

# Real life book production — lessons learned from *The L<sup>A</sup>T<sub>E</sub>X Companion*\*

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## Abstract

Some aspects of the production of *The L<sup>A</sup>T<sub>E</sub>X Companion* are described.

## 1 Deciding to write a book

Text processing support staff at CERN, as, without doubt, in many other research institutes, universities or companies, had followed Leslie Lamport's advice in the L<sup>A</sup>T<sub>E</sub>X Reference manual [2], and developed a *Local Guide*, which describes how L<sup>A</sup>T<sub>E</sub>X can be used on CERN's various computer platforms, explains which interesting style files are available, and provides a set of examples and pointers to further information. Alexander Samarin and one of the authors (Michel) had long planned to expand the material in that guide, to make it more generally available.

When Frank visited CERN in April 1992 to give a presentation on the L<sup>A</sup>T<sub>E</sub>X3 project, we talked to him about our idea. We outlined vaguely what we wanted to write, and Frank found the idea 'interesting'. After he got back home he proposed to talk to Peter Gordon of Addison-Wesley, to see whether they would be interested. They were, and at that point, all three of us decided that it would be a good idea to collaborate.

## 2 Defining contents and time scale

At the end of June 1992 Michel had a first meeting with Frank in Mainz, where they wrote a detailed table of contents, down to the section level, which contained in most cases an extended outline, with an estimated number of pages.

Work by each of the authors, as assigned in the plan discussed in Mainz, continued over the summer, so that by the time of the Prague EuroT<sub>E</sub>X Conference in September 1992 we already had a nice 300 page preprint, which we discussed in great detail during various meetings in the Golden City. We also met with Peter Gordon, our editor at Addison-Wesley and finalized aspects of the contract we had been discussing previously. The final date for delivery of the compuscript was tentatively set for April 1st 1993, in order to having a chance of getting the book printed for the TUG Conference in Aston (Birmingham, UK) in the summer.

Further work on the book during the autumn and the winter was essentially carried out by Frank and Michel, since Alexander went back to Russia at the end of October 1992, and when he finally returned to Geneva in March 1993, he took up a job with ISO, and had very little time left to spend on the book.

## 3 Getting feedback

The text, as it was at the end of 1992, was sent to several of our colleagues and friends in the L<sup>A</sup>T<sub>E</sub>X world, and they kindly spent part of their Christmas holidays reading the first complete draft of the book. At the same time Addison-Wesley had some chapters read by a few of their reviewers.

It is extremely important and helpful to have feedback at an early stage, not only to find possible mistakes, but also to receive comments and suggestions from other people, who can often shed an interesting new light on points which are taken for granted, or point out grey areas in style and explanation.

## 4 Design specification

In the meantime Frank was hard at work trying to translate the page specifications (for headings, figures, captions, running titles, etc.) as given by the Addison-Wesley designer into values of T<sub>E</sub>X glue, rules, boxes, and penalties. It was not always evident how to translate the fixed-space approach of the classical design specs into T<sub>E</sub>X's page-layout paradigm; so on various occasions 'clarifications' had to be obtained.

## 5 Coding conventions

It was soon realized that it is extremely important to have a common way to generically mark up commands, environments, counters, packages, or any other global distinctive document element. This not only ensures a homogeneous presentation throughout the book, but also allows one to change presentation form without modifying the in-

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put text; one merely has to change the definition of the generic command (a few examples are shown in table 1). As a supplementary benefit one can decide to globally (and automatically) enter certain of the marked-up entities in the index.

## 6 Setting up communication channels

In order to make communication between the production people in the Boston area and ourselves easier, it was decided to bring in the expertise of a production bureau, *Superscript*, with its competent manager Marsha Finley, and her colleague Anne Knight. Another decision was to have the complete text reviewed by a professional copy-editor.

Around Easter 1993 we thus started to copy PostScript files with ftp (quite a new procedure to all the production people involved, who were, at best, used to transporting 3.5 inch diskettes between their Macs or IBM PCs and the printing bureau). These files were then retrieved on the Sun in the Reading office of Addison-Wesley, printed locally, and picked up by Marsha, who took the pages to the copy-editor. The latter returned the edited copy to Marsha, several copies were made, and Frank and Michel both got a copy via Federal Express. The changes were then introduced into the text, by either Frank or Michel, and, whenever we had a problem, we would solve it via e-mail with Marsha.

## 7 And then came L<sup>A</sup>T<sub>E</sub>X<sub>2 $\epsilon$</sub>

While this iterative process was getting well under way, an unexpected event happened. Frank and Leslie Lamport, who was visiting Mainz in the spring of 1993, decided to consolidate L<sup>A</sup>T<sub>E</sub>X into a new version, L<sup>A</sup>T<sub>E</sub>X<sub>2 $\epsilon$</sub> , which would bring together the various dialects and formats floating around on the various networks and archives, and include the New Font Selection Scheme (NFSS) by default. It would also include a few limited extensions and propose a better style writer interface.

This very good news for the L<sup>A</sup>T<sub>E</sub>X community, however, meant for us that we were now describing and using an evolving software system. After the copy-editing stage, in several tens of places non-trivial changes had to be introduced in the text, new paragraphs written, and complete new sections added in some parts. Moreover, the *Companion* was typeset with the alpha release of the continuously-changing version of L<sup>A</sup>T<sub>E</sub>X<sub>2 $\epsilon$</sub> , thus giving us some surprises from time to time (of which one or two even ended up in the first printing of the book).

## 8 Getting ready to print

By the end of the summer we had included all the comments of the copy-editor into the compuscript, and done most of the updates for L<sup>A</sup>T<sub>E</sub>X<sub>2 $\epsilon$</sub> . We then went on to the proofreading stage, where, again with Marsha Finley acting as liaison, a proofreader reread all pages after ‘final typesetting’, pointing out remaining typos or errors in cross-references.

## 9 Tuning L<sup>A</sup>T<sub>E</sub>X and hand work

While we were preparing the final run, we had to tune the L<sup>A</sup>T<sub>E</sub>X parameters extensively, in particular to allow for the huge number of floats we had to deal with, but also for finding suitable glue settings and penalties. There was also some hand tuning needed.

Table 2 shows the amount of hand-formatting we found necessary to produce the final copy of the book.

To flag all visual formatting clearly (so that it could easily be identified and removed in case the text needed changing), we never used the standard L<sup>A</sup>T<sub>E</sub>X commands directly. Instead we defined our own set of commands, often simply by saying, e.g., `\newcommand{\finalpagebreak}{\pagebreak}`.

The table divides the commands used into three groups. The first deals with changes to the page length: `\finallongpage` and `\finalshortpage` run a page long or short, respectively, by one `\baselineskip`. The command `\finalforcedpage` enlarges a given page and is therefore always followed by an explicit page break in the source. The second group contains the commands for ‘correcting’ L<sup>A</sup>T<sub>E</sub>X’s decision about when to start a new page, and the final group contains a single command for adding or subtracting tiny bits of vertical space to improve the visual appearance.

The average number of corrections made with commands from the first group is slightly over 20%, or one out of five double spreads, since we applied such a change always to pairs of pages. If you look at the chapters with a large percentage of corrections, you will find that they contain either very large in-line examples or large tables that should stay within their respective sections.

Hard page breaks were inserted, on average, every tenth page, often in conjunction with a command from the first group. In most cases this was used to decrease the number of lines printed on the page.

Most uses of `\finalfixedskip` can be classified as ‘correcting shortcomings in the implementation of the design.’ With an average of about 16% this may seem high. But in fact such micro adjustments usually come in pairs, so this corresponds to approximately one correction every 12 pages.

## 10 Preparing the index

As already mentioned above, most of the important document elements were entered into the index in an automatic way by using generic mark-up to tag them. But that is not enough to have a good index, and indeed, we went over each page and asked ourselves which keywords should be entered into the index so as to direct the reader to the information on that page. In fact quite a few readers’ comments that we received after the first printing had to do with suggestions for adding additional keywords into the index.

## 11 Production problems

Since we were working in different locations (Geneva and Mainz) on different workstations (Digital and Hewlett-Packard) and with mostly non-identical versions of L<sup>A</sup>T<sub>E</sub>X (Frank was ‘improving’ L<sup>A</sup>T<sub>E</sub>X2<sub>ε</sub> continuously, whereas Michel was using a ‘frozen’ version that got updated every now and then), small differences could appear in line and page breaks, leading on many occasions to a state of mini-panic, which had to be relieved by an exchange of one or more urgent e-mail messages, often sent well after midnight, when the other members of our families had already long gone to bed.

## 12 The first printing

After a final L<sup>A</sup>T<sub>E</sub>X run of our complete 560-page book, late on December 1st, Michel was able to copy the the resulting PostScript file, 9.5 Mbytes in size, in 26 self-contained pieces, by ftp from the CERN computer to Reading. This was necessary since the PostScript files had to be transferred on 1.44 Mbyte PC diskettes between the Sun at Addison-Wesley and the Varsity 4300P 1200 PostScript printer of the service bureau, where the camera-ready pages were produced.

## 13 Taking a break, or so we thought

So, we could spend a nice 1993 Christmas holiday, hoping that everything would go all right, and, fair enough, we received the first printed copy of our book just after the New Year. Soon our first readers started to send us comments and suggestions, and to point out problems of various kinds (printing, typos, unclear explanations).

In March Addison-Wesley informed us that we had to prepare an updated version of the book for a second printing at the beginning of May. We thus started to introduce the suggested corrections and improvements into the text, finally ending up with over 160 pages that we wanted to reprint (many of them containing only tiny changes, but also, owing to knock-on effects, sometimes several pages in a row had to be reproduced). We also took advantage of readers’ comments to redo the complete index.

## 14 Conclusion

We hope we have been able to convey in this short article some of the excitement, fun and frustration people experience when trying to write a book.

We are well aware of the fact that those of you who have been involved in the production of books or large documents have come across several of these problems before. We nevertheless hope that by telling our ‘story’ some of the lessons we learnt will be useful to some of you.

## References

- [1] Goossens, Michel, Frank Mittelbach, and Alexander Samarin. *The L<sup>A</sup>T<sub>E</sub>X Companion*. Reading Mass.: Addison-Wesley, 1994.
- [2] Lamport, Leslie. *L<sup>A</sup>T<sub>E</sub>X—A Document Preparation System—User’s Guide and Reference Manual*. Reading Mass.: Addison-Wesley, First Edition, 1986 and Second Edition, 1994.

## Acknowledgements

We would like to thank Geeti Granger and Gareth Suggett for their helpful comments and suggestions.

L<sup>A</sup>T<sub>E</sub>X command (control sequence) ‘\stop’ should be input as `\Lcs{stop}` to produce the text and the reference, as `\xLcs{stop}` to produce only the reference and as `\nxLcs{stop}` to only typeset the command sequence in the text.

```
\newcommand{\Lcs}[1]{\mbox{\normalfont\ttfamily\bs#1}\xLcs{#1}}
\newcommand{\xLcs}[1]{\index{#1@\ttfamily\protect\idxbs#1}}
\newcommand{\nxLcs}[1]{\mbox{\normalfont\ttfamily\bs#1}}
```

`\Lmcs` makes a main index entry for places where one defines or really talks about a command.

```
\newcommand{\Lmcs}[1]{\mbox{\normalfont\ttfamily\bs#1}\xLmcs{#1}}
\newcommand{\xLmcs}[1]{\index{#1@\ttfamily\protect\idxbs"#1|idxbf}}
```

The `\Lcsextra` command is for producing a subentry for a command name.

```
\newcommand{\Lcsextra}[1]{\mbox{\normalfont\ttfamily\bs#1}\xLcsextra{#1}}
\newcommand{\xLcsextra}[2]{\index{#1@\ttfamily\protect\idxbs#1}!#2}}
\newcommand{\Lmcsextra}[1]{\mbox{\normalfont\ttfamily\bs#1}\xLmcsextra{#1}}
\newcommand{\xLmcsextra}[2]{\index{#1@\ttfamily\protect\idxbs#1}!#2|idxbf}}
```

For flagging a range of pages covered by a definition, we use the ‘rangef’ (start of range), and ‘ranger’ (end of range) construct.

```
\newcommand{\xLcsextrarangef}[2]{\index{#1@\ttfamily\protect\idxbs"#1}!#2|({}}
\newcommand{\xLcsextraranger}[2]{\index{#1@\ttfamily\protect\idxbs"#1}!#2|)}}}
```

**Table 1:** Examples of generic tags used to reference command sequences

<i>Chapter</i>	2	3	4	5	6	7	8	9	10	11	12	13	14	A1
<i>Number of pages</i>	36	36	18	40	16	58	44	16	36	36	26	50	18	36
<code>\finallongpage</code>	0	3	1	0	3	10	4	2	3	0	4	9	7	4
<code>\finalshortpage</code>	0	5	4	4	0	2	10	0	0	8	6	0	0	2
<code>\finalforcedpage</code>	1	0	0	2	2	0	1	0	0	1	0	1	0	0
<i>Page length change</i>	1	8	5	6	5	12	15	2	3	9	10	10	7	6
<i>Average per page</i>	.03	.22	.29	.15	.33	.08	.34	.13	.08	.25	.38	.2	.39	.17
<code>\finalpagebreak</code>	4	5	2	4	3	7	12	1	0	6	4	5	3	6
<code>\finalnewpage</code>	0	1	0	0	0	0	0	0	0	0	0	1	0	0
<i>Page break change</i>	4	6	2	4	3	7	12	1	0	6	4	6	3	6
<i>Average per page</i>	.11	.17	.11	.1	.19	.12	.27	.06	0	.17	.15	.12	.17	.17
<code>\finalfixedskip</code>	4	3	4	11	0	8	2	2	0	14	6	10	7	3
<i>Average per page</i>	.11	.08	.22	.28	0	.14	.05	.13	0	.39	.23	.2	.38	.08
<i>Sum</i>	9	17	11	21	8	27	29	5	3	29	20	26	17	15
<i>Average per page</i>	.25	.47	.61	.53	.5	.47	.66	.31	.08	.81	.77	.52	.94	.42

**Table 2:** Manual work—some numbers (from [1])