

A FONT AND LOGO GENERATOR FOR PC'S

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Abstract: A font and logo generator for MS-DOS and PC-DOS driven PC's is presented. The software is written in Turbo Pascal, and it uses only standard features of IBM/PC-compatible personal computers. The system consists of a laserprinter, and optionally a data tablet or a digitizer. The output form of the patterns may be optimized bitmap or a PostScript-file. Graphic objects are saved in disks coded by name or attached ASCII-code.

Introduction

Characters and letters with good typographic quality (or at least the feel of it) give us signals of outstanding nature of the message. They may transfer us the spirit of the subject together with the words. Someone has said that "The Medium is the message". The medium consists of text, pictures, drawings, logos, and finally, the whole publication.

With a slight exaggeration we may state that typesetting the printed page is an art form requiring as much skill and care of details as fine sculpture or classical painting. On one hand we esteem highly widely accepted classical types, on the other hand we like personality and unique solutions in graphic arts.

Modern tools, like microcomputers, help us in designing and proofing letterforms as well as logos. With appropriate definitions to fonts and other elements of graphic arts, we can achieve a useful graphic tool for our purposes even in small systems.

Total sets of registered fonts will be available in future for microcomputer systems through compact discs (CD-ROMS) with capacity of 500 Megabytes. Hence, they are easily and rapidly in use for publication.

Additional personal touch may be realized with the help of inexpensive personal computer, data tablet and laserprinter, even today. Graphic arts can give the expression of time, space and context by using proper forms of letters and shapes.

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Firmware

The firmware consists of a standard PC, a laserprinter, and optionally a data tablet or a digitizer. The software is written in Turbo Pascal, and it utilizes only standard features of the PC.

The user interface comprises a standard keyboard and screen, and optionally a data tablet. The cursor can be easily moved by cursorkeys, but digitizing or designing of complex forms may be somewhat awkward or cumbersome without a data tablet.

As an output device one may use a low-cost laserprinter or a PostScript-compatible typesetter.

Graphic elements

Fonts, logos and other graphic objects consist of lines, arcs and other curves. Lines are defined by the two endpoints. Arcs are defined by three points: two points will mark the start and the end while one point steers the arc through itself.

In order to define other smooth curves with a small amount of control points, you have to utilize some curvefitting or related methods. I have chosen Bezier-curves.

Bezier-curves are defined by polynomials that are in parametric form (1) - (3):

$$x = p_x(t), \quad \text{and} \quad y = p_y(t), \quad \text{where} \quad (1)$$

$$p_x(t) = \sum_{i=0}^m C_i^m t^i (1-t)^{m-i} x_i \quad (2)$$

$$p_y(t) = \sum_{i=0}^m C_i^m t^i (1-t)^{m-i} y_i. \quad (3)$$

The guiding points of the curve is denoted by (x_0, y_0) , (x_1, y_1) , ..., (x_m, y_m) .

The guiding points give rise to a smooth curve between the two endpoints. The curvature is controlled by the intermediate points. Figure 1a. shows a Bezier-curve controlled by four points. There are a few more guiding points in Figure 1b.

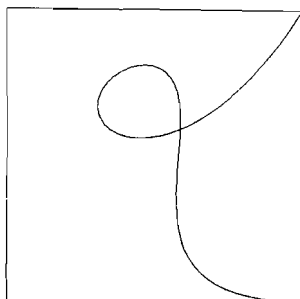
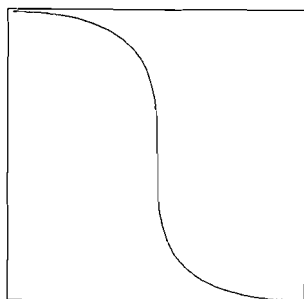


Figure 1a. A Bezier-curve of 4 guiding points. Figure 1b. Another Bezier-curve.

You may define a glyph or a shape with any combination of lines, arcs and Bezier-curves. The height and width of the object can be defined in points with the help of menus when printed.

Filling, shading or coloring of the constructed object can be done in a versatile way.

Output

Printing is accomplished with a laserprinter or a PostScript-compatible typesetter. You can adapt the printed bitmap to the resolution of the printer, or send out so-called PostScript-files that describe the graphic pattern with readable strings. Apple's LaserWriter uses PostScript, too.

The resolution of a low-cost laserprinter is 300 dots per inch (dpi). The corresponding ratio between the typographic point and the pointsize of laserprinter is about 4. For this reason the practical lower limit of the font size is round 4 points.

If one uses a laserprinter without fullpage memory, one may come across with difficulties in utilizing the whole page with bitmapped graphics.

Typographic quality

Using typesetters, like Linotronic 101 or 300, the resolution of 1500 or 2500 dpi may be reached, respectively.

Low-cost laserprinters lack the resolution necessary for clear exhibition of small fontsize or smooth lines at small angles.

The dots of the "i" shown in enlarged 12-point letterform may be compared printed in three different resolutions, viz. 200, 400 and 800 dpi (Fig. 2). The tiny filled circle looks like a cross, square or sphere depending on the resolution.

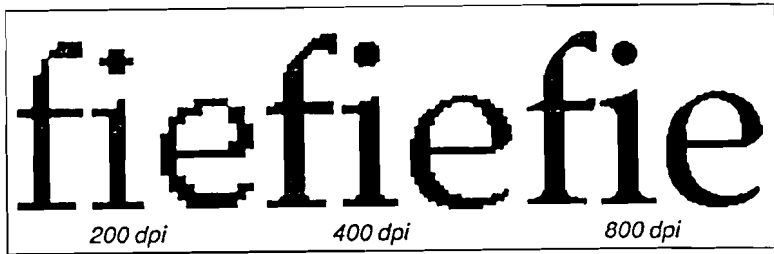


Figure. 2. 12-point Zapf Calligraphic 801 (courtesy of Bitstream Inc.) at 200, 400 and 800 dpi (Spencer, 1985).

The graphic patterns may be somewhat crisp and lines at angles jagged when printed with the resolution of 300 dpi. For line art proofing this is, however, good enough in most applications. Presentation of halftones needs the resolution of at least 600 dpi in order to produce sharp pictures with reasonable gray scale.

Appendix C shows some printed examples of designed line arts with 300-dpi laserprinter.

Appendix D presents a 32 by 32 dot character (of *Fraktur*-type) in various sizes.

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Appendix A

Origins and definitions

FONT (French *fonte*, with a verb *fondre*, to cast) is a complete assortment of type in one size and style.

Times and **Helvetica** are examples of a type of letterforms.

SIZE is usually expressed in points, which is a typographic unit. Unfortunately, a point is not a standard unit.

Pica (= 4.212 mm) is a unit of 12 English points, which is 1/72 of an inch (= 0.351 mm).

Didot is another point (= 0.3759 mm). Cicero is a unit of 12 Didot points (= 4.51 mm).

The size of a font usually varies between 1 and 360 points. The definition of a modern font assures good resolution no matter what the point size is.

STYLE of a font may be plain, **bold**, *italic*, **outline** or **shadow**, for example.

LOGO is an abbreviation of **LOGOTYPE**, which is a distinctive company signature, trademark, colophon, newspaper nameplate, etc.

CALLIGRAPHY (Greek *Kallos*, beauty; *Graphein*, to write) means beautiful handwriting especially as an art. You can define your own fonts with calligraphy.

ORNAMENTS are (classical) decorations to adorn printed publications. Initials (*anfangs*) are sometimes adorned with flowers or aldusornaments.

Appendix B

Trademarks

Apple, the Apple logo , and **AppleTalk** are trademarks of **Apple Computer, Inc.**

MS-DOS is a trademark of **Microsoft Corp.**

IBM and **PC-DOS** are registered trademarks of **International Business Machines Corp.**

Linotronic 101 and **300** are trademarks of **Allied Corp.**

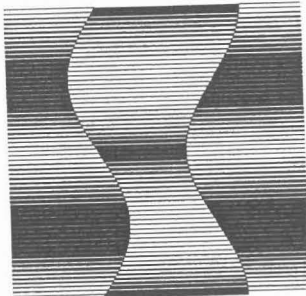
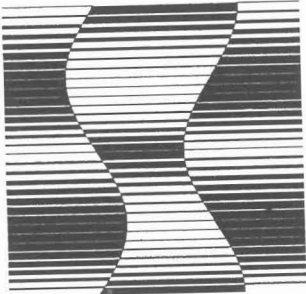
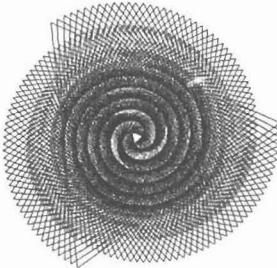
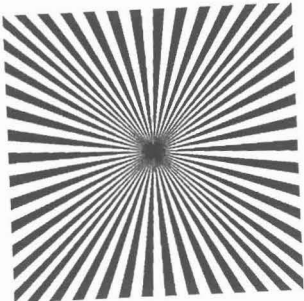
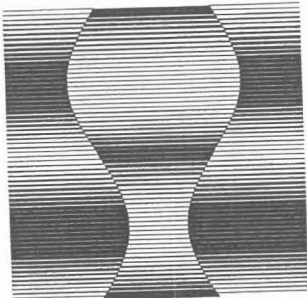
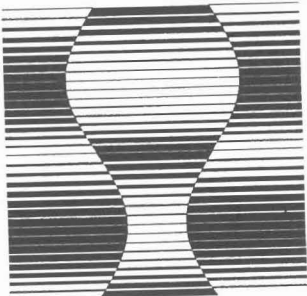
PostScript is a trademark of **Adobe Systems, Inc.**

Times is a trademark and **Helvetica** is a registered trademark of **Allied Corp.**

Turbo Pascal is a trademark of **Borland International, Inc.**

Appendix C

Line art examples



Appendix D

Jagged 32 by 32 dot character

