Book Reviews

Review of: Modern TEX and Its Applications

Jon Radel

Michael Vulis, *Modern TEX and Its Applications*. CRC Press, 1993. vii + 294 pp. + floppy disk ISBN 0-8493-4431-X.

This work is a departure from the current stream of books on TEX in several ways, the most important being that it documents VTEX, which the author himself refers to as a heresy, rather than TEX — more about this later. The author also claims that this book is aimed at the uncovered middle ground between the guides for the utter beginners and the reference works for the TEX professional, a tricky position to attain and not really as uncovered as Michael Vulis claims. And while I did find a total of three TEX books published in the U.S. since 1984 which do not mention the TEX Users Group on my shelf, this appears to be the only one that references *TUGboat* articles repeatedly while not mentioning TUG once.[1]

1 For the Technically Oriented Beginner

The bulk of this book is a quietly unassuming, but very practical, guide to how to use Plain TEX, with ample material on the extensions of VTEX. I think the sequence of the book would be most appealing to a user with a background in microcomputer based wordprocessing software, no background in TEX, little interest in the clever transfer of traditional typesetting technology to the idiom of TEX's internals, and enough technical orientation to move quickly through this material. It tells the reader how to set margins and pick fonts long before it mentions glue, box variables or tokens, and the reader is supplied ample practical examples but very little information about TEX's insides.

After the introductory chapter covers basics: `\input`, `\bye`, why one doesn't use a wordprocessor that puts control characters in the file for TEX input, and enough other information to allow the user to TEX his first file, the book moves on to a chapter on "Fonts and Characters". It is here that the differences between TEX and VTEX become very apparent. The primary extension in VTEX is its support for scalable, vector fonts in both VTEX itself and the matching drivers. This allows for such commands as `\font\myfont=mvpalr scaled 1200 aspect 600 bold 04 slant 500`. After this `\myfont` would refer to a nice looking serif font made hideous by scaling to 12 points, squashing down to 60% of its original height, making slightly bolder, and slanting 22 degrees to the right. While this example I have concocted is rather useless, the point is made that given a couple of vector files, which are already smaller than the `.PK` files of standard TEX, the user can create slanted characters, bold characters, small capitals, etc., on the fly without any additional disk space being used for font storage. This feature alone has won over at least one TEX user with a laptop [1].

Unfortunately, in this chapter the author's biases get in the way of reporting the current state of affairs for users of TEX, as opposed to VTEX. For example, while Computer Modern Roman has become the face that many love to hate, the author's dismissal of it, with "Of the three [primary text fonts in the CM family], Roman is a fairly weak clone of the Century SchoolBook," took me by surprise coming after one of the better two page histories of typefaces that I've read. It is true, I suppose, that the target audience for this book isn't interested in the full history behind Donald Knuth's choice of Monotype Modern No. 8A, but the author's assertion is a rather abrupt one sentence history of the font.

One could get the impression from this chapter that all TEXs other than VTEX have been standing still for some time. When making his arguments about vector fonts saving significant disk space, he gives the outmoded `.PXL` files slightly more prominent billing than the more compact `.PK` files that all of VTEX's competitors have been using for years. He also mentions the Almost Computer Modern (AM) alongside the Computer Modern (CM) fonts without any explanation of the distinction or of the fact that AM fonts were replaced by the CM fonts over half a decade ago. Virtual fonts, not too surprisingly, get no coverage at all.

Luckily, things pick up again as the book covers topics where VTEX differs little from TEX. Chapter 3 covers "Formatting", with coverage of headers and footers, skips, how paragraphs and pages are set, footnotes, and how to deal with the various problems surrounding these. In keeping with the goal of the book, there is plenty of practical advice on how to deal with issues such as under and overfull boxes, without an excess of technical detail. The same is true of Chapter 4, which covers "Math

[1] Since insufficient bibliographic information is given on all other works referenced, this isn't really a snub — just sloppy.

Mode" with a large number of examples and a few details, such as why one should not reassign fonts to math font families 2 and 3 without great care.

By Chapter 5, "Variables, Dimensions, Glue", the coverage necessarily gets somewhat more complex and technically oriented. It, Chapter 6, "Macros", Chapter 7, "Input/Output and Extensions", Chapter 8, "Modes, Rules, Boxes", and Chapter 9, "Tabulation and Tables", give a through coverage of everything needed to do basic macro writing and layout tasks under Plain TeX. There is, however, insufficient information for the user to write his own complex formats. For example, `\shipout` and `\output` are covered in about a page. The reader is left with the knowledge of roughly what they do, that `\output` is what you revise if you want double-column output, but no knowledge at all of how to go about such revisions.

The last chapter, "Font Rotation", is a bit of an oddball. It starts with an abridged version of Alan Hoenig's *TUGboat* article on the topic [2], followed by an explanation of how this is better done under VTeX. I was left a little confused as to the point; while this is terribly clever and interesting, I'm not sure how many people will find it of use. Personally, I would have found an expansion of the section on Cyrillic fonts, to one with general coverage of setting non-English texts, to be of greater practical use than 10 pages on how to typeset on circles. On the other hand, those who are switching from a wordprocessor to TeX might indeed be interested in such effects.

The penultimate chapter is an appendix, with the font tables requisite to any TeX manual, though this one features the VTeX fonts prominently, a bit of information on graphics inclusion, most of the macros which are supplied with VTeX as an extension to Plain, and a two page guide to the enclosed demo version of VTeX. The book closes with chapter 12, "Index". Unfortunately, it's incomplete, missing completely such commands as `\aliasfont`, one of the more important additions in VTeX.

2 Problems

There are two problems that keep me from recommending *Modern TeX* freely as a good working manual for technically oriented TeX users who have no intention of writing their own complex suites of macros, or of using LaTeX or other existing packages that go beyond Plain. The first is that the coverage of VTeX specific features is firmly entangled with that of features available in TeX also. Not only are the fonts more flexible under VTeX, but there are a variety of primitives, such as `\random`, which returns a random number, `\sincos`, which calculates a sine and cosine of an angle, and macros that extend those in `plain.tex`—though these the user can find in the appendix or on the included disk. While these extensions are not necessary, as most TeX users prove on a regular basis, it would be frustrating to work with a manual containing intriguing examples you couldn't use. Naturally, this isn't a problem if you use VTeX. Given that, the demo software, and the $100 off coupon for a VTeX system included in my copy, I'm sure that this book will serve as persuasive marketing for VTeX.

The second problem, unfortunately, affects all readers. While I found little that I could point at and say, "That is completely wrong" (but see below), the book is riddled with a variety of inconsistencies and imprecisions. For example, Computer Modern Typewriter is referred to in various places as "TeleType", "teletype" and "typewriter" without an explanation or pattern that I can discern. While that one is unlikely to confuse the average user, others, such as the statement on page 31 that the name of a font "may only contain characters and not digits or other non-characters" stand a good chance of confusing any reader who doesn't quickly realize that "letters" is meant in place of "characters" here, while the terms are used in the usual fashion elsewhere in the book.

There are also some explanations that could be more precise without necessarily being made more complex. For example, page 12 has an explanation of the escape character that includes the following text: "Built-in command names (as opposed to user-defined ones) must be blocks of letters without embedded punctuation marks or spaces (`\centerline`, not `\center line`, for example), or they must consist solely of non-letter symbols (`\!` or `\$`, for example)." While wonderful things can be done if you start changing category codes, under normal circumstances I am doubtful about leaving the beginning user with the impression that he can embed spaces in control sequences he defines, or use multiple non-code 11 (non-letter) characters. Removing the distinction between "built-in" and "user-defined" commands, and appropriate application of the word "single" would give something I consider of greater utility to the beginner. On the other hand, maybe the author is simply confused on the distinctions between control symbols and control words, as on the next page he states, "spaces after a command are ignored." This is followed by an example: "Similarly, '`\$␣5`' is equivalent to '`\$5`'. You should type '`\$\␣5`' to obtain [a dollar sign and '5' separated by a space]." Even in VTEX the first part of this example is not true.

It is also unfortunate that the generally well thought out examples — they are both amusing without being overbearingly cute and generally economical in the number of TEX features they showcase per example — are marred by errors. Some are silly and more likely to amuse than confuse (did you know that if you supply VTEX with "A Quick Brown Fox Jumps", it will typeset "The Quick Brown Fox Jumps"?). Others will cause the new user, already struggling with the concept of ligatures and the fact that real typesetters think opening and closing quotes are different, no end of confusion. The monospaced text, which purports to be a representation of the user's input, reduces various multi-character input sequences to a single monospaced character. On page 45, after explaining how to input hyphens, dashes, and quotes, an example is given that uses all of them. Until I looked at the output, I couldn't tell which was supposed to be an en-dash and which an em-dash, though the hyphen is a bit shorter. Any reinforcement of the notion of typing one, two, or three hyphens is lost.

Another class of comments by the author that I find a bit troubling is where he sells non-VTEX TEX short by making dubious claims about what it can't do. They range from his comment that the lack of a dollar sign is "a layout bug in some of the Computer Modern fonts," something I would not consider a bug but rather a design decision that was, in hindsight now that we have 256 character fonts, less than perfect (my computer science background may leave me too sensitive to the distinction between design shortcomings and implementation bugs) to far more serious ones. After discussing how to get upright quotes, German low quotes, and guillemets in VTEX, stating "Under standard TEX, none of these characters is available" would, in my opinion, leave the reader with the impression not, as is the case, that such characters are non-trivial to make use of in Plain TEX, but that if you aren't using VTEX, you can't use them at all.

Of course, a very close reading will uncover the ironic combination of several of the above tendencies: After insinuating that a degree symbol is available only in VTEX, by listing it on page 47, in a section headed "The following additional symbols are supported by VTEX," an example on page 89 contains `$91^\circ$` rather than the VTEX equivalent, `91\D`.

3 The Demonstration Software

The book comes with a single floppy (5 1/4″ high density, though 3 1/2″ is available on request) containing a demonstration version of VTEX. A few of the pieces that come with the full program are missing, such as the integrated editor, FAX output support, and some of the fonts. Upon use you quickly notice a 72 point "DEMO" in the middle of every page. Despite this, the software includes ample capability to experiment with VTEX, and includes printer support of LaserJet, DeskJet, PostScript, BubbleJet and Epson dot matrix printers. Quite frankly, if it weren't for that "DEMO", I would have written today's batch of outgoing letters using VTEX, as some of the supplied fonts are a nice change from Computer Modern.

Unfortunately, it is not possible to tell from the supplied information whether some of the problems I had (such as installing LATEX under VTEX) were artifacts of the demo software, or are also present under the full VTEX. Presumably, there exists a utility for adding new `.TFM` files to the library of such files that VTEX uses, as I could not get the demo version to recognize the individual `.TFM` files for the LATEX fonts.

4 The Heresy of VTEX

It is with some trepidation that I bring this up at all, as some of the discussion on this topic has gotten heated, for example during the question period after Michael Vulis presented his paper at the 1990 TUG conference [3]. On the other hand, he is not shy about it in this book:

> The second heresy was the support of modern scalable font technology in VTEX, the MicroPress' implementation of TEX. VTEX enhances TEX in several ways; being the leading deviant dialect, it receives very substantial attention in this volume, since if TEX is going anywhere, it is all but certain that this is the direction it will take.

No mention is made of another "heresy" of growing popularity, TEX–XET, which allows for bidirectional typesetting. He gives further thoughts on the matter of keeping TEX alive by extending it in a later paper [4], and the material in both of these papers is presented in *Modern TEX*. In some ways the extensions of VTEX are quite superficial: scalable font technology and a few handy primitives that neither are vital nor impact the fundamental workings of TeX. In contrast, some of the underlying assumptions and limitations of TeX are being challenged in papers, such as that presented by Philip Taylor at Euro-TeX '92 [5], and discussions on the NTS-L e-mail discussion list. True, VTeX is a shipping product, and the New Typesetting System (NTS) is not even close to that stage, but the vision of TeX's future offered by VTeX is a limited one.

References

[1] A.G.W. Cameron, "The Airplane Workstation." *Personal Workstation* 2(6):14–17 (June 1990).

[2] Alan Hoenig, "Circular Reasoning: Typesetting on a Circle, and Related Issues." *TUGboat* 11(2):183–190 (June 1990).

[3] Michael Vulis, "VTeX Enhancements to the TeX Language." *TUGboat* 11(3):429–434 (September 1990).

[4] Michael Vulis, "Should TeX be Extended?" *TUGboat* 12(3):442–447 (September 1991).

[5] Philip Taylor, "The Future of TeX." *TUGboat* 13(4):433–442 (December 1992).

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Review of: Mathematical TeX by Example

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Arvind Borde, *Mathematical TeX by Example*. Academic Press, 1993; $19.95 (U.S.); ISBN 0-12-117645-2; 356 pp; not quite as deep as Crown 4to.

In *Mathematical TeX by Example*, Arvind Borde continues in the mould which he pioneered in his earlier work *TeX by Example* [1] — a style which eschews the discursive didactic approach and, with the absolute minimum of introduction, brings the reader face-to-face with real TeX code, presenting on the facing page the typeset material which results from the use of this code. The code is not simply presented as a *fait accompli*, but is accompanied by copious notes (set as footnotes) which explain the significance of each of the TeX commands used, and which give a general commentary on the purpose and implications of the code. The advantages of this approach are obvious: the reader is not bemused by meandering discussions about topics which are as yet merely vague concepts, but is instead presented with real-life instances of TeX code and, at the same time, shewn the typographic effects which this code accomplishes. Arvind prepares the reader for the eponomyous Examples with a mere 13 pages of introduction (14, if the preface is included) and then plunges into his subject with vigour, presenting as a first instance of his method the code and text which generate the facing page, which itself forms the introduction to Example 1. The code used in this first instance is both simple and powerful: much is achieved simply by \inputting two files, and more is achieved by assignments to (what are presumably) token-list registers and count registers. Sadly, at this point, it becomes only too clear that the material has not been proof-read by a TeX expert: two glaring errors leap out from the very first page of code, and the aware reader is led to believe that the book *may* not turn out to be all that it is cracked up to be. The errors which so readily manifest themselves are not critical — one, indeed, is simply that the comment on line 2 is apparently an echo of that on line 1, rather than being the correct comment for the second line, whilst the other occurs in the footnotes, where \EndPage at line 26 is said to be '*an abbreviation for \hfil\break*' (one suspects that it is really an abbreviation for \vfil\eject). But

[1] *TeX by Example*: Borde, Arvind; 1992. Published by Academic Press at £13-00 (U.K.), $19-95 (U.S.); ISBN 0-12-117650-9; 178 pp; not quite as deep as Demi 4to.

another, more serious, infelicity dogs this very first page — lack of consistency, in the use of three different variants of the assignment statement: with a `<becomes>` operator, with a `<space>`, and with neither (lines 5, 30 & 32 respectively). This I regard as a serious error in any pedadogic work, but particularly in one which seeks to teach by example; for not only is the reader led to believe that no one form is preferable to the others, but, more seriously, doubt is raised in the percipient reader's mind as to exactly *why* the different forms are being used and what subtle distinction is being made (only much later, when the reader is already TeXnically literate, will he or she come to realise that these different forms merely represent an inexcusable example of what Fowler would term '*elegant variation*').

On turning the page, we are presented with a fairly daunting demonstration of mathematical TeX and, on the facing (*recto*) page, the resulting (and somewhat less daunting) page of mathematics. To be fair, the mathematical TeX is, upon closer inspection, not particularly advanced, and indeed probably represents about as gentle an introduction to mathematical TeX as might be reasonably expected in a work of this nature; we are introduced to in-line and displayed mathematics, subscripts and superscripts, the prime as implicit superscript, equation numbers, mathematical Greek, square roots and a bordered Hessian matrix. No attempt is made to factor out common elements at this stage, and the markup adopted is strictly functional. Again there are subtle inconsistencies: for example, a footnote refers to '*`vol.\ 28, pp. 68--96`*', with a control space after `vol.` but a normal space after `pp.`; thus `vol.` takes its correct, normal, space, whilst `pp.` takes a totally unjustifiable end-of-sentence space. Finally on this page, we note that in the footnote, '*Crelle's Journal*' is letter-spaced by hand, with an explicit `\thinspace` (abbreviated to `\:`) between each pair of letters; this is consistent with the functional markup being used at this stage, but nowhere, so far as can be determined from the index, does the author develop a more general `\letterspace` command.

The next page introduces `\displaylines`, yet, remarkably, neither is it used to produce multi-line displays nor is its use justified in the footnotes in any way; the reason for its use at this stage remains somewhat obscure.

By the fourth page of code, macro definitions are introduced (by example, of course); one to place a bar at a constant height over its parameter, one to use this bar in a frequently recurring expression, and a third to produce what might best be described as a bird's foot, by overstriking a `<less-than>` and a `<minus>` (doubtless mathematicians will rush to tell me the correct name for this symbol!). Here, too, the first hint of sophistication appears, with the bird's foot being defined as a `\mathrel` operator, to automatically achieve the most appropriate spacing.

Thereafter, each new page introduces new (and usually more sophisticated) techniques, whilst the markup moves from being purely functional to increasingly descriptive, high-level and content-oriented (which, interestingly, also models the development of the typical (better) TeX practitioner). I suspect that the mathematics becomes increasingly complex to match the increase in sophistication of the markup, but as a non-mathematician I am not in a position to judge the truth of this assertion.

Example 7 marks a significant watershed in the development of the book: whilst all previous examples have been in set in Computer Modern, Example 7 introduces for the first time the possibility of typesetting in other fonts, being set in Computer Concrete with mathematics in AMS Euler. Example 8 continues this trend by being set in Times Roman and MathTime, whilst Example 9 is set in Lucida Bright and LucidaNewMath. Example 10 continues the exploration of new territory by demonstrating the possibility of in-line PostScript graphics and the inclusion of PostScript files. Examples 11 and 12 demonstrate an alternative approach to graphics, using Michael Wichura's PICTeX. Example 13 demonstrates the use of the LaTeX picture environment within the medium of Plain TeX, and also gives samples of Piet Tutelaers' chess font. This concludes the diversion into graphics.

Example 14 marks the second watershed in the book, by considering for the first time formats other than Plain TeX, and in particular considers AMS-TeX. Examples 17 and 18 demonstrate some of the possibilities of LAMS-TeX, and conclude Chapter 2 of the book (Chapter 1 was the Introduction; Chapter 2 is composed solely of the Examples from which the book takes its name).

Chapter 3 summarises the features of AMS-TeX, and compares and contrasts these with those of Plain TeX; Chapter 4 performs a similar function (although in less detail) for LAMS-TeX and AMS-LaTeX. Chapter 5 is devoted solely to a discussion of fonts, including Computer Modern, PostScript, American Mathematical Society (Euler and maths), Computer Concrete, LaTeX symbol, and the 256-character DC/EC fonts, as well as the little-exploited but very powerful virtual font mechanism.

Chapter 6 returns to the main theme of the book by documenting, in detail, the TEXniques which were used to typeset the book; in particular, the method by which the 'page-within-a-page' format was implemented, and all the 'assumed' macros which were used to simplify and rationalise the markup. Here may be found, for example, the true definition of `\EndPage` (which turns out to be `\vfil\eject` as suggested above, rather than `\hfil\break` as claimed within the text); here too may be resolved any other contradictions which may have originated from an occasionally careless footnote. The code is excellently laid out using natural indentation wherever possible, and frequently (although not invariably) with vertical alignment of `\if`, `\else` and `\fi` (a technique which many other authors would do well to consider). If I were to offer any criticism of the layout of the code, it would be to suggest that the 'left-hand side' of a macro definition (`\def`, the control sequence or active character, and the parameter list) is worthy of a line in its own right whenever the replacement text of the macro runs to two or more lines; to concatenate it with the first line of the replacement text reduces the legibility of both. I might also suggest that open and close braces spanning several lines of code are worthy of the same high standards of alignment which are afforded to the `\if`, `\else`, `\fi` referred to above: it is never easy to find closing braces when they are both horizontally and vertically displaced from the open braces which they match. Considering the code itself, as opposed to the manner in which it is presented, it is what might be termed true plain TEX: refreshingly free of commercial-ats (except where they are essential), no obvious obsession with `\expandafter` and its friends, and a level of sophistication which should not be beyond the ambit of any potential reader — familiarity with TEX up to the level of `\mark` and its cohorts is all that is required. The same criticism of inconsistency of representation as was made of the main text is equally applicable here, however, and amongst the more perplexing features are the author's occasional tendency to leave one space between a control word and a following close brace; under normal circumstances this is perfectly OK, but one wonders why the author felt it necessary — only in code considerably more sophisticated than that presented here might such a space become truly essential. More seriously, the frequent use of two or more instances of the same explicit numeric, dimension or glue literal would suggest to the less-aware student of this book that it is safe to ignore what is generally regarded as a fundamental precept of good programming style: if a constant is to be used more than once, it warrants being given a *name*, both so that the reader can be certain that it is the *same* constant being referred to, and to protect the author from accidental changes to one instance of the constant not being reflected in all others.

The penultimate section of the book is a comprehensive bibliography, in which one is not surprised to find Knuth's entries composing 42% of the total; the majority of the other authors cited are recognised authorities in their own fields.

The final section is simply entitled '*Glossary/ Index*', and one might be forgiven for initially affording it little interest. And yet, in the opinion of this reviewer, this chapter represents one of the greatest strengths of the whole book, for in its modestly-titled pages all relevant TEX primitives, Plain TEX and AMS-TEX commands, as well as those developed specifically for this book, are discussed and/or defined. Knuth's asterisk convention for denoting TEX primitives is followed, and AMS-TEX commands are tagged with a small AMS. In essence, it is a mini TEX dictionary/encyclopædia, and contains a wealth of invaluable information (with the occasional error) in its 110 pages.

A comparison of *Mathematical TEX by Example* with its earlier stablemate *TEX by Example* (of which I received a complimentary copy by courtesy of the author) yields some interesting comparisons: Arvind has clearly learned by experience, and in his second work avoids many of the slightly amateurish touches which marred *TEX by Example.* Gone, for instance, is the double spacing which created such a bad impression in much of the earlier work, and the overall trim size is reduced from (slightly less than) Demi 4to. to (slightly less than) Crown 4to., leading to a much more manageable volume. The dropped caps, too, presented in a quasi-illuminated manner, add a pleasing touch of class.

In assessing the overall merit of a book such as this, one must consider various parameters: the intended audience, the value to such an audience, the accuracy and precision of the text, the relevance of the examples, and to a lesser extent, the degree to which the book overlaps others in its field and outshines (or is outshone by) them. For *Mathematical TEX by Example*, the intended audience is clear: practicing mathematicians and mathematical secretarial staff who are, in the words of the author, '*already broadly familiar with the basic uses of TEX [and who seek an introduction to] additional tools and techniques — mainly related to typesetting mathematics*'. There is little doubt that such an audience will derive great benefit from this book — it covers a wide range of mathematical typesetting problems, and gives not just a description of the TEXniques which might be used to solve them, but instances of the actual code; in that sense it is, therefore, a recipe book, and accordingly it possesses both the strengths and the weaknesses which typify books of that *genre*. If the problem requiring a solution is covered in the book (i.e. if its recipe is given), then the problem is completely solved; but if the problem is *not* covered (i.e. if no such recipe can be found), then the reader is left little wiser. Fortunately, by virtue of the very comprehensive Glossary/Index with which this book concludes, this deficiency of the recipe-book approach is mitigated, for even if the exact problem is nowhere discussed within the Examples, there is an excellent chance that the elements of the problem are at least alluded to in the Glossary/Index. Yet this approach, too, has its limitations: for example, the text on pages 16/17 reads '*may be written with the aid of a bordered Hessian, as follows:*', but if one turns to the Glossary/Index, knowing full well that one needs to typeset a '*bordered Hessian*', no such entry exists. One is led round the houses, via `\bordermatrix` (which yields a dead-end, at least in the context of this enquiry), via `matrices` (Plain TEX), to `$\matrix$` (Plain) which finally yields the relevant page number (amongst many others). The Glossary/Index could therefore be improved (in the opinion of this reviewer) by containing key phrases which identify specific instances amongst the examples. In terms of accuracy and precision, the text is less than perfect, but is not so severely flawed as to render it useless; I recommend to Arvind that he employ a TEXnically literate proof-reader for any future volume, for whilst his approach is excellent, the inconsistencies and occasional real errors which populate this book do tend to detract from its value. Finally, in terms of the competition, *Mathematical TEX by Example* has one great advantage: it (and its stablemate, *TEX by Example*) are unique in their approach (at least, as far as I am aware; I have encountered no other TEX books which seek to educate solely through example); for those, then, who prefer to learn by osmosis rather than through orismology, this book is to be recommended, although perfectionists might do well to wait for a second edition, in which one hopes the errors and inconsistencies will have been eliminated.

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Macros

The Bag of Tricks

Victor Eijkhout

A 144 point Hello! to you all.

On `comp.text.tex` I see with some regularity questions about actions on a whole page. For instance, how to put a box around a page, or how to overlay a piece of text on each page. Here is a solution based on redefinition of `\shipout`. Doing things this way has the advantage that it does not depend on the format used.

If you have more than one application like this, you could for instance put the following macros in a file `wholepage.tex`:

```
\let\xshipout\shipout
\def\shipout{\futurelet\SomeBox\yshipout}
\def\yshipout
 {\ifx\SomeBox\box
    \let\next\ShipZero
  \else \ifx\SomeBox\copy
          \let\next\ShipZero
        \else
          \let\next\ShipAfterZero
  \fi\fi
  \afterassignment\next\setbox0=
  }
\def\ShipAfterZero{\aftergroup\ShipZero}
```

This saves the old `\shipout`, and defines a new one that first investigates what kind of box is coming up. This box is then put in `\box0`, and a call to `\ShipZero` processes this and really ships it out by a call `\xshipout\box0`.

For every specific application a definition of `\ShipZero` has to be made. Here is a way to do overlays:

```
\newbox\OverlayBox
\def\ShipZero
 {\setbox0\vtop{\kern0pt \box0}
  \setbox0\vtop{\kern0pt
    \vtop to 0pt{\kern0pt
      \copy\OverlayBox\vss}
    \nointerlineskip \box0}
  \xshipout\box0 }
```

If you put these macros into a file `overlay.tex` followed by a line `\input wholepage`, then you can make an overlay by, for instance

```
\input overlay
\setbox\OverlayBox
  \hbox to \hsize{\hfil\tt TEST}
```