

About micro-typography and the *hz*-program

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Desktop publishing has changed the production of books in recent years. For the first time the author has the possibility of preparing and influencing the design of his text. A publisher will not always be happy about this, especially if the author does not want to follow the strict rules of the publishing house which it may have followed for years. But everybody should welcome this new method of collaboration between author and publisher. What the author needs is a simple set of precise instructions to avoid misunderstanding.

Desktop publishing opened the art of typography to many people; many of them in the past ignored the look of a book. Many more people are interested in typefaces and have developed a feeling for the differences, even the minor differences, for example in the various Garamond designs. Type designers hope very much that they will also develop a critical eye for bad copies of alphabets, of which so many are on the market today. In this way sensitivity to the design of books will increase and we will generally get better quality.

The gap between the professional typographer and the new group of Mac and PC users is shrinking more and more, for it is now possible by means of special typographic programs to include the most sophisticated typographic details in a design — details used in the old days only by the masters. But not everything will be done by the programs now available. The designer still has to make the decisions to achieve his aims.

I want to include a few remarks here about the major mistakes made by PC users. The first one to mention in this context is the bad habit of arranging too narrow spacing. The letters are set too close to each other and thus legibility is reduced. I can give you an example. Look at the combinations *rn* and *cl* in Futura, when you reduce the interletter spacing. This widely spread infection originates on Madison Avenue, and it will take some time until we get rid of this virus in text composition for books.

In the past, typography was in the hands of professionals, compositors, and specially trained people. Today we are facing a completely different situation: alphabets are in the hands of non-professionals, of all kind of users, of office people, of young people working with the capabilities of their Macintosh or PC. These people today make decisions about which typefaces should be used. But to select an alphabet for a special purpose is no easier these days than it was in the past, when only a limited number of typefaces were available for book production. Very often a designer had to make compromises, because his printing firm had only a limited choice of faces on its Monotype or Linotype equipment. Today thousands of alphabets are available and easy to get, some of them for less than a dollar. The question may arise, do we need so many new alphabets, since it makes everything much more complicated. The word ‘new’ I want to put in quotation marks.

I will give an answer without going too deeply into the business of type design. Many of the alphabets used today for text composition are copies of historic types, some of them of the 16th or 18th century, originally produced as metal type for letterpress printing. But today we use laser printers and offset reproduction.

Type design was always a reflection of the spirit of its time, of the techniques of typesetting by hand or machine. Type in former centuries was integrated into the artistic style of a period. We no longer erect Renaissance palaces or Baroque churches. New type designs should reflect our time, the time of industrial design and the electronic generation of letters. Only a few typefaces in the past have followed this philosophy of expressing our time and echoing advanced computer techniques in their letterforms. These alphabets have not been commissioned by companies in the typesetting business, but developed by independent type designers.

Here I would like to mention the Lucida type family designed by Bigelow & Holmes. This is not a warmed-up version of an already existing traditional alphabet. The Lucida alphabets show the way for type design in the future. Besides text faces, many attractive alphabets will always be in demand for headlines and special purposes. As far as text typography is concerned the range of faces is not too large and, of course, much more time and research is needed to develop a good text face that will be universally accepted. Coming back to the use of typefaces in electronic publishing: many of the new typographers receive their knowledge and information about the rules of typography from books, from computer magazines or the instruction manuals which they get with the purchase of a PC or software. There is not so much basic instruction, as of now, as there was in the old days, showing the differences between good and bad typographic design. Many people are just fascinated by their PC's tricks, and think that a widely-praised program, called up on the screen, will make everything automatic from now on.

We are facing another situation: the new freedom of choice and the possibilities of altering letterforms are not always controlled by taste or by an understanding of the laws of legibility. The message — properly and well arranged for transfer to the reader — is still the goal of every typographic solution; not pages full of effects in different type sizes or fancy arrangements like fireworks on the page, which you can see everywhere these days.

You can study good typography in detail, for example, in the handling of two-line or three-line initials, and the careful balancing of weights and mixing of different type styles.

Now there are so many alphabets at your disposal and therefore the tendency is to show them all, for you are so proud of your selection and your ability to retrieve them all in seconds. This is of course dangerous, since the user has practically no restrictions. Too many people depend on the poor instructions from PC manuals in doing their best to master typographic arrangement. In other words, many software companies sell 'food', but don't tell the buyer how to cook the 'food' or how to serve it properly.

With the large number of digital alphabets available today — hundreds in seconds — you get many extra typographic features in text faces: a choice of ligatures, small caps (even in italics), lining and non-lining figures, special characters in the true style of the alphabet, not something taken from the pi box in your type case, perfect kerning of letter combinations, hanging hyphens in small sizes, several weights of letterform, together with slanted romans — which means oblique alphabets — as a second italic.

Here is another comparison with metal type of the past: for superior figures only two styles were available in the old days, one designed for sans serifs and another for all the seriffed types, including the italics. Today's superiors fit perfectly to the alphabet used. In

setting type we can make any variation in the fitting of the letters, with closer setting in larger sizes for headlines to get really compact composition in the line. This is something which you could do in metal type only with a large amount of careful hand work. Swash capitals including final letters and nice ornaments are offered, specially designed for new alphabets in some cases, when you want to do something very special.

With today's possibilities it is very easy to arrange type in circles or at any angle on a page. New doors are opened for working with type. And don't forget we can get printouts of our work very quickly, and if you like you can see your text in all kinds of type styles to check it and find out the best presentation. As well as all these typographic extras we are now in a position to play with colours, different colours for lines of text, for backgrounds or combined with pictures or unusual special effects in illustrations. With many shades available we have practically no restrictions at all and no longer only a few colours to work with. Colour is so important in today's design concepts. The integration of type and pictures is the dominating expression of contemporary design. In addition you are capable of increasing the quality of your typography with the magic electronic tools in your hand. Desktop publishing is no longer a simplified version of book production. You are able to compete with sophisticated typesetting equipment. The software available today can produce typography of a very high standard.

I will give you some more details about a new typographic computer program in a short history and description of the *hz*-program:

In 1964 at Harvard University I talked about programmed typography. This was too early in the sixties, and the industry ignored such ideas. The manufacturers of typesetting machines were only interested in computerized production, and not at all in aesthetic questions of typography. In 1970 the University of Texas wanted me to teach computerized typography in Austin, Texas. But in spite of very attractive offers by the administration my wife refused to move to Texas. That was the end of that story. The next invitation was from Alexander Lawson in Rochester, New York. The School of Printing Management and Sciences at RIT, the Rochester Institute of Technology, was the first university in the world to establish, in 1976, a chair for research and development on the basic structures of typographic computer programs. Since 1977 I have been teaching at RIT.

We worked with variable combinations of typographic elements—we called them bricks—as modular units and creative tools. By means of instruction commands these elements could be arranged and rearranged in many variations and combinations for books and magazine layouts. With these pre-programmed units we worked step by step—but always limited by the memory of the computers. At Rochester in the beginning we did not get any help or technical support from the typesetting industry. Every new idea was killed by the costs of programming and by the restrictions of space at that time. I must confess we had a lot of difficulties with coding to simplify the keystrokes. Don't forget, in the seventies there were no PCs or windowing systems to use.

With the late Aaron Burns in New York in 1977 I founded a company to develop programs for 'Office Communication', as we called it. Also Herb Lubalin joined in with our crazy ideas. All these first developments had been on a menu basis which allowed a solution to be selected from a list of illustrated examples.

The next big step: in 1984 Steve Jobs with his Macintosh started in a completely new direction. New software was needed, and typographic presentation on the screen could be more varied and easier to handle. The possibility of getting various typefaces without any

big investment enlarged the typographic palette very quickly in the following years. More and more quality was wanted, and plenty of computer space was now available and cheap for everybody.

Software was offered for all kinds of solutions from many new companies. This was the time for me to begin work again on a high-level typographic computer program. People now took such ideas seriously and not just as the dreams of a perfectionist. What was tailored at RIT in the seventies has been refined in a final version together with URW in Hamburg since 1988. Our goal was to include all the digital developments available.

You can see the differences between the traditional typesetting of a column and the same story executed by the *hz*-program in figure 2. What we wanted to produce was the perfect grey type area without the rivers and holes of too-wide word spacing. The general concept was not new at all. Our old hero Johannes Gutenberg in nearby Mainz also wanted the perfect line, to compete with the calligraphers of the 15th century. But he used a lot of ligatures—special letter combinations to save space—like *be*, *da*, *do*, *he*, *pp*, etc. In addition he needed many abbreviations, which were in common use in his time.



Figure 1. The lowercase characters used for the 42-line Bible by Johannes Gutenberg, printed at Mainz about 1455

Let us take a look at Gutenberg's famous 42-line Bible, printed about 1455. What makes this Bible the unattainable masterpiece of the art of printing? Its printing on a wooden handpress? Not really, because by today's standards the presswork is not of extraordinary quality and sharpness. We can still obtain handmade rag paper today. Maybe the secret of his beautiful pages is in the proportions of the columns on the sheet. But this we are able to repeat. Therefore only the composition is to be considered.

How could Gutenberg get those even grey areas in his two columns without disturbingly wide holes between the words? His secret: the master achieved this perfection by using several characters with different widths, combined with ligatures and abbreviations, in his lines. He finally needed 290 characters for the composition of the 42-line Bible. It must have been an enormously time-consuming job to realize his vision of good typography,

What makes the Gutenberg Bible the unattainable masterpiece of the art of printing? The printing on a hand-press? Not really, because of today's standards, the inking was not of extraordinary quality. We could order hand-made rag paper also in our day. Maybe the secret of his beautiful pages is in the proportions of the columns on the paper. But this we are also able to copy. Therefore only the composition is to be considered.

How could Gutenberg get those even grey areas of his columns without disturbing or unsightly holes between words? His secret: the master achieved this perfection by using several characters of different width combined with many ligatures and abbreviations in his type case. He finally created 290 characters for the composition of the 42-line Bible. An enormous time consuming job to realize his idea of good typographic lines: the justified lines of even length, compared to the flush-left lines of the works of the famous mediaeval scribes.

But with Johannes Gutenberg's unusual ligatures and abbreviations, today we can't use this principle for contemporary composition. Now we can get help through the versatility of modern electronic software and formats to receive a perfect type area in our production, to get closer to Gutenberg's standards of quality: The *hz*-Program of URW.

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Figure 2. Left column: Regular typesetting. Right column: Composition using the URW hz-Program

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We can't work with Johannes Gutenberg's unusual ligatures and abbreviations to get economical typesetting today — our readers are not familiar with the abbreviations of the 15th century. But we could get help through the versatility of modern electronics, and through software and formats to achieve a better type area in our productions, so that we get closer to Gutenberg's standards of quality. With the *hz*-program you have optical margin compensation at the left and right sides of text columns. It is a complete aesthetic program for micro-typography with a maximum of two consecutive hyphenated words. Good typography allows us up to three hyphenations. The *hz*-program automatically finds the best solution. Kerning in roman, and even more so in italic, was the biggest problem for metal type. It was not possible at all on a Linotype machine, and in hand composition it was a hard job if kerned letters did not exist in a font.

How the *hz*-program works: it is partly based on a typographically acceptable expansion or condensing of letters, called scaling. Connected with this is a kerning program which calculates kerning values at 100 pairs per second. The kerning is not limited only to negative changes of space between two critical characters, but also allows in some cases positive kerning, which means the addition of space.

Digital typography will set the future trends of aesthetics in typesetting. With all the programs available today there is no excuse any more for mediocre typography in books or magazines.

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Chairman, Zapf, Burns & Company, New York, 1986–1991.

Hon. Royal Designer for Industry, London. Honorary member of 23 graphic societies and institutions in Germany, USA, England, France, Belgium, Sweden, Estonia and Hong Kong. Hon. Citizen, State of Texas.

Gutenberg Prize, Mainz; Frederic W. Goudy Award, Rochester; Robert H. Middleton Award, Chicago; etc.