

Adjusting Margins for Multicolumn and Unicolumn Output^{*†}

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Abstract

This package provides an extension of the `multicol` package [1] with the option to change the margins for multicolumn and unicolumn layout. The package understands the difference between the even and odd margins for two side printing.

Contents

1	Introduction	2
2	User Interface	3
3	Implementation	5
3.1	Declarations	5
3.2	Options	5
3.3	Loading Packages	5
3.4	Registers	5
3.5	Starting Environment	5
3.6	Ending Environment	7
3.7	Output Routines	7
3.8	Not Balancing Columns	7
3.9	Ending the Style	8

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[†]Note: This package is released under terms which affect its use in commercial applications. Please see the details at the top of the source file

1 Introduction

One of the common requests from the book designers is the possibility to change the margins of the text in the middle of the page. The standard \LaTeX `list` environment does exactly this. Thus it is not surprising that many packages creatively use this tool to change the layout. An example is the `changepage` package [2]. Unfortunately this approach has a serious drawback: a list sets the margins globally. If the material is split between the pages, the margins on the first page are repeated on all the subsequent pages. While this is fine for one-side printing, it leads to a catastrophe for the two-sided one, as can be seen from the following example (provided by Ivo Welch):

```
\documentclass{book}
\usepackage{lipsum,multicol}
\evensidemargin=1.5in
\oddsidemargin=-3em
\textwidth=5in

\newenvironment{chmargin}[2]{%
  \begin{list}{}{\topsep0pt\partopsep0pt\itemsep0pt\parsep\parskip%
    \listparindent\parindent\itemindent\parindent
    \leftmargin#1\rightmargin#2\relax}\item}%
  {\end{list}}

\begin{document}

\chapter{Show}
\section{Normal}
\marginpar{I need a lot of outer margin space in the normal text.}
\lipsum[1-10]
\begin{chmargin}{0pt}{-160pt}
  \section{End of Chapter Material}
  \textbf{Now I want to use the outer margin because I need width.}
  \lipsum[11-16]
  \fbox{\textbf{\Large Darn---it extends into the inner spine margin now.}}
  \lipsum[17-40]
\end{chmargin}

\end{document}
```

To remedy this problem, we need a completely different approach: we need to change the output routine. This is done in this package.

Since the text with the special layout is often typeset in the multicolumn mode, we load the `multicol` package [1] and patch it to provide two changes:

1. Margins changes, persistent over the pages.
2. The possibility of an one-column “multicolumn” layout. Of course, this layout does not make sense in the context of the original `multicol` package, but is useful when the margins are changed.

Note that since this package uses the `multicol` package, it inherits its special moral obligation for the commercial users. Please see the source file for the details.

This file was commissioned for by Prof. Ivo Welch, <http://www.ivo-welch.info/>. He also provided sample files and patiently tested it.

2 User Interface

The installation of the class follows the usual practice [3] for L^AT_EX packages:

1. Run `latex` on `adjmulticol.ins`. This will produce the file `adjmulticol.sty`.
2. Put the file `adjmulticol.sty` to the place where L^AT_EX can find them (see [3] or the documentation for your T_EX system).
3. Update the database of file names. Again, see [3] or the documentation for your T_EX system for the system-specific details.
4. The file `adjmulticol.pdf` provides the documentation for the package (this is the file you are probably reading now).

As an alternative to items 2 and 3 you can just put the files in the working directory where your `.tex` file is.

To use this package, add to the preamble of your document the line `\usepackage{adjmulticol}`.

The package provides two new environments for adjusted multicolumn layout.

`adjmulticols`

The environment `adjmulticols` is similar to the environment `multicols`, but it has three mandatory arguments instead of one:

```
\begin{adjmulticols}{<number>}{<inner margin>}{<outer margin>}
<text>
\end{adjmulticols}
```

For example,

```
\begin{adjmulticols}{2}{12pt}{-1in}
Text Text Text
\end{adjmulticols}
```

Here *<number>* is the number of columns. Unlike `multicols`, `adjmulticols` environment allows this number to be 1.

The *<inner margin>* and *<outer margin>* are calculated from the current text area margins, so negative values mean the extension of the text area. In one-sided printing *<inner margin>* is the left margin, and *<outer margin>* is the right margin. You probably would not want to use this package for one-sided printing, since in this case `changepage` package [2] works fine. In two-sided printing *<inner margin>* is the margin on the spine side of the page, and *<outer margin>* is the margin on the other side.

You can use the optional arguments of the `multicols` environment. Note that the argument of the first optional argument, the header text spread over all columns, is typeset with the *normal* margins. If you want to change margins for the header too, you may want to use one-column `adjmulticols` environment instead.

`adjmulticols*` The starred version of the environment, `adjmulticols*` is similar to the `multicols*` environment: it does not balance the columns on the last page.

Since the package redefines output routines, it may behave strangely if used with the packages that also redefine it or rely on the `\pagegoal` and `\pagetotal` dimen registers. The command `\Needspace` from `memoir` package [4] is known to lead to loss of the text in some rare cases, and therefore this command is disabled inside `adjmulticols`. Usually one can get the same effect as this command by setting the `\premulticols` to the desired value [1].

3 Implementation

3.1 Declarations

We start with declaration, who we are:

```
1 <style>\NeedsTeXFormat{LaTeX2e}
2 <*gobble>
3 \ProvidesFile{adjmulticol.dtx}
4 </gobble>
5 <style>\ProvidesPackage{adjmulticol}
6 <*style>
7 [2011/02/23 v1.0 Adjusted margins for multicolumn layout]
```

3.2 Options

All options are sent to `multicols`:

```
8 \DeclareOption*{\PassOptionsToPackage{\CurrentOption}{multicol}}
9 \ProcessOptions\relax
```

3.3 Loading Packages

We use `multicol` to get all the code from it:

```
10 \RequirePackage{multicol}
```

3.4 Registers

`\adjmc@inner` Inner margin delta: left on odd pages, right on even pages for two-sided typesetting, and left for one-sided typesetting.

```
11 \newdimen\adjmc@inner
```

`\adjmc@outer` Outer margin delta: right on odd pages, left on even pages, and right for two-sided typesetting

```
12 \newdimen\adjmc@outer
```

`\adjmc@saved@leftmargin` We save the value of `\multicol@leftmargin` between the calls in the register `\adjmc@savedleftmargin`:

```
13 \newdimen\adjmc@saved@leftmargin
```

3.5 Starting Environment

`\adjmulticols` We have three mandatory arguments instead of one for `multicols`: the number of columns, the left margin delta and the right margin delta:

```
14 \def\adjmulticols#1#2#3{\col@number#1\relax
15 \def\@tempa{#2}%
16 \ifx\@tempa\empty\adjmc@inner\z@\else\adjmc@inner#2\fi
17 \def\@tempa{#3}%
18 \ifx\@tempa\empty\adjmc@outer\z@\else\adjmc@outer#3\fi
```

The standard `multicols` have the minimum of two columns. We, of course, want to consider one column layout too:

```

19 \ifnum\col@number<\@ne
20   \PackageWarning{adjmulticol}%
21     {Using ‘\number\col@number’
22     columns doesn’t seem a good idea.^^J
23     I therefore use one columns instead}%
24   \col@number\@ne\fi
25 \ifnum\col@number>10
26   \PackageError{adjmulticol}%
27     {Too many columns}%
28     {Current implementation doesn’t
29     support more than 10 columns.%
30     \MessageBreak
31     I therefore use 10 columns instead}%
32   \col@number10 \fi

```

We also disable `\Needspace` from memoir package [4]:

```

33 \def\Needspace{\PackageWarning{adjmulticol}%
34   {The command \noexpand\Needspace is disabled}%
35   {The command \noexpand\Needspace is not compatible with our
36   output routine}}

```

As in the standard package we redefine the footnote making command:

```

37 \ifx\@footnotetext\mult@footnotetext\else
38   \let\orig@footnotetext\@footnotetext
39   \let\@footnotetext\mult@footnotetext
40 \fi

```

And look for the optional arguments

```

41 \@ifnextchar[\adjmult@cols{\adjmult@cols[]}]

```

`\adjmult@cols` Looking for the second optional argument. Note that we use `\premulticols` for the default:

```

42 \def\adjmult@cols[#1]{\@ifnextchar[%
43   {\adjmult@@cols{#1}}%
44   {\adjmult@@cols{#1}[\premulticols]}}

```

`\adjmult@@cols` And now we are gathered all arguments:

```

45 \def\adjmult@@cols#1[#2]{%

```

The macro `\prepare@multicols` uses the current value of `\linewidth`. We do not change his, but rather change `\linewidth`:

```

46   \advance\linewidth by -\adjmc@inner\relax
47   \advance\linewidth by -\adjmc@outer\relax

```

Then we redefine the output routines:

```

48 \let\page@sofar=\adjmc@page@sofar

```

and start the standard multicols:

```

49   \mult@@cols#1[#2]}

```

3.6 Ending Environment

`\endadjmulticols` Here we use the standard environment end. Note that it uses `\@checkend`, so we need to redefine `\@currenenvir` to fool the check.

```
50 \def\endadjmulticols{%
51   \def\@currenenvir{multicols}%
52   \endmulticols}
```

3.7 Output Routines

`\adjmc@page@sofar@orig` First, we save the original declaration of `\page@sofar`:

```
53 \let\adjmc@page@sofar@orig=\page@sofar
```

`\adjmc@page@sofar` We redefine `\page@sofar` to change the margins and allow for one-column output:

```
54 \def\adjmc@page@sofar{%
```

If we have one column, the standard mechanisms leave empty space instead of the first column. Ok, we use the fact that there is a copy of the first column in `\mult@firstbox`...

```
55   \ifnum\col@number=\@ne
56     \setbox\mult@rightbox\box\mult@firstbox
57     \fi
```

We redefine `\multicol@leftmargin` to introduce the shift of the box. We save the old code in `\adjmc@saved@leftmargin`

```
58   \adjmc@saved@leftmargin=\multicol@leftmargin
59   \if@twoside
60     \ifodd\c@page
61       \advance\multicol@leftmargin by \adjmc@inner\relax
62     \else
63       \advance \multicol@leftmargin by \adjmc@outer\relax
64     \fi
65   \else
66     \advance \multicol@leftmargin by \adjmc@inner\relax
67   \fi
```

Then we invoke the original `\page@sofar` and restore the margin:

```
68   \adjmc@page@sofar@orig
69   \multicol@leftmargin=\adjmc@saved@leftmargin}
```

3.8 Not Balancing Columns

The starred versions do not balance the columns.

`\adjmulticols*` This follows the code of the `multicols` package:

```
70 \newenvironment{adjmulticols*}{%
71   \ifinner
72     \PackageWarning{multicol}%
73     {multicols* inside a box does
74     not make sense.\MessageBreak
```

```
75         Going to balance anyway}%  
76     \else  
77         \let\balance@columns@out  
78             \multi@column@out  
79     \fi  
80     \adjmulticols}{%  
81     \vfill  
82     \endadjmulticols}
```

3.9 Ending the Style

```
83 </style>
```


References

- [1] Frank Mittelbach. *An Environment for Multicolumn Output*, August 2006. <http://mirrors.ctan.org/macros/latex/required/tools/multicol.pdf>.
- [2] Peter Wilson and Will Robertson. *The changepage and chngpage Packages*, October 2009. <http://mirrors.ctan.org/macros/latex/contrib/changepage>.
- [3] UK T_EX Users Group. UK list of T_EX frequently asked questions. <http://www.tex.ac.uk/cgi-bin/texfaq2html>, 2008.
- [4] Peter Wilson. *The Memoir Class for Configurable Typesetting*, February 2011. <http://mirrors.ctan.org/macros/latex/contrib/memoir>.

Index

Numbers written in *italic* refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in *roman* refer to the code lines where the entry is used.

Symbols	<code>\def</code> .. 14, 15, 17, 33,	<code>\NeedsTeXFormat</code> 1
<code>\@currentenv</code> 51	42, 45, 50, 51, 54	<code>\newdimen</code> 11–13
<code>\@empty</code> 16, 18		<code>\newenvironment</code> ... 70
<code>\@footnotetext</code> .. 37–39	E	<code>\noexpand</code> 34, 35
<code>\@ifnextchar</code> 41, 42	<code>\else</code> 16, 18, 37, 62, 65, 76	<code>\number</code> 21
<code>\@ne</code> 19, 24, 55	<code>\endadjmulticols</code> <u>50</u> , 82	
<code>\@tempa</code> 15–18	<code>\endmulticols</code> 52	O
		<code>\orig@footnotetext</code> . 38
A	F	P
<code>\adjmc@inner</code>	<code>\fi</code> .. 16, 18, 24, 32,	<code>\PackageError</code> 26
. <u>11</u> , 16, 46, 61, 66	40, 57, 64, 67, 79	<code>\PackageWarning</code> ...
<code>\adjmc@outer</code> 20, 33, 72
..... <u>12</u> , 18, 47, 63	I	<code>\page@sofar</code> 48, 53
<code>\adjmc@page@sofar</code> 48, <u>54</u>	<code>\if@twoside</code> 59	<code>\PassOptionsToPackage</code>
<code>\adjmc@page@sofar@orig</code>	<code>\ifinner</code> 71 8
..... <u>53</u> , 68	<code>\ifnum</code> 19, 25, 55	<code>\premulticols</code> 44
<code>\adjmc@saved@leftmargin</code>	<code>\ifodd</code> 60	<code>\ProcessOptions</code> 9
..... <u>13</u> , 58, 69	<code>\ifx</code> 16, 18, 37	<code>\ProvidesFile</code> 3
<code>\adjmult@cols</code> 43, 44, <u>45</u>	L	<code>\ProvidesPackage</code> ... 5
<code>\adjmult@cols</code> ... 41, <u>42</u>	<code>\let</code> ... 38, 39, 48, 53, 77	
<code>\adjmulticols</code> ... <u>14</u> , 80	<code>\linewidth</code> 46, 47	R
<code>\adjmulticols*</code> <u>70</u>		<code>\relax</code> 9, 14,
<code>\advance</code> 46, 47, 61, 63, 66	M	46, 47, 61, 63, 66
	<code>\MessageBreak</code> ... 30, 74	<code>\RequirePackage</code> ... 10
B	<code>\mult@cols</code> 49	
<code>\balance@columns@out</code> 77	<code>\mult@firstbox</code> 56	S
<code>\box</code> 56	<code>\mult@footnotetext</code> .	<code>\setbox</code> 56
 37, 39	
C	<code>\mult@rightbox</code> 56	V
<code>\c@page</code> 60	<code>\multi@column@out</code> . 78	<code>\vfill</code> 81
<code>\col@number</code> .. 14, 19,	<code>\multicol@leftmargin</code>	
21, 24, 25, 32, 55	. 58, 61, 63, 66, 69	Z
<code>\CurrentOption</code> 8		<code>\z@</code> 16, 18
D	N	
<code>\DeclareOption</code> 8	<code>\Needspace</code> 33–35	