# On the origin of patterning in movable Latin type : Renaissance standardisation, systematisation, and unitisation of textura and roman type

Blokland, F.E.

# CHAPTER 5

The previous chapter introduced the concept of standardising horizontal proportions, resulting in a limited number of character widths. This could have been used for the production of both textura and roman type. The two types were compared and the similarities in the widths of their characters were illustrated. The present chapter examines standardisation of character widths in greater detail. For this a unit-arrangement system is introduced and distilled from examples of both textura and roman type, in an attempt to provide further evidence that roman type, much like textura type, was the result of the standardisation of its handwritten origins to the type production process. If Gutenberg, Fust and Schöffer, and other early Renaissance punchcutters did indeed apply such a unitisation, then this seems to be in contradiction with the opinions of typographers like De Vinne, who believed that fifteenth-century types were made without a system and that peculiarities were determined by the handwritten letters that served as models.[156]

## 5.1 Unitisation in textura type

The division in units as described in the previous section results in a unit-arrangement system: a system in which all character widths and spaces are defined in units. This section will first discuss the advantages of using such a system in type production, before presenting evidence of the use of horizontal unitisation in textura type.

A unit-arrangement system is multifunctional. Units can be used for standardising the design process, for transferring larger-sized pen-based drawings to the punches (although there are no such drawings preserved from the Renaissance), and for standardising the widths of copper bars for the production of matrices. In addition, the justification of lines is relatively simple if spaces are defined within the same unit-arrangement system. This is especially the case for typesetting short lines such as the ones found, for instance, in early German bibles. For example, in Figure 5.1, the word space is defined by the number of units on which the letters are placed. Each unit in the example equals the width of the stems.

[156] Theodore Low De Vinne, *The Invention of Printing: a Collection of Facts and Opinions* (New York: Francis Hart & Co., 1876), p.518.

Figure 5.1 The word space amounts two units in this example.

Besides simplifying the justification of type, another advantage of defining character widths in units is that fixed-width moulds can be standardised. Extrapolating this idea, it is tempting to consider that such units could even have been used as common denominators in movable type from different punchcutters. While this is purely speculation, it could be tested in research.

As evidence of the use of a unit-arrangement system in textura type production, Figure 5.2 shows the textura type applied by Johann Fust and Peter Schöffer in their famous *Psalterium* from 1457 on a bisected version of the grid shown in Figure 4.12. The width of the i is divided in this case into two units and hence the n is placed on four and the m on six units.

Figure 5.2 Textura type by Johann Fust and Peter Schöffer on a relatively refined grid.

This refinement is necessary to accommodate the letters that do not fit into the three-unit grid (for the m), such as the c, e, long s, and t. The c and e in Figure 5.2 have been placed on three units.

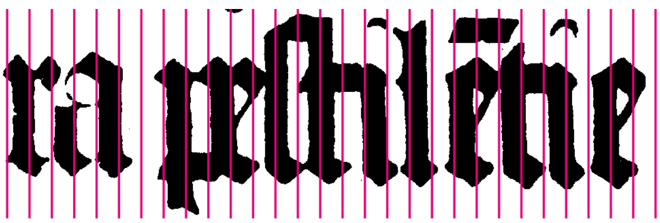

Figure 5.3 Detail of the grid fitting of the textura type from Fust and Schöffer.

A closer look at the grid-fitted textura type from Fust and Schöffer (Figure 5.3) reveals some shifting in certain locations. Most of the deviations from the grid can probably be explained by inaccuracies resulting from the type-manufacturing, typesetting and printing processes. The x-height of the textura type is roughly five millimetres. Some of the deviations are the result of shifts within the grid, such as the 'ra', 'pe', and 'sti' ligatures on the bottom line of the figure, that seem logical considering the structure of these ligatures. They seem to require a more refined grid with eight units for the n, such as the one shown in the Figure 5.4.

Figure 5.4 Further refined grid for the textura type by Fust and Schöffer.

Although somewhat less refined than Fust and Schöffers's textura type in the aforenamed *Psalterium*, the one Gutenberg applied in his 42-line Bible (Figure 5.5) two years earlier also fits on a grid with eight units for the n. This is unsurprising, considering the fact that Gutenberg employed Schöffer.[157]

Figure 5.5 Gutenberg's textura type from his 42-line Bible (1455).

[157] Kapr, *Johannes Gutenberg*, p.197.

To what extent were fifteenth-century punchcutters able to refine grids? There must undoubtedly have been a technical limitation at a certain point in the process. What should be taken into account when considering this question is that one can calculate in units without having to apply each unit on the punches and matrices; the most important point to remember is that the characters' widths are multiplications of units. The units can also be used to calculate the positions of the stems. Having illustrated examples of this unitisation in textura type, the next section will show evidence of a similar unit-arrangement system in roman type, thereby supporting my hypothesis that roman type production made use of standardisation analogous to the production of textura type.

## 5.2 Unitisation in roman type

If, as I hypothesise, the textura-type pattern was used for roman type, then a similar refinement of the grid is a logical step for roman type as well. The fact that Adobe Jenson, the digital revival of Jenson's roman made by the American type designer Robert Slimbach (1956), quite closely follows the original proportions of the letters –although somewhat deviating in details because of optical spacing (Figure 5.6)– makes it suitable for investigating whether it can be placed on a grid. Such an investigation is illustrated in this section.

Figure 5.6 The outline of the lowercase m of Adobe Jenson placed on top of Jenson's m.

The stem interval is the dominant factor in the rhythmical patterns of textura and roman type. It therefore makes sense to divide the distance between the centres of the stems of the lowercase n into smaller units by bisecting this distance. One can imagine that a course grid is easier to control than a very refined one because it helps to limit the number of different widths.


Figure 5.7 Jenson's roman placed on a simple grid.

For the grid shown in Figure 5.7 I divided the distance between the stems into four units. This resulted in eight units for the character width of the n and 12 units for the m. My fitting of Adobe Jenson on 12 units for the m resulted in nine rows of character widths, each with letters that share the widths of the n, i, f, a, m, E, A, H, and M respectively. For kerned versions of letters, such as the capital T, rows with (slightly) smaller widths can be used. It would be interesting to investigate whether the total number of rows can be further reduced.

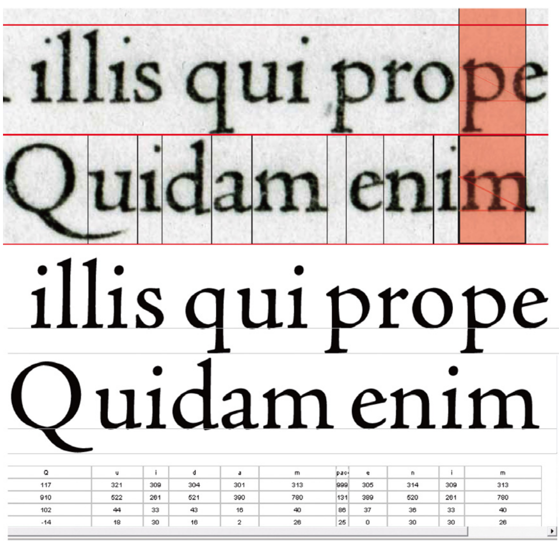


Figure 5.8 Jenson's original roman reproduced with a unitised version of Adobe Jenson.

Providing further evidence of the use of unitisation in Renaissance font production, the original printing by Jenson shows some irregularities in fitting, such as a the relatively large trailing space of the q and the tight spacing between the d and the a, and the e and the n, that cannot easily be explained optically (as was discussed in the previous chapter), but that could however be explained by fitting his type on units (Figure 5.8). This would mean that the number of widths was standardised and limited using a unit-arrangement system and that the position of the characters was adapted, i.e., rounded, to fit the grid.

The original size of Jenson's type is quite small; this inevitably resulted in some deviations when striking, casting and printing. Nevertheless, the first result of unitised fitting of the digital version as shown in Figure 5.7 is far from disappointing when compared with (enlarged) original prints from the fifteenth century. It illustrates the same kind of irregularities in spacing as those prints. This is a very simple system: the word space used in this type is two units. It is plausible that the fewer grid units there are, the stronger the rhythm of the type is. A simple beat could in this case be better than a complex one.

Adobe Jenson is a digital revival of a historic typeface. Its fitting does not show any standardisation such as the one that I applied based on 12 units for the m. When it comes to the character widths in revivals of Renaissance type, the fitting is usually done optically, as described in the eighteenth century by the French punchcutter, typefounder, and author Pierre Simon Fournier (1712–1768) in his *Manuel Typographique, utile Aux Gens de Lettres.* Any standardisation of character widths seems not to have been considered nor investigated before. At the Museum Plantin-Moretus in Antwerp I closely examined French Renaissance foundry type and matrices to investigate such standardisation. The technical details of Renaissance type production will be discussed in detail in the next chapter.

To further illustrate the effect of the rounding of character widths to units, I show once more in Figure 5.9 the outcome of the designing of roman type on a template generated with LeMo, as discussed in Section 3.4.

quill jumped and bounced
and one headline of penman
compiled a bad headache

Figure 5.9 Text typeset with roman type that finds it origin in systematised writing.

In Figure 5.10 I rounded the original spacing from the geometric pattern that was generated with LeMo to a highly simple unit-arrangement system, using the stem thickness here as the base value. This resulted in only six units for the width of the lowercase n.

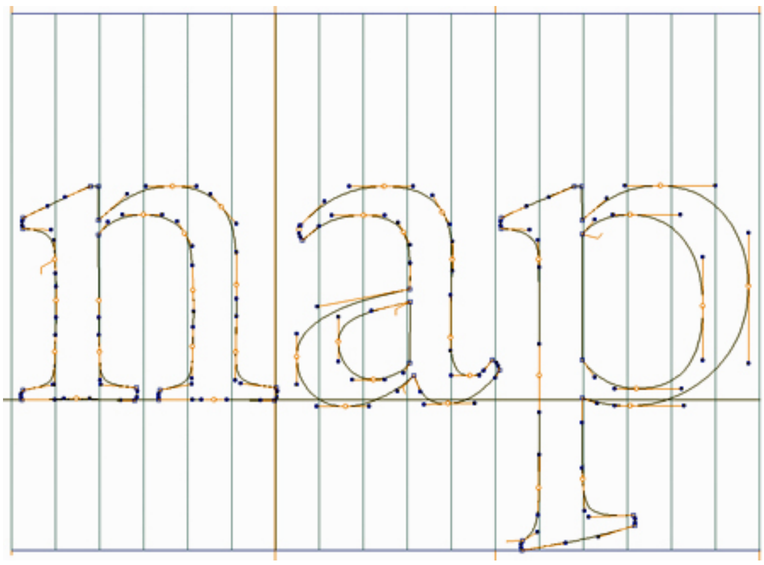

Figure 5.10 The template-based roman type converted to a simple grid system.

The original character proportions are preserved here; the fitting becomes slightly tighter overall, but the default word spaces (for an unjustified line) become just slightly wider, resulting in three units. The outcome is presented in a text in Figure 5.11. Throughout the process until this point, the character proportions and their widths were generated ‘artificially’: no optical corrections were made to the character widths.

quill jumped and bounced
and one headline of penman
compiled a bad headache

Figure 5.11 Text typeset with the grid-fitted roman type.

If the grid is refined, optical adjustments can be made by decreasing the size of the units. For example, the proportions of the letters can at this point be redefined by adjusting them to the grid. A way to refine the grid is to double the number of units, as shown in Figure 5.12.

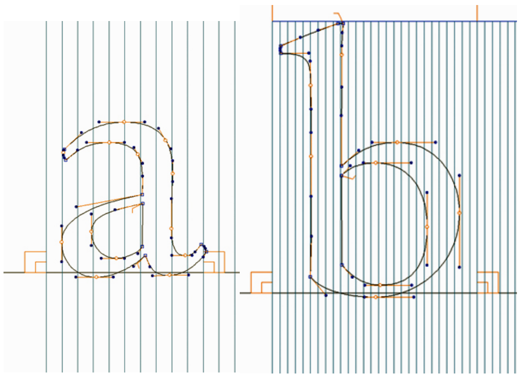

Figure 5.12 Refinement of the grid.

### 5.3 The unit-arangement system

As discussed in the previous section, it is highly likely that Jenson standardised the widths within his roman type in line with the morphologically related textura. The construction of the latter makes it very well suited to subdividing the stem interval into units. The present section discusses this unit-arrangement system in greater detail, highlighting the natural pattern in roman type and using that pattern to distil standardised units, or 'cadence units', from that type.

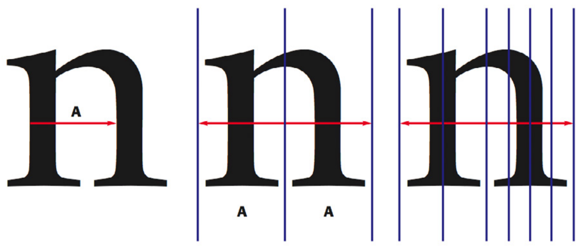


Figure 5.13 The creation of character widths and units based on the stem interval.

The grid shown in Figure 5.13 is based on the division of the counter of the n into two equal space parts. The line is drawn exactly in between the stems. Subsequently the distance from stem to stem, indicated with 'A', is used to define both side bearings so that the resulting character width is twice A. This distance can be divided into a number of equal parts. Repetitive bisecting can do this, which makes the outcome a power of two. This division is organic because the size of the units stems from the design itself. The fact that the other lowercase letters belong to the same rhythmic pattern implies that this unit-arrangement system should work for them as well. Although the basis of the unitisation is different here than the one displayed in Figure 5.9, the stem-based units of the latter equal a division of the stem interval into four units.

There is no documentation that proves the existence of unitisation based on the stem interval in roman type from the Renaissance and later times. Hence, one could argue that such a unitisation is artificial, even if it seems to capture the patterning of the archetypal models, as shown in Figure 5.7. However, there is evidence that unitisation was applied before the Romain du Roi. In *Mechanick Exercises on the Whole Art of Printing* from 1683–84, the English printer, punchcutter, and typefounder Joseph Moxon (1627–1691) shows a proprietary unit-arrangement system for which he divided the body into 42 units (Figure 5.14).

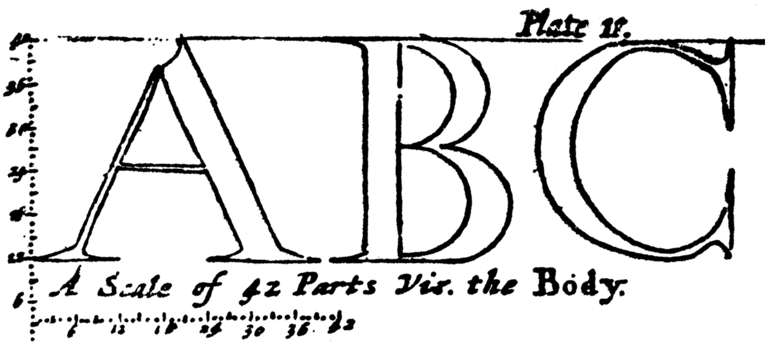


Figure 5.14 Moxon's division of the body into 42 units.

Moxon provides no clue about how he defined these units. In Appendix 6, *Units and grids* I elaborate further on interpretations of Moxon's grid, such as the one by De Vinne, but for the purposes of this chapter I investigated whether the grid could find its origin in the stem interval; hence whether or not it is represented by cadence units.

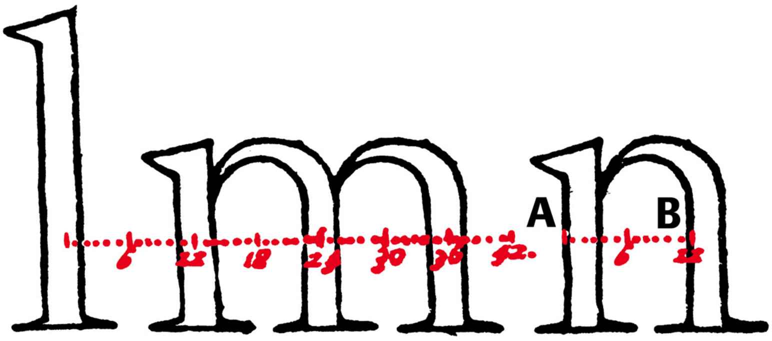


Figure 5.15 Moxon's division into 42 units positioned on the stem interval.

I cut and pasted the unitisation in Moxon's engravings from *Mechanick Exercises* and I placed the units on the stem interval of the lowercase letters (Figure 5.15). I did not alter the distances between the letters in the engravings. Moxon uses a division of the body in 'seven equal parts' of six units each. Twelve units seem to fit perfectly on the stem interval (Figure 5.16).

Figure 5.16 Moxon's grid from *Mechanick Exercises* seems to be based on the stem-to-stem distance.

This results in a character width of the n of 24 units. These units are not the result of a repetitive bisecting of the stem interval; in that case the outcome is always a power of two. But any division can be used: the outcomes will always remain organic.

Word spaces are a part of the pattern and should also be unitised. Dividing character widths and word spaces into units was already done by the Roman carvers of the Scriptura Monumentalis. The size of the units was based on the stem width: 'In brief, the stem width of a letter of whatever height provides the spacing measure for that line.'[158]

[158] Richard D. Grasby, *Processes in the Making of Roman Inscriptions* (Oxford: Centre for the Study of Ancient Documents, 2009,) p.12.

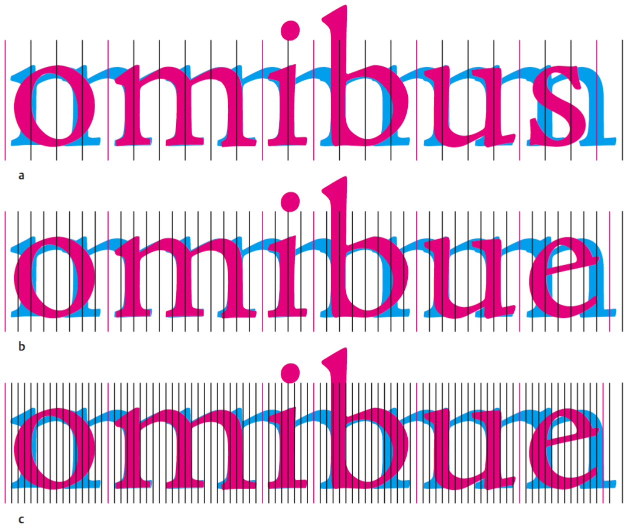


Figure 5.17 Refinement of applied unitisation (on Adobe Jenson).

On the top line in Figure 5.17 the background is formed by the stem interval. This grid is sufficient for positioning the letters in ‘omibu’. However, the incorporation of the s requires a refinement of the grid. To this end, the stem interval is bisected. On the second line in Figure 5.17 the e replaces the s, and for the left side bearing no extra refinement is required. The curved part is an overshoot of the stem. However, the grid is too coarse for positioning the right side bearing of the e. Thus, it is bisected again. On the bottom line in Figure 5.17 the resolution of the grid in the second line has been doubled. This makes it possible to apply small corrections to the spacing. These corrections obstruct the stem interval, but improve the equilibrium of white space, especially if type has not been designed with the preservation of the stem interval in mind.

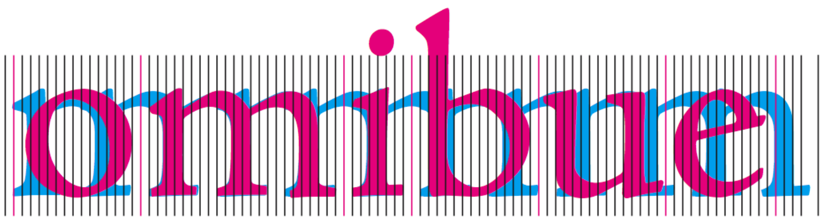


Figure 5.18 Repositioning of letters using a refined grid.

Figure 5.18 shows some shifting of the letters within the grid. In Figure 5.19 the grid is doubled again to make a small reduction of the space between the stem of the b and the left side bearing possible.

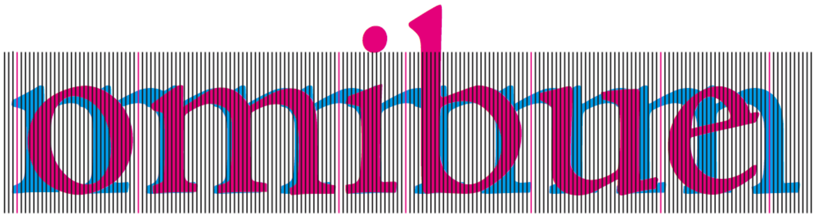

Figure 5.19 Further grid refinement

Figure 5.20 illustrates a division of the character width of the n in the top row into 16 units. The bottom row shows a division of the character width of the n into 32 units. In practice it seems that 32 units for the n (which results in 48 units for the m when this letter is made of a clear repetition of the n) is refined enough to control the spacing of present-day digital roman and italic type. Of course, for digital type the grid can be bisected infinitely.

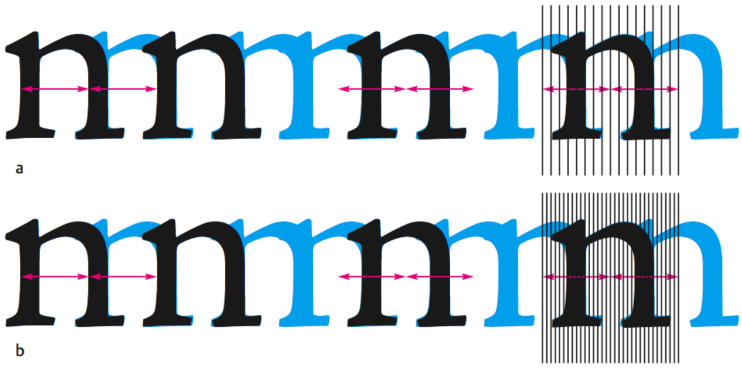


Figure 5.20 Defining cadence units.

The fact that the units applied here are derived from the proportions of the type makes them an intrinsic part of its design. The units represent the rhythmic flow in pattern. I labelled them 'cadence units' for this reason, referring to music and the way in which a cadence represents the beat. Their usage is not restricted to roman type; they can be distilled from, and applied to, italic type as well.

Figure 5.21 Cadence units applied on a cursive.

The stem interval and overshoot of curves is identical in roman and italic type. Figure 5.21 shows the italic of DTL VandenKeere, which I based on the Ascendonica Cursive from the Renaissance punchcutter François Guyot, on a cadence units grid.

Due to its morphologic relationship to textura, the natural pattern in the Humanistic minuscule can be distilled in roman type. This section demonstrated how this pattern can form cadence units in type, forming a useful framework for width standardisation.

## 5.4 Comparing unitised and optical type fitting

To provide further evidence that the Renaissance punchcutters used a unit-arrangement system in their type production process, this section compares optical fitting with unitised grid fitting of type. Spacing via cadence units is an extremely simple and fast method when applied manually, and no knowledge of letters or any experience with spacing is necessary. The algorithm is also simple and the cadence fitting can be computerised accordingly. The question is then what this means for roles of æsthetics and the eye, which are widely believed to rule in roman type production.

In *Letters of Credit,* the English type designer, typographer, book designer, and author on typography, Walter Tracy (1914–1995) advises the reader to space the lowercase n and o first. 'When the two letters look well regulated they are measured against the units gauge and the widths of the letters and their side spaces modified so as to maintain the ideal balance of black to white.'[159]

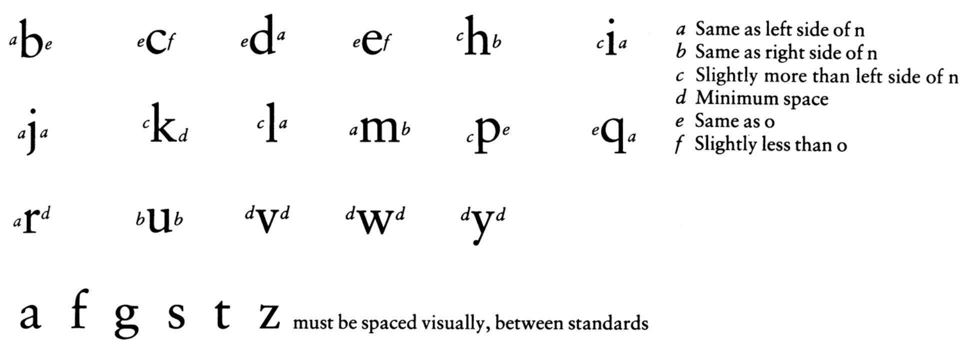


Figure 5.22 Tracy's relative values for the positioning of lowercase side bearings.[160]

[159] Tracy, *Letters of Credit,* p.75.
[160] Ibid., p.75.

Tracy provides a scheme with relative values for the spacing of the other characters, which refer to the side bearings of the n and the o (Figure 5.22). There is also a scheme for capitals (Figure 5.23). A few letters: a, f, g, s, t, z, and S fall outside his scheme and 'must be spaced visually, between standards.'[161]

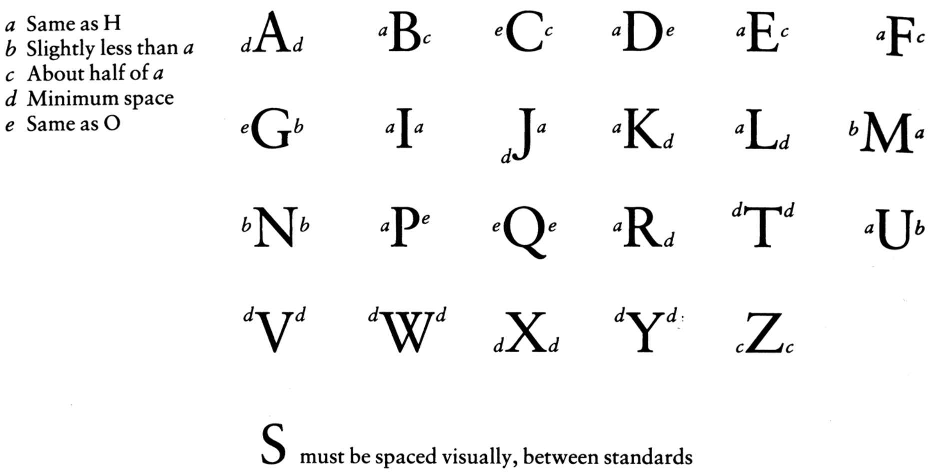


Figure 5.23 Tracy's relative values for the positioning of uppercase side bearings.[162]

To be able to apply Tracy's systematisation, first a number of letters have to be spaced by eye. In contrast, the application of cadence units does not require an optical basis. Cadence units can be derived organically from the type itself and this makes it possible not to use a relative system like Tracy's, but an absolute one using fixed units. If the morphology of a typeface is related to that of the archetypal models, the same spacing method –translated into cadence units– can be applied. It does not seem to be logical to exclude the a, f, g, s, t, z, and S from a spacing system, like Tracy did, because these letters are adapted (optically balanced) by the designer to the same pattern as the other letters.

[161] Ibid., p.75.
[162] Ibid., p.74.

Cadence_units arrangement

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | A | 1 | (left and right from x-axis extreme) | 2 | a | 6 | (left and right from x-axis extreme, right from stem) |
| 8 | B | 3 | (left from stem, right from x-axis extreme) | 5 | b | 2 | (left from stem, right from x-axis extreme) |
| 3 | C | 2 | (left and right from x-axis extreme) | 2 | c | 1 | (left and right from x-axis extreme) |
| 8 | D | 3 | (left from stem, right from x-axis extreme) | 2 | d | 6 | (left and right from x-axis extreme, right from stem) |
| 8 | E | 2 | (left from stem, right from x-axis extreme) | 2 | e | 1 | (left and right from x-axis extreme) |
| 8 | F | 2 | (left from stem, right from x-axis extreme) | 6 | f | 1 | (left from stem, right from x-axis extreme) |
| 3 | G | 6 | (left from x-axis extreme and right from stem) | 2 | g | 1 | (left and right from x-axis extreme) |
| 8 | H | 8 | (left and right from stem) | 6 | h | 6 | (left and right from stem) |
| 8 | I | 8 | (left and right from stem) | 6 | i | 6 | (left and right from stem) |
| 6 | J | 6 | (left and right from stem) | 6 | j | 5 | (left and right from stem) |
| 8 | K | 1 | (left from stem, right from x-axis extreme) | 6 | k | 1 | (left from stem, right from x-axis extreme) |
| 8 | L | 2 | (left from stem, right from x-axis extreme) | 6 | l | 6 | (left and right from stem) |
| 8 | M | 8 | (left and right from stem) | 6 | m | 6 | (left and right from stem) |
| 8 | N | 8 | (left and right from stem) | 6 | n | 6 | (left and right from stem) |
| 3 | O | 3 | (left and right from x-axis extreme) | 2 | o | 2 | (left and right from x-axis extreme) |
| 8 | P | 2 | (left from stem, right from x-axis extreme) | 6 | p | 2 | (left from stem, right from x-axis extreme) |
| 3 | Q | 3 | (left and right from x-axis extreme) | 2 | q | 5 | (left from x-axis, right from stem) |
| 8 | R | 1 | (left from stem, right from x-axis extreme) | 6 | r | 1 | (left from stem, right from x-axis extreme) |
| 3 | S | 3 | (left and right from x-axis extreme) | 3 | s | 3 | (left and right from x-axis extreme) |
| 1 | T | 1 | (left and right from x-axis extreme) | 5 | t | 1 | (left from stem, right from x-axis extreme) |
| 6 | U | 6 | (left and right from stem) | 5 | u | 5 | (left and right from stem) |
| 1 | V | 1 | (left and right from x-axis extreme) | 1 | v | 1 | (left and right from x-axis extreme) |
| 1 | W | 1 | (left and right from x-axis extreme) | 1 | w | 1 | (left and right from x-axis extreme) |
| 1 | X | 1 | (left and right from x-axis extreme) | 1 | x | 1 | (left and right from x-axis extreme) |
| 1 | Y | 1 | (left and right from x-axis extreme) | 1 | y | 1 | (left and right from x-axis extreme) |
| 2 | Z | 2 | (left and right from x-axis extreme) | 2 | z | 2 | (left and right from x-axis extreme) |
| | | | | 3 | . | 3 | (left and right from x-axis extreme) |
| | | | | 3 | , | 3 | (left and right from x-axis extreme) |

Figure 5.24 Cadence unit-arrangement system based on 36 units for the n.

Figure 5.24 shows a table with the distances between stems or extremes on the x-axis of the upper- and lowercase letters and the side bearings. The values in this table are based on a number of (digital revivals of) archetypal models I analysed. The distances are defined in cadence units, based on 36 units for the width of the n (Figure 5.25), which is refined enough to suit digital roman type. For the first range of tests I used 18 units for the stem interval. For later tests, as presented in Appendix 11, *Parameterized fitting results*, I used 32 units, which is in the power of two range and hence closer to the bisected units distilled from Renaissance prints, as described in Chapter 5.

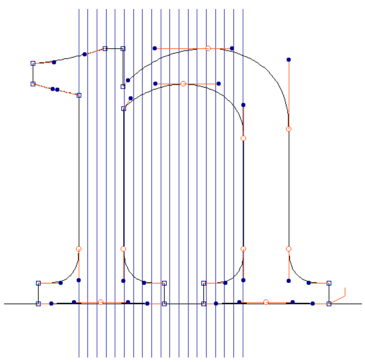

Figure 5.25 The division of the stem interval into 18 units, resulting in 36 units for the character width.

The width of the units depends on the width of the typeface. For example, the n of a condensed typeface has a relatively short stem interval. The total number of cadence units used for dividing the stem interval is the same as in the case of a wider n. Hence, the applied number of units for spacing is the same for narrow and wide types. The system can be compared to a harmonica.

For digital font production the width of the cadence units can be translated into a number of units[163]. If the resulting width contains fractional parts, the value has to be rounded to the nearest integer.

To apply these cadence units, the letters must be moved (slightly) on the grid if the grid was not used to define the proportions of the letters. If the resolution of the applied grid is more refined, for instance 72 or 144 units instead of 36, eventually the grid can fit *any* typeface and the letters do not have to be moved. More refined grids can also make sense if for instance the spacing has to be made slightly tighter and hence smaller units are required for fine tuning.

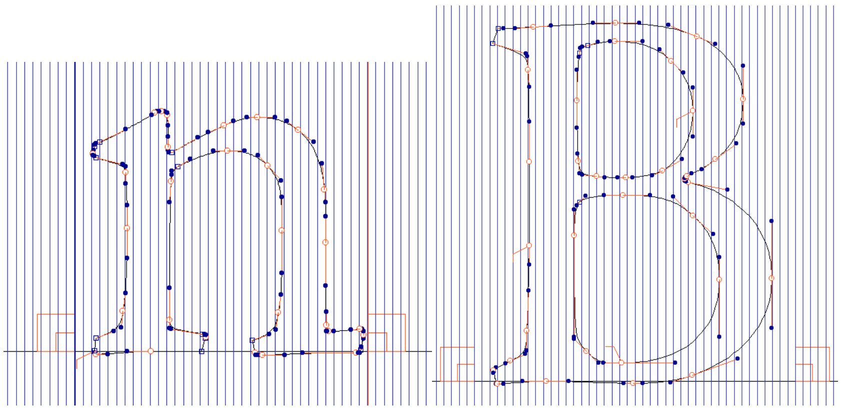

Figure 5.26 Grid fitting of the n and B from Adobe Jenson.

Figure 5.26 depicts six units applied from the left stem of the n to the left side bearing, and five units from the right stem of the n, according to the table shown in Figure 5.24. The proportions of the n and B almost perfectly coincide with the grid. Figure 5.27 shows the n of Adobe Garamond on the derived cadence units. Because the proportions of Adobe Jenson and Adobe Garamond differ slightly, the size of the cadence units differs accordingly. If a roman type design is based on a patterning that deviates considerably from for example Jenson's archetypal model, the cadence unit table can be adapted to the specific details of the typeface. If other typefaces follow the same pattern, also the same cadence unit table can be used for spacing.

[163] PostScript-based digital fonts usually have an em-square of 1000 units, while TrueType-based fonts usually have 2048 units on the em.

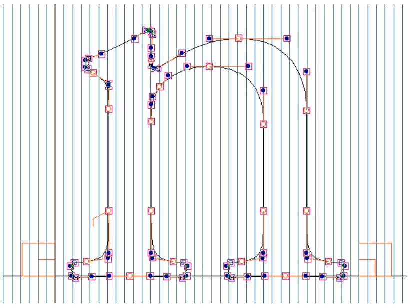

Figure 5.27 The n from Adobe Garamond on cadence units.

The cadence-unit system is suitable for computerisation. For the following examples I applied the unitisation by hand in a font editor. I placed the grid in the background of the glyphs and used the values from the aforementioned table. The top half of Figure 5.28 shows the original 'factory' spacing of Adobe Jenson with no additional kerning. The second variant shows the same typeface spaced using the cadence-unit system. The result of the fittings applied in both texts is very close. I have to note here that Adobe Jenson was one of the typefaces that I investigated for calibrating the cadence-units system, so the resemblance in fitting is not completely coincidental.

Original: ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
The invention of printing from movable types was one of the chief events affecting the history of European civilization. The task of duplicating texts without variance was impossible before Gutenberg equiped the scholar with the accuracy of type. Prejudiced connoisseurs in the fifteenth century deplored the new mass production of books, but men of letters eagerly hailed the printing press as a method of disseminating knowledge in permanent form; and the earliest printed books soon rivalled in beauty, as they superseded in economy, the fine manuscripts of their day. The invention of Printing from movable types was one of the chief

Cadence: ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
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Figure 5.28 Factory spacing (top) and grid-fitting on cadence units of Adobe Jenson.

The top half of Figure 5.29 shows the original spacing of Adobe Garamond without kerning. The second variant shows the same typeface spaced using the cadence-unit system. Although there are some minor differences between both fittings, in general the cadence-units fitting comes very close to the factory fitting.

Original: ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
The invention of printing from movable types was one of the chief events affecting the history of European civilization. The task of duplicating texts without variance was impossible before Gutenberg equiped the scholar with the accuracy of type. Prejudiced connoisseurs in the fifteenth century deplored the new mass production of books, but men of letters eagerly hailed the printing press as a method of disseminating knowledge in permanent form; and the earliest printed books soon rivalled in beauty, as they superseded in economy, the fine manuscripts of their day. The invention of Printing from movable types was one of the chief events

Cadence: ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
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Figure 5.29 Factory spacing (top) and grid-fitting on cadence units of Adobe Garamond.

If the table values work for these two archetypal models, one would expect that this is also the case for all morphologically related roman type. For the following examples, the same table (Figure 5.24) was used. The size of the units are font-specific, therefore for each type I first measured the stem interval and defined the grid by dividing it by 36.

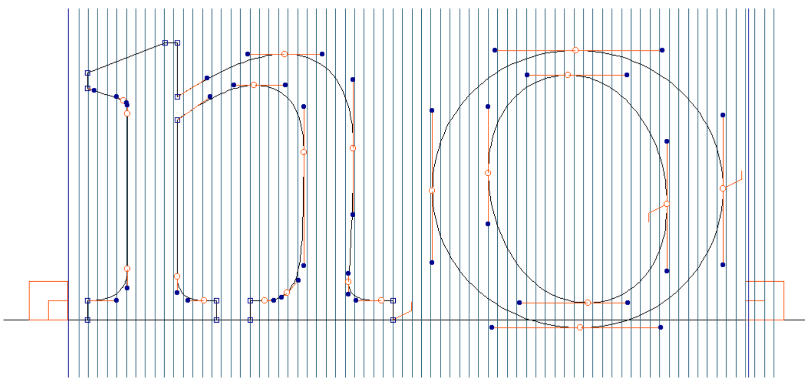

Figure 5.30 The n and o of Monotype Bembo Book placed on cadence units.

Figure 5.30 shows the n and o of Monotype Membo Book on a 36 cadence unit grid for the n. The application of the table values results in the spacing shown in the second line of Figure 5.31. This spacing comes quite close to the original one in the first line.

OHamburgefonstiv

Monotype Bembo: factory spacing

OHamburgefonstiv

Monotype Bembo: cadence units spacing

Figure 5.31 Montoype Bembo Book on factory spacing (top) and cadence-units spacing.

Differences can be found in the combinations ‘e-f’ (too narrow) and ‘I-v’ (too wide). Otherwise the spacing looks remarkably similar. The single unit defined for the side bearing of the e is clearly not enough and the single unit for the side bearings of the v seems to be too much. The uneven spacing of the e and the v also appear in Figure 5.32, which contains a comparison of the original and cadence-units spacing of Swift. This seems to be a structural problem, so it could make sense to change the values in the table into two units for the right side bearing of the e and zero for both side bearings of the v.

OHamburgefonstiv

Swift: factory spacing

OHamburgefonstiv

Swift: cadence units spacing

Figure 5.32 Swift on factory spacing (top) and cadence-units spacing.

Although in all details clearly a design from the twentieth century, the underlying patterns and structures in Swift are directly related to that of the archetypal models, and hence the fitting can be handled in an identical manner. The original spacing of the capitals is relatively narrow in Swift, and this is where the biggest differences can be found. Figure 5.33 shows three spacing variants of DTL Documenta. The first line shows the fitting that I applied by eye around 1990. The second line shows the cadence-units spacing. The distance from the e to its right side bearing is too narrow, as is the case with the u. The third line shows the spacing generated with the URW Kernus 3.0 application for Mac OS 9. Kernus 3.0 calculates the space between glyphs and to this end uses a few key glyphs, like the lowercase n and o. It does not recognise stems and curves as such and only targets a white-space equilibrium.


Figure 5.33 DTL Documenta on optical spacing (top), cadence-units spacing (centre) and equilibrium spacing.

Because the size of the units depends on the size of the stem interval, the size of the units differ per typeface. However, a typeface can be spaced using a cadence-units table that has been defined for a morphologically related typeface irrespective of its width. It does not matter whether such a typeface is expanded or condensed: the system works like a harmonica. Furthermore, if a table is adapted for a bold variant of a typeface, the units can be applied on other, design-related bold versions as well.

One could argue that such measurements do not have to be defined in units. The amount of space between the stems and side bearings of an archetypal lowercase n can also be measured in relation to the n's counter, and subsequently the spaces for the other letters can be calculated and adapted as well. This is actually how URW Kernus works: it does not use a table but translates the space into units, like one can do with graphic paper, and then makes the number of units between letters even. As previously mentioned, the application does not recognise stems, and purely focuses on the white-space equilibrium. This results unfortunately in fitting differences if serifs are not all identical.

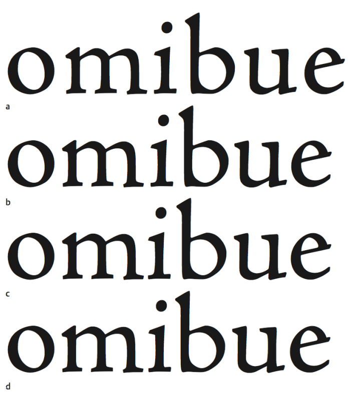


Figure 5.34 Fence-posting (a), refined fence-posting (b, c) and original spacing of Adobe Jenson (d).

As another example, Slimbach optically spaced Adobe Jenson without the use of units, much in the same way as it is generally accepted that Jenson himself did it. However, a very similar fitting can be obtained using a refined unit-arrangement system. Figure 5.34 shows the spacing as a result of grid refinement in four steps. The line (a) shows purely fence posting on a grid of four units for the n, as also shown in the top line in Figure 5.16. In the next line (b) the grid has 16 units for the n. The positioning of the letters is improved because the refined grid makes smaller corrections possible. The third row (c) in Figure 5.33 shows a 32-unit grid for the n. The last line (d) shows the original spacing (by eye) of Adobe Jenson, as provided by its designer, Slimbach. The original spacing and the 32-unit grid spacing are remarkably similar. Æsthetic considerations lead here to a refinement of the grid to 32 units for the n. If such refinements have been optically established once, one can apply them as rules without the requirement to optically judge the outcome. The fact that optical spacing of roman type can easily be translated to such a grid can be considered proof of the fact that roman type finds its origin in patterning on an organic grid that is based on the stem interval.

In line with the previous chapter, this chapter focused on the width standardisation in roman type. A unit-arrangement system was distilled from the inherent patterns of textura and roman type. The chapter then compared optical and grid fitting to illustrate the extent to which seemingly æsthetic preferences can be obtained systematically. The aim was to provide further evidence that roman type production, much like textura type production, was the result of the standardisation of its handwritten origins by the Renaissance punchcutters to the type production process. Evidence of this standardisation can also be distilled from Renaissance artefacts; however, before this evidence can be presented, a technical introduction to the Renaissance type production process is necessary. The following chapter will provide this introduction.