

BLUe's OTR for notes: back-to-the-roots

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abstract

The back-to-the-roots OTR for BLUe's notes is discussed. It consists of Plain TeX's OTR for 1-column and the compatible extension as given in The TeXbook for 2-columns. Only the pagebody differs: 2-columns instead of 1-column. This replacement is aimed at facilitating a personalized preprint

OTR, such that BLUe can easily adapt it. The modified `blue.tex` will be distributed by CTAN, and NTG's 4AllTeX CD-ROM.

keywords

BLUe, education, macrowriting, manmac, output routine, plain TeX, preprint format.

1 Introduction

The abbreviation OTR denotes Output Routine. In The TeXbook 251 the function of an OTR is described as follows

'Page numbers, headings, and similar things are attached after each page has been ejected, by a special sequence of TeX commands called the current output routine.'

The OTR has all to do with with the look-and-feel of a publication. Important issues are

- size of the page body, the page proper
- the head'line' and foot'line'
- fonts (kind, representation and associated quantities)
- global magnification.

In this note the replacement of BLUe's OTR for notes is accounted for. It is not a plea for more, not for moving frontiers of science.¹ More the opposite, to go back-to-the-roots, to honour what was already given in The TeXbook, and to distill what for PPT notes is needed and integrate this in `blue.tex`.

Knuth discusses OTRs in The TeXbook Chapter 23, and in the Appendices B—`\plainoutput`—and E—`\begindoublecolumns`, `\doublecolumnout`, and `\enddoublecolumns` as part of the example format `manmac`, to typeset the 2-column index in The TeXbook.

I'm only sorry that I was led astray a few years ago by the appeal of TUGboat's OTR, and I apologize for what I made out of it. In the change some errors have been accounted for. It was less than what Knuth already had described in The TeXbook Chapter 23.

I leave advanced wishes and perfections to professionals, especially those in a demand-driven environment, because `blue.tex` is all about minimal markup with results of a preprint nature.

2 Plain's OTR

`\plainoutput` is compact. It is explained in The TeXbook 253–256, and listed in Appendix B 364. Its purpose is to set a page proper preceded by a headline and followed by a footline—both just one line—in 1-column. Top insertions and footnotes have been accounted for. The size of the pagebody block is invariant towards scaling.

The usual `\hoffset` and `\voffset` control positioning of the page on the paper. Default 1 inch on top and on the left. The toplevel of the macros read as follows.

```
\def\plainoutput{\shipout\vbox{%
  \makeheadline\pagebody\makefootline}%
  \advancepageno
  \ifnum\outputpenalty>-20000
  \else \dosupereject%end of note
  \fi}
```

The next level reads.

```
\def\makeheadline{\vbox to 0pt
  {\vskip-22.5pt
   \line{\vbox to 8.5pt{}%
         \the\headline}%
   \vss}\nointerlineskip}
\def\pagebody{\vbox to\ysize
  {\boxmaxdepth=\maxdepth \pagecontents}}
\def\makefootline{\baselineskip24pt
  \line{\the\footline}}
```

Explanation. Makeheadline moves upward within a zero-sized vbox. The headline is set in an hbox of `\hsize`, and that is it. For the footline Knuth assumes that the footline is

1. David Salomon has discussed various advanced applications of the OTR in a series of 4 notes published in TUGboat.

really just one line and modified the `baselineskip` to create the separation between the page proper and the footline.²

The user can adapt the look-and-feel by changing

- `\hsize` and `\vsize`, the page proper parameters³
- `\headline` and `\footline`, token variables
- the magnification.

3 Incorporation in BLUE

All we have to do is to envelop the OTR and parameter settings in `\onecol`.

```
\def\onecol{\output{\plainoutput}%
  \vsize=25truecm\hsize=16truecm
  \def\makeheadline{\vbox to0pt{%
    \vskip-22.5pt
    \hbox to\hsize{\the\headline}\vss}}%
  \def\makefootline{\baselineskip24pt
    \hbox to\hsize{\the\footline}}}
```

Remark. The header on the first page can be suppressed by the following.

```
\headline={\global\headline
  {\sevenrm\the\issue\hfill\it\the\title}}
```

The line which marks the beginning of the note is wired-in `\beginscript`, but can be suppressed by omitting there

```
\hrule\kern2ex\noindent
```

4 Knuth's PPT 2-columns OTR

In *The T_EXbook* 257 Knuth provides a 2-column variant.⁴ A simple one in the spirit of the PPT idea, straight, no fancy tricks. No beginning with the title matter over the width of the page, no balancing of the columns on the final page, no switch over from 2-to-1 column, or vice versa, in general. Please do read Knuth's 257.

4.1 Incorporation in BLUE

All we have to do is to envelop the OTR and parameter settings in `\twocol`, and handle `\fullsize` appropriately..

```
\newdimen\fullsize \newbox\leftcolumn
\def\twocol{\let\lr=L
\output{\if L\lr
  \global\setbox\leftcolumn=\pagebody
  \global\let\lr=R%
  \else\doubleformat\global\let\lr=L%
  \fi
  \ifnum\outputpenalty>-20000
  \else\dosupereject\fi
```

```
}%end output
%
\def\doubleformat{\shipout\vbox{%
  \makeheadline
  \hbox to\fullsize{\box\leftcolumn
    \hfil\pagebody}%
  \makefootline}\advancepageno
}%end doubleformat
%
\vsize=25truecm \hsize=7.75truecm
\intercolwd=.5truecm
\fullsize=2\hsize
\advance\fullsize by\intercolwd
\def\endscript{\makesignature
  \vfill\supereject
  \if R\lr\null\vfill\eject\fi
  \end}
\def\makeheadline{\vbox to0pt{%
  \vskip-22.5pt
  \hbox to\fullsize{\the\headline}\vss}}%
\def\makefootline{\baselineskip24pt
  \hbox to\fullsize{\the\footline}}%
}%end twocol
```

Remarks. The headline and footline read for 1- and 2-column format the same only the `\hsize` must be adapted.

The 2-column OTR for the index for *The T_EXbook*, that is in *Manmac*, sets small, halfwidth, pages of double length and after that each is split into 2-columns. For typesetting the index in 2-columns Knuth used a special OTR for that purpose next to the general one. This special OTR calculates a 'page' of half the width but twice the usual length, and after that splits this into 2 equal halves, to be combined as two columns on the real page. A nice idea, but it does not account for footnotes.⁵ Knuth mentions

'It's possible to do fancier column balancing on the last page but the details are tricky if footnotes and other insertions need to be accommodated as well.'

It becomes simpler when footnotes are printed at the end of the second column, I presume.⁶ However, the OTR for the index of *manmac* allows the beginning—title of the chapter and introductory remarks—to be set over 2-columns, and it ends again in 1-column to set the quotations.

2. Remember that T_EX encloses the OTR invoke by (scope) braces. See *The T_EXbook* 253

3. With defaults 6.5 true in and 8.9 true in.

4. The extension to 3-column is given in *The T_EXbook* exercise 23.4.

5. See *The T_EXbook* 417.

6. The latter is done in the MAPS approach of 1997, in L^AT_EX

5 Conclusions

BLUe's note OTRs have been simplified, by taking over what Knuth already provided. A user can adjust `\onecol` and `\twocol` easily, by copying these macros and changing parameter values.

For the size of the page proper the (independent) parameters are `\vsize` and `\hsize`, the height and width of the text in one column.

For `\twocol` the parameter `\intercolwd` is also an independent parameter and can be adapted. For this situation the width of the page—`\fullhsize`—is a dependent parameter and equals $2 * \text{"hsize} + \text{"intercolwd}$.

`blue.tex` of 1997 will be sent to CTAN, and hopefully be distributed on NTG's 4AllTeX CD-ROM.

Have fun, and all the best.