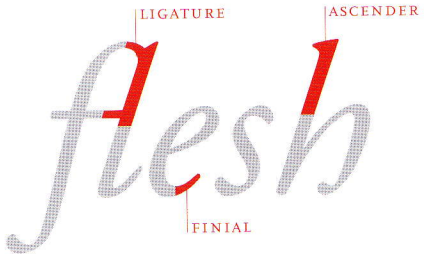
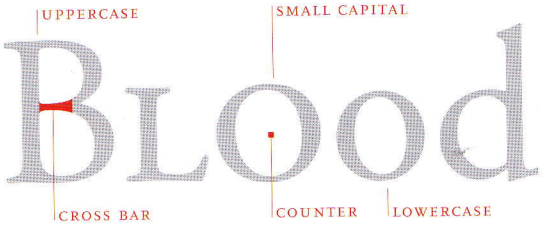
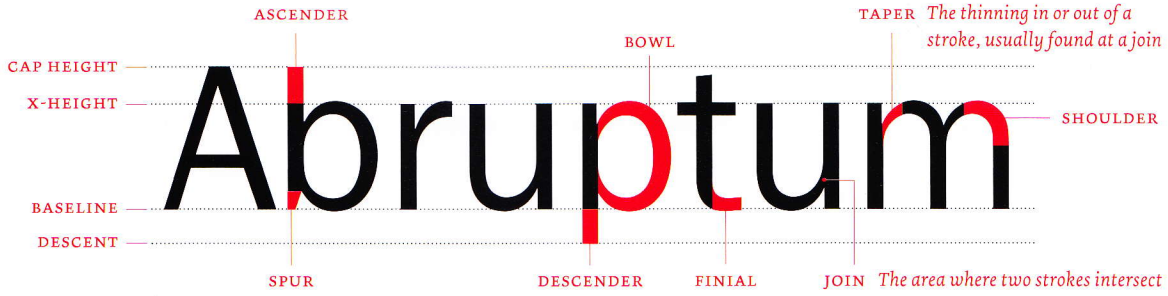

CAP HEIGHT
X-HEIGHT
BASELINE
Fancy
STEM
BOWL
SERIF
DESCENDER

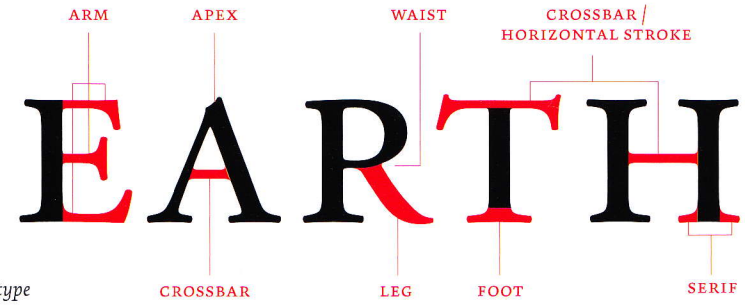

LIGATURE
ASCENDER
flesh
FINIAL


TERMINAL
ASCENDER
fresh
SPINE

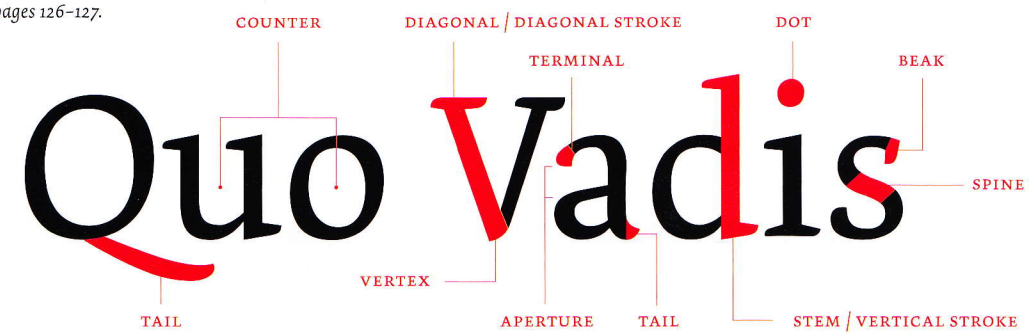

UPPERCASE
SMALL CAPITAL
Blood
CROSS BAR
COUNTER
LOWERCASE

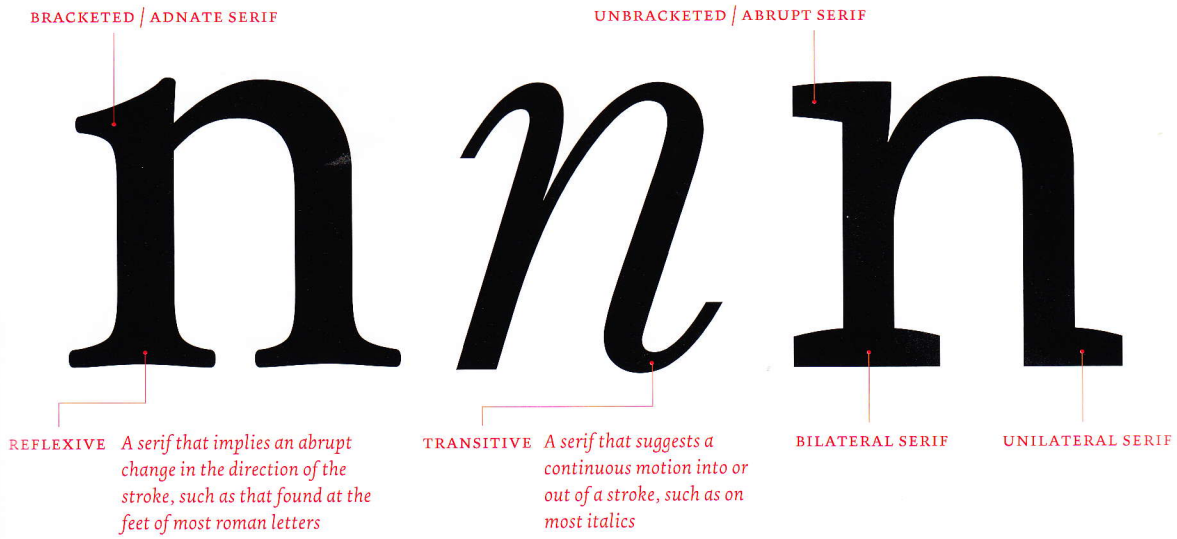
LETTER STRUCTURE

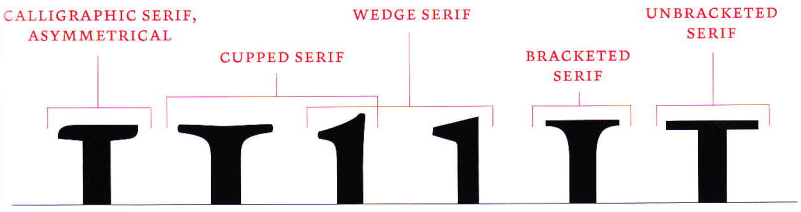




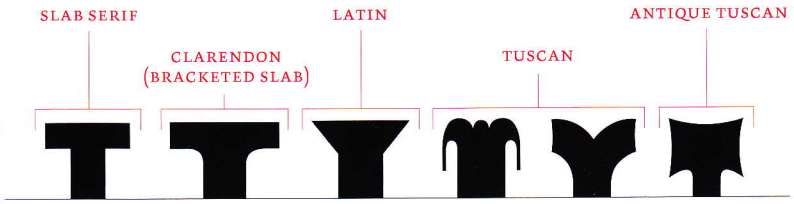
For more lettering and type terms and definitions, see the Glossary on pages 126–127.



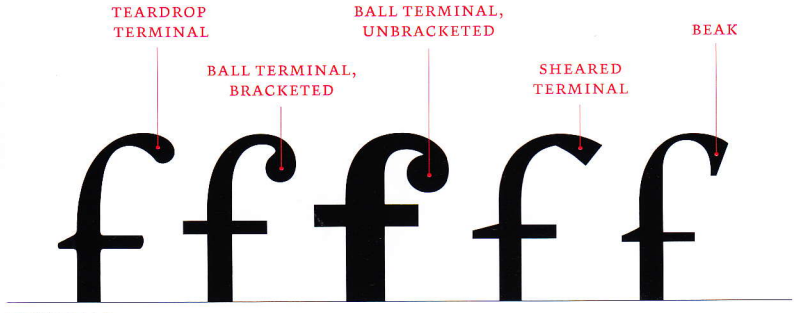




TEXT SERIFS



DISPLAY SERIFS AND NINETEENTH-CENTURY STYLES

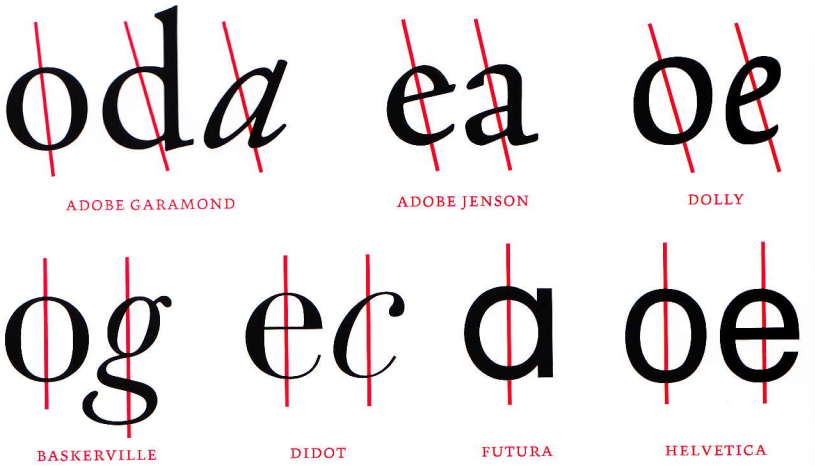


TERMINALS

SERIFS AND TERMINALS *represent the entrance and exit marks of the pen. The origins of various serif shapes relate to different writing styles, tools, pen angles, and amounts of pressure. By the eighteenth and nineteenth centuries, the forms of serifs and terminals had become detached from their calligraphic origins, as type designers and sign painters treated serifs as separate ornamental or geometric elements.*

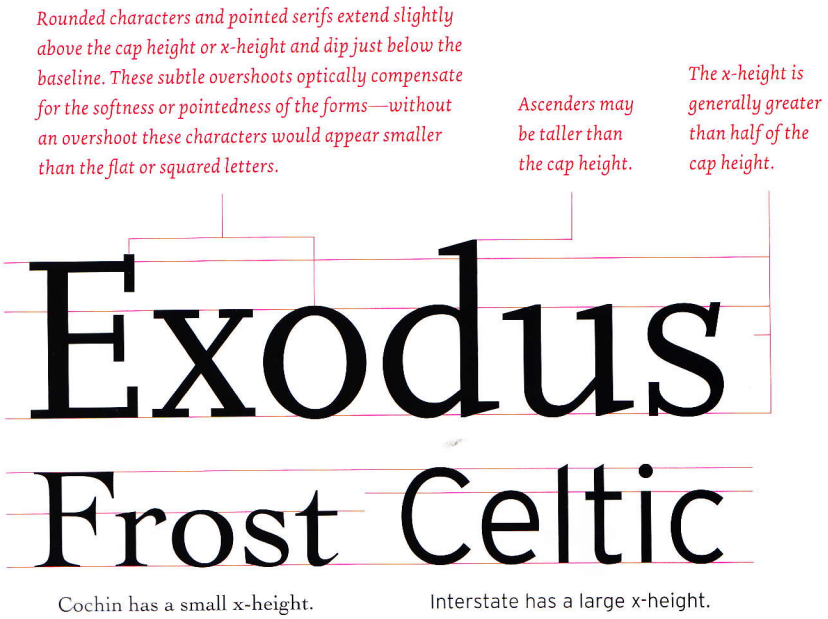
AXIS *refers to the angle of emphasis within a letter or stroke. Letters or typefaces with modulated strokes have areas of thicks and thins, visible in rounded characters like the* o *or* a. *Typefaces derived from broad-nibbed pen writing typically have a diagonal axis that reflects the angle of the pen's tip. Multiple axes can exist within the same font or letter. Axis differs from slope, which refers to the angle or slant of an italic or oblique font.*

(See also Angle of Translation on page 52.)



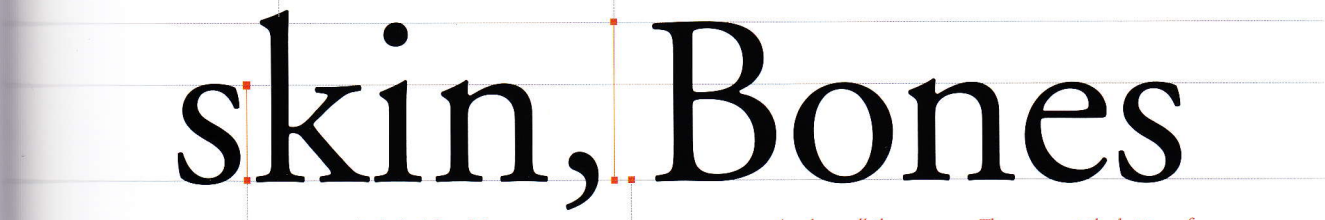
CONTRAST *is the amount of variation from thick to thin within and between the strokes of a character. Without any contrast or stroke modulation, letters suffer from uneven color, and their horizontal strokes appear optically thicker than their stems.*

The X-HEIGHT *is the vertical measurement of a lowercase letter's main body, usually defined by the* x. *It differs from typeface to typeface. Increasing a font's x-height increases the apparent size of the letters and generally improves legibility at small sizes. An excessively large x-height can have the opposite effect, reducing the overall readability of word shapes and making the letters seem graceless. An x-height that is too small can produce letters that look top-heavy or stunted.*



Some elements may extend slightly above the cap height.

CAP HEIGHT *is the distance from the baseline to the top of capital letter. The cap height of a typeface determines its point size.*



X-HEIGHT *is the height of the main body of the lowercase letter (or the height of a lowercase x), excluding its ascenders and descenders.*

THE BASELINE *is where all the letters sit. This is the most stable axis along a line of text, and it is a crucial edge for aligning text with images or with other text.*

The curves at the bottom of letters such as o or e hang slightly below the baseline. Commas and semicolons also cross the baseline. If a typeface were not positioned this way, it would appear to teeter precariously, lacking a sense of physical grounding.

Although kids learn to write using ruled paper that divides letters exactly in half, most typefaces are not designed that way. The x-height usually occupies slightly more than half of the cap height. The bigger the x-height is in relation to the cap height, the bigger the letters will look. In a field of text, the greatest density occurs between the baseline and the top of the x-height.

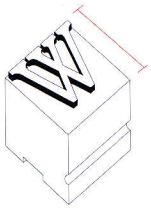
Hey, look!
They supersized
my x-height.

Two blocks of text are often aligned along a shared baseline. Here, 14/18 Scala (14-pt type with 18 pts of line spacing) is paired with 7/9 Scala.

12 points equal 1 pica

6 picas (72 points) equal 1 inch

60-POINT SCALA
A typeface is measured from the top of the capital letter to the bottom of the lowest descender, plus a small buffer space.



In metal type, the point size is the height of the type slug.

HEIGHT Attempts to standardize the measurement of type began in the eighteenth century. The *point system*, used to measure the height of a letter as well as the distance between lines (*leading*), is the standard used today. One *point* equals 1/72 inch or .35 millimeters. Twelve points equal one *pica*, the unit commonly used to measure column widths.

Typography also can be measured in inches, millimeters, or pixels. Most software applications let the designer choose a preferred unit of measure; picas and points are a standard default.

ABBREVIATING PICAS AND POINTS

8 picas = 8p

8 points = p8, 8 pts

8 picas, 4 points = 8p4

8-point Helvetica with 9 points of line spacing = 8/9 Helvetica

WIDE LOAD

INTERSTATE BLACK
The set width is the body of the letter plus the space beside it.

TIGHT WAD

INTERSTATE BLACK COMPRESSED
The letters in the condensed version of the typeface have a narrower set width.

WIDTH A letter also has a horizontal measure, called its *set width*. The set width is the body of the letter plus a sliver of space that protects it from other letters. The width of a letter is intrinsic to the proportion of the typeface. Some typefaces have a narrow set width, and some have a wide one.

WIDE LOAD

TIGHT WAD

TYPE CRIME:
HORIZONTAL & VERTICAL SCALING
The proportions of the letters have been digitally distorted in order to create wider or narrower letters.

You can change the set width of a typeface by fiddling with its horizontal or vertical scale. This distorts the proportion of the letters, forcing heavy elements to become thin, and thin elements to become thick. Instead of torturing a letterform, choose a typeface with the proportions you need, such as condensed, compressed, or extended.

32-PT SCALA

32-PT INTERSTATE REGULAR

32-PT BODONI

32-PT MRS EAVES

Do I look fat in this paragraph?

These letters are all the same point size, but they have different x-heights, line weights, and proportions.

When two typefaces are set in the same point size, one often looks bigger than the other. Differences in x-height, line weight, and character width affect the letters' apparent scale.

Mrs Eaves, designed by Zuzana Licko in 1996, rejects the twentieth-century appetite for supersized x-heights. The font, inspired by the eighteenth-century designs of John Baskerville, is named after Sarah Eaves, Baskerville's mistress, housekeeper, and collaborator. The couple lived together for sixteen years before marrying in 1764.

nice *x*-height

48-PT HELVETICA

48-PT MRS EAVES

Bigger x-heights, introduced in the twentieth century, make fonts look larger by maximizing the area within the overall point size.

Every typeface wants to know, "Do I look fat in this paragraph?" It's all a matter of context. A font could look perfectly sleek on screen, yet appear bulky and out of shape in print. Some typefaces are drawn with heavier lines than others, or they have taller x-heights. Helvetica isn't fat. She has big bones.

9/12 HELVETICA

Every typeface wants to know, "Do I look fat in this paragraph?" It's all a matter of context. A font could look perfectly sleek on screen, yet appear bulky and out of shape in print. Some typefaces are drawn with heavier lines than others or have taller x-heights. Mrs Eaves has a low waist and a small body.

9/12 MRS EAVES

Every typeface wants to know, "Do I look fat in this paragraph?" It's all a matter of context. A font could look perfectly sleek on screen, yet appear bulky and out of shape in print. Mrs. Eaves has a low waist and a small body.

12/14 MRS EAVES

12/14 HELVETICA

The default type size in many software applications is 12 pts. Although this generally creates readable type on screen displays, 12-pt text type usually looks big and horsey on a printed page. (12 pts is a good size for children's books.) Sizes between 9 and 11 pts are common for printed text. This caption is 7.5 pts.

Adobe Garamond was designed by Robert Slimbach in 1988.

The idea of organizing typefaces into matched *families* dates back to the sixteenth century, when printers began coordinating roman and italic faces. The concept was formalized at the turn of the twentieth century.

The roman font is the core or spine from which a family of typefaces derives.

ADOBE GARAMOND REGULAR

The roman form, also called "plain" or "regular," is the standard, upright version of a typeface. It is typically conceived as the parent of a larger family.

Italic fonts, which are based on cursive writing, have forms distinct from roman.

ADOBE GARAMOND ITALIC

The italic form is not simply a mechanically slanted version of the roman: it is a separate typeface. Note that the letter a *has a different shape in the roman and italic variants of Adobe Garamond.*

SMALL CAPS HAVE A HEIGHT THAT IS SIMILAR TO *the lowercase* X-HEIGHT.

ADOBE GARAMOND EXPERT (SMALL CAPS)

Small caps (capitals) are designed to integrate with a line of text, where full-size capitals would stand out awkwardly. Small capitals are slightly taller than the x-height of lowercase letters.

Bold (and semibold) typefaces are used for emphasis within a hierarchy.

ADOBE GARAMOND BOLD AND SEMIBOLD

Bold versions of traditional text fonts were added in the twentieth century to meet the need for emphatic forms. Sans-serif families often include a broad range of weights (thin, bold, black, etc.).

Bold (and semibold) typefaces each need to include an italic version, too.

ADOBE GARAMOND BOLD AND SEMIBOLD ITALIC

The typeface designer tries to make the bold versions feel similar in contrast to the roman, without making the overall form too heavy. The counters need to stay clear and open at small sizes.

A full type family has two sets of numerals: *lining* (123) and *non-lining* (123).

ADOBE GARAMOND REGULAR AND EXPERT NUMERALS

Lining numerals occupy uniform units of horizontal space, so that the numbers line up when used in tabulated columns. Non-lining numerals, also called "text" or "old style" numerals, have a small body size plus ascenders and descenders, so that they mix well on a line with lowercase letters.

A *type* **family** CAN BE faked by *slanting,* or **inflating**, or SHRINKING letters.

ITALIC BOLD SMALL CAPS

TYPE CRIME:
PSEUDO ITALICS
The wide, ungainly forms of these skewed letters look forced and unnatural.

TYPE CRIME:
PSEUDO BOLD
Padded around the edges, these letters feel blunt and dull.

TYPE CRIME:
PSEUDO SMALL CAPS
These shrunken versions of full-size caps are puny and starved.

Takes two

SCALA, WITH KERNING SUPPRESSED

Spacing appears uneven, with gaps around the T *and* w.

Takes two

SCALA, WITH KERNING

Spacing seems more even, although some characters nearly touch.

nearly touch

SCALA ITALIC, WITH KERNING SUPPRESSED

A gap appears between the l *and* y.

nearly touch

SCALA ITALIC, WITH KERNING

The characteristic intimacy of italic requires kerning.

KERNING If letters in a typeface are spaced too uniformly, they make a pattern that doesn't look uniform enough. Gaps occur, for example, around letters whose forms angle outward or frame an open space (W, Y, V, T, L). In metal type, a *kerned* letter extends past the lead slug that supports it, allowing two letters to sit more closely together. In the digital typefaces used today, the space between letters is controlled by a table of *kerning pairs*, which specify spaces between different letter combinations.

LOVE LETTERS

The VE *and* TT *combinations make the words look mismatched.*

LOVE LETTERS

Kerning has been manually adjusted for a more even appearance.

rub my back

rub my back

rub my back

KERNING LARGER SIZES Because the space between characters expands as the type size increases, designers often fine-tune letterspacing when working with large letters. As the word "rub" gets bigger, the gap between *u* and *b* grows more obvious.

rub my back

TYPE CRIME:

TOO MUCH SPACE

Mind the gap, especially at larger sizes.

A typical starting point for the spacing process is to set a character's side bearings to approximately 50 percent of the optical width of its counter. By looking at a string of a single character typed repeatedly, a designer can decide if the spacing should be looser or tighter. Most fonts' side bearings are optically between one half and one third of the width of its average counter space. Serifs help bridge the spaces between letters, and serif typefaces often have slightly looser optical spacing than sans serif fonts. However, uniform spacing between letters' serifs is less important than the optical spacing between the main strokes of two adjoining characters.

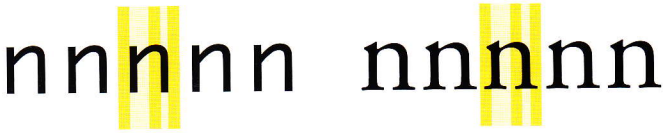
Different fonts have different spacing requirements depending on their end use and visual characteristics. Type designers space some faces more generously to maintain legibility at small sizes, while display faces often benefit from more compact spacing.

The goal of spacing is to achieve even rhythm and color by eliminating white gaps and tight, dark areas. A designer typically begins by determining comfortable side bearings for control characters like H and O. Then strings of the control characters are tested with additional letters at various point sizes. If any problems appear, spacing, or the character itself, must be adjusted.

Without kerning, awkward gaps appear between several pairs of these characters. Punctuation and combinations of upper- and lowercase letters frequently require kerning to maintain a font's even spacing.

ROGUES GALLERY

Too-tight letterspacing causes the characters to run together, reducing legibility and creating color problems. Type spaced too loosely creates distracting gaps between letter pairs and causes words to break apart.



INITIAL SPACING *(Side bearings set to 50 percent of each counter; feels too loose)*

FINAL SPACING *(Side bearings slightly reduced)*

LOOSEY GOOSEY

SCALA SANS *(More open spacing)*

TIGHTY WHITEYS

VAG ROUNDED *(Very tight spacing)*

HHHHH OOOOO HHOHH HOHOHO
nnnnn ooooo nnonn nononon
HHDHOHODOO HHPHPHHHPHPHH
nnpnonopoo nnknknnnknknn nnnvnnn
HHSHH OOSOO HSHSHS OSOSOS
nnsnn oosoo nsnsns ososos

SOME SAMPLE SPACING STRINGS USING THE H, O, n, AND o AS CONTROL CHARACTERS.

UNKERNED TYPE

WITH KERNING

Type designers consider the space between letters as important as the forms of the letters themselves. Like a sculptor extracting a human figure

Type designers consider the space between letters as important as the forms of the letters themselves. Like

TRACKING Adjusting the overall space between letters, rather than the space between two characters, is called *tracking*, also known as letterspacing. It is common practice to letterspace capitals and small capitals, which appear more regal when standing apart. By slightly expanding the tracking across a body of text, the designer can create a more airy field. Negative tracking is rarely desirable. This device should be used sparingly, to adjust one or more lines of justified type.

Lowercase letters respond less favorably to letterspacing than do uppercase letters, because they are designed to sit together intimately on a line.

LOVE LETTERS

SCALA CAPITALS, NORMAL TRACKING

LOVE LETTERS

SCALA CAPITALS, LOOSE TRACKING

LOVE LETTERS LOVE LETTERS

SCALA SMALL CAPITALS, NORMAL VS. LOOSE TRACKING

love letters *love letters*

SCALA, ROMAN AND ITALIC, LOOSE TRACKING

love letters *love letters*

SCALA, ROMAN AND ITALIC, NORMAL TRACKING

NORMAL TRACKING

Letters do love one another. However, due to their anatomical differences, some letters have a hard time achieving intimacy. Consider the letter *V*, for example, whose seductive valley makes her limbs stretch out above her base. In contrast, *L* solidly holds his ground yet harbors a certain emptiness above the waist. Automated kerning tables solve these problems in most situations, but some letters may require personal attention at larger sizes. Capital letters, being square and conservative, prefer to keep a little distance from their neighbors.

POSITIVE TRACKING

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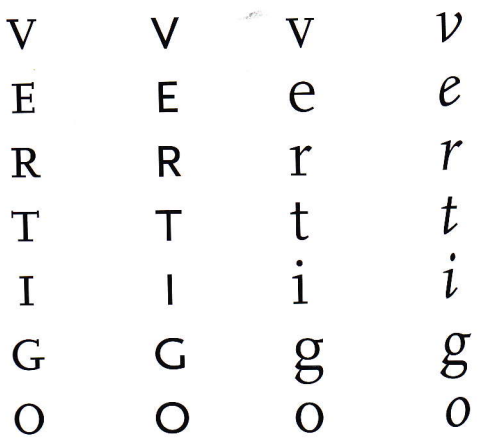
NEGATIVE TRACKING

Letters do love one another. However, due to their anatomical differences, some letters have a hard time achieving intimacy. Consider the letter *V*, for example, whose seductive valley makes her limbs stretch out above her base. In contrast, *L* solidly holds his ground yet harbors a certain emptiness above the waist. Automated kerning tables solve these problems in most situations, but some letters may require additional guidance at larger sizes. Capital letters, being square and conservative, prefer to keep a little distance from their neighbors.

TYPE CRIME:

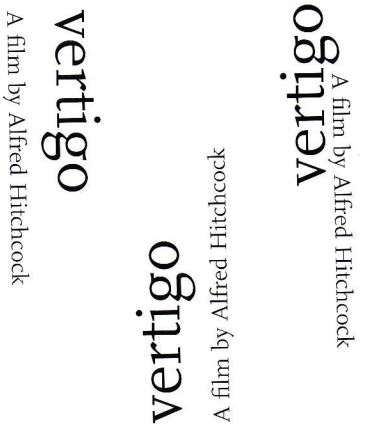
NEGATIVE TRACKING

Make the shoe fit, not the foot. Don't use negative tracking to save space.



SMALL CAPS, STACKED

TYPE CRIME:
STACKED LOWERCASE



SCALA LOWERCASE, VERTICAL BASELINES
top to bottom *bottom to top* *both directions*

STACKED CAPITALS

Roman letters are designed to sit side by side, not on top of one another. Uppercase letters form more stable stacks than lowercase letters. Centering the column helps to even out the differences in width. (The letter *I* is a perennial problem.)

STACKED LOWERCASE

Stacks of lowercase letters are especially awkward because the ascenders and descenders make the vertical spacing appear uneven, and the varied width of the characters makes the stacks look precarious.

VERTICAL BASELINES

The simplest way to make a line of text form a vertical line is to change the orientation of the baseline from horizontal to vertical. This preserves the natural affinity among letters sitting on a line.

There is no fixed rule determining whether type should run from top to bottom or from bottom to top. It is more common, however, especially in the U.S., to run text on the spines of books from top to bottom. (You can also run text up and down simultaneously.)

English is not Chinese. John Kane, 2002

You can express the meaning of a word or an idea through the spacing, sizing, and placement of letters on the page. Designers often think this way when creating logotypes, posters, or editorial headlines. In this project, physical processes such as disruption, expansion, and migration are expressed through the spacing and arrangement of letters. The round *O*s in Futura make it a fun typeface to use for this project.

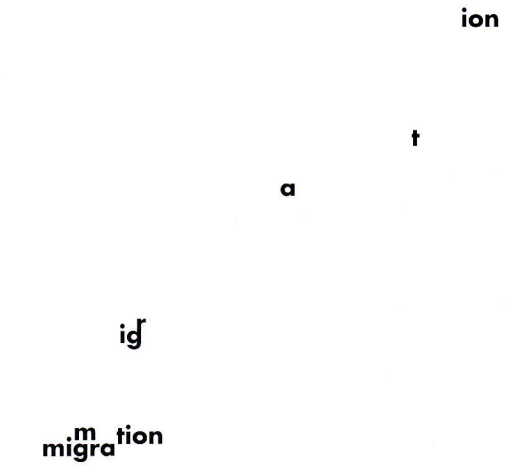
Examples of student work from Maryland Institute College of Art

JOHNSCHEN KUDOS

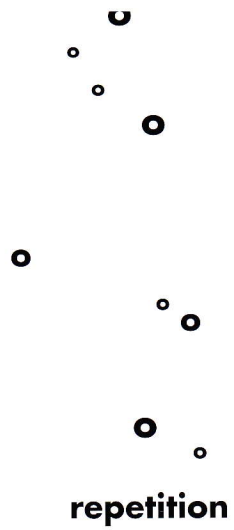
JOHNSCHEN KUDOS

JOHNSCHEN KUDOS

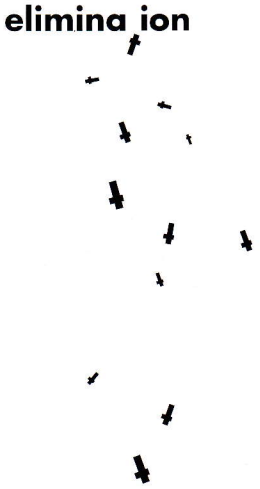
MARCOS KOLTHAR



JASON HOGG



HEATHER WILLIAMS

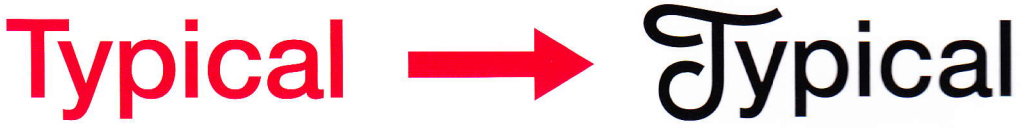


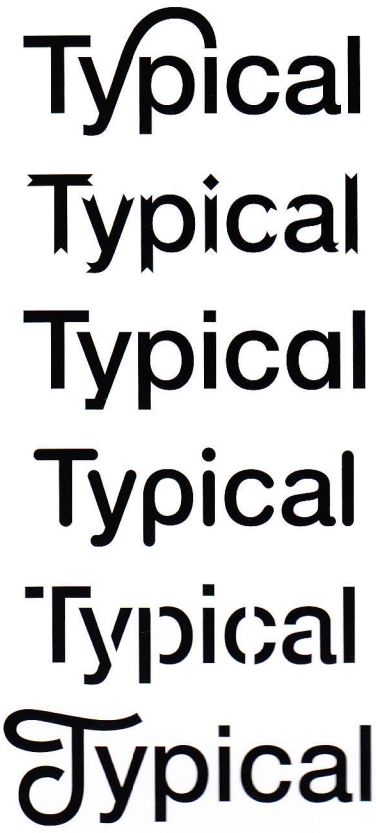
HEATHER WILLIAMS

EXERCISE: MODIFYING TYPE

Even minor adjustments can give type a new or more complex voice. An act as straightforward as rounding sharp corners or creating a stencil from a particular character can completely change the tone of a type treatment. Modifying an existing font shifts it from type into the realm of custom lettering, giving the letters their own unique flavor.

Choosing an existing typeface such as Helvetica, modify one word in several different ways to see how these alterations affect the appearance and tone of the letters. Pay careful attention to the type's underlying system. Modifications to one letter can affect the rest of the word in unforeseen ways and may require compensations in weight, spacing, and width. Any adjustments should respect the relationships of the typographic system.





LETTERING BY SARA FRANTZMAN

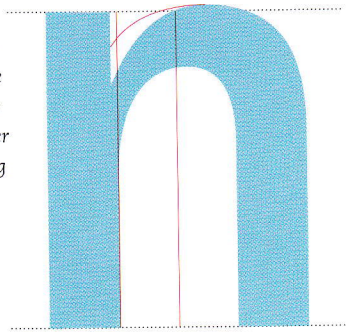
1. MICA COMMENCEMENT EXHIBITION, 2008, Oliver Munday
2. PRODUCTION DEPARTMENT, 2006, Folkert Gorter
3. TKNY (TOKYO AND NEW YORK), 2002, Ali Cindoruk
4. VICTORIA & ALBERT MUSEUM, 1988, Alan Fletcher
5. MIYAKE, 2001, Ali Cindoruk
6. GRAVITY ART, 2008, Folkert Gorter
7. AMT, 2004, Fwis
8. CREATIVE ALLIANCE, 2003, Traci Jones Design
9. VIRTUAL ARMY, 2008, Buro Destruct
10. CAFÉ 03, 2002, Ian Lynam
11. SQUIDS, 2007, Post Typography
12. VALLEY WINES, 2006, A3 Design
13. VISUALINGUAL BOOKS, 2006, Maya Drozdz
14. CLAIR, 2006, Shaw Jelveh Design
15. ZOO YORK, 2007, Justin Thomas Kay

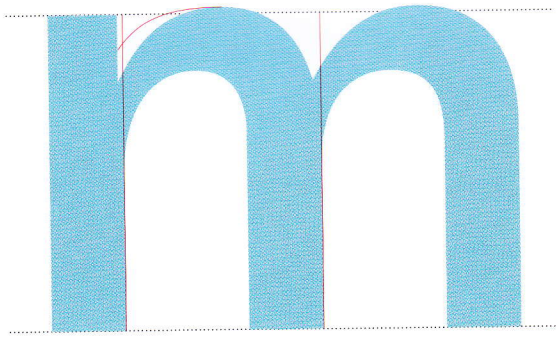
Many designers begin a typeface by drawing the lowercase n. *Once the* n *is perfected, the* u, h, *and* m *quickly follow suit. While all four letters are similar, they usually have subtle variations in emphasis, curvature, and width.*

The shoulders of the n, m, *and* h *push to the upper right, balancing the weight of the stems and emphasizing the forward motion of reading and writing.*

The rounded portions of the letters overshoot the x-height or baseline.

Considerable tapering at the join keeps this area of the letter from appearing too dark.



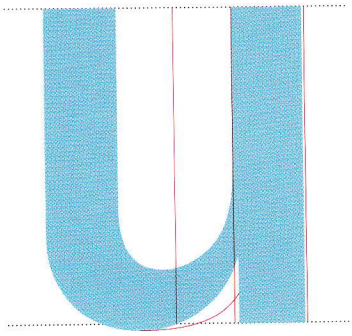


The m*'s counters are approximately the same shape and area as the counter of the* n. *In some typefaces the* m*'s counters are slightly narrower.*

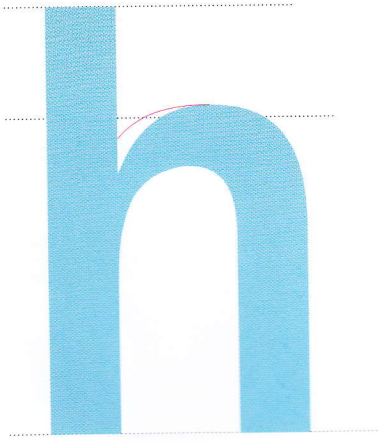
The two counter spaces of the m *are optically equal in area.*

nnnnnnmmmmmmmmuuuuuuuuhhhhhh

The counters of the n, m, u, *and* h *are not symmetrical.*



The finish and appearance of the stems' tips—flat, angled, serifed, flared, or other—are reflected throughout the font's system.

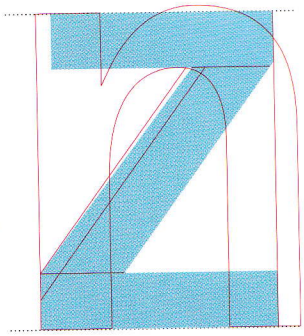


In fonts with greater stroke contrast, the right stem of the u *is typically thinner than the left. In Franklin Gothic there is only a slight difference.*

The length and appearance of the ascenders establish important relationships between the x-height, cap height, and ascender height.

The z's diagonal breaks the rules of stroke emphasis and axis; in weight it is similar to strokes that follow the opposite axis, top left to bottom right. This anomaly reflects a change in the angle of translation. Without this emphasis, the z would appear too light, especially in serif fonts.

The z is usually narrower than the n.

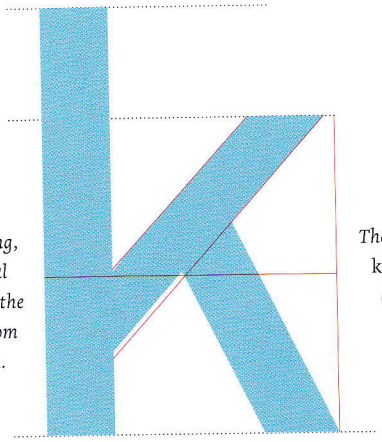


The diagonal stroke may taper slightly.

The bottom of the z is wider than its top.

The base of the k's leg extends beyond its upper arm, to keep the letter from appearing top-heavy.

Thinning, tapering, and other optical adjustments keep the center of the k from feeling too dark.



The waist of the k is above its centerline.

The k's three counter spaces enclose relatively equal areas of negative space.

zzzzzzzzkkkkkkkkpppp

ROGUES GALLERY

n

This n is too wide, and its curved top lacks an overshoot.

h

The counter of the h is symmetrical, making the letter's shoulder slump backward.

m

This m's right counter is too narrow.

c

This c's aperture and top stroke are both too wide.

e

A low, heavy crossbar and short finial make this e top-heavy and out of proportion.

a

This a has insufficient stroke thinning, and its top curve extends beyond the letter's bowl.

v

This v appears wide, and lack of stroke tapering makes its join too dark.

x

This perfectly symmetrical x lacks tapers and appears top-heavy.

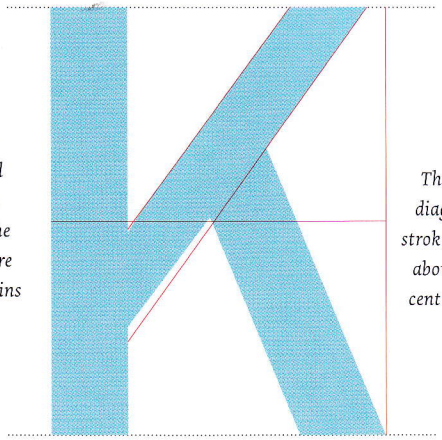
y

The strokes of this y join at the baseline, making its counter too large and its tail too short.

The K's three counter spaces are made relatively equal in area, to maintain visual balance.

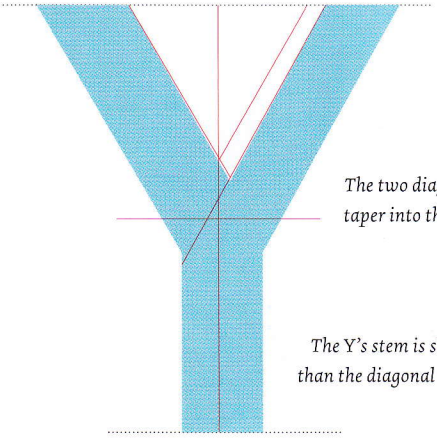
Like other diagonal characters, the Y has a left diagonal that is slightly heavier than its right one, maintaining proper stroke emphasis.

Significant thinning and a subtle ink trap reduce the darkness where the diagonal joins the stem.



The K's diagonal strokes meet above the centerline.

The leg of the K extends farther than its arm and is noticeably heavier.



The two diagonals taper into the join.

The Y's stem is shorter than the diagonal strokes.

Mimicking the A's pattern of axis and emphasis, the V's left diagonal is thicker than its right.

WWWWKKKKKKKKYYYYYYYY

der than the M.

r diagonals may different angles outer strokes.

ROGUES GALLERY

H

This wide H has a too-heavy crossbar.

E

This symmetrical E has arms of equal length, making it look awkward.

F

The lower arm of the F is too high and wide.

T

This T's stem is light, and its crossbar is too wide.

L

This L's broadness accentuates its uneven negative space.

G

This G's crossbar is wide and placed too high; its top curve extends past its base.

C

This C is too wide, and the top stroke hangs beyond its base.

B

This symmetrical B has bowls of equal size, giving it a top-heavy look.

P

This P's bowl is too high and pinched.

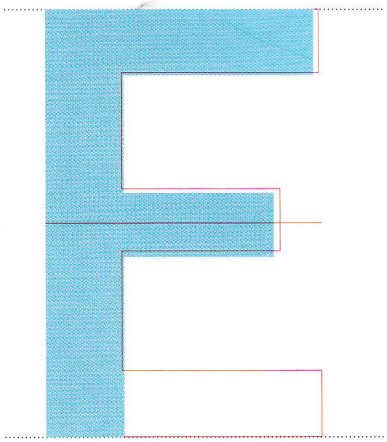
R

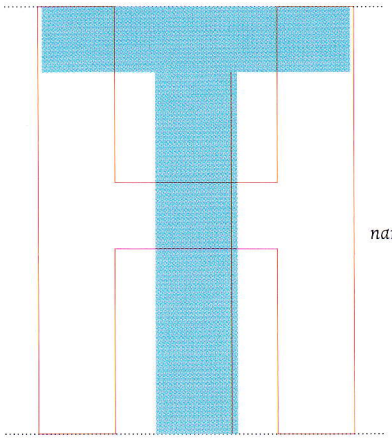
The long leg and small bowl of this R distribute the negative space unevenly while darkening the join.

A narrow width and slightly heavier stroke weight help offset the F's irregular shape.

Serif typefaces often reduce the awkward spacing of the E, F, T, and L with enlarged and heavy serifs that fill some of the space within each character.

The center arm of the F is slightly lower than that of the E, to balance the negative space.



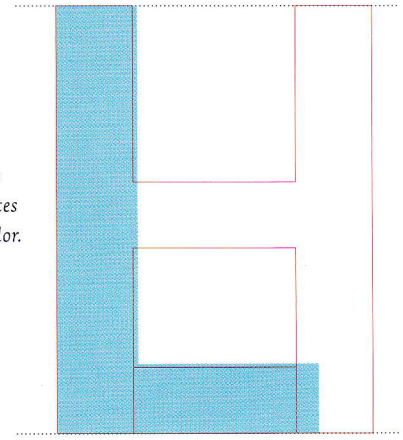


The T is narrower than the H.

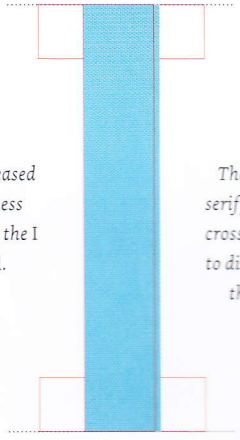
The stroke weight of the stem is increased to balance the T's overall lightness.

EEEFFFFFFFFFTTTTTTTTTLLLLLLLLLIIIIIIII

A thicker stroke weight compensates for the L's light color.



Slightly increased stem thickness differentiates the I from the l.



The I in some sans serif fonts has a short crossbar or slab serifs to distinguish it from the lowercase l.

The L is a problematic character for type designers because of its large, asymmetrical open space. Making the L significantly narrower improves (but does not eliminate) spacing issues.

In serif fonts the I's serifs mimic the top of the L and bottom of the T.