

# The `multitoc` package\*

Martin Schröder

Crüsemannallee 3

D-28213 Bremen

Martin.Schroeder@ACM.org

PGP-Key: 2048 bit / KeyID 292814E5  
7E86 6EC8 97FA 2995 82C3 FEA5 2719 090E

1999/06/08

## Abstract

This package allows setting only the table of contents, list of figures and/or list of tables in two or more columns. The number of columns can be configured via commands; the multicolumn toc(s) can be selected via package options.

## Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>	<b>5</b>	<b>The Implementation</b>	<b>3</b>
1.1	The problem . . . . .	1	5.1	The parameters . . . . .	3
1.2	A solution . . . . .	2	5.2	Initial Code . . . . .	3
<b>2</b>	<b>Parameters</b>	<b>3</b>	5.3	The options . . . . .	3
<b>3</b>	<b>Options</b>	<b>3</b>	5.4	Executing options . . . . .	4
<b>4</b>	<b>Required packages</b>	<b>3</b>	5.5	Redefining <code>\starttoc</code>	4
			5.6	Code from Version 1.00	5

## 1 Introduction

### 1.1 The problem

When you want to set only the table of contents of a document in two (or more columns), there is one known way<sup>1</sup>: Add an

```
\addtocontents{toc}{\protect\begin{multicols}{2}}
```

before the `\tableofcontents` and an

```
\addtocontents{toc}{\protect\end{multicols}}
```

---

\*The version number of this file is v2.01, last revised 1999/06/08.

The name `multitoc` is a tribute to the 8 + 3 file-naming convention of certain “operating systems”; strictly speaking it should be `MulticolumnToc`.

<sup>1</sup>This was first used in the `doc` package[4].

at the end of the document. This way your `.toc` will start with `\begin{multicols}{2}` and end with `\end{multicols}`. This can be automatised by using `\AtBeginDocument` and `\AtEndDocument` but this has the drawback that it may collide with other commands inserted using `\AtEndDocument` that try to write information to the auxiliary file (like the `countlto` package[5]). This is because  $\text{\TeX}$  has two ways to write information to files [3, p. 226–228]: immediately (when the `\write` is prefixed by `\immediate`) or deferred till the current page is finished and written out by  $\text{\TeX}$  (at the next `\shipout`). `\addtocontents` does a deferred `\write`, `countlto` does an immediate.

Sidenote: `\addtocontents` writes a command to the `.aux` file to write its information to the `.toc` file. The `.aux` is read in and executed by `\end{document}` and at the next run by `\begin{document}`. So the `.toc` is written by `\end{document}` and at the next run by `\begin{document}`.

When you use the automatised solution with `countlto` this may happen:

1. The `\addtocontents{toc}{\protect\end{multicols}}` is inserted using `\AtEndDocument` somewhere in the preamble.
2. `countlto` inserts this code

```
\clearpage
\immediate\write\@auxout{\string\newlabel{TotalPages}{\the\count1}{\the\count1}}
```

via an `\AtBeginDocument{\AtEndDocument{` so it can be sure that this code is the *last* code executed by `\AtEndDocument`.

3. At the `\end{document}` first the code from step 1 is executed which adds the information to the current page to write the `\@writefile{toc}{\end{multicols}}` to the auxiliary file *when the current page is finished*.

Then the code from step 2 is executed, which lets  $\text{\LaTeX}$  clear the page (to force all pending writes to be written) and *immediately* after that write the information for the `TotalPages` to the auxiliary file.

Now suppose that the `\end{document}` is called *just after*  $\text{\LaTeX}$  has finished the last page. The code from step 1 is never written to the file (since at the `\clearpage`  $\text{\LaTeX}$  has no page to finish and so the code waits for the `\shipout` which won't come), but the code from step 2 is. So you now have an `.aux` which won't write the `\end{multicols}` to the `.toc`. This of course produces an error at the next run.

## 1.2 A solution

`\@starttoc` An easy way around this is to simply redefine `\@starttoc` from [2] which reads in the `.toc` to wrap a `multicol` around it.<sup>2,3</sup>

<sup>2</sup>Thanks to Frank Mittelbach for reminding me of this.

<sup>3</sup>Version 1.00 of this package provided a more elaborate solution to this using `\immediateaddtocontents`; this is no longer needed. But the commands from version 1.00 are still provided (see section 5.6).

## 2 Parameters

`\multicolumntoc` The number of columns for the table of contents, list of figures and list  
`\multicolumnlot` of tables can be set by redefining the commands `\multicolumntoc`,  
`\multicolumnlof` `\multicolumnlot` and `\multicolumnlof`. The default is two columns.

## 3 Options

The package has the following options:

`toc` The table of contents is set in `\multicolumntoc` columns.

`lof` The list of figures is set in `\multicolumnlof` columns.

`lot` The list of tables is set in `\multicolumnlot` columns.

## 4 Required packages

The package requires the `multicol` and the `ifthen` packages.

## 5 The Implementation

1 `\package`

We need the `multicol` and the `ifthen` packages.

2 `\RequirePackage{multicol}`

3 `\RequirePackage{ifthen}`

### 5.1 The parameters

```
\multicolumntoc 4 \newcommand{\multicolumntoc}{2}
\multicolumnlot 5 \newcommand{\multicolumnlot}{2}
\multicolumnlof 6 \newcommand{\multicolumnlof}{2}
```

### 5.2 Initial Code

```
@multitoc@toc \if@multitoc@toc is used to flag the use of the toc option.
7 \newboolean{@multitoc@toc}
```

```
@multitoc@lot \if@multitoc@lot is used to flag the use of the lot option.
8 \newboolean{@multitoc@lot}
```

```
@multitoc@lof \if@multitoc@lof is used to flag the use of the lof option.
9 \newboolean{@multitoc@lof}
```

### 5.3 The options

The options simply set the corresponding flags.

10 `\DeclareOption{toc}{\setboolean{@multitoc@toc}{true}}`

11 `\DeclareOption{lot}{\setboolean{@multitoc@lot}{true}}`

12 `\DeclareOption{lof}{\setboolean{@multitoc@lof}{true}}`

## 5.4 Executing options

There are no default options.

```
13 \ProcessOptions\relax
```

## 5.5 Redefining \@starttoc

\@starttoc From [2]:

The \@starttoc{<ext>} command is used to define the commands:

```
\tableofcontents, \listoffigures, etc.
```

For example: \@starttoc{lof} is used in \listoffigures. This command reads the .<ext> file and sets up to write the new .<ext> file.

```
\@starttoc{EXT} ==
BEGIN
  \begingroup
  \makeatletter
  read file \jobname.EXT
  IF @filesw = true
    THEN open \jobname.EXT as file \tf@EXT
  FI
  @nobreak :=G FALSE %% added 24 May 89
  \endgroup
END
```

We store the current definition in \@multitoc@starttoc and wrap it in a multicol environment if the right option has been selected. We also have to determine the number of columns to use.<sup>4</sup>

```
14 \let\@multitoc@starttoc\@starttoc
15 \renewcommand*{\@starttoc}[1]{%
16   \ifthenelse{\boolean{\@multitoc@toc}\and\equal{#1}{toc}}{%
17     \begin{multicols}{\@multicolumntoc}%
18       \@multitoc@starttoc{#1}%
19     \end{multicols}%
20   }{}%
21   \ifthenelse{\boolean{\@multitoc@lot}\and\equal{#1}{lot}}{%
22     \begin{multicols}{\@multicolumnlot}%
23       \@multitoc@starttoc{#1}%
24     \end{multicols}%
25   }{}%
26   \ifthenelse{\boolean{\@multitoc@lof}\and\equal{#1}{lof}}{%
27     \begin{multicols}{\@multicolumnlof}%
28       \@multitoc@starttoc{#1}%
29     \end{multicols}%
30   }{}%
31 }
```

<sup>4</sup>This could probably be coded more efficiently, but this code works...

## 5.6 Code from Version 1.00

The first version of this package took a different approach to solving the problem mentioned in section 1.1 and provided the commands `\protected@write@immediate` and `\immediateaddtocontents`. Their code has been retained here for compatibility reasons.

`\immediateaddtocontents` `\immediateaddtocontents` is a version of `\addtocontents` which does just what the name implies: Write the information `\immediate`.

`\protected@write@immediate` This is a changed version of `\protected@write` from [1]. It takes three arguments: an output stream, some initialization code, and some text to write. It then writes this *immediately*, with appropriate handling of `\protect` and `\thepage`.

```
32 \newcommand*{\protected@write@immediate}[3]{%
33   \begingroup
34   \let\thepage\relax
35   #2%
36   \let\protect\string
37   \edef\reserved@a{\immediate\write#1{#3}}%
38   \reserved@a
39   \endgroup
40   \if@nobreak\ifvmode\nobreak\fi\fi
41 }
```

`\immediateaddtocontents` This is a changed version of `\addtocontents` from [2]. The `\immediateaddtocontents{<table>}{<text>}` command *immediately* adds `<text>` to the `.<table>` file, with no page number.

```
42 \newcommand*{\immediateaddtocontents}[2]{%
43   \protected@write@immediate\auxout
44   {\let\label@gobble \let\index@gobble \let\glossary@gobble}%
45   {\string\@writefile{#1}{#2}}}
46 </package>
```

## References

- [1] Johannes Braams, David Carlisle, Alan Jeffrey, Leslie Lamport, Frank Mittelbach, Chris Rowley and Rainer Schöpf. `ltxfiles.dtx`. CTAN: `tex-archive/macros/latex/base/ltxfiles.dtx`. L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> kernel.
- [2] Johannes Braams, David Carlisle, Alan Jeffrey, Leslie Lamport, Frank Mittelbach, Chris Rowley, Tobias Oetiker and Rainer Schöpf. `ltxsect.dtx`. CTAN: `tex-archive/macros/latex/base/ltxsect.dtx`. L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> kernel.
- [3] Donald E. Knuth. *The T<sub>E</sub>X Book*, volume A of *Computers and Typesetting*. Addison-Wesley, 1986. Eleventh printing, revised, May 1991.
- [4] Frank Mittelbach. The `doc` and `shortvrb` package. CTAN: `tex-archive/macros/latex/base/doc.dtx`. L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> package.

- [5] Martin Schröder. The countlto package. CTAN:  
 tex-archive/macros/latex/contrib/supported/ms/countlto.dtx.  
 L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> package.

## Index

Numbers written in *italic* refer to the page where the corresponding entry is described, the ones underlined to the code line of the definition, the rest to the code lines where the entry is used.

	<b>Symbols</b>	
<code>\@auxout</code>	..... 43	<code>\immediateaddtocontents</code> ... 5, <u>42</u>
<code>\@gobble</code>	..... 44	<code>\index</code> ..... 44
<code>\@multitoc@lof</code>	..... <u>9</u>	<b>L</b>
<code>\@multitoc@lot</code>	..... <u>8</u>	<code>\label</code> ..... 44
<code>\@multitoc@starttoc</code>	. 14, 18, 23, 28	<code>\let</code> ..... 14, 34, 36, 44
<code>\@multitoc@toc</code>	..... <u>7</u>	<b>M</b>
<code>\@starttoc</code>	..... 2, <u>14</u>	<code>\multicolumnlof</code> ..... 3, <u>4</u> , 27
<code>\@writefile</code>	..... 45	<code>\multicolumnlot</code> ..... 3, <u>4</u> , 22
<b>A</b>		<code>\multicolumntoc</code> ..... 3, <u>4</u> , 17
<code>\and</code>	..... 16, 21, 26	<b>N</b>
<b>B</b>		<code>\newboolean</code> ..... 7–9
<code>\begin</code>	..... 17, 22, 27	<code>\newcommand</code> ..... 4–6, 32, 42
<code>\begingroup</code>	..... 33	<code>\nobreak</code> ..... 40
<code>\boolean</code>	..... 16, 21, 26	<b>P</b>
<b>D</b>		<code>\ProcessOptions</code> ..... 13
<code>\DeclareOption</code>	..... 10–12	<code>\protect</code> ..... 36
<b>E</b>		<code>\protected@write@immediate</code> <u>32</u> , 43
<code>\edef</code>	..... 37	<b>R</b>
<code>\end</code>	..... 19, 24, 29	<code>\relax</code> ..... 13, 34
<code>\endgroup</code>	..... 39	<code>\renewcommand</code> ..... 15
<code>\equal</code>	..... 16, 21, 26	<code>\RequirePackage</code> ..... 2, 3
<b>F</b>		<code>\reserved@a</code> ..... 37, 38
<code>\fi</code>	..... 40	<b>S</b>
<b>G</b>		<code>\setboolean</code> ..... 10–12
<code>\glossary</code>	..... 44	<code>\string</code> ..... 36, 45
<b>I</b>		<b>T</b>
<code>\if@nobreak</code>	..... 40	<code>\thepage</code> ..... 34
<code>\ifthenelse</code>	..... 16, 21, 26	<b>W</b>
<code>\ifvmode</code>	..... 40	<code>\write</code> ..... 37
<code>\immediate</code>	..... 37	

## Change History

v0.90		tained . . . . .	5
General: New . . . . .	1	@multitoc@lof: new . . . . .	3
v1.00		@multitoc@lot: new . . . . .	3
General: \clearpage . . . . .	3	@multitoc@toc: new . . . . .	3
Documentation improved . . .	1	\protected@write@immediate:	
v2.00		retained . . . . .	5
General: Redesign . . . . .	1, 3	v2.01	
\immediateaddtocontents: re-		General: Moved to LPPL . . . . .	1