

Paradigms: Headache?

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1 BLUE's Design II

Hi folks. When using \LaTeX I was plagued in the past by the little glob of white space on the first line after a head. It made me clear that 'spaces are harmful,' to paraphrase Dijkstra. When designing blue.fmt I had to look at the problem again among others, and to

- provide a simple suite, with hardly no knowledge of the user assumed about parameter separators
- gobble redundant spaces as much as possible
- allow also processing on the fly of the title
- choose a coding style, and
- choose a 'markup language.'

My starting point was `\beginsection` *The T_EXbook*, p355. I chose head as root name conform to TUGboat.

2 Headers

I will design `\beginhead` and `\endhead`, next to the minimal markup variant `\head{...}`.¹

2.1 Design goals

From a typography point of view I would like to

- discourage to set the title alone at the end of a page
- typeset (flexible) vertical space (big) before and after (med) the title
- gobble spaces at the beginning of the title
- set the title in bold face (and the current size) unindented
- don't indent the first line of the text after.

2.2 What are the problems?

The markup language constructs have to be chosen. In macro expansion the two-part macro \TeX nique should be the basis. In blue's format I adopted the pairs `\begin<tag>` and `\end<tag>`.

In order to set the title loose from the context we have to determine values for the glue, and be sure that it disappears at the top of a page. The coding solution below has different values for the parameters as supplied in `\beginsection`. From experiments it turned out that the values supplied by Knuth don't give nice results with 'BLUE's Format.' Too much glue was inserted for my taste.

¹The subhead variants are similar but different in detail. Especially in undoing glue when heads follow-up each other without intervening text. Beware!

Another problem is to prevent the headtitle to be printed at the bottom of a page on its own. The latter is related to the 'widow-orphan' phenomenon.

The coding of the minimal markup variant without parsing but with processing on the fly of 'the argument' has to be resolved in some elegant way.

The idea of a `\pre<tag>` and `\post<tag>` is general. It parameterizes the placement of a document element within context. Important! Whether you talk about titles, displays, tables, graphs, or you name it. Perhaps this should be generalized in something like `\pasteup<tag>`.

```
\def\beginhead{\prehead\bgroup\headfont}
\def\endhead{\egroup\posthead}
%with auxiliaries
\def\prehead{\vskip0pt plus2ex
\penalty-250\vskip0pt plus1ex
\bigskip\noindent}
\def\posthead{\nobreak\medskip
\noindent\ignorespaces}
```

2.3 Take a deep breath

The minimal markup form, *with the same functionality*, reads

```
\def\head#{\beginhead\bgroup
\aftergroup\endhead
\afterassignment\ignorespaces
\let\dummy=}
```

Explanation. The # as last character of the parameter text makes that the opening brace and what follows is placed after the replacement text of `\head`, *The T_EXbook*, p204. The replacement text starts a group via `\bgroup` and reads away the opening brace. The latter \TeX nique has been borrowed from plain's `\footnote`, *The T_EXbook*, p.363, as used at the end of the replacement text of `\fo@t`. Spaces which precede the title are ignored via the invoke of `\ignorespaces` at the right time. Quite something isn't it?

2.4 Paradigm

We should build upon two-part macros. In order to add the short variant to *similar* two-part macros the following template can be used.

```
\def<tag>#{\begin<tag>\bgroup
\aftergroup\end<tag>
\afterassignment\ignorespaces
\let\dummy=}
```

2.5 Take a deeper breath

When using the above template in practice it occurred to me that \TeX could handle that too. For $\backslash\text{head}$ the desired functionality is that

```
\onepartmacro{head}
```

will build the macro $\backslash\text{head}$ based upon the two-part macros $\backslash\text{beginhead}$ and $\backslash\text{endhead}$.

The naive coding—which does not work, but makes the purpose quite clear—reads

```
\def\onepartmacro#1{\def\#1##{\begin#1
  \bgroup\aftergroup\end#1
  \afterassignment\ignorespaces
  \let\dummy=}}
```

Several desired functionalities have to be coded in \TeX 's peculiar way, with as result

```
\def\onepartmacro#1{{
\ea\let\csname begin#1\endcsname=0
\ea\let\csname end#1\endcsname=0
\toks0={\bgroup\aftergroup}
\toks1={\afterassignment\ignorespaces
  \let\dummy=}
\ea\xdef\csname#1\endcsname##{
  \csname begin#1\endcsname
  \the\toks0 \csname end#1\endcsname
  \the\toks1 }}}
```

Explanation. A lot of the trickery about partial expansion, *The \TeX book*, p.216, has been applied. First a $\backslash\text{csname}$ is used to compose the names from the root name. Second the one-part macro is defined via an $\backslash\text{xdef}$ with suppression of the expansion of the $\backslash\text{begin}\langle\text{name}\rangle$, $\backslash\text{end}\langle\text{name}\rangle$, and the other tags. It is an $\backslash\text{xdef}$ to keep the auxiliaries used local. The first is handled via the property that a control sequence equal to a character (in general an unexpandable control sequence) is not expanded. The second is handled by the property that a $\backslash\text{the}$ on a token list is a one-step expansion.

2.6 Some remarks

Note that I did not gobble spaces at the end of the title argument. In the headtitle they won't harm because the title is set on a line of its own.²

Processing a title on the fly is needed for verbatims and in general when we don't like the 'eyes' of \TeX to set catcodes differently from those the script expects when digested in the 'stomach.'

The bad news

is that minimal markup for $\backslash\text{head}$ and the like can be felt as an anachronism. With (L \AA) \TeX intelligent editors we don't need minimal markup anymore.

Disclaimer

The above template does not work for all two-part macros, for example not for verbatims and my btable .

²In the other heads the space at the end of the argument can be there on purpose. Watch out!

³blue.fmt is available from the CTAN, as is the accompanying article BLUE's Format.

The good news

is that via this mechanism we can abstract at the *user level* from token variables and definitions. The user can supply the information as if it was a token variable. The using of the long form or the minimal form has been reduced to a matter of taste. And that is a good thing.

3 Tests

This note itself contains examples of use in its original form.

```
\beginhead|Head text
      in verbatim|\endhead
Text after\|next line
```

```
\head{Head text, with |this|
      in verbatim}
Text after\|next line
```

with results

Head text in verbatim

Text after
next line

Head text, with this in verbatim

Text after
next line

Run it,³ and have fun. All the best.

4 Note added in proof

In order to allow for a blank line after the heading it is necessary to replace $\backslash\text{ignorespaces}$ by a more general command like $\backslash\text{ignorewhitespace}$ due to Phil Taylor, or TUG's $\backslash\text{ignorespacesandpars}$. A blank line after a heading is natural for a text without explicit markup. Knuth started from natural markup and stayed close to that, in MHO. His markup tags to format the chapter (titles) in the \TeX book file are

```
\beginchapter
\endchapter
```

that is, imagine ASCII text with visual layout and in order to markup the title *and text* insert the above commands, with the natural blank line already there to end the arguments of $\backslash\text{beginchapter}$. Knuth's $\backslash\text{beginchapter}$ not only takes care of the title but also handles the chapter contents on the fly until $\backslash\text{endchapter}$ is encountered. Really much different from L \AA \TeX 's approach to name but one general set of markup tags.

Knuth and natural markup.

Imagine that the ASCII text of a section reads

```
Section 1. Title
```

```
Now starts the section text
proper....
And this is the last line of it.
```

What is the simplest and most natural markup for this?

First the requirements

- Section should be flexible towards language variation
- Title should be processed on the fly

A solution is the following extension heavily inspired by `\beginchapter` of `manmac`

```
\def\beginsection#1 #2#3. {\bgroup
  \def\par{\egroup\the\posthead}%
  \beginhead#1 #2#3. }
\posthead{\nobreak\medskip
  \noindent\ignorewhitespace}
\let\endsection\relax% or forget about it
\def\ignorewhitespace{\begingroup
%Due to Phil Taylor EuroTeX 94
\catcode\ =9
\catcode\^^I=9
\catcode\^^L=9
\catcode\^^M=9
\futurelet\dummy\endgroup}
```

The marked up script is obtained by only inserting `\beginsection!!!`

```
\beginsection Section 1. Title
```

```
Now starts the section text
proper....
And this is the last line of it.
\endsection%for the purists
```

The beauty of the above approach, Knuth's IMHO, is that the total section is handled, the title as well as the contents part, with the title proper processed on the fly, and that it remains as close to natural markup as I can think of. Language problems are absent. One can abstract from 'Section' of course via a toks variable `\sectionname` for example. Automatic numbering can be inserted too, but the question is whether it is really handy, especially in view of subsections and the like.

Acknowledgements.

Phil Taylor is kindly acknowledged for his `\ignorewhitespace` as generalization of `\ignorespaces`, and his suggestion to assign `\relax` to tokens instead of the number 0 to inhibit expansion.