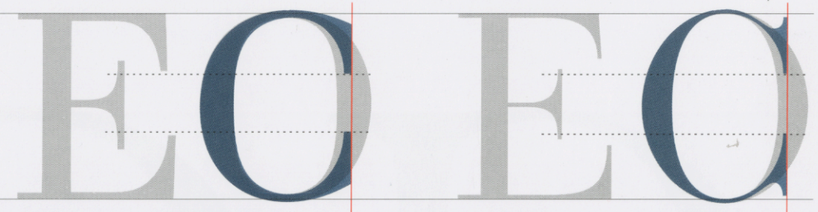
Guardi Spur-like element **Caslon**

Transitional
Lower serif slightly
larger than upper serif



New Baskerville **Perpetua**

Didone
Upper serif below capline
Lower serif above baseline
Lower serif slightly larger
than upper serif



Walbaum Larger lower serif **Bauer Bodoni**

Slab Serif
Bold strokes may be
thinned (to less
than normal horizontal
thickness) at joins

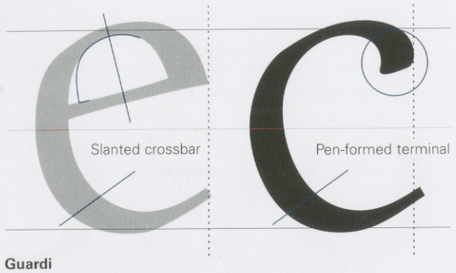


Serifa **Melior**

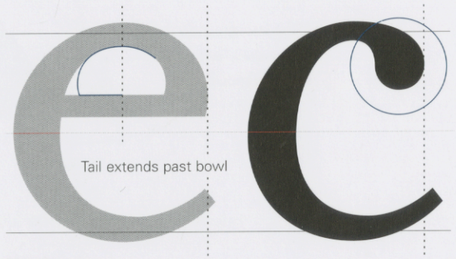
Details of the Lower Case c

The top of the lower case c is finished with either a serif or a terminal. Pen-shaped terminals reflect the calligraphic origins of Venetian faces; circular terminals balance the high contrast of Didones; and block forms match the weight of heavy Slab Serifs. An oval terminal is actually a softened pen-form, and therefore most appropriate for Garalde and Transitional typefaces.

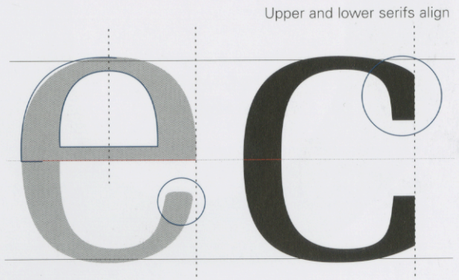
Serif and terminal size varies widely. However, in general, the diameter of a terminal should not exceed the maximum bowl stroke thickness. Of course, terminals (and serifs) do tend to be larger in Transitional, Didone and Slab Serif fonts. For even colour, these typestyles need terminals that fill the open space inside the bowl of the c.



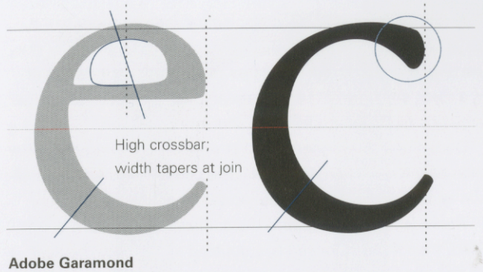
Guardi
(Venetian)



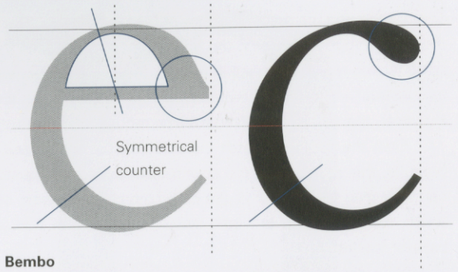
Mrs. Eaves
(Transitional)



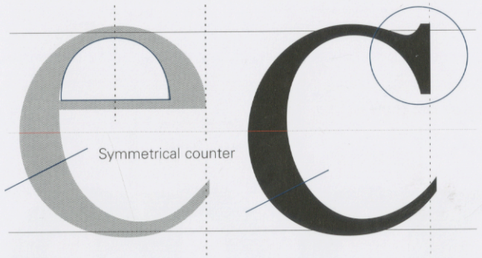
Melior
(Slab Serif)



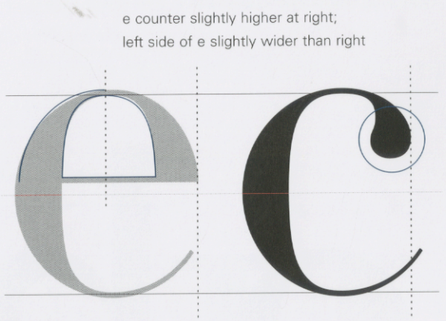
Adobe Garamond
(Garalde)



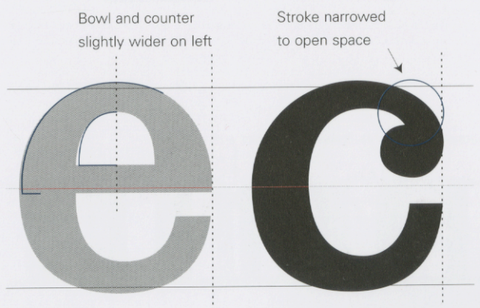
Bembo
(Venetian/Garalde)



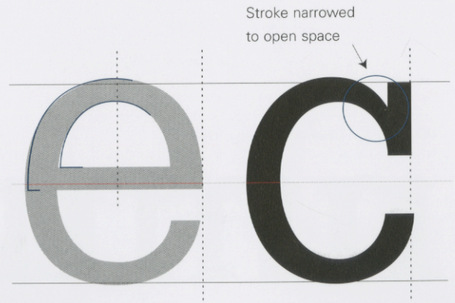
Perpetua
(Transitional)



HTF Didot
(Didone)



Clarendon
(Slab Serif)



Glypha
(Slab Serif)

Serif Capital G

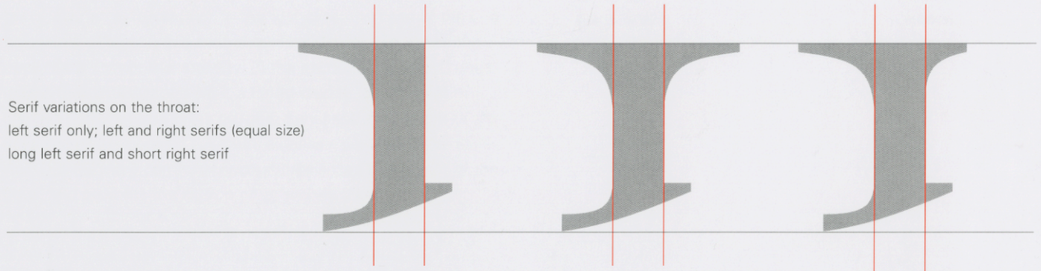
The G and C have obvious similarities in their basic form, but their bowls are not identical. Because the G has a thick vertical throat, it can become significantly darker than the C. To reduce colour, the bowl of the G may be subtly thinned at the upper right and/or lower left. If necessary, the size of the upper serif may also be reduced.

Since the throat is a visual disruption, it looks best when drawn well below the visual centre. (This also helps the legibility of the G, since a wider aperture prevents confusion with the O.) For optimum stability, the throat of the G may be slightly heavier than the normal vertical stem thickness. Extra weight is often needed to counterbalance the taller bowl with a shorter stem.

In most typefaces, the throat of the G aligns to the outer edge of the upper serif. However, in fonts with limited aperture, this can make the G too dark. When this occurs, the letter can be lightened by enlarging its interior counter – the throat can be shifted past the outer edge of the upper serif. If still more space is needed, the entire bowl should be redrawn with a wider, extended shape.

The top of the throat may be finished with either a pair of serifs (one on each side) or a single left-facing serif. In the latter case, the length of the left serif varies, but it should be at least the thickness of the throat, if not more. In the double serif scenario, the right serif should be shorter than the left. Cropping the outer serif improves spacing relationships with letters that follow the G, especially when the next letter has a left vertical stem (as in Gl, Gh, GE, GN and GR, for example).

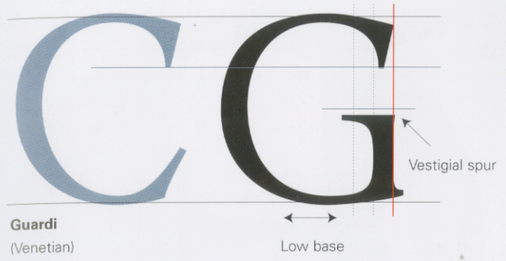
The bowl of the G is difficult to design in that it must smoothly join and support the throat. The shape differs from the O in that the bottom curve is lower and thicker as it rises to the right; in some typefaces, the bottom of the bowl rests directly on the baseline. A vertical or horizontal spur may be added at the transition between the bowl and throat. A vertical spur has a stabilizing effect, since it reinforces the upright axis. A horizontal spur visually extends the curve of the bowl and therefore emphasizes the natural left-to-right direction of reading motion.



Serif variations on the throat:
left serif only; left and right serifs (equal size)
long left serif and short right serif



Galliard
(Garalde)



Guardi
(Venetian)

Low base



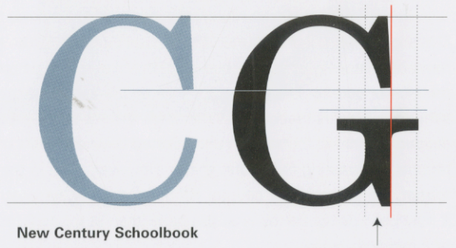
Didot
(Didone)

Rounded notch at base



Palatino
(Venetian/Garalde)

Tiny right serif



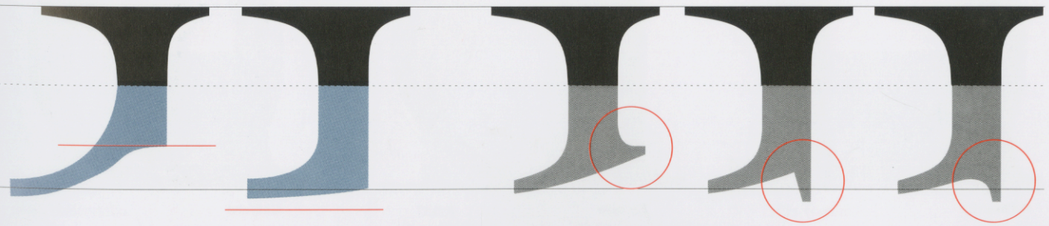
New Century Schoolbook
(Slab Serif)

Throat notched at base

Venetian and Garalde fonts exhibit the greatest size variation between left and right throat serif;
in Transitional, Didone and Slab Serif fonts, the left serif is only slightly longer than the right serif.

Alternate throat positions:
high (well above baseline) or low (resting upon baseline)

Alternate spur designs:
bracketed horizontal spur, vertical spur or bracketed vertical spur



Serif Lower Case g

The lower case g is one of the most beautiful letters in the roman alphabet. This double storied form is rich with single and compound curves, creating a complex shape that is free and organic, yet structured and intelligent. It is these contrasting qualities that give the g its unique and expressive personality.

The serif g has four distinct parts: an upper o, a transitional link, a lower loop and a small ear. The upper o is a modified version of the lower case o: it is shorter (roughly 60–70% of the x-height) and therefore drawn with lighter stroke widths.

The link begins at the lower left of the upper o. As the link curves to the right, it increases from the minimum to the maximum stroke thickness. In Venetian and Garalde fonts, the transition in weight is abrupt, reflecting the sharp turn of a calligraphic pen. In Didone, Transitional and Slab Serif types, the transition is softer and more gradual.

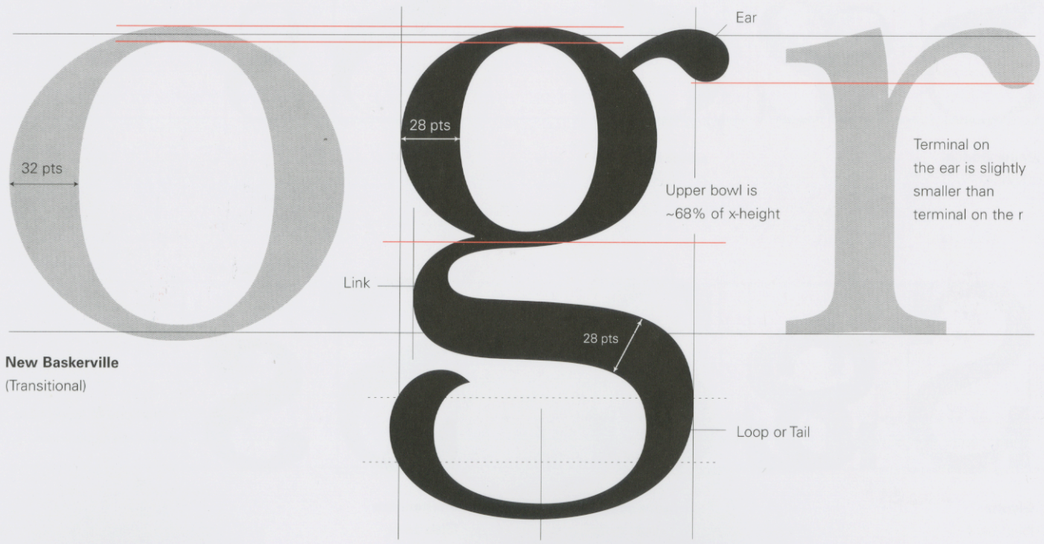
The lower loop of the g has many variations and options. The initial stroke may be either horizontal or diagonal; a diagonal creates a narrow g with a short loop, while a horizontal creates a wide g with a tall loop. In either case, the loop may be open or closed. If open, the loop may be finished with a terminal or point. If closed, the angle of closure may relate to the angle of the link.

Note that the lower loop may be asymmetrical in structure and weight (as in Didot, for example). That is, the thinnest part of the loop may be at an angle rather than in the centre – even in fonts with vertical stress. This occurs because the g is a closer relative of the s than the o. Both the s and the g are organized around a central spine – an organic ogee curve that increases and decreases in weight.

The final element of the g is the ear. The ear protrudes from the upper right of the small o, at or near the x-height. The main stroke of the ear may be curved or horizontal; its end may be cut at an angle, or finished with a terminal (in general, a form similar to the terminal on the r). For ease in letterspacing, the ear should not extend too far past the outer right edge of the lower loop.



Above, Bauer Bodoni.
The terminal on the ear of the g should relate to other terminals in the typeface.



New Baskerville
(Transitional)



Serif Capital P and R

The P and R are closely related to the B. However, there are subtle differences in the structure of these three letters.

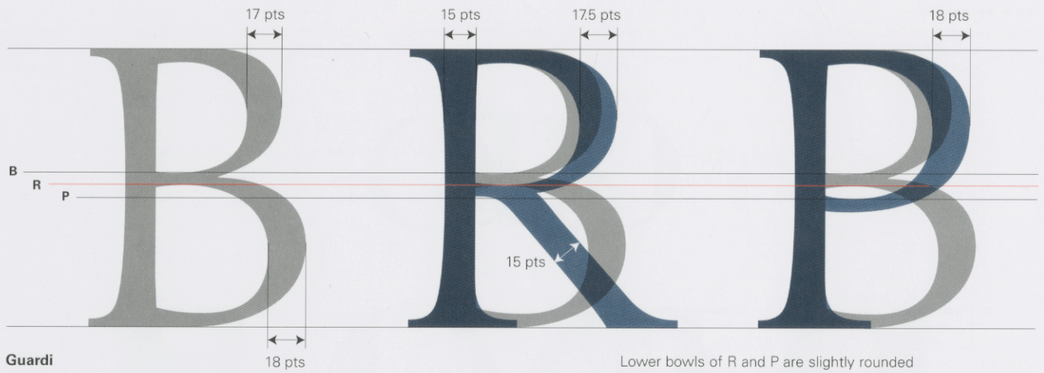
The bowl of the P is sized between the upper and lower lobes of the B. An enlarged bowl helps fill the open space at the bottom of the letter and makes the overall character more robust.

The bowl of the R also falls between the sizes of the upper and lower lobes of the B. However, the R bowl is usually smaller than the P bowl. Because a generous tail fills the lower half, the R bowl requires less expansion.

The bottom of the bowls on the P and R is usually horizontal. However, in typefaces influenced by calligraphy, the bowl may be curved as it joins the stem – and/or disconnected. When disconnected, the gap between strokes should be of reasonable size.

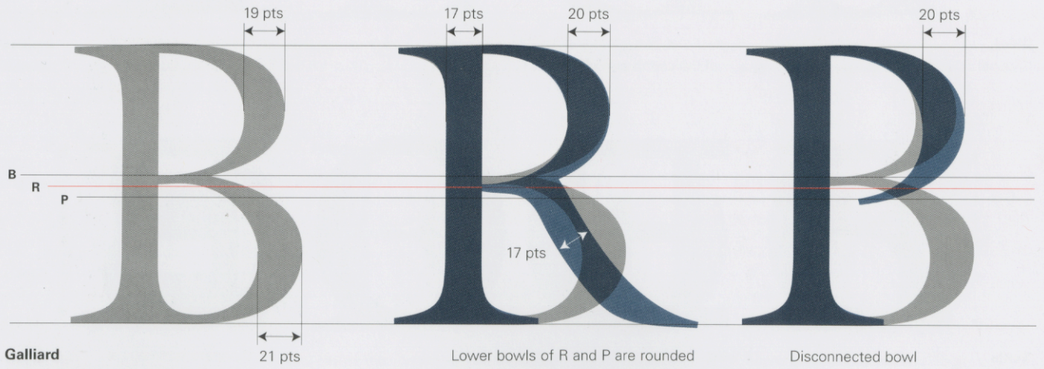
The tail on the R is either a diagonal or an upright arch. A diagonal creates a wide R, while the upright arch generates a more condensed width. When arched, the end of the tail is finished with either a right-facing serif or a spur (the vestige of a calligraphic connection). Both features improve legibility by encouraging left-to-right reading motion. For the sake of clarity, the left side of the R tail never has a serif. In fact, the inner stem serif of the R stem may be shortened to avoid congestion at the base of the letter.

When the tail of the R is diagonal, it should extend decisively past the outer edge of the upper bowl. However, obvious exaggeration should be avoided. A long tail creates spacing problems, especially when the R is followed by a letter with a vertical stem (as in Rh, Ri, RL, RE, RK, RM, RN and RU, for example).



Guardi
(Venetian)

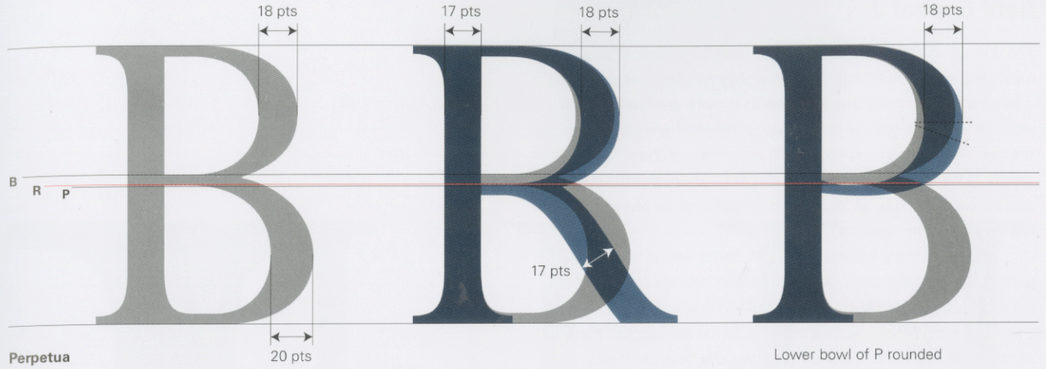
Lower bowls of R and P are slightly rounded



Galliard
(Garalde)

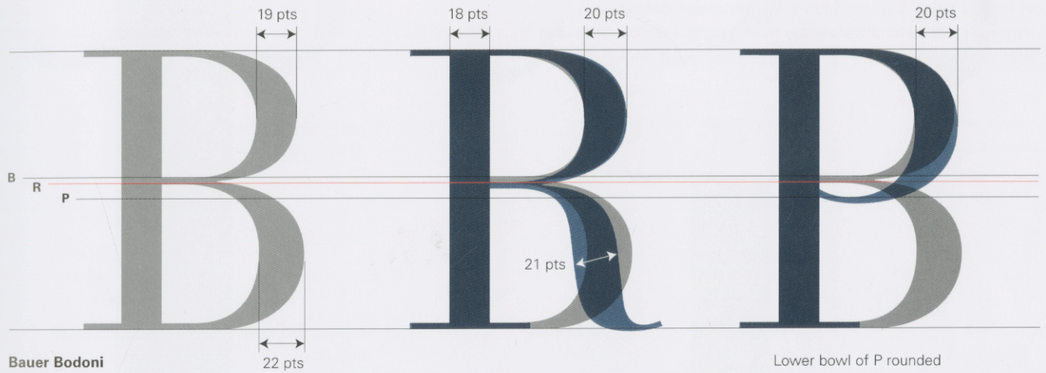
Lower bowls of R and P are rounded

Disconnected bowl



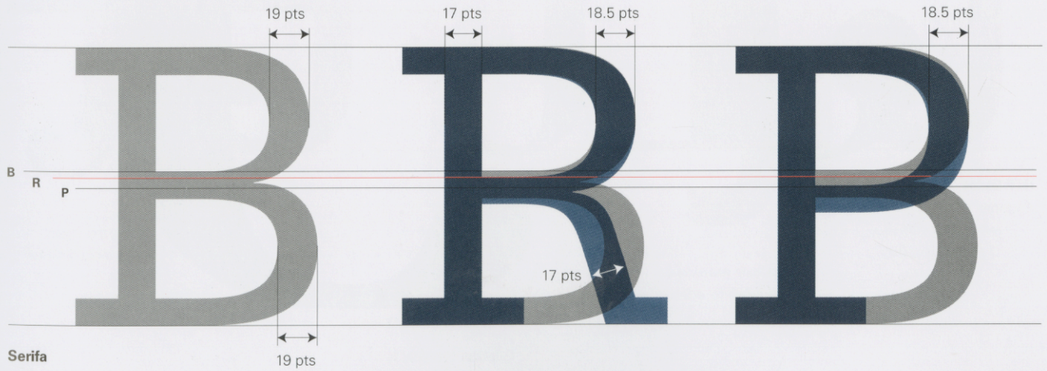
Perpetua
(Transitional)

Lower bowl of P rounded



Bauer Bodoni
(Didone)

Lower bowl of P rounded



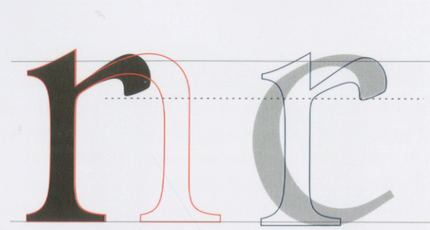
Serifa
(Slab Serif)

Serif Lower Case r

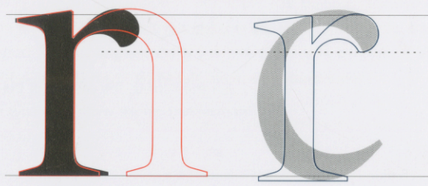
Like the n, the lower case r is a branched letter. However, the arch of the r differs from the n; it has a lower vertex, and thus, a larger notch. The larger notch prevents congestion at the join and shapes the branch into a more dynamic curve.

Unfortunately, the r is a letter that colours unevenly, since the open space beneath the branch leaves a lighter spot. Drawing the r at a narrow width helps to increase its density; a sizable terminal also helps to partially fill the gap.

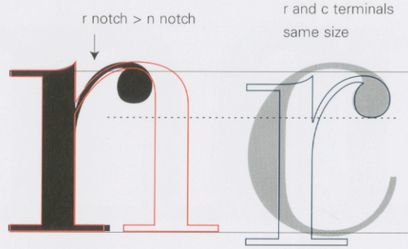
The terminal on the r is usually a smaller version of the terminal on the c. As always, terminal shapes vary according to the general typestyle. Calligraphic forms are the norm for Venetian, Garalde and Transitional fonts; circular forms occur in Didones; and block forms are the standard for Slab Serifs. Exceptions occur mostly in the unbracketed slab serifs known as Egyptians, since here, the vertical block form can become too large – crowding the interior of the r as well as adjacent characters. In these fonts, the branch of the r should end more simply, with a vertical or diagonal slice.



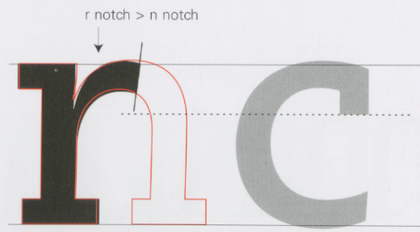
Guardi
(Venetian)



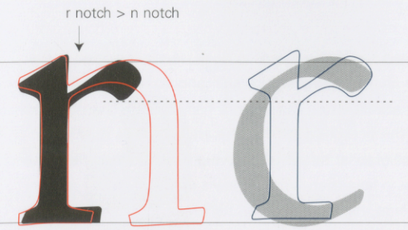
Le Monde
(Transitional)



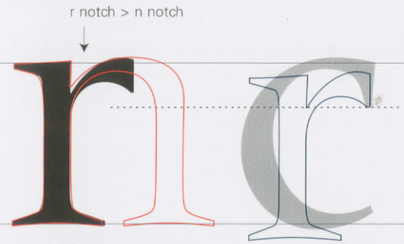
Bauer Bodoni
(Didone)



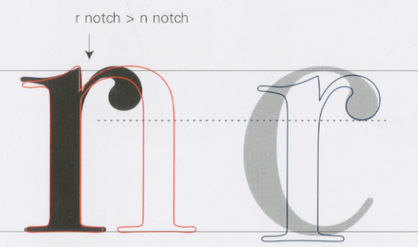
PMN Caecilia
(Slab Serif)



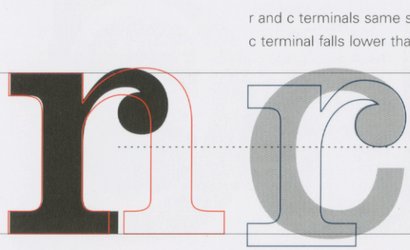
Adobe Jenson
(Venetian)



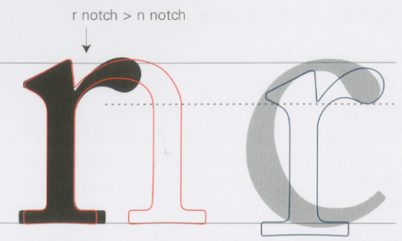
Méridien
(Transitional)



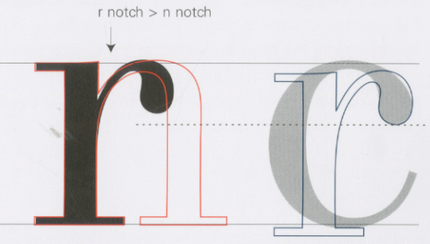
Bodoni
(Didone)



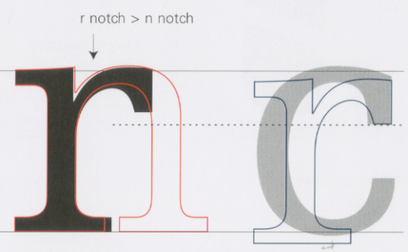
Clarendon
(Slab Serif)



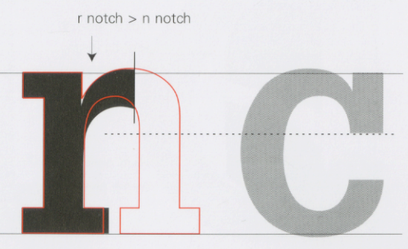
Adobe Caslon
(Garalde)



Walbaum
(Didone)



Egyptienne
(Slab Serif)

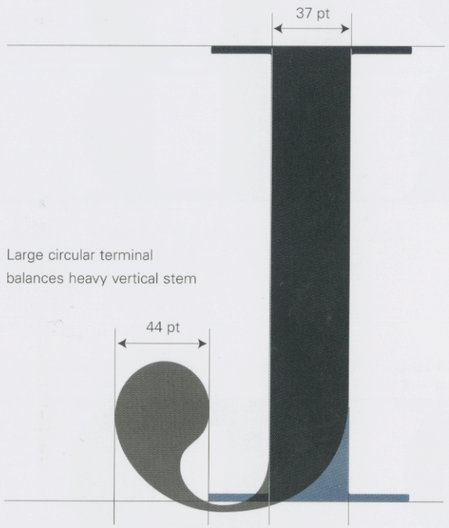


Glypha
(Slab Serif)

Serif Capital J

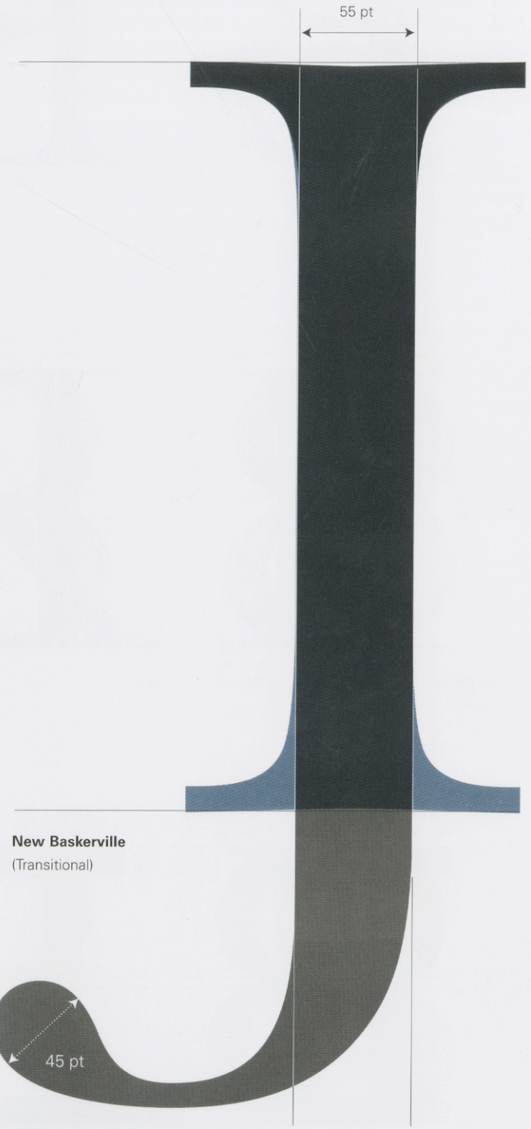
The J is essentially a modified upper case i – a vertical stroke extended into a left facing curve. The degree of curvature varies; it ranges from a sharp diagonal turn to a more gradual elliptical arc. The length of the tail also varies: it ranges from slightly below the baseline (perhaps matching the overshoot of the O) to considerably lower. Longer tails are, of course, more dramatic and expressive. However, as in the R, they often cause problems with line and character spacing.

The tail of the J ends with a point, flared wedge, serif or round (circular or oval) terminal. Round terminals may be bracketed to create a teardrop form. There is no rule to guide the selection of a specific terminal shape, but different forms do suggest historical periods. Venetian and Garalde fonts typically have terminals that look calligraphic – a blunted point, a serif or a flared wedge. Transitional types are more refined; the calligraphic terminal is rounded into an elliptical teardrop. Didone fonts have large, circular terminals, since these shapes maintain the characteristic high contrast of the typestyle. Slab serif terminals have the most variation, but in general, flared endings are the most practical choice. In these bold type designs, there is limited room for larger forms.



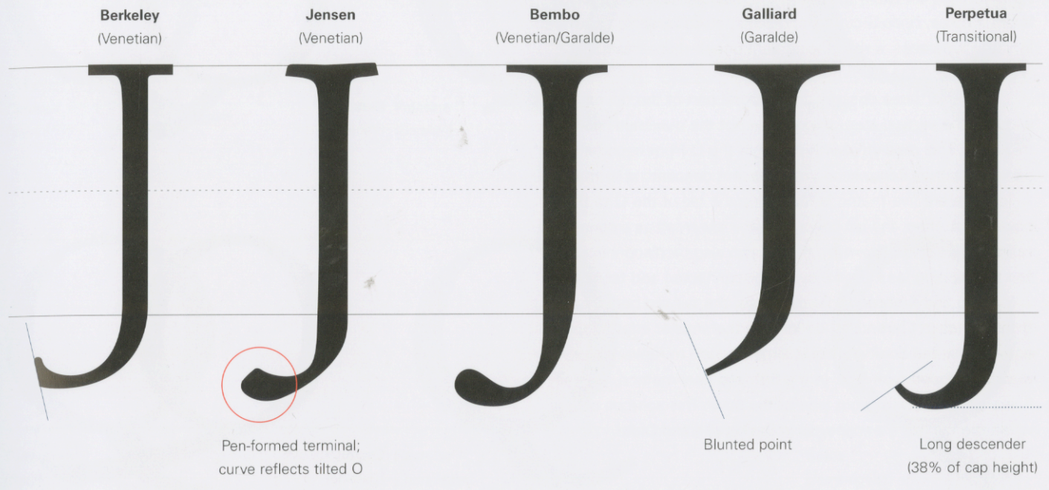
Large circular terminal
balances heavy vertical stem

HTF Didot
(Didone)



New Baskerville
(Transitional)

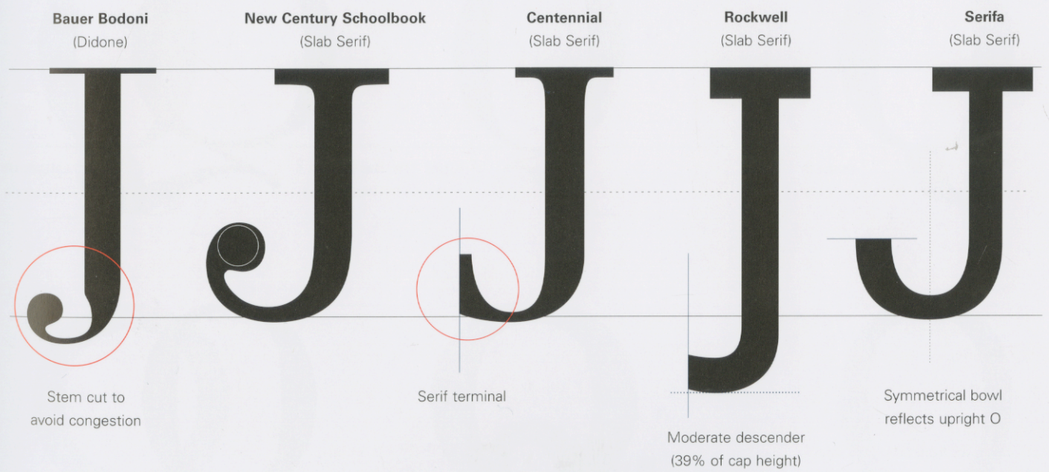
Elliptical terminal is
smaller than vertical stem



Pen-formed terminal;
curve reflects tilted O

Blunted point

Long descender
(38% of cap height)



Stem cut to
avoid congestion

Serif terminal

Moderate descender
(39% of cap height)

Symmetrical bowl
reflects upright O

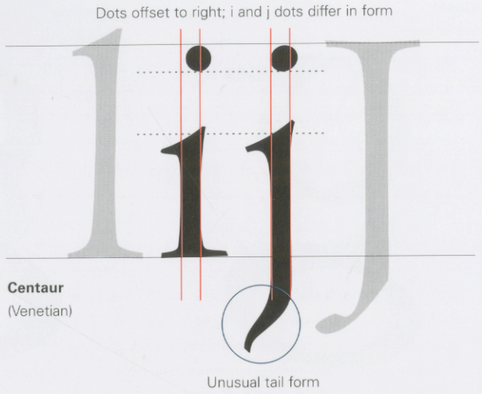
Serif Lower Case i and j

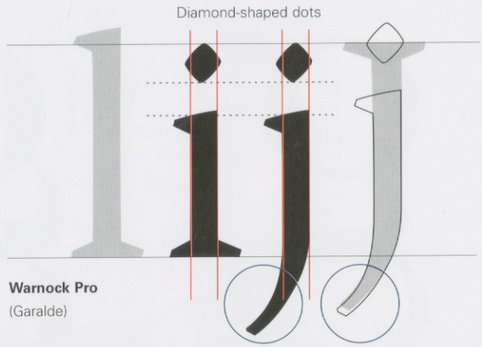
The i and j are two of the simplest letters to construct. The stem of the i is merely a short version of the lower case L, while the j is an i with a descending hook.

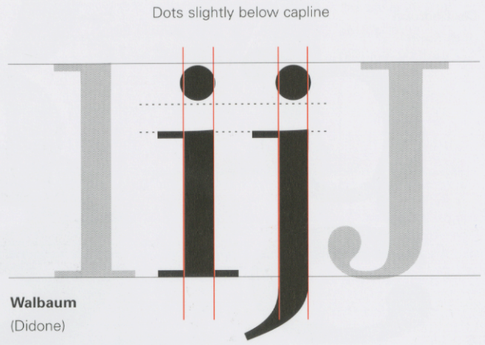
The dots on the i and j, however, require some finesse. While the dot may be virtually any shape (for example, a circle, ellipse, rectangle, square or diamond), their size must be scaled to match the optical weight of the base stem. This means that circular or diamond-shaped dots have should have diameters that are slightly wider than the vertical stem width. Square or rectangular dots can directly match the normal vertical stem weight.

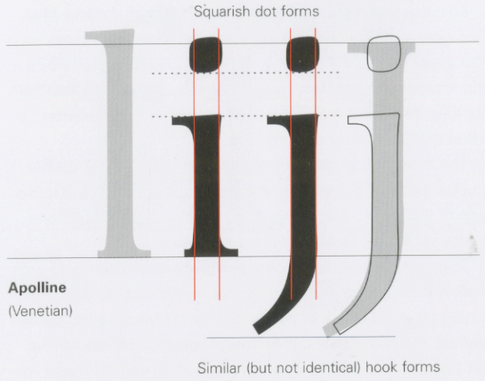
In general, the dots of the i and j are centred over the base stems at or near the capline. However, as always, there are exceptions. In some Venetian and Garalde designs, the dot is shifted to the right, as if the writer was quickly dashing off a note. (Some typographers believe this offset makes text more legible, since it emphasizes left-to-right reading motion.) In typefaces with short x-height, dots are often positioned lower to better connect them with their base glyphs. Conversely, in typefaces with tall x-height, dots are usually raised above the capline to avoid congestion.

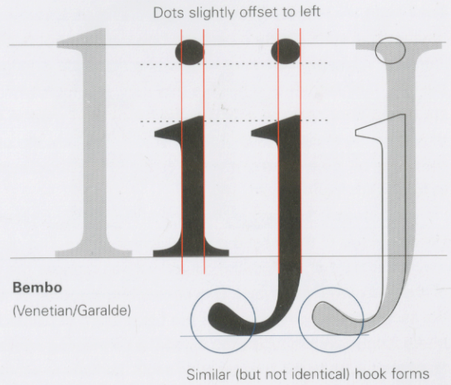
Once the shape and alignment of the dots is resolved, only the problematic hook of the j remains. As discussed for the upper case J, the lower case hook has two options. The hook can be drawn as a short and narrow arc (to contain the descender in its own space) or as a low and wide curve (to sweep the descender under preceding letters). Both of these options successfully avoid collisions between the lower case j and adjacent characters.

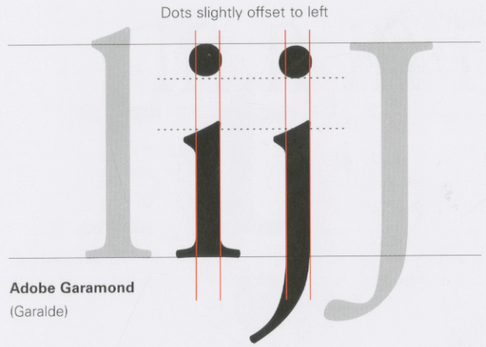


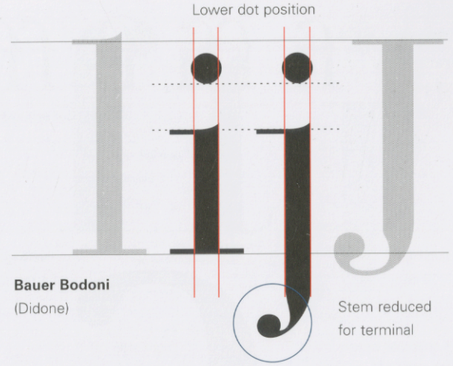


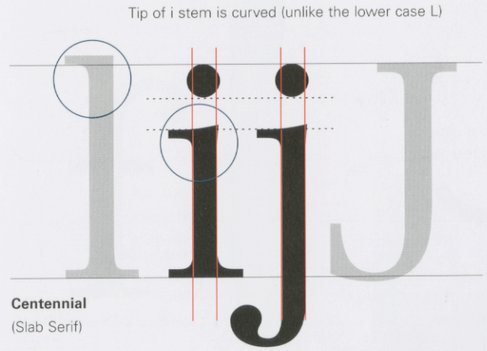


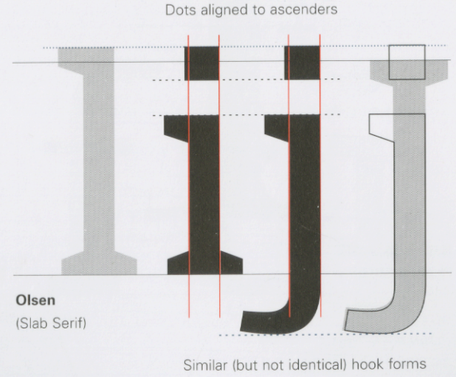












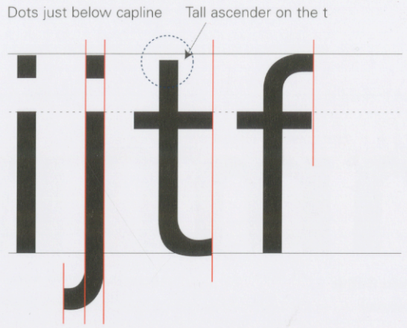
Sans Serif Lower Case i, j, f and t

In sans serif fonts, the design of the i requires little effort, since it is merely a vertical stem with a square, rectangular or circular dot. However, the sans serif j and f are more difficult to create, since both letters lack the balancing terminals which aid the original serif letters.

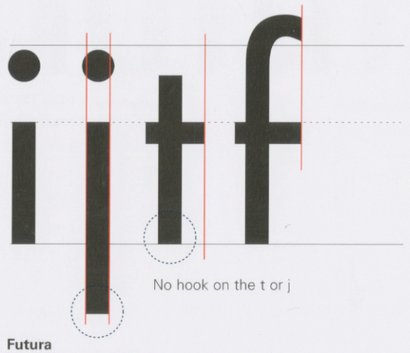
One solution is to slice the hooks of the j and f at vertical or inclined angles. This way, the curves can end with a flare, dagger or blunted point (whichever form is most harmonious with the other stem endings in the font). In general, designers prefer to keep the end of the hook close to the outer edge of the crossbar, since a narrow f avoids collisions with adjacent characters. Similarly, the j should also be drawn at a minimal character width.

In the sans serif f and t, the asymmetry of the crossbars is less pronounced than in the serif letters. The tail of the t should be cut at an angle complementary to the j and f. The tip of the t may be sheared at an angle, as described previously for the serif letter. However, this tip is rarely bracketed to the crossbar, although there are exceptions (as in the inscrutable Gill Sans, for example).

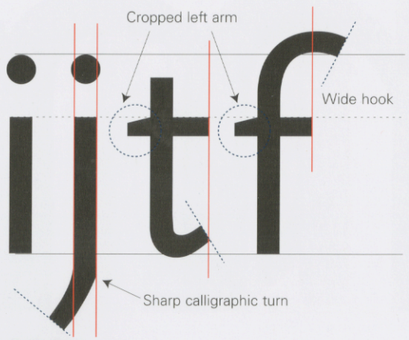
In humanist sans serifs, the i and j may have short horizontals appended to the top and bottom of their vertical stems. These crossbars make the letters more unique and therefore more legible. In contrast, in geometric sans serifs, the j and t are often reduced to bare vertical stems. While this certainly conforms to the spirit of geometric abstraction, these minimal letterforms are more difficult to recognize and decode in text.



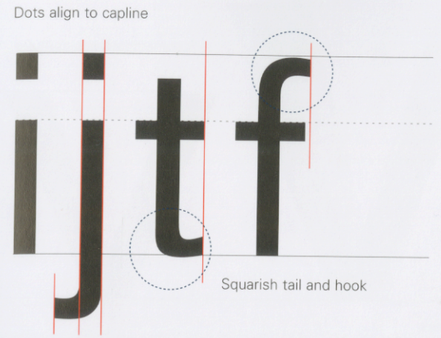
News Gothic
(Grotesque)



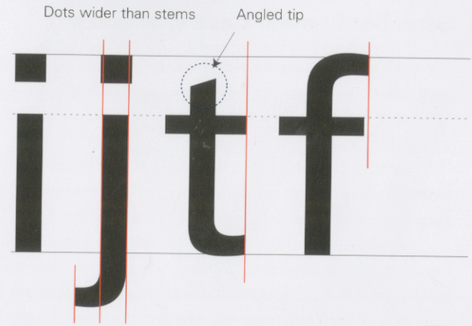
Futura
(Geometric Sans Serif)



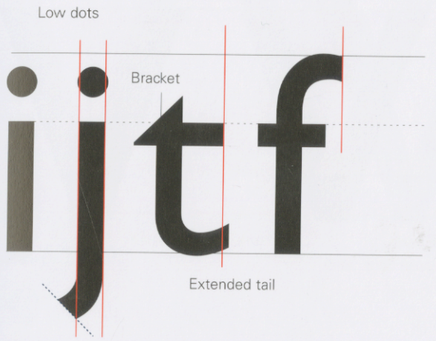
Scala Sans
(Humanist Sans Serif)



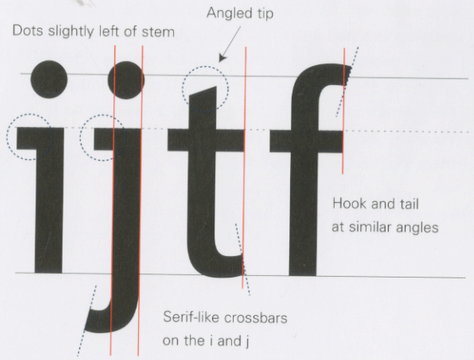
Akzidenz Grotesk
(Grotesque)



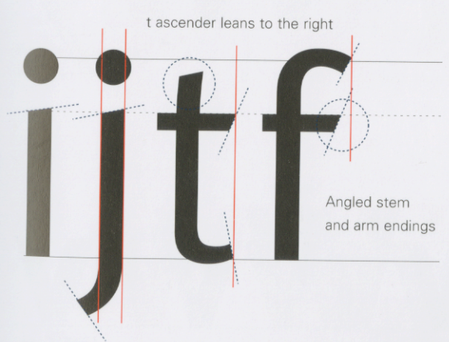
Univers
(Neo-Grotesque)



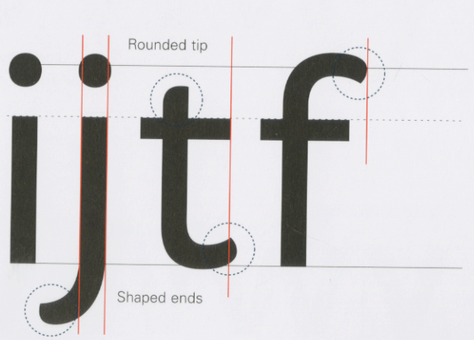
Gill Sans
(Geometric/Humanist Sans Serif)



Vialog
(Humanist Sans Serif)



Meta Plus
(Humanist Sans Serif)



FF Strada
(Humanist Sans Serif)

Serif Lower Case f and t

The f and t are related, since both have crossbars that intersect their vertical stem. These crossbars, however, are not necessarily identical. While both are asymmetric (the right side is longer than the left), their lengths and heights may vary. Although both bars are 'hung' at or near the x-height, the bar of the t may be raised to reduce the mass of its left triangular join. Similarly, the bar of the f may be lowered to give more space to the hook, especially in fonts with high x-height.

In Venetian, Garalde and Transitional fonts, the crossbar of the t is connected to the ascender by a diagonal stroke. This diagonal may be straight or curved (the curved version reduces the weight of the heavy triangular join). This connecting diagonal cuts into the ascender, reducing the tip of the t to a sharp or blunted point. Interestingly, even in typefaces without a connecting stroke, the tip of the t is often still sheared at an angle, perhaps to subtly evoke the earlier calligraphic practice.

Like the a, the stem of the t is finished with a curved tail. For efficient letterspacing, this tail should align near the outer edge of the upper crossbar. The curve of the tail should relate to other round letters in the typeface, but, in general, Didone and Slab Serif fonts have taller and more enclosed tail forms than Venetian, Garalde and Transitional designs.

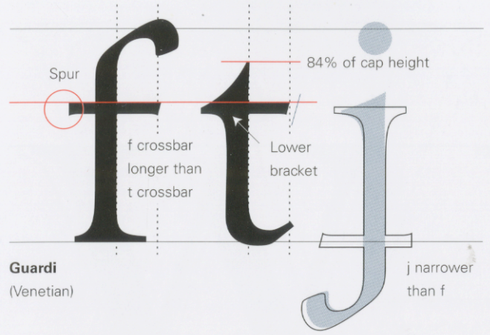
The most critical element of the lower case f is, of course, the upper hook. The hook is sometimes, but not always, a mirror image of the lower case j. As before, the key issue is collisions, but with ascenders rather than descenders.

To prevent congestion, some designers draw a narrow f with a shallow hook. However, this is not recommended, because the resulting f is timid and less legible (the t and f become too similar). Therefore, the best solution is to design specific ligatures for the most troublesome combinations: fi, fj, fl, ff, ffl and ffi. These ligatures allow the normal f to be drawn with fewer visual constraints.

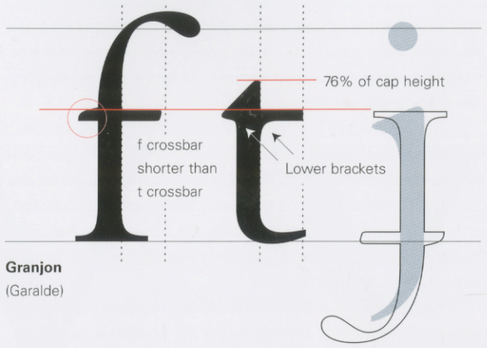


Galliard set without ligatures (left) and with ligatures (right).

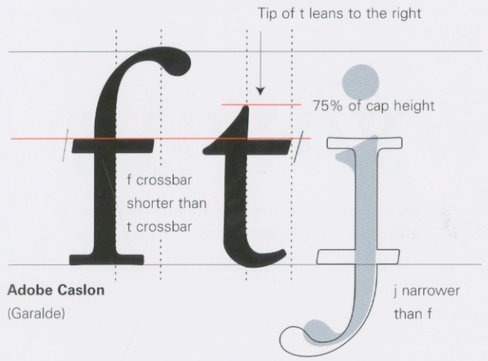
New Baskerville
(Transitional)



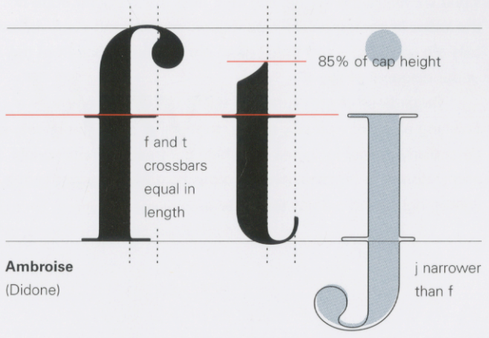
Guardi
(Venetian)



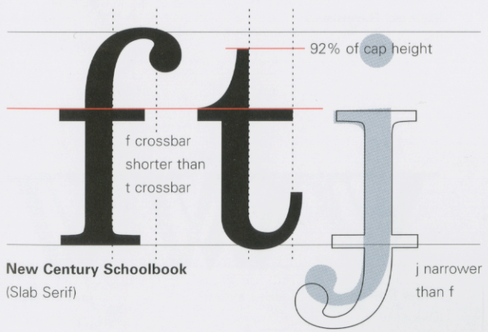
Granjon
(Garalde)



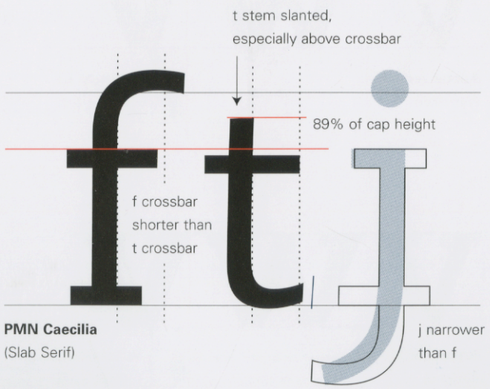
Adobe Caslon
(Garalde)



Ambroise
(Didone)



New Century Schoolbook
(Slab Serif)



PMN Caecilia
(Slab Serif)

Serif Capital K

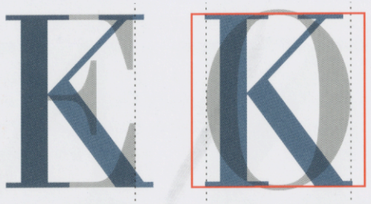
The K is an expressive letter that adds character to an alphabet. It can be constructed with either a single or double junction. The single junction is more elegant as an abstract form, since it has clear symmetry and defined negative shapes. However, the double junction is easier to condense and letterspace (the open area to the right of the letter is reduced).

In the single junction form of the K, the diagonal strokes meet at or below the mid-line. As in all letters discussed up to this point, a wide base is needed for stability. Therefore, the lower diagonal leg must be longer than the upper arm. The junction itself is usually pointed rather than blunted, although the point may be hidden by overlap with the vertical stem. In certain Transitional fonts, a horizontal crossbar forms the connection with the upright stroke; this device helps to even colour.

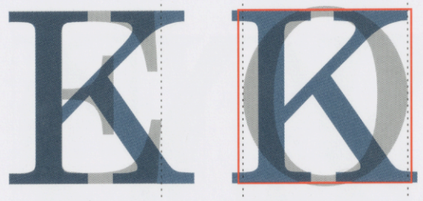
In the double junction form of the K, the arm meets the stem well below the midline. The leg is then positioned along the lower half of the arm. The principle of construction is similar to the R; to support the weight of the upper story, the lower leg must extend past the tip of the right serif.

In either the single or double junction construction, the diagonal strokes of the K may be straight or curved. And, as in the other diagonal letters, these strokes may be narrowed at the joins to relieve congestion. The base leg may end with either symmetrical serifs, a single right-facing serif or a blunted point. This last option (pointed) is only appropriate when the leg has the form of a curved tail, as in the R. When serifs are used, they may be drawn shorter on the outside to facilitate even letterspacing.

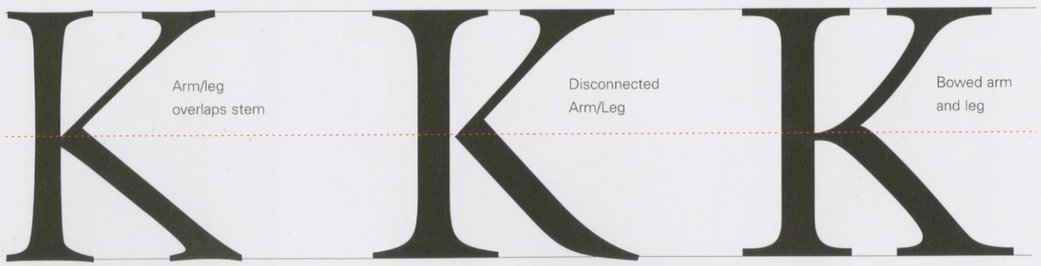
In typefaces with classic proportions, the K is usually wider than the E, but narrower than the O. In typefaces with modern proportions, the width of the K varies. In light or condensed typefaces (such as Fenice) the K still falls between the widths of the E and O. However, in bold or expanded, the K is usually wider than the O, since it must accommodate the complex union of bold and heavy strokes.



Fenice, above, has modern proportions.
The K is wider than the E, but equal to the O.
The K has narrow, rectangular proportions.



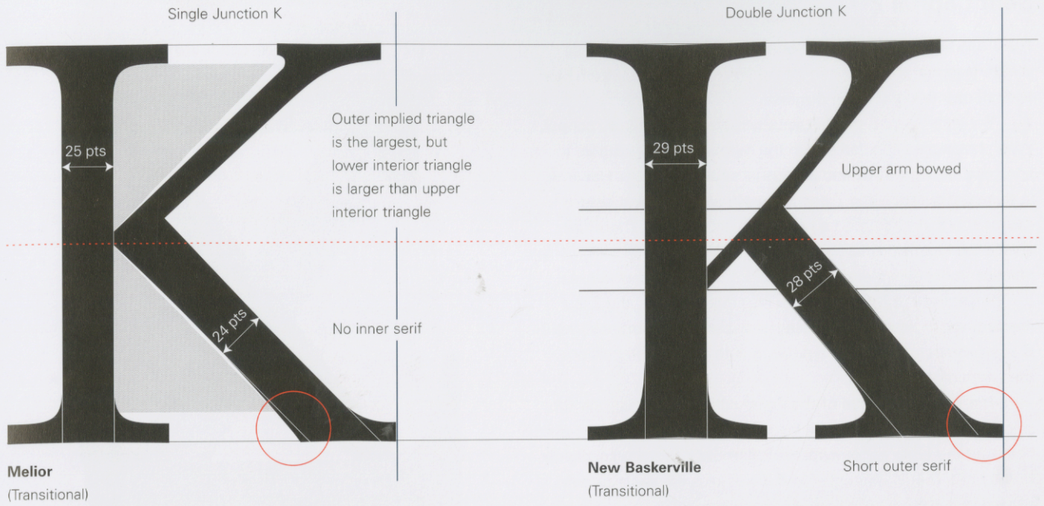
New Century Schoolbook, above, has modern proportions.
The K is wider than the E and the O.
The K has wide, rectangular proportions.



Centaur
(Venetian)

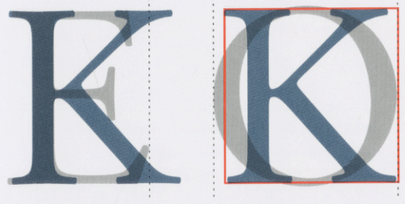
Galliard
(Garalde)

Bembo
(Venetian/Garalde)

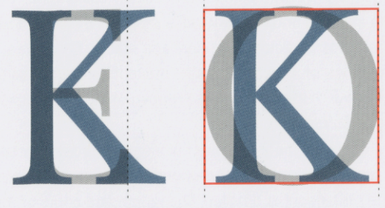


Melior
(Transitional)

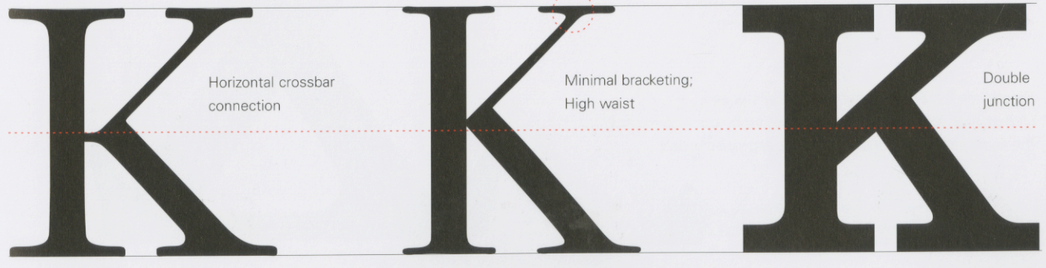
New Baskerville
(Transitional)



Adobe Garamond, above, has classic proportions.
The K is wider than the E, but narrower than the O.
The K has square proportions.



Albertina, above, has classic proportions.
The K is wider than the E, but narrower than the O.
The K has narrow, rectangular proportions.



Janson
(Transitional)

Bodoni
(Didone)

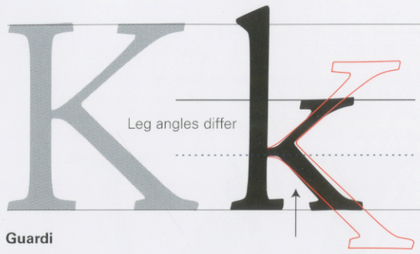
Clarendon
(Slab Serif)

Serif Lower Case k

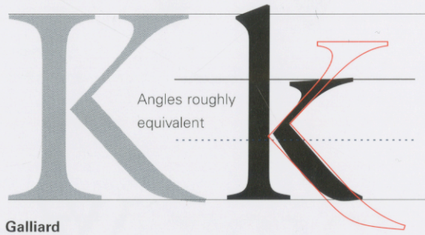
Unlike the capital letter, the lower case k has an ascending stem. However, the diagonal assembly of arm and leg has the same options as before: a single or double junction, joined to the stem or separated by a gap.

Most designers prefer to keep the junction of the K consistent across the upper and lower case. However, doing so may require shifting the angles of the arm and/or leg, since the x-height changes the proportions of the letter assembly. Small changes in angle are acceptable, but obviously divergent stroke directions should be avoided. In the latter case, a decisive structural change (for example, a different junction structure, or a different arm and leg shape) is a better solution.

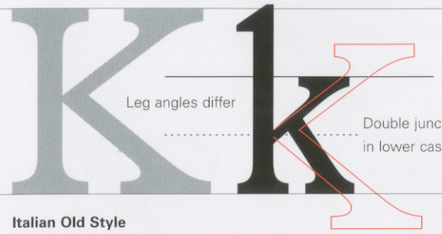
Note that the altered proportion of the lower case may affect the serifs on the smaller k. The interior serifs on the stem and leg may be truncated (or even removed) to ease congestion at the baseline. This is especially true for bold or condensed fonts.



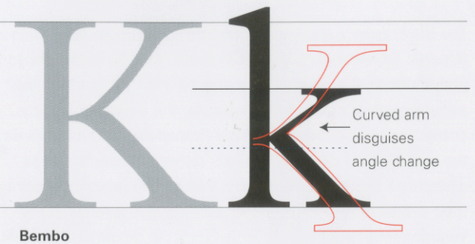
Guardi
(Venetian)



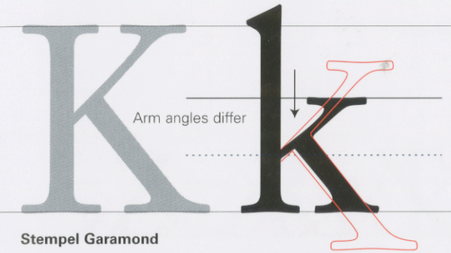
Galliard
(Garalde)



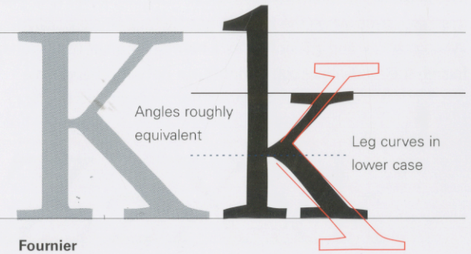
Italian Old Style
(Venetian)



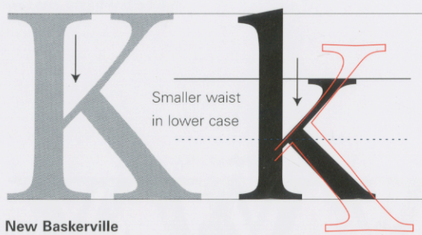
Bembo
(Venetian/Garalde)



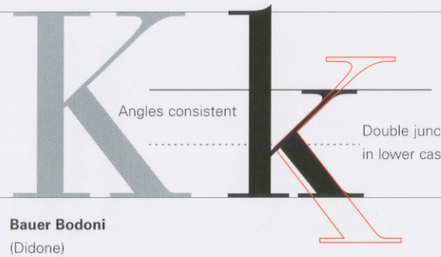
Stempel Garamond
(Garalde)



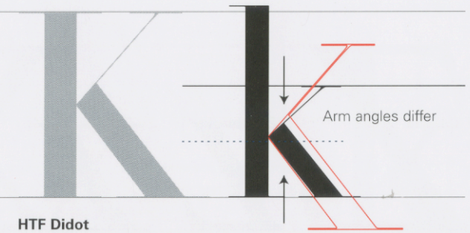
Fournier
(Transitional)



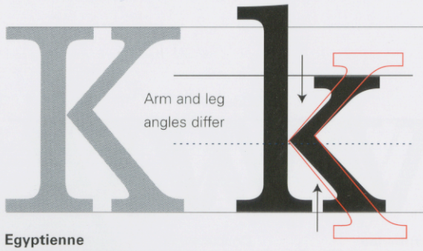
New Baskerville
(Transitional)



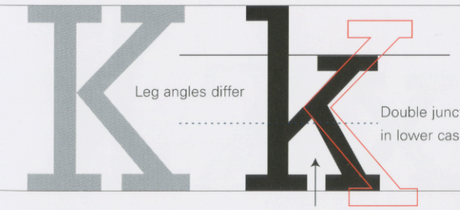
Bauer Bodoni
(Didone)



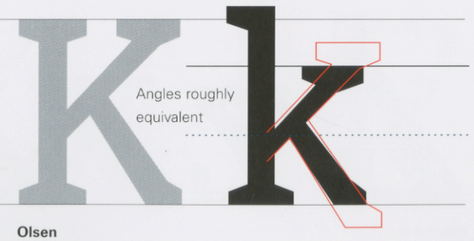
HTF Didot
(Didone)



Egyptienne
(Slab Serif)



Glypha
(Slab Serif)



Olsen
(Slab Serif)

Sans Serif Lower Case k, x and z

Like the v and w, the sans serif x and z follow the structure of their capital counterparts. Occasionally, there may be some alteration in the lower case z from the upper case, especially when the typeface is designed with unusual stem endings.

As in the serif typestyles, the arm and leg assembly of the k usually matches that of the capital. Note that the single junction (also referred to as a chevron waist) colours less evenly than the double junction. Still, many designers prefer this form for its simplicity, especially when designing geometric sans serifs. The single junction often permits the angles of the k and x to be almost identical; this subtle reinforcement strengthens unity in the diagonal letter subset and the overall typeface.

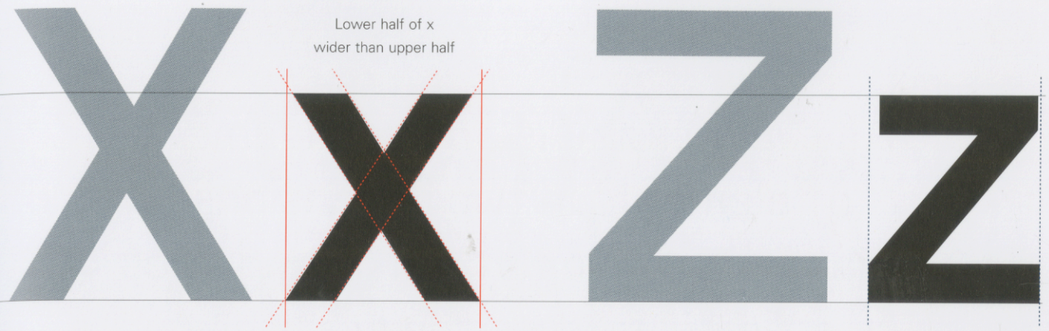


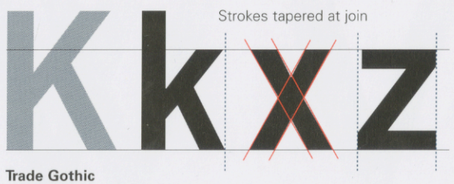
Meta Bold, above.
Stroke endings vary on the upper and lower case Z.



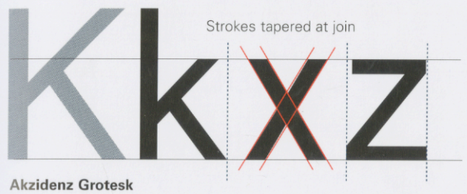
Bau
(Grotesque)

Upper and lower case K
both have double junction

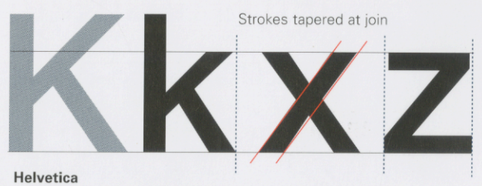




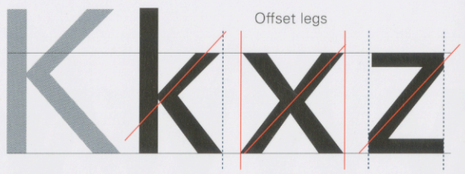
Trade Gothic
(Grotesque)



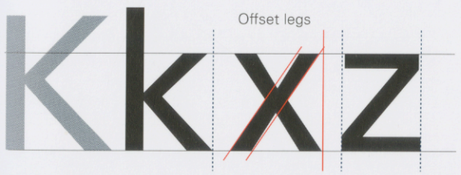
Akzidenz Grotesk
(Grotesque)



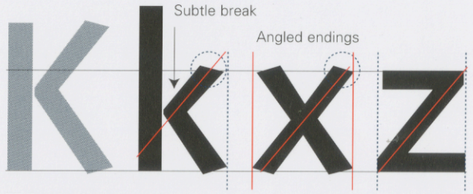
Helvetica
(Neo-Grotesque)



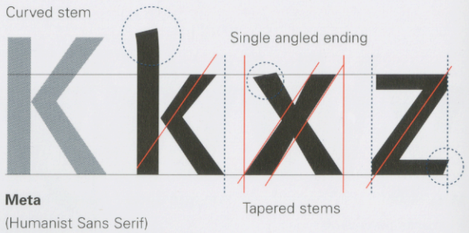
Univers
(Neo-Grotesque)



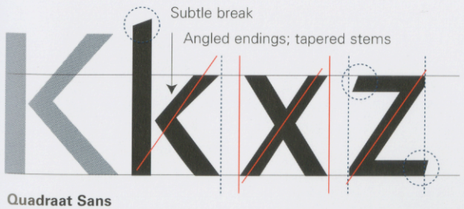
Frutiger
(Humanist Sans Serif)



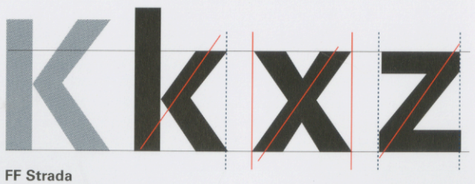
FF Eureka Sans
(Humanist Sans Serif)



Meta
(Humanist Sans Serif)



Quadraat Sans
(Humanist Sans Serif)



FF Strada
(Humanist Sans Serif)

WWW

Sans Serif Lower Case n, m, h, u and r

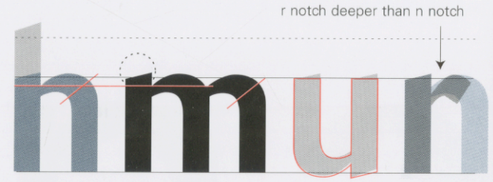
As in the serif typestyles, the n, m, h, u and r can be designed with either symmetrical or asymmetrical structure. The asymmetric version is preferred, because it emphasizes the horizontal direction and therefore facilitates reading. Asymmetric structure also creates more even colour in text, because weights are shifted from the midline to the corners of the letters.

Because sans serif faces have lower contrast, the joins of branched letters can fill with unwanted ink. To counteract this tendency, the triangular reliefs adjacent to the branch should be enlarged. Either the vertex can be moved to a lower point, or the width of the branch stroke can be thinned (at the point of departure). Alternatively, the stem can be curved away from the vertex – or even eliminated altogether. In the latter case, the resulting characters are interesting for their minimal, abstract quality, but unfortunately, are somewhat difficult to recognize (the n and u become less distinct from the r and o).

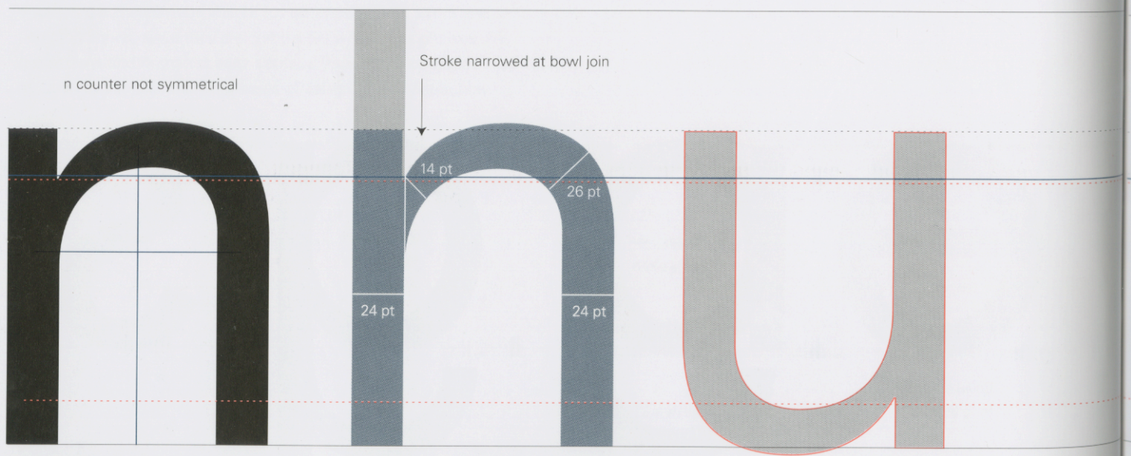
In grotesques and humanist sans serifs, the upright stems of the n, m, h, u and r are sometimes sliced or shaped into quasi-calligraphic terminals. These features can improve legibility by making the characters more unique. However, designers should carefully consider the impact of shaping on the overall font, from both visual and functional perspectives. Shaping must be consistent throughout the entire design and ideally should not disrupt the balance, colour or spacing of any letter.



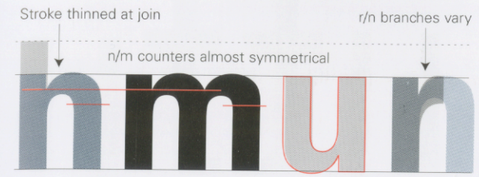
Le Monde Sans
(Humanist Sans Serif)



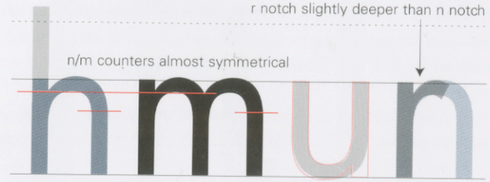
Quadraat Sans
(Humanist Sans Serif)



Helvetica Neue
(Neo-Grotesque)



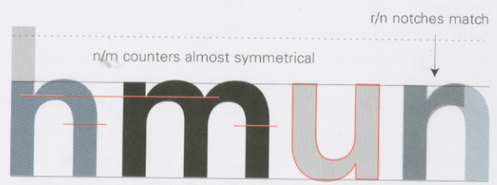
Franklin Gothic
(Grotesque)



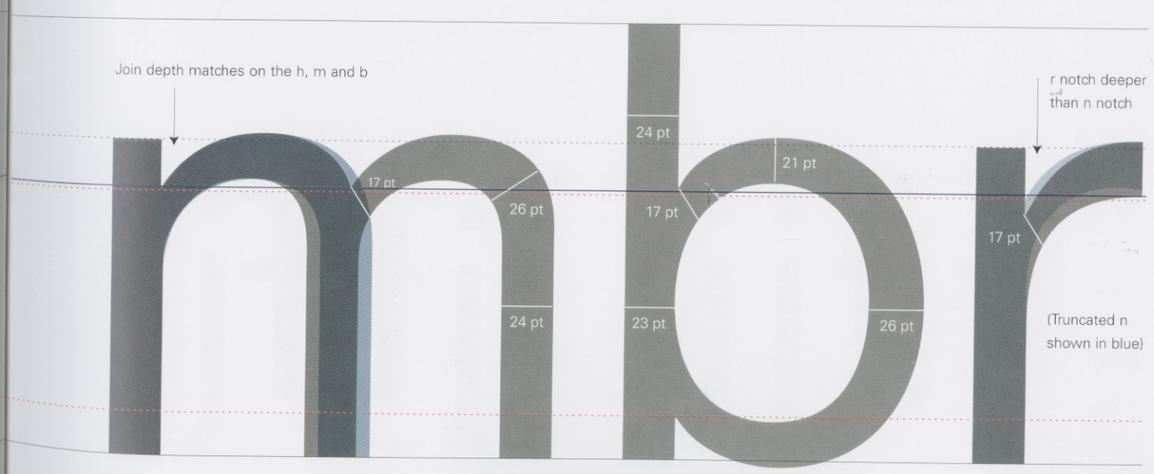
Futura
(Geometric Sans Serif)



FF Eureka Sans
(Humanist Sans Serif)



Avenir
(Geometric Sans Serif)



Serif Capital Q

The Q is simply an O with a tail. The most common tail is a right facing curve – a shape that reinforces left-to-right reading motion. The length and arc of the tail varies greatly; short tails interfere less with surrounding letters, but long tails are more expressive and dramatic. Generally speaking, the main tail variations include flared strokes, ogee/S-curves and z-shaped calligraphic swashes. In some typefaces, a right facing serif or ball-shaped terminal is appended to the tip of the tail.

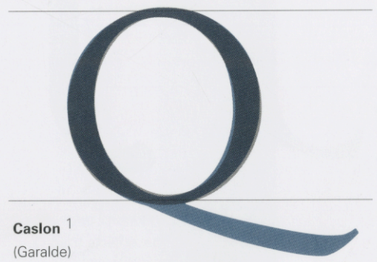
In any of these designs, the thickest part of the tail has the width of the vertical stem thickness – not the maximum bowl thickness. This medium width prevents the Q from becoming too dark (and avoids congestion with adjacent descending forms).

There are five methods for joining the tail of the Q to the bowl. Most often, the tail flows from the lower left as a connected, calligraphic stroke. However, the tail can also be disconnected and overlapping (as in Berkeley), or disconnected and tangent (as in Palatino and Ambroise). Furthermore, the tail can begin inside the bowl (as in Clarendon), as long as the smaller interior space enclosed by the bowl and tail is large enough to remain clear, even at reduced type size. In the fifth and final method, the tail flows from the lower right side of the bowl. This solution occurs when the tail has a z-shape, as in Baskerville and Didot.

1 - tail flows from bowl (left side)
2 - tail flows from bowl (right side)
3 - tail overlaps bowl
4 - tail tangent to bowl
5 - tail inside bowl



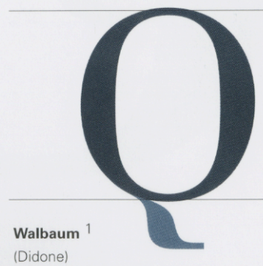
Berkeley 3
(Venetian)



Caslon 1
(Garalde)



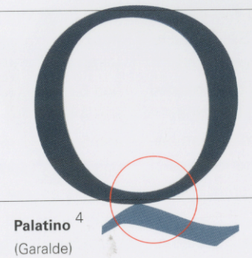
Baskerville 2
(Transitional)



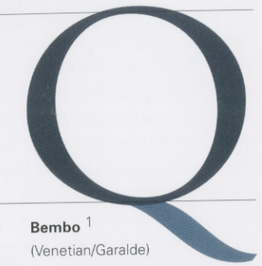
Walbaum 1
(Didone)



Centaur 1
(Venetian)



Palatino 4
(Garalde)



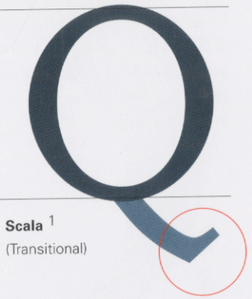
Bembo 1
(Venetian/Garalde)



Garamond 1
(Garalde)



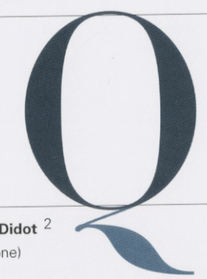
Fournier 1
(Transitional)



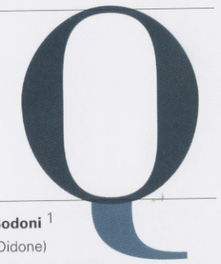
Scala 1
(Transitional)



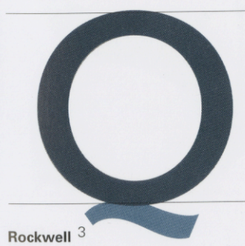
Ambroise 4
(Didone)



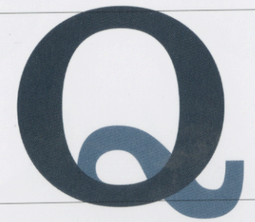
HTF Didot 2
(Didone)



Bodoni 1
(Didone)



Rockwell 3
(Slab Serif)



Clarendon 5
(Slab Serif)



Egyptienne 1
(Slab Serif)

Sans Serif Q

Like its serif counterpart, the sans serif Q is constructed from an O and a tail. The end of the tail may be shaped (as in the arms of the E, for example) or sliced (horizontally, vertically or diagonally).

Because sans serifs have low stroke contrast, congestion often occurs at the join of the bowl and tail. To avoid this problem, the tail may be disconnected from the bowl. Alternatively, the bowl and/or tail stroke may be narrowed at the join.

Since the sans serif typestyle is motivated by uniformity and regularity, it would seem logical to relate the Q to the R and K. (For example, the tail of the Q might be drawn at the angle of the leg on the R.) However, this is not a standard practice. Many designers believe that sans serifs are less legible than serif fonts, since sans serifs have less distinct (albeit more consistent) construction. For this reason, the structure of the Q is often deliberately made different from that of the R and K.

QRK

Quadraat Sans (Humanist Sans Serif)
Similar angles between the Q, R and K

QKR

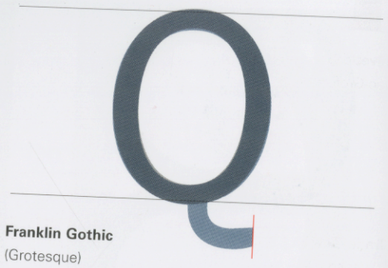
Frutiger (Humanist Sans Serif)
Similar angles between the Q and K

QKR

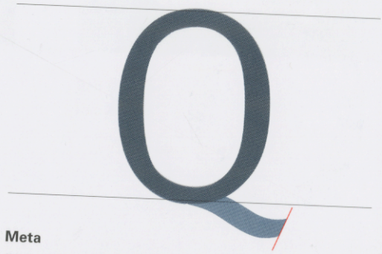
Vialog (Humanist Sans Serif)
Q differs from the K and R

QRK

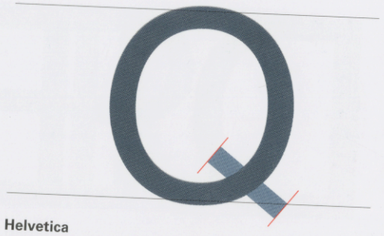
Legacy Sans (Humanist Sans Serif)
Similar forms between the Q and R



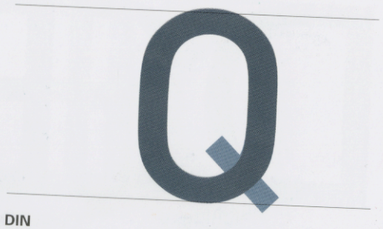
Franklin Gothic
(Grotesque)



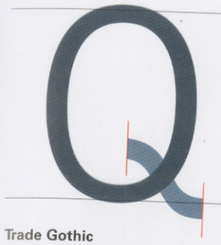
Meta
(Humanist Sans Serif)



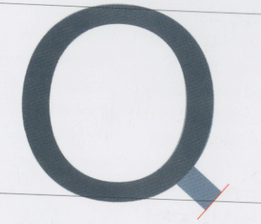
Helvetica
(Neo-Grotesque)



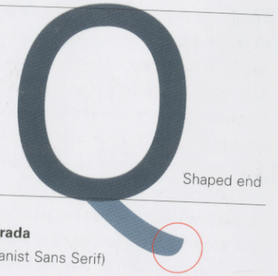
DIN
(Geometric Sans Serif)



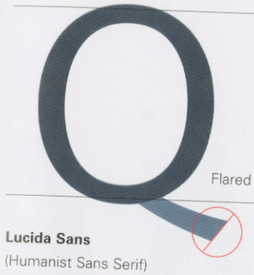
Trade Gothic
(Grotesque)



Akzidenz Grotesk
(Grotesque)



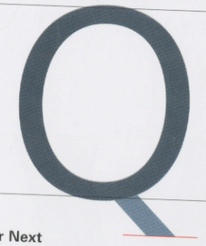
FF Strada
(Humanist Sans Serif)



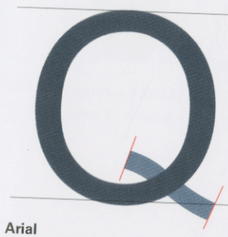
Lucida Sans
(Humanist Sans Serif)



Thesis - Sans
(Humanist Sans Serif)



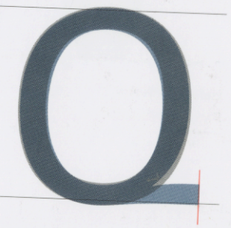
Frutiger Next
(Humanist Sans Serif)



Arial
(Neo-Grotesque)



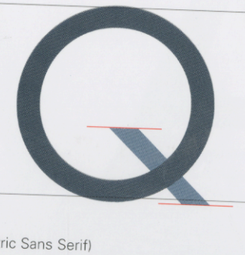
Verdana
(Neo-Grotesque)



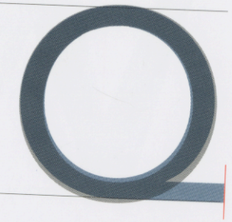
Univers
(Neo-Grotesque)



Gill Sans
(Geometric Sans Serif)



Futura
(Geometric Sans Serif)



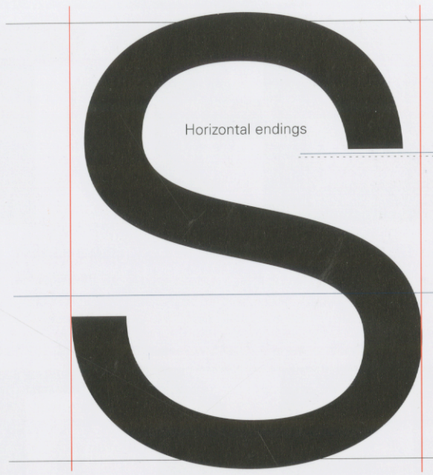
Avenir
(Geometric Sans Serif)

Sans Serif S, C and G

For optimal consistency in colour and form, the sans serif S, C and G should have similar apertures. Wide apertures are generally more desirable, since additional space clarifies the structural differences between related forms (for instance, the S, B and 8). In fact, fonts designed for difficult viewing conditions (such as those for signage and digital screens) have large counters proven to increase their legibility. In the words of Robert Bringhurst, author of *The Elements of Typographic Style*, 'Aperture [is] often a gauge of grace or good fortune in typefaces.'

Besides aperture, the other structural element that connects the S, C and G are the all-important stroke endings. The tips of these letters may be cut at any angle – horizontal, vertical, oblique, acute – or shaped into any unique form. These endings should, of course, be related, but their angles or shapes need not be identical. For example, no two endings in the S, C and G of Scala Sans match in degree, but the angles work together to suggest a humanist and calligraphic origin.

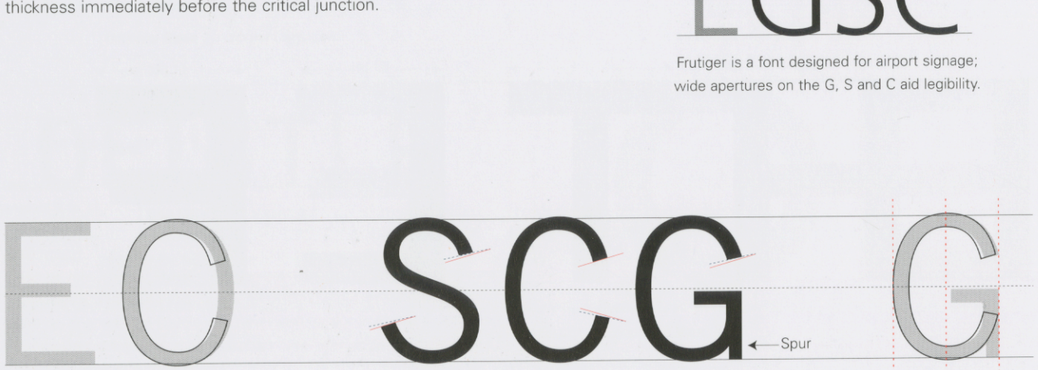
In terms of anatomy, there is little difference between the sans and serif versions of the S, C and G. As before, the maximum bowl weights are slightly heavier than in the capital O. And, as before, special attention is required at the intersection of the bowl and throat in the G. Here, low contrast leads to a heavy join, especially in bold or condensed designs. To ease congestion, the bowl stroke may be reduced to less than the normal horizontal thickness immediately before the critical junction.



Helvetica Neue
(Neo-Grotesque)

EGSC

Frutiger is a font designed for airport signage; wide apertures on the G, S and C aid legibility.



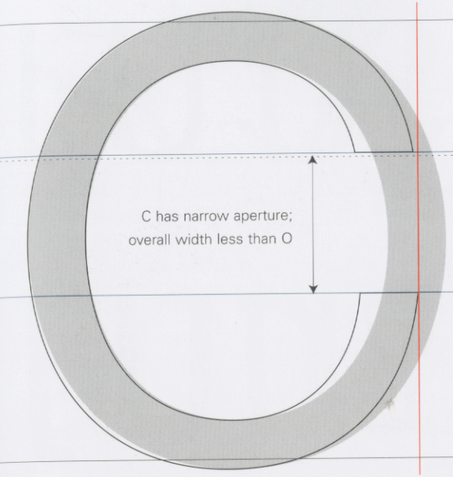
Trade Gothic
(Grotesque)

Shared angles between the S, C and G



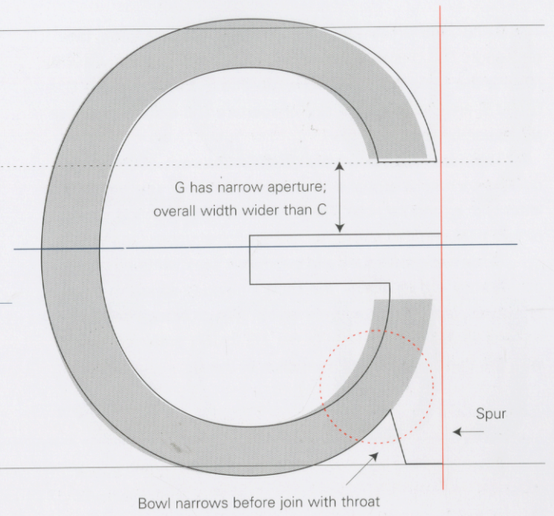
Avenir
(Geometric Sans Serif)

S and C endings at similar angles; G differs



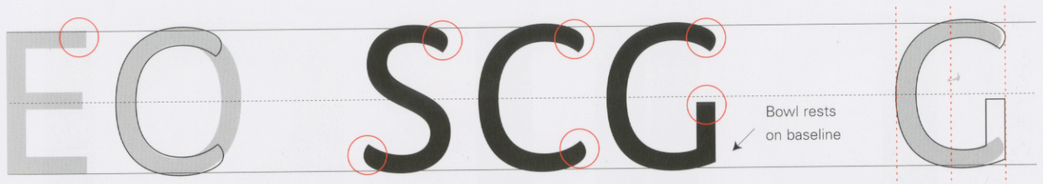
OGSC

FF DIN is a square-sided geometric font; the straight-edged G, S and C relate to the rectangular O.



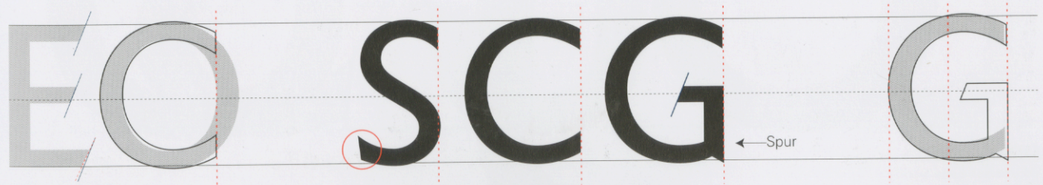
EGSC

Rotis has a unique, script-like C. The S and C have open apertures, but the G is more enclosed.



FF Strada
(Humanist Sans Serif)

Combination of shaped and squared endings



FF Eureka Sans
(Humanist Sans Serif)

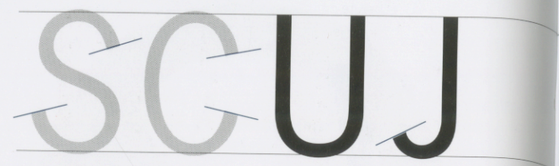
Combination of vertical and angled endings

Sans Serif U and J

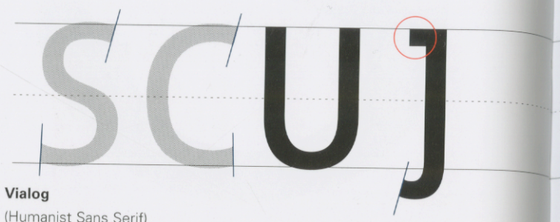
The U and J are similar in their appearance, but different in their derivation. The U is related to the V, and therefore is drawn with roughly the same structure and width. The J is related to the C, G and S, and therefore has similar aperture and endings as these round-combination letters.

The J and U have two design variations each. The J can be drawn as a medial capital with a regular curve, or as a descending letter with an angular hook. The U has either two identical stems, or two thick and thin stems, as in the original upper case V).

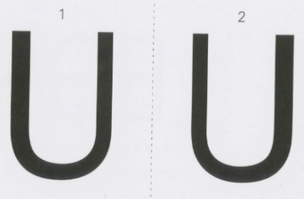
Since neo-grotesques and geometric sans serifs emphasize consistency and rationality, the short J tends to appear in those typestyles, along with the symmetrical U. In grotesque and humanist sans serifs, the long form of the J is usually preferred, along with the traditional thick-thin variation of the U.



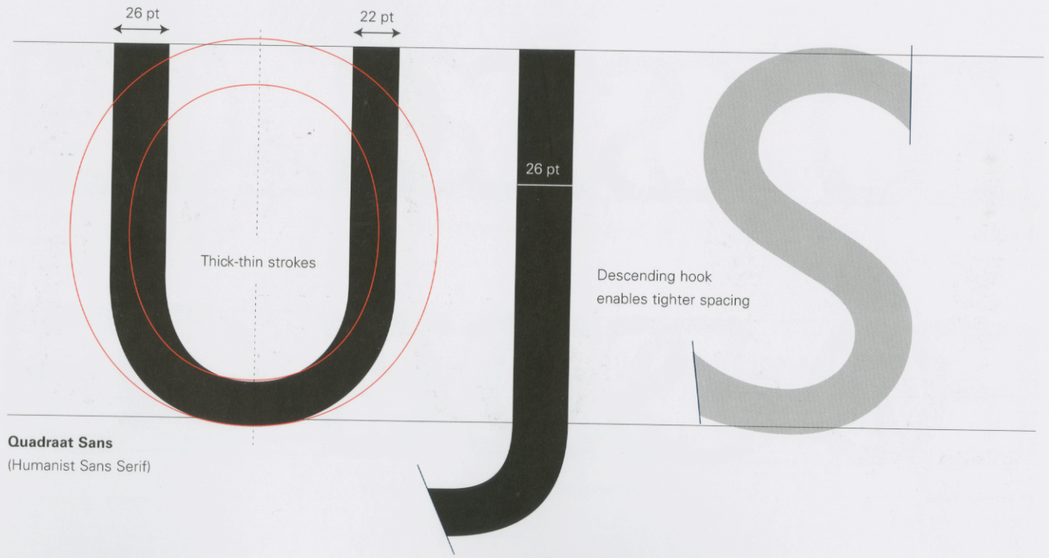
News Gothic
(Grotesque)



Vialog
(Humanist Sans Serif)



Franklin Gothic, left. Asymmetry is expected and, therefore, difficult to see in the normal orientation (1). However, the varied stem widths are obvious when the letter is reversed (2).



Quadraat Sans
(Humanist Sans Serif)



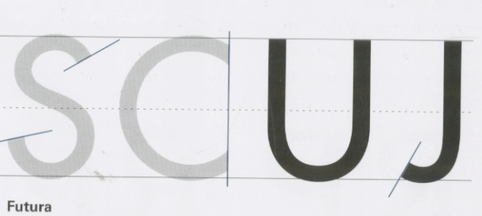
FF Meta Plus
(Humanist Sans Serif)



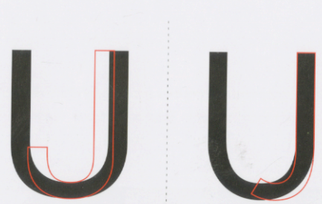
Le Monde Sans
(Humanist Sans Serif)



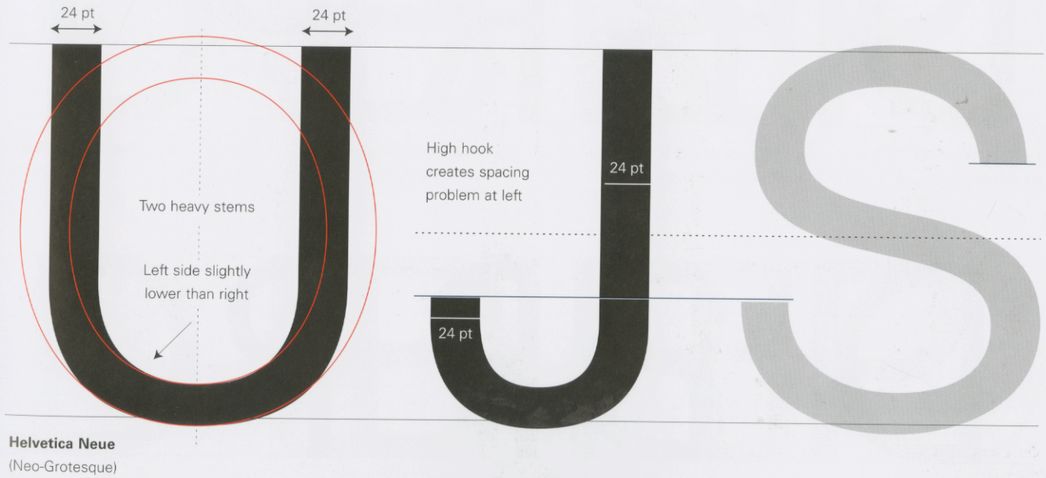
Rotis Sans Serif
(Neo-Grotesque)



Futura
(Geometric Sans Serif)



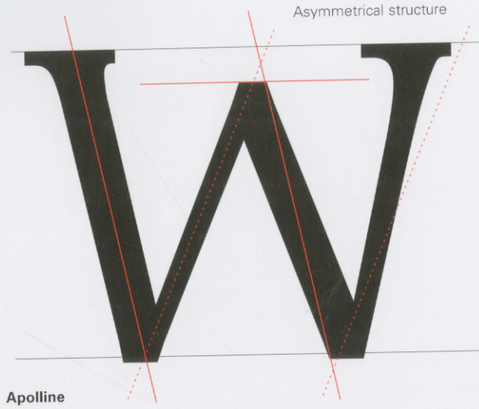
Helvetica, far left and Futura, near left.
The curvatures of the upper case J and U differ;
the counter of the U is slightly more square.



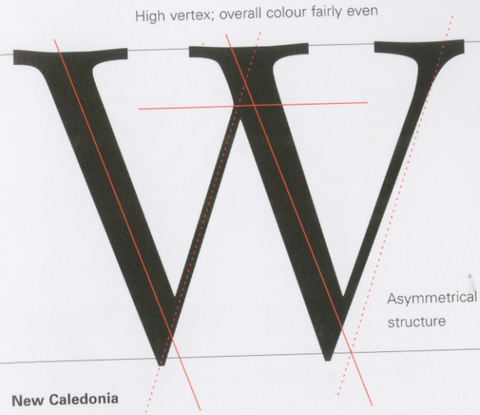
Helvetica Neue
(Neo-Grotesque)

The third and final W is the cropped option, which is also the most compact structure. Unfortunately, this format produces a letter with slightly uneven colour; the left side is darker than the right. However, because the colour difference leads the eye from left to right, the issue is of limited concern. In any case, if the colour difference is too pronounced, the right outermost leg may be angled inward for greater density.

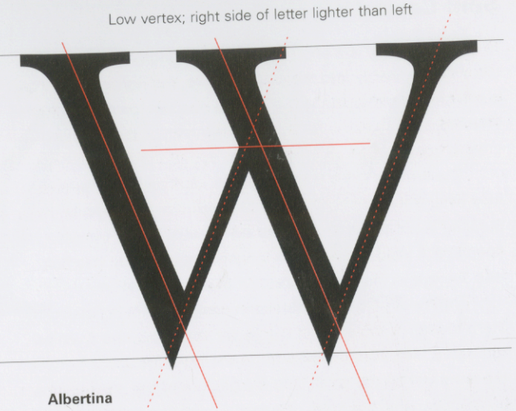
In most fonts with a cropped W, only one of the interior legs is removed. However, there are faces where both legs have been truncated above the intersection. This option is only recommended when the central vertex of the W is high; a low vertex results in a letter with an extremely light and open centre. Additionally, the shape of this open centre is often awkward and amorphous; the W looks best when its three interior counters are clearly triangular in form.



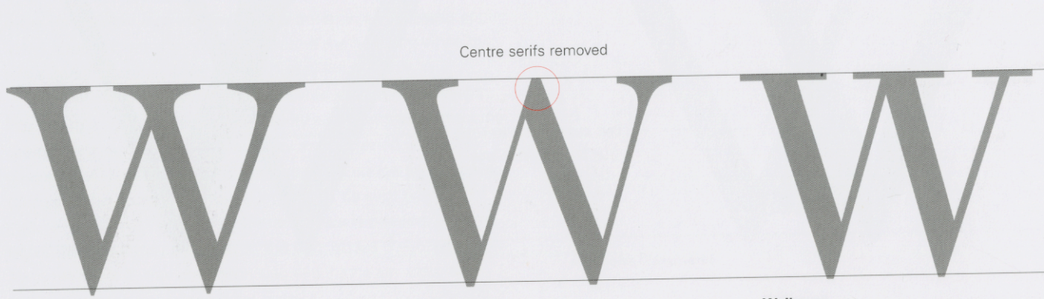
Apolline
(Venetian)



New Caledonia
(Transitional/Didone)



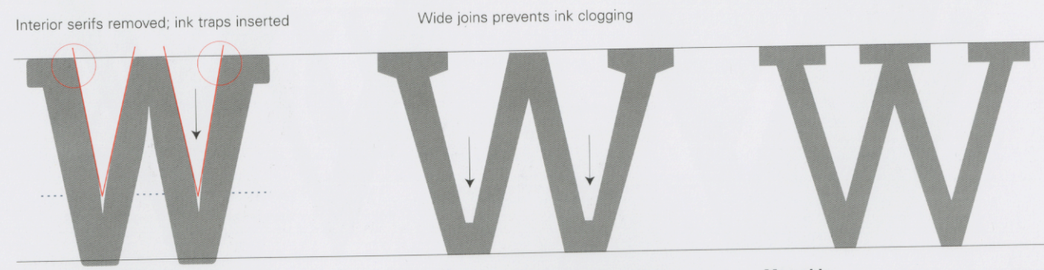
Albertina
(Transitional)



Galliard
(Garalde)

New Baskerville
(Transitional)

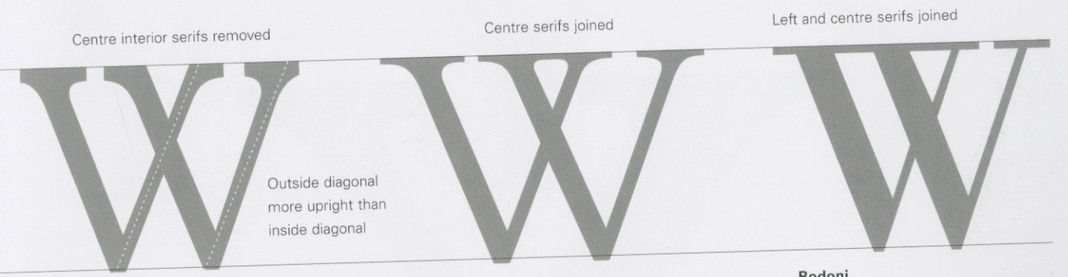
Walbaum
(Didone)



Officina Serif
(Slab Serif)

Olsen
(Slab Serif)

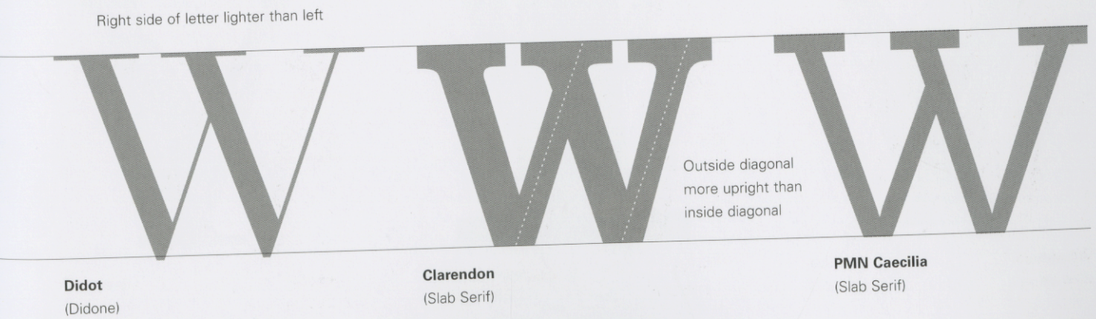
Memphis
(Slab Serif)



Italian Old Style
(Venetian)

Bembo
(Venetian/Didone)

Bodoni
(Didone)



Didot
(Didone)

Clarendon
(Slab Serif)

PMN Caecilia
(Slab Serif)

Serif Lower Case v, w and y

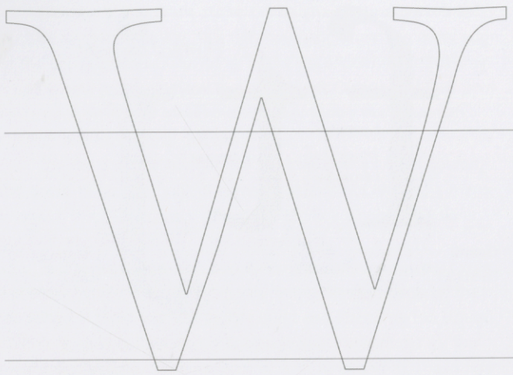
The lower case v, w and y are a set of closely related letters. As in the upper case, the v is the primary building block: the w is made from two condensed v forms, while the y is made from the v and a descending tail.

The lower case v and w are easy to design; they are simply shorter versions of the capital letters. However, the expanded and overlapped version of the W is not recommended for the lower case, since the central counter becomes too congested at small size. Therefore, in certain fonts, the upper and lower case w may not match. Although anatomical consistency is desirable, even colour is more important.

Note that the original v sometimes requires modification before it can be used in the y. When the x-height is high, the vertex of the v should be shifted upward to make room for the descending tail. If the font is condensed, the interior of the v may need expansion to prevent build up at the baseline (where the three diagonal strokes intersect).

Traditionally, the tail of the y flows from the right arm of the v and curves to the left, ending at or near the left outer edge of the letter. In contemporary type design, angular and even vertical tails are common – and these need not be continuous from the upper diagonal of the v.

Regardless of structure, the tail of the y must end with a finishing element – usually a flare, terminal or serif. The ending is particularly critical for types with high contrast. In Transitionals and Didones, a terminal evens colour by adding weight to the lighter, right-hand side of the letter.



New Baskerville
(Transitional)

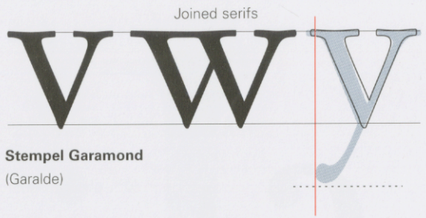


The terminal on the lower case y should relate to other terminals in the typeface (Clarendon, shown above).



Adobe Jenson
(Venetian)

Joined serifs



Stempel Garamond
(Garalde)



Ambroise
(Didone)

Vertical tail

Joined serifs



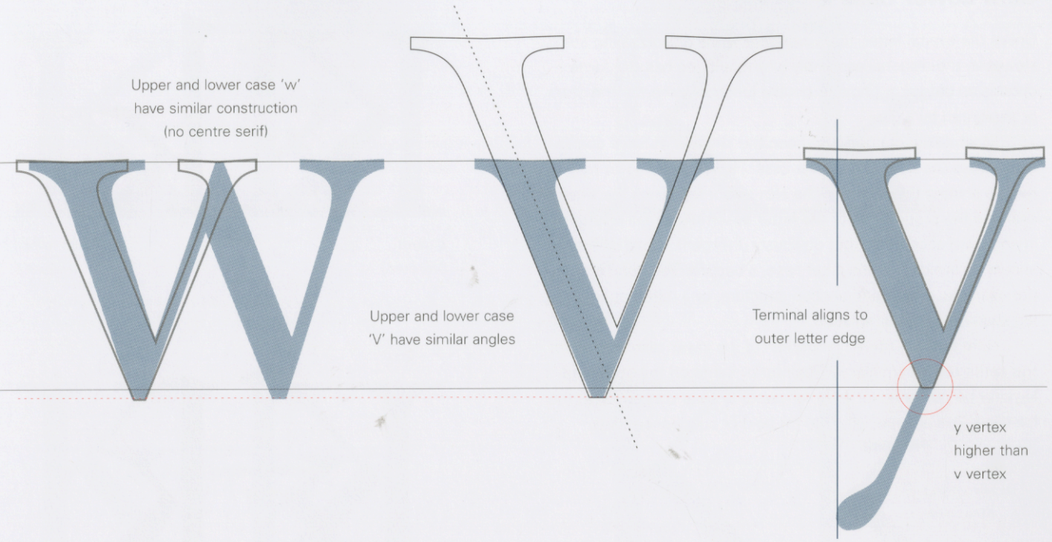
Bauer Bodoni
(Didone)

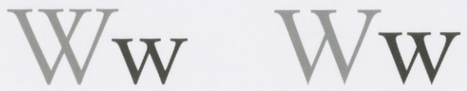
Upper and lower case 'w' have similar construction (no centre serif)

Upper and lower case 'V' have similar angles

Terminal aligns to outer letter edge

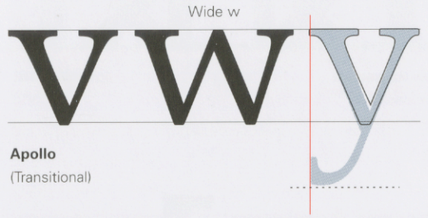
y vertex higher than v vertex





The structure of the upper and lower case W may not match.
In Adobe Garamond (left), the four-arm version of the W would be too complex at smaller size.
In Albertina (right), the lower case w has a higher central crossing to prevent congestion.

Wide w

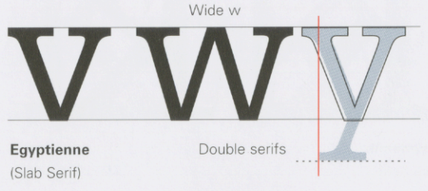


Apollo
(Transitional)



Le Monde Journal
(Transitional)

Wide w



Egyptienne
(Slab Serif)

Double serifs



Olsen
(Slab Serif)

Wide and 'stepped' vertex; y tail sheared at an angle

Numbers

The letters of our modern alphabet stem from the ancient Roman civilization, but the numbers are actually Indian and Arabic* in origin. The Romans used a complex combination of letters instead of numbers, but this system was awkward, to say the least, for any purpose other than monumental inscriptions. The adoption of the Arabic numerals greatly simplified accounting and computation; the new format also made bookkeeping and scientific calculation more legible, efficient and economical.

By the mid-1500s, the use of Arabic numerals was fairly standard throughout Europe – largely due to the development of the printing press and the subsequent distribution of consistent printed materials. However, from a type design standpoint, numerals were highly unsophisticated. Most printers had a single set of figures that they used with many different typefaces. The first typographer to refine numeral design was the sixteenth-century French type designer Claude Garamond. Garamond is credited for developing the first set of figures that specifically complemented a font of type.

Garamond's numerals were intended for use in text, and therefore had ascenders and descenders, as well as similar proportions to the lower case letters. This style, known today as text figures (also called oldstyle or lower case) is still in use. In general, text figures are drawn slightly taller than the x-height to avoid confusion between letters and figures of the same shape (such as the zero and the lower case o, for example). Similarly, the descenders of the text figures are usually shorter than those on the letters. In most fonts, the 0, 1 and 2 are medial forms; the 3, 4, 5, 7 and 9 descend, and the 6 and 8 ascend. However, these alignments were not always standard. In the most common variation, the 3 and 5 are also ascending figures.

In the eighteenth century, the Industrial Revolution changed the landscape for type design. To meet the needs of new clients and media, printers created taller numbers known as modern, lining or ranging figures (the latter terms stem from the alignment – or arrangement – of the numbers amongst the capital letters). Lining figures are slightly shorter and lighter than the upper case letters to prevent their unwanted dominance in text. At the time of their invention, the larger bodies of these figures were thought to improve legibility. However, research done by Miles Tinker in 1930** has since proven otherwise; text figures are actually easier to read, both singly and in groups. Furthermore, many designers prefer text figures simply for their formal variety.

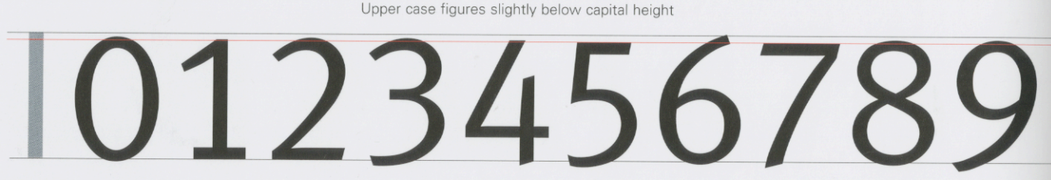
Still, modern figures have their place in the current typographic scene. Their increased height is more harmonious with the upper case letters, and their uniform appearance works well to reduce visual clutter. For example, on business cards, the combination of phone numbers, addresses and zip codes is often clearer and more attractive when set with lining numerals.

These and other specialized applications make an excellent argument for including multiple sets of numbers in a font. Unfortunately, when mechanical typesetting was introduced in the late 1800s, oldstyle numerals were often omitted from typefaces for reasons of economy. (At the time, text figures were less fashionable, so most fonts included only upper case numerals.)

Luckily, times and fashions change – and modern digital tools make it possible to include many sets of figures in a single font. Today, digital typefaces often contain four different numeral styles: upper and lower case, with both proportional and tabular spacing. Tabular numbers (also called monospaced) are, as the name suggests, designed for tables. Each number fits within an en-space for perfect alignment. However, because this fixed measure creates unavoidable visual distortions, an alternate set of proportionally spaced figures may be included for use in text.

More recently, a new form of numeral has been introduced. Hybrid figures have very short ascenders and descenders; their height is somewhere between the capital and x-height. Therefore, hybrid figures have less variation than true lower case numerals, but are not as uniform as upper case figures. The widespread acceptance of the hybrid style has yet to be determined. Some designers have criticized the format for an indecisive appearance, but others have embraced these numerals as a simple but effective visual compromise.

Upper case figures slightly below capital height

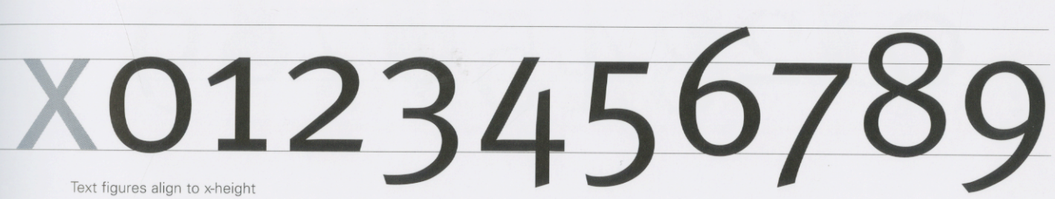


Meta
(Humanist Sans Serif)

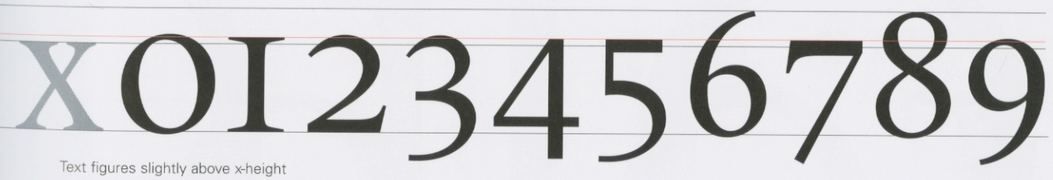
Upper case figures at capital height



Le Monde Livre
(Transitional)



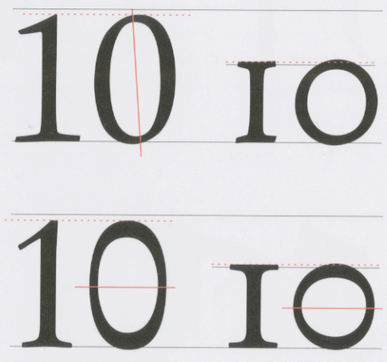
Text figures align to x-height



Text figures slightly above x-height

* The term 'Arabic' is a misnomer. The numerals originated in India around 264-230 BC, but they were introduced to Europe by merchants trading with Arabia.
**'The Relative Legibility of Modern and Old Style Numerals', *Journal of Experimental Psychology*, 13, 453–461.

The design of the 1 has developed for functional rather than aesthetic reasons. The flag and serifs make the number more distinct and therefore more legible. These features also help the number work as a monospaced character. As mentioned earlier, all tabular figures occupy the same width (an en-space) in order to align in tables. Extending and enlarging the top and bottom of the 1 helps to expand its narrow structure.



Above, Adobe Jensen. Oblique stress in the upper case zero.
Below, Stempel Garamond. Horizontal stress in both zeros.
In these fonts, the upper case figures are shorter than the capitals, and the text figures are taller than the lower case letters.



Galliard
(Garalde)



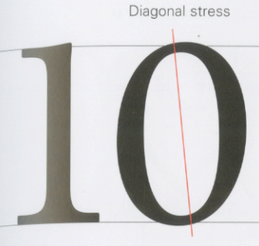
Bodoni
(Didone)



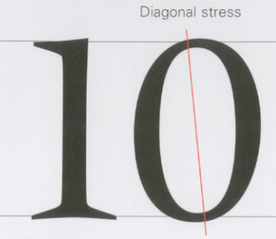
Olsen
(Slab Serif)



Futura
(Geometric Sans Serif)



Apollo
(Transitional)



Méridien
(Transitional)



New Baskerville
(Transitional)



Centennial
(Slab Serif)



Century Schoolbook
(Slab Serif)



Rockwell
(Slab Serif)



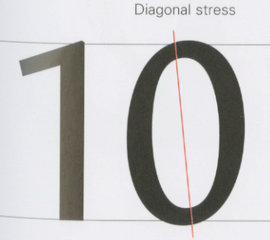
Trade Gothic
(Grotesque)



Univers
(Neo-Grotesque)



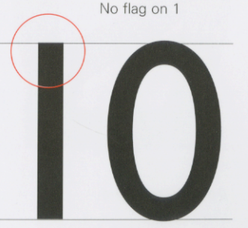
Helvetica
(Neo-Grotesque)



Le Monde Sans
(Humanist Sans Serif)



Meta
(Humanist Sans Serif)



Gill Sans
(Humanist Sans Serif)

Number 4

Perhaps no other figure has the complexities of the number four. There are three main skeletal structures: a thin diagonal with a thin crossbar; a thin diagonal with a thick crossbar; or a thick diagonal with a thin crossbar.

Furthermore, the diagonal itself has various options. It may be straight, bowed or flared, and it may be connected or disconnected to the crossbar and stem. When connected, the join may be sharp or blunted; when disconnected, the gap between the strokes varies in width.

The stroke endings of the four also have several alternatives. In sans serifs, the ends of the four may be cut vertically or at an angle; in serif fonts, the ends may be finished with bracketed or unbracketed serifs. Serifs can be positioned on one or both sides of the main strokes, in three possible locations: at the end of the crossbar, at the tip of the apex or at the foot of the vertical stem.

Luckily, the four does have one simplification – the upper and lower case figures share the same form. However, the lower case version of the four descends (although not as much as a descending letter). In some fonts, serif placement differs in the upper and lower versions of the four, since the smaller text figure has less interior space for serif ornamentation.

Perhaps the best way to mentally organize these seemingly infinite variations is to focus on a single objective. Because the four has a triangular structure, the figure often appears small and uneven in comparison to other numbers. There are only two ways to make the four more robust: we can expand the overall form or increase the mass of the strokes.

To increase the overall width of the four, the counter must be drawn wider. This can only be accomplished by altering the position or design of the diagonal and crossbar. Similarly, the four can only be darkened by augmenting the widths of the diagonal and crossbar (the width of the vertical stem is fixed). Therefore, the many options described here are simply different means towards the same end: a heavier and more imposing numeral.

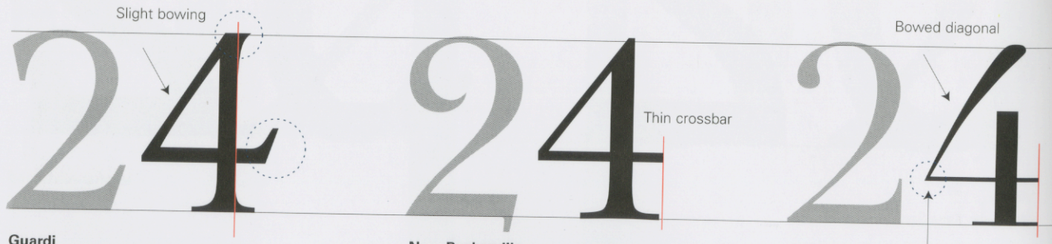


Apolline
(Venetian)

HTF Didot
(Didone)

Centennial
(Slab Serif)

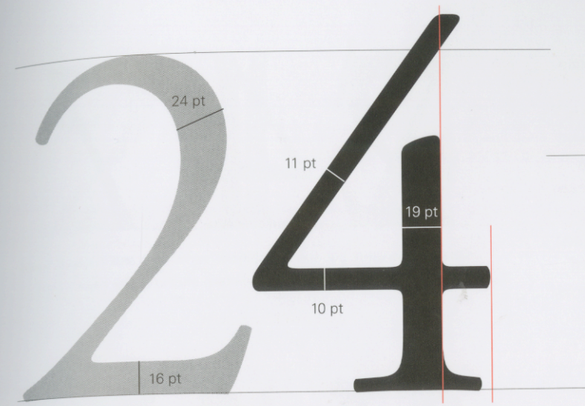
The crossbar of the four rests directly on the baseline; this crossbar may be thinner than the crossbar of the two. The oldstyle four descends, but its depth may be shorter than the descenders on the lower case letters.



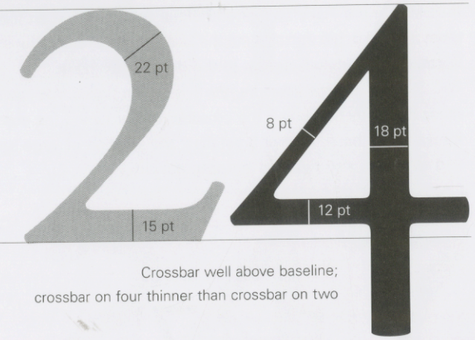
Guardi
(Venetian)

New Baskerville
(Transitional)

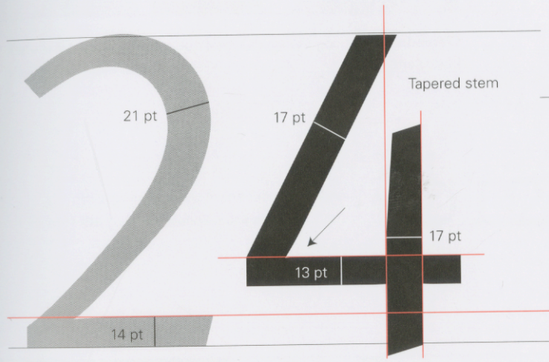
Didot
(Didone)



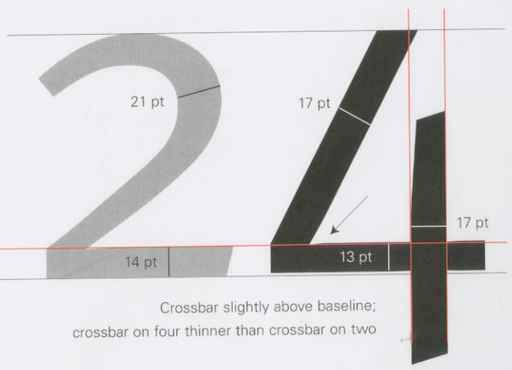
Adobe Garamond
(Garalde)



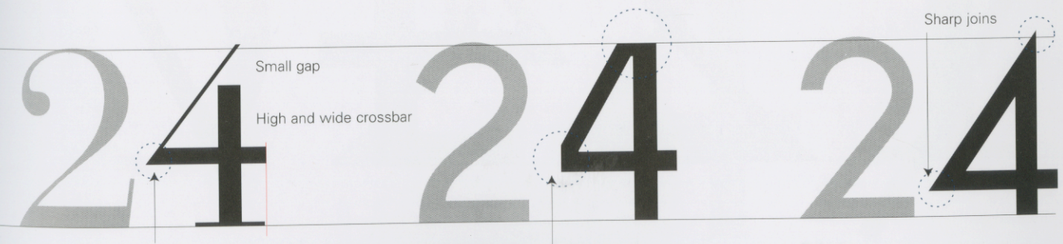
Crossbar well above baseline;
crossbar on four thinner than crossbar on two



Meta
(Humanist Sans Serif)



Crossbar slightly above baseline;
crossbar on four thinner than crossbar on two



Bauer Bodoni
(Didone)

Sharp vertex

Bell Gothic
(Grotesque)

Wide joins

Futura
(Geometric Sans Serif)

Quotation Marks

Prior to the seventeenth century, there was no consistent punctuation used to indicate direct speech. Occasionally, conversation was set in italics, but often, writers relied on general context or explicit phrases (such as 'he said') to mark spoken dialogue.

The modern quotation mark is actually a direct descendant of the 'double comma' – an archaic mark used to distinguish sentences of special importance. In the early years of letterpress printing, this mark was made by shifting and rotating pairs of commas. A true quotation mark (cast on a single metal body of type) may not have existed until Bodoni's time (the late 1700s). For many foundries, it may have been an issue of economy rather than style – it was cheaper and easier to make do with double commas, especially since printing type cases didn't always have a slot for this extra character.

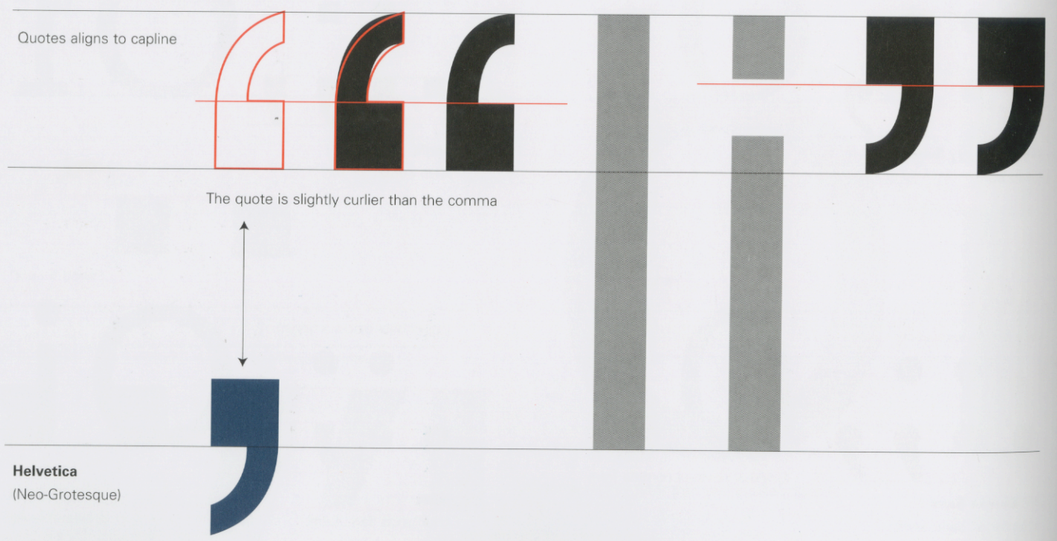
Although modern digital systems now provide a specific key and code for quotation marks, the form of the quote remains the same: a pair of evenly spaced commas. While some designers prefer a top-heavy orientation (also called 'droopy quotes'), the normal configuration is '66' and '99'. In this format, the opening quote is sometimes set slightly higher than the closing quote for optical alignment.

Note that the quotation mark should not be confused with the double prime (which is an inch mark) or worse, the double acute (which is a diacritic). True quotation marks show direction and enclosure. They are also called curly quotes, book quotes and smart quotes (the latter after the 'intelligent software' that automatically sets punctuation according to context).

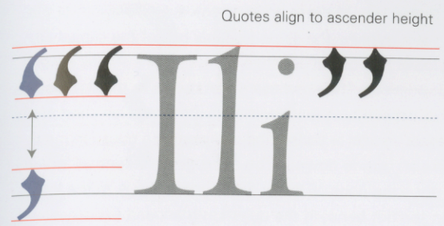
Type designers should realize that quoting standards vary considerably around the globe. In some languages, the initial quote is the '99' character, and it is placed on the baseline rather than the capline. In French and Italian, angle quotes are the norm; these are also called chevrons, duck's feet, French quotes and guillemets (after the French inventor and typecutter Guillaume Le Bé). Additionally, the British standard uses single quotes where the Americans use double. There is also an interesting European tradition where quotation marks are dispensed with altogether. Instead, speech is indicated by an initial em-dash – an elegant and minimal solution.



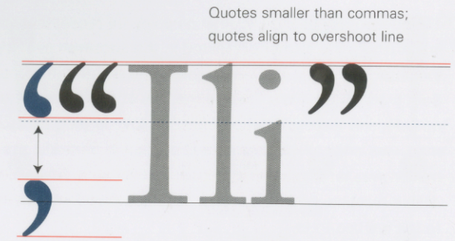
From left to right: top-heavy quotes; 66/99 quotes; a double prime mark; guillemets; and the double-acute diacritic.



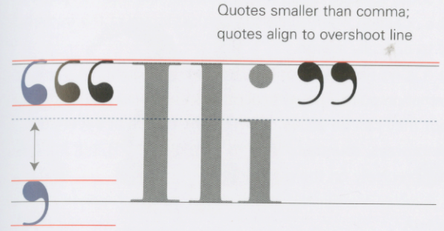
Helvetica
(Neo-Grotesque)



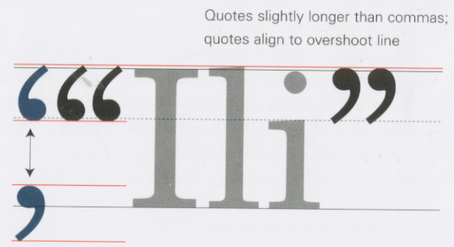
Centaur
(Venetian)



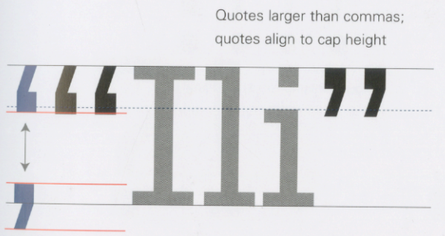
Adobe Caslon
(Garalde)



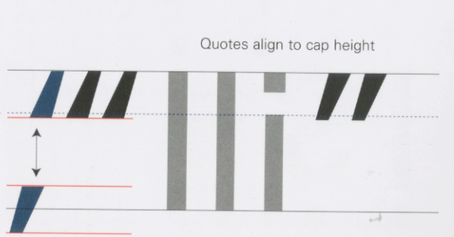
Ambroise
(Didone)



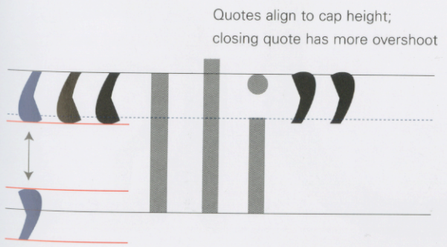
New Century Schoolbook
(Slab Serif)



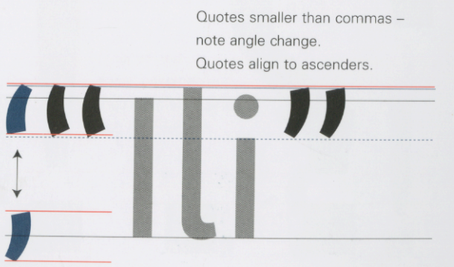
Serifa
(Slab Serif)



Univers
(Neo-Grotesque)



Scala Sans
(Humanist Sans Serif)



Bliss
(Humanist Sans Serif)

Question Mark and Exclamation Point

The question mark and exclamation point are recent inventions in punctuation; the former originated in the sixteenth century, while the latter evolved in the seventeenth and eighteenth centuries. Both marks stem from Latin terms: the question from 'quaestio' (to ask), and the exclamation from 'io' (joy). In fact, the question mark was originally written as a Q over an o. Similarly, the exclamation was written as an upper case i over an o. After centuries of this practice, both ligatures gradually evolved into the modern forms we use today.

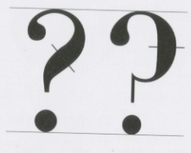
The exclamation point is a simple character to construct. Its upper portion is merely a vertical stroke that tapers from the maximum upper case stroke width to a sharp or blunted point. The top of the exclamation may be flat, rounded or angled to match other endings or terminals in the typeface.

The design of the question mark is more difficult. In fonts with vertical stress, the thickest part of the hook is in the horizontal centre, at 3 o'clock. In typefaces with oblique stress, the weight is either in the spine (as in the s), or in the upper and lower halves of the bowl (as in the calligraphic version of the z). In certain serif typefaces, the top of the hook is finished with a round or pointed terminal. Regardless of these options, however, the width of the question mark remains the same (roughly half of the capital O).

The lower half of the question mark's hook also has several structural variations. The short stem that points to the dot may be tapered, especially in fonts with high contrast. This short stem may be either vertical or curled; the curl creates a question mark shaped like an upside down s. The short stem is centred directly over the dot – the hook of the question mark hangs to the left.

Even the dot beneath the question mark and exclamation point requires some finesse. The dot is usually the same size as the period, but it can be reduced for lighter colour when necessary. The space above the dot ranges between a half and full period width. In some fonts, the gap is larger in the exclamation point than in the question mark, since the vertical forms of the exclamation tend to optically merge.

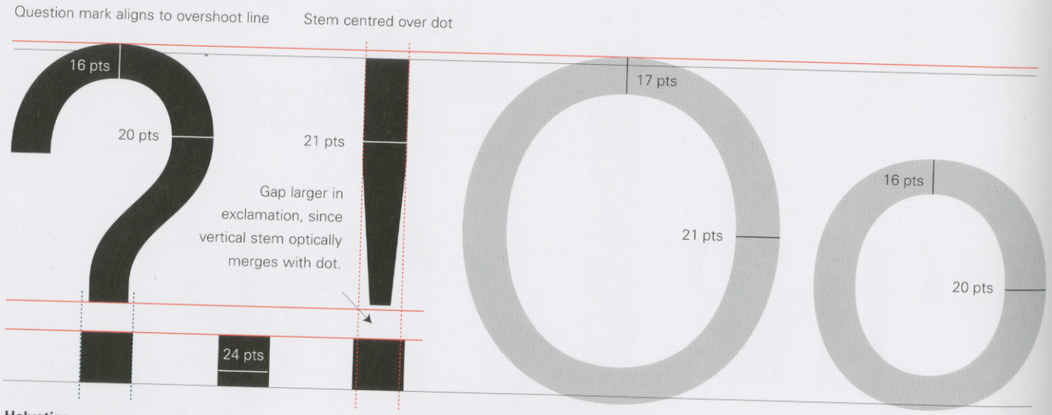
There is no fixed rule for the height of the question mark and exclamation point. The vertical position of these marks should match, but they can be above or below the capital or ascender height. As always, rounded forms require overshoot, but square forms rest precisely on the guidelines.



Left, Bodoni. Maximum weight occurs in the diagonal spine.
Right, Didot. Maximum weight occurs in the vertical centre of the hook.



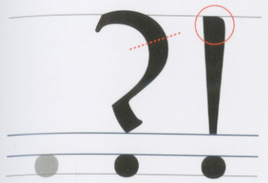
Four exclamation stem variations.
The top and sides may be rounded, tapered or straight.



Helvetica
(Neo-Grotesque)

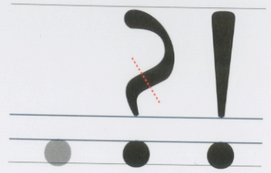
Dots on the ? and ! are the same size as the period.

Calligraphic exclamation stem

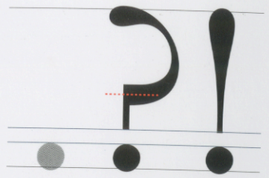


Guardi
(Venetian)

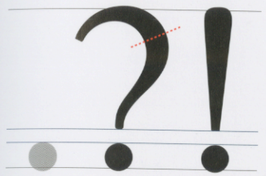
Punctuation below capline



Adobe Garamond
(Garalde)



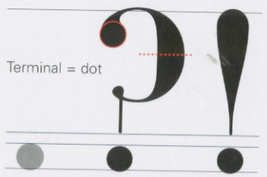
New Baskerville
(Transitional)



Apollo
(Garalde)

Dots on ? and ! smaller than period

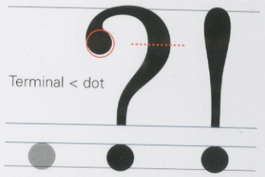
Terminal = dot



Ambroise
(Didone)

Dots on ? and ! smaller than period

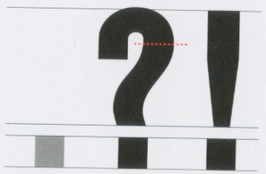
Terminal < dot



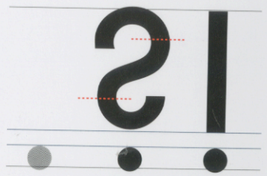
New Century Schoolbook
(Slab Serif)



FF Olsen
(Slab Serif)

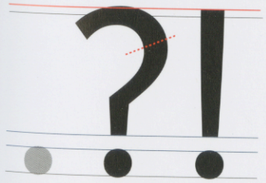


HTF Champion Gothic
(Grotesque)



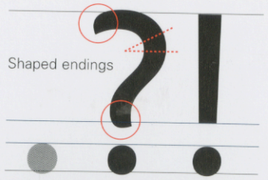
Futura
(Geometric Sans Serif)

? and ! align to ascender height

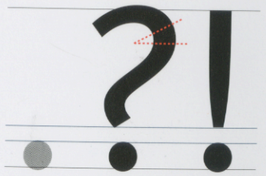


Parisine
(Humanist Sans Serif)

Shaped endings



FF Strada
(Humanist Sans Serif)



Bliss
(Humanist Sans Serif)