

It's about ...

Typesetting paragraphs
Adjust or not adjust, ...
Two methods
Adjust spacing in double columns
Adjust spacing with emergency stretch
Look what happens
Only horizontal scaling
Fine tuning
Some observations

Typesetting paragraphs

 $T_{E\!X}$ is pretty strong in typesetting paragraphs, and instead of looking at individual lines, it treats such a paragraph as a whole. When typesetting a paragraph, $T_{E\!X}$

- tries to break lines without breaking words
- permits hyphenation within certain constraints
- stretches inter word spacing

As a bonus pdfT_EX

can fool the reader by changing glyphs

and thereby improves the grayness of the typeset page.



Adjust or not adjust, ...

We can improve the look and feel of a typeset paragraph by slightly adjusting the shape of the glyphs:

- using glyphs with different width for similar characters
- stretching the horizontal 'curves' of glyphs
- scaling the glyphs in the horizontal direction
- moving interpunction and quotes into the margins

Herman Zapf's method is mainly based on using a discrete set of glyphs for similar characters, while Hàn Thê Thàn's pdfTEX applies (discrete) horizontal scaling. At TUG98 Miroslava Misáková presented a combined strategy, using METAFONT to generate glyphs.



Two methods

Currently PDFT_EX has two strategies built in. The first one does not influence the paragraph building. It simply stretches of shrinks lines that are under-or overfull.

The second method is interwoven with the paragraph builder and helps TEX to find better line breaks, by offering alternative horizontal glyph scaling.

Both methods show the best results when used with multiple master fonts, but traditional type 1 fonts are handled pretty well too.

In the next examples the colored text is adjusted and layed over the 'normal' text. The first sample shows what happens when \pdfadjustspacing is set to 1, the other two show the results of setting it to 2.



stretch 0 shrink 0 step 5

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stretch 30 shrink 30 step 5

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stretch 35 shrink 35 step 5

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Adjust spacing in double columns

Adjusting the spacing (or actually the glyphs) makes most sense in multi column mode. The mechanism is invoked by saying for instance:

\font\tenrm=cmr10 stretch 30 shrink 20 step 10

This means that the width of a glyph in this font be increased by at most 4% or deminished by at most 2%. because steps of 1% are taken, 7 different widths are possible. Individual glyphs can be influenced by setting its \efcode.

On the next pages, the top half of the screen shows the normal case, while the bottom half shows the adjusted text.

stretch 5 shrink 5 step 5

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Adjust spacing with emergency stretch



Adjusting works best when \emergencystretch is set to for instance 1em. In many cases multi column typesetting can't do without.

\emergencystretch=1em

Although this visual optimization is supposed to be used with high resolution printers, low resolution printing cq. viewing also shows the difference.

Again, on the next pages, the top half of the screen shows the normal case, while the bottom half shows the adjusted text.

stretch 5 shrink 5 step 5

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stretch 25 shrink 25 step 5

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Look what happens

Only horizontal scaling

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Fine tuning



Some glyphs are more sensitive to (even small) changes than others. Therefore PDFT_EX permits you to influence stretching at the glyph level.

\efcode'W=500 \efcode'e=1250

This means that the W gets less than average sretch and shrink, while the e gets some more. Glyphs with many straight vertical lines are visually more sensitive to scaling than horizonal lines and curves.

The next examples show the consequences of setting the **\efcode**'s to values other than the default of 1000.

Stretch 90 - Expansion Codes



Stretch 90 - Expansion Codes: W=0 e=0



Stretch 90 - Expansion Codes: W=0 e=0 h=0



Stretch 90 - Expansion Codes: W=0 e=4000



Stretch 90 - Expansion Codes: W=8000 e=0



Some observations

- ▶ for centuries there have been examples of mixed width fonts
- ▶ once upon a time lead lines were simply squeezed upto, 1%
- ▶ there are examples of additional space saving ligatures
- ▶ in handwriting one can slow down and/or speed up
- ▶ there are T_EX based optimizations on a per line/paragraph basis
- thereby one can stretch a ragged right or right aligned line
- ▶ but now pdfT_FX can apply discrete horizontal scaling
- ▶ in general 5% is about the maximum amount to stretch

