Book Reviews

Review of: **TEX for the Beginner**

Victor Eijkhout

Wynter Snow, *TEX for the Beginner*. Addison-Wesley, 1992. xii + 377 pp. + index (23 pp.) ISBN 0-201-54799-6.

The spectrum of books about TEX has been broadened by another beginner's book about plain TEX: with *Introduction to TEX* (Norbert Schwarz; Addison-Wesley, 1990), *A Beginner's Book of TEX* (Raymond Seroul and Silvio Levy; Addison-Wesley, 1991) and *TEX by Example* (Arvind Borde; Academic Press, 1992) there is now *TEX for the Beginner* by Wynter Snow.

In contrast to the Seroul and Levy book, which is somewhat academic in style, this book has a very chatty style that is both its strong and its weak point. The author has a lively style of writing and uses rather unorthodox metaphors for TEX's behaviour (did you know that macros come in meat-and-potatoes and jelly-doughnut varieties?), which in general are quite illuminating.

For instance, the fact that lines are spaced at \baselineskip distance is described "as if TEX has a ruler exactly \baselineskip long that it uses to decide where the next shelf should go", which is a good way of putting it. Sometimes, however, too much American cultural background is needed. For instance, I think I understand what is meant by "back in grade school" (page 90), but I'm not sure what is meant by "a taffy-like substance" (page 97). Considering how international the TEX community is, this point is not without significance.

1   Structure of the book

TEX for the Beginner is divided in five parts. The first two parts are about the basics of using TEX. In particular the first part is very practically oriented: there are tips for people using word processors who dump their file in ascii mode, and there are instructions for people using the Macintosh implementation of TEX, *Textures*.

Part III is the longest and probably the most useful. Its sixteen chapters explain TEX commands and give macros for the most common things that you do in TEX. Part IV is about advanced topics such as boxes and rules, and it has a short chapter

about more theoretical aspects of TEX. Part V is about 'Bug Diagnosis' and has two appendices.

The book's index contains both the concepts and control sequences that were treated in the book itself, as well as the TEX primitives and plain TEX control sequences that have to be looked up in *The TEXbook*. The latter kind simply do not have page references. This makes sense: if you are trying to decode someone else's macros it tells you that something is a primitive or part of plain TEX (and you'll have to consult another book), and it can prevent you from redefining such commands.

Although the division in parts globally makes sense, on a detailed level the organization is somewhat messy. For instance, the chapter 'Adjusting awkward line breaks' is in part I among the basics, while 'Adjusting awkward page breaks' is in part IV with advanced topics. Also, the 'actor model', the author's metaphor for TEX's workings, is introduced in a chapter called 'Getting a printout'. While its place is logical in the course of the exposition, it makes for awkward referencing.

2   Who is this book meant for?

Among the books that aim to be for the beginning TEXer, this book presents the most basic information, including tidbits that are specific to certain computers. The discussion is clearly for people wanting to learn plain TEX, but there are so-called 'LATEX notes', which can function both to point the plain TEX user to corresponding concepts in LATEX, and to help the LATEX user make a transition to plain TEX. They are not enough to learn LATEX from. Too often they tell the reader that the whole of a chapter cannot be used in LATEX.

Another concept that will help the beginner is that the author identifies a few dozen bugs, which are clearly marked in the text, and referenced in the index. They have been given names with varying degrees of helpfulness, ranging from the 'Disappearing footnote bug' to the 'Cart before the horse bug'.

3   Level of complexity

Since this is a beginner's book, some topics are only touched on lightly. The author advises the reader to write lots of macros (and gives many examples) but real TEX programming is never done: the control sequences \edef and \expandafter don't appear in the book.

Similarly, there are chapters about headers and footers and about (stationary and floating) figures, but \output is not mentioned.

4 Layout

Unfortunately, I cannot say much positive about the looks of this book. The author uses a liberal amount of white space around examples and list items, the text has a ragged right margin, and the output of the examples is indented to a different margin than the input code. All together it swims before my eyes. In addition to changing from roman type to typewriter for the examples, the author uses Computer Modern Sans Serif type for the bugs and the LaTeX notes. This only adds to the confusion. The fact that headings are underlined with a page-wide rule makes the pages look only slightly more structured.

The back cover of this book appears to use the Computer Modern type, and it has plain TeX's extended spacing after punctuation, but strangely enough the TeX and LaTeX logos do not have any of their characteristic back kerning, and ligatures are missing. Let's say the front cover makes up for the back.

5 But are there jokes?

Snow has a lively imagination in coming up with novel analogies for TeX's workings, and that definitely makes this book amusing to read. And if the author has ever been teased about her name, she certainly hasn't suffered from it: the parts of the book have ski-oriented titles ('Onto the slopes', 'Down we go'), and the front cover shows lion cubs throwing snowballs and building a snow man in the likeness of the TeX lion.

6 Evaluation

TeX for the Beginner goes easy on the theory of TeX, and instead takes the reader by the hand, showing in a practical way how to get the work done. The explanations are enough to give a beginning TeX user a basic understanding, but are often not 100% accurate. For instance, the statement 'The primitives \csname and \endcsname take a string of characters and convert it into a control sequence' and its clarification in a footnote '\csname converts a token list into a control sequence' are both slightly off: in between \csname and \endcsname all tokens are expanded (so unexpandable tokens are not allowed) until only character tokens remain, then a control sequence is made out of these.

However, I haven't found any real errors in the book.

If the explanations can best be characterized as 'adequate', similarly the macros in part II get the user under way, but they are not complete. For instance, chapter 16, 'Obeying lines and spaces: verse and computer code' does not give macros for a true verbatim mode, so the computer code that can be handled is rather limited. (The examples are in the language Logo, and don't use special characters such as the caret, which appears in Pascal, or braces, which occur very often in C.)

More surprising, chapter 17 about headings never mentions \nobreak to prevent a page break between a heading and subsequent text. A \TitleSection example in the chapter about headers and footers does incorporate a \nobreak, however, without drawing attention to it.

In general, though, the examples cover a lot of territory, and they do so with a good explanation.

Snow introduces some non-standard terminology ('giving a reporter an input' instead of 'giving a parameter a value') which may make the transition to more advanced TeX literature harder for the reader. Since the terminology is used consistently I don't have too much of a problem with it.

In all, this book is a useful addition to the TeX library. It is well written and contains many practical examples. Readers who would like to learn TeX in a linear, incremental way, should definitely check out this book.

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***Review of*: TeX by Example: A Beginner's Guide**

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Arvind Borde, *TeX by Example: A Beginner's Guide*. San Diego: Academic Press, 1992. xiv + 169 pp. ISBN 0-12-117650-9. $19.95.

Arvind Borde's *TeX by Example: A Beginner's Guide* is very obviously a labor of love in introducing new users to the world of TeX — or the result of the frustration associated with having to repeatedly explain commonly-used formatting commands to one's colleagues. Since it is noted that the book

represents a significantly expanded version of the author's widely-distributed *An Absolute Beginner's Guide to Using TEX* (1987), either of these motivations is possible as a non-unique factor. The text utilizes a practical and visually appealing side-by-side layout, making Borde's book one of the most useful introductory primers on the market for virtually any language. Notably, most of this is achieved without the employment of extensive macros; however, where non-standard TEX or author-written macros are employed, it is liberally noted.

Does this place *TEX by Example* in the "introductory" class of TEX materials? Very decidedly so! However, readers should not make the mistake of placing this innovative text in the "introductory-only" class of TEX materials. Indeed, in the case of *TEX by Example* it is not wise to limit the readership even to a "TEX-only" audience as users of any derivative of TEX — LaTEX, AMS-TEX, REVTEX, eplain, ... — can benefit from the information and examples contained in it by reviewing the underlying command structure used in a "plain" TEX environment to generate various outputs. Since derivatives may or may not be fully compatible with all aspects of "plain" TEX, the examples may not be directly applicable, although the concepts certainly provide an acceptable template for extensions.

The real beauty of *TEX by Example* lies in its design. From the beginning of the text (p. vi) to the end (p. 91), each right-hand side (RHS) page is TEX output, covering properly-formatted topics from poetry, to philosophy, to physics, to mathematics, to the game of cricket, to just about anything else — even TEX.

Each facing left-hand side (LHS) page includes two very important components. First, the actual TEX input code which created the TEX output on the RHS facing page is provided verbatim. Therefore, a very quick reference tool is at the fingertips of the reader — if you see what you want the final output to look like on a RHS page, just look directly to the facing LHS page and the necessary TEX code to generate this output is immediately available. Second, the LHS input pages are marvelously documented in a series of footnotes which generally explain some of the differences available to users, as well as how the structure of the input can impact the ultimate output. If a topic has been covered previously, the reader is usually provided at least a hint where to look earlier in the text for its previous discussion.

Additionally, *TEX by Example* includes at least two other components of interest. First, following the text of the book (pp. 91–159) is a relatively comprehensive alphabetical Appendix, which serves as both an index of topics and a glossary of commands. It is fashioned very much after *The Permuted Index of TEX Commands*. Admittedly, this is not the best way to learn a language; however, many basic aspects of TEX are explained throughout this Appendix. Also, the Appendix serves as a good quick reference which can be used in concert with other manuals. The reader can easily look for a topic, such as "equation numbers" and be pointed to examples from within the text, as well as related commands. Alternately, the reader can just as easily look for a TEX command, such as "\medbreak", and find an explanation of that command's use. A very important dimension of the glossary of commands is the clear identification of TEX primitives, as compared to TEX composite commands or command macros utilized directly in the production of the book.

Second, Borde has been generous enough to include virtually all of his macros used in *TEX by Example* for use by the reader and public at large. The major command macros are referenced on page 136 of the Appendix, which points the user to their use and first appearance in the text. One of the most intriguing commands defined by Borde is \fermat. This command tackles Pierre Fermat's generally accepted "theorem", making necessary calculations, then reporting the result. The insights from this reveal TEX's usually-undiscussed capability as a programming language.

The book ends with its Epilogue. The Epilogue includes the major layout commands used by Borde in his creation. The complete macros used in the text appear here. Readers can easily copy them for their own use, selectively use them as templates for their own macro sets, or merely refer to them for some of the tricks Borde employs (such as the side-by-side layout with accompanying notes). If the reader doesn't wish to type in the text of these macros, they have been made available from most major TEX-related archives for electronic mail retrieval or access through anonymous ftp, or, in the absence of an electronic link, the files are available on diskette.

In summary, users at all levels of TEX-related processing languages ought to have this innovative guide handy. While covering a wide array of topics, the general tone of the text is very reader friendly, which allows it to serve as a remarkable beginner's guide, per its title. However, its comprehensive overview of usage, meaning, and structure is invaluable to users at all levels, making it a

very powerful reference guide to complement the standard manuals for your favorite flavor of TeX.

References

Arvind Borde, *An Absolute Beginner's Guide to Using TeX*, informal report (prepared for the Syracuse University Relativity Group), 1987.

Bill Cheswick, *A Permuted Index for TeX and LaTeX*, Providence, TeX Users Group, *TeXniques*, No. 14, 1991.

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Review of: **Desktop Publishing in Astronomy & Space Sciences**

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André Heck, ed., *Desktop Publishing in Astronomy & Space Sciences*. Singapore: World Publishing Co. Pte. Ltd., 1992. ISBN 981-02-0915-0.

These are the proceedings of a conference held on 1–3 October 1991 at the Astronomical Observatory, Strasbourg, France. This meeting was organized by André Heck, who edited the proceedings. The book was produced in record time: I am writing this review in September 1992.*

The authors of the individual articles prepared them in camera-ready form, most of them using TeX or LaTeX. However, I am afraid that the resulting product is not a publishing work of beauty. The instructions to the authors were to prepare a manuscript at 12 points with a baselineskip of 14 points, and I presume that the hsize was 6.5 inches and the vsize was 9 inches. But as published the hsize was 4.6 inches and the vsize was 6.5 inches. With this reduction I had to use a magnifying glass to read some of the abstracts, which were prepared at less than 12 points, and if the original text was

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* Editor's note: The review copy was received at the TUG office in June 1992.

less than 12 points I usually had to use a magnifying glass for that too. There is a name index but no subject index. Despite these problems this book is well worth the attention of TeX devotees.

The articles on TeX and LaTeX will contain no real surprises for readers of TUGboat, as they could have appeared in the proceedings of the TUG annual meeting for 1991 which was devoted to publishing. The leading journals in astronomy and astrophysics are now encouraging manuscript submission in TeX or LaTeX. For me the fun part of the book was in reading what those who do not use TeX had to say. Some of the time it was clearly due to ignorance. For example, J. O. Breen gave a talk which was an undiluted advertisement for the Apple Macintosh and the wonderful software that can run on it, including this gem: "equation editors such as Prescience's Expressionist and Design Science's MathType, create typeset equations to be pasted into scientific and technical papers." Mr. Breen is not an editor, nor is he a publishing astrophysicist as far as I can discover.

Mr. Breen prefers to create manuscripts using WordPerfect 5.1, as do a couple of other contributors, and output examples of this word processor are on display. TeX users can justifiably feel smug and optionally can wear a condescending sneer. WP 5.1 has terrible internal spacing in its equations and displays extremely loose lines, showing far too much white space. The other non-TeX contributors do not identify their output programs, but their contributions give good illustrations of why desktop publishing acquired a bad name in its early stages.

There was a significant amount of discussion about how the software should evolve. There was clearly a desire on the part of some people that a wider selection of fonts should be readily available with TeX. For example, publishers frequently would like to use Times Roman; at least one of them converts to Times after receiving a compuscript in Computer Modern, but others are clearly prepared to use Computer Modern. I was surprised to find essentially no discussion of scalable fonts; for some time now I have been using such fonts in conjunction with Vector TeX from MicroPress, and I don't know how I ever got along without them previously. People would like to have better graphics facilities to use with TeX, either as a language facility incorporated into TeX, or a more convenient way to merge PostScript into a TeX file.

There is a general expectation in the astronomical community that on-line electronic publishing will have a rapid growth in the near future. Editors clearly intend to subject papers for electronic

publication to a standard refereeing process. But what format should such papers have? Since people will want to be able to print copies of particular papers, formatting in TeX becomes a leading possibility. Such papers could then be passed through a standard TeXing process and printed, or they could be read after processing through a TeX screen previewer. However, there was additional discussion about how one could create electronic archives consisting of large data bases of electronic papers. Would TeX help in the archiving and accessing processes?

It has been very interesting to read a book about desktop publishing in which TeX is the leading contender, rather than being out of sight among the packages that allow you to produce fancy newsletters. But the growth of desktop publishing software packages has been so rapid that it is clear that TeX must make good use of the new emerging technologies if it is to maintain its leading position among astronomers and other scientific users. Despite its faults of presentation, the book is recommended.

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Typesetting on PCs

TeX-386 implementations for IBM PCs: Comparative timings

Erich Neuwirth

Timing tests were performed on several implementations of TeX for IBM PCs (and compatibles). All currently available 386-specific implementations were tested. Additionally the latest available versions of emTeX for other processor classes were tested. Since the last published benchmarks used sbTeX in the 8086 version as the standard the latest version of this implementation was also included for reference purposes. PCTeX as the most widely used commercial implementation of TeX for PCs was used in its 8086 flavor for the same reason.

These were the tested versions:

SBTeX 3.8
emTeX 3.0 [3a]
emTeX286 3.0 [3a]
bigemTeX 3.0 [3a]
bigemTeX286 3.0 [3a]
PCTeX 3.14
emTeX386 (beta8)
TeXas 1.0
PCTeX386 3.14
BigPCTeX386 3.14

The files used for testing were the same as in the previously published series of benchmarks:

- Text1 is *The TeXbook*.* It is 494 pages long.
- Text2 is a mathematical paper which needs LaTeX and PiCTeX, so it really uses lots of memory. The document is 11 pages long.
- Text3 is a book of solutions for a college mathematics textbook. It consists almost completely of formulas and there is almost no text. It is among the most complicated TeX files I have ever seen. It uses LaTeX and additionally the msxm and msym fonts from (old) AMS-TeX. The document is 40 pages long.
- Text4 is the demo file for MusicTeX, which is a rather large macro package for typesetting music. The document is 2 pages long.
- Text5 is Michael Wichura's original paper from *TUGboat* 9, no. 2, describing PiCTeX. It makes extensive use of PiCTeX macros and also uses rather large data sets for the graphics. Additionally it uses the *TUGboat* macro files (in a stripped down version). The document is 10 (narrower than a page) columns long.
- Text6 is Barbara Beeton's review and the Boston Computer Society mathematical text processor benchmark from *TUGboat* 6, no. 3. It (naturally) contains complicated formulas and uses the *TUGboat* style. The document is 4 pages long.

Table 1 shows the times associated with the tests.

The following special events occurred during the benchmark:

(1) capacity exceeded, program stopped.
(2) Michael Wichura's PiCTeX article could only be run in one column mode with non-386 versions of TeX having standard TeX memory.

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* The file for *The TeXbook* used with permission of the American Mathematical Society.