

The `flushend` package

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1 Introduction

The package is used to balance columns on the last page in twocolumn mode.

2 Usage

Just load the package: that's all.

`\flushend`

This macro switches on column balancing on the last page. It is used by default.

`\raggedend`

This macro switches off column balancing on the last page.

`\atColsBreak`

`{\tokens}`

Adds `\tokens` in place of the original column break (made without balancing).

Example: `\atColsBreak{\vskip-2pt}`

`\showcolsendrule`

It can be used just for debugging: adds rule to the bottom of columns.

3 Tips

Sometimes the balancing can be not so good. In that case to stretch right column by `\tex dimension` add command `\vskip-\tex dimension` just before `\end{document}`. To shrink right column use `\vskip\tex dimension`.

Example:

`\vskip-10pt%`
`\end{document}`

4 Implementation

```

1 \NeedsTeXFormat{LaTeX2e}
2 \ProvidesPackage{flushend}[1997/10/01]

3 \newbox\@aaa
4 \newbox\@ccc
5 \@ifundefined{viper}{\newbox\@viper}{}
6 \@ifundefined{hold@viper}{\newbox\hold@viper}{}
7 \newtoks\atColsBreak \atColsBreak={}
8 \newdimen\@extra@skip \@extra@skip\z@
9 \newdimen\@nd@page@rule \@nd@page@rule\z@

\last@outputdblcol

10 \def\last@outputdblcol{%
11   \if@firstcolumn
12     \global \@firstcolumnfalse
13     \global \setbox\@leftcolumn \box\@outputbox
14   \else
15     \global \@firstcolumntrue
16     \if@lastpage
17       \@tempdima\ht\@leftcolumn
18       \splittopskip\topskip\splitmaxdepth\maxdepth
19       \setbox\@tempboxa\vbox{%
20         \unvbox\@leftcolumn\setbox0\lastbox\unskip
21         \the\atColsBreak
22         \unvbox\@outputbox\setbox0\lastbox\unskip
23       }%
24       \@tempdimb .5\ht\@tempboxa
25       \loop
26         \setbox\@aaa\copy\@tempboxa
27         \setbox\@ccc\vbox to\@tempdimb{%
28           \vsplit\@aaa to\@tempdimb
29           \vss
30           \vsplit\@aaa to\@tempdimb
31         }%
32       \wlog{Extra height:\the\ht\@aaa\space when \the\@tempdimb}%
33     \ifvoid\@aaa
34     \else
35       \advance\@tempdimb 1\p@
36     \repeat
37     \loop
38       \setbox\@aaa\copy\@tempboxa
39       \setbox\@ccc\vbox to\@tempdimb{%
40         \vsplit\@aaa to\@tempdimb
41         \vss
42       }%
43     \wlog{(2)Left:\the\ht\@ccc\space
44           Right:\the\ht\@aaa\space
45           Output:\the\@tempdimb
46           }%

```

```

47 \ifdim \ht\@ccc<\ht\@aaa
48 \@tempdimb \the\ht\@aaa
49 \repeat
50 \wlog{- LAST -^^JExtra skip:\the\@extra@skip
51      ^^JLeft:\the\ht\@ccc
52      ^^JRight:\the\ht\@aaa
53      ^^JOutput:\the\@tempdimb
54      }%
55 \setbox\@ccc\vbox to\@tempdimb{%
56 \vsplit\@tempboxa to\@tempdimb
57 \vss
58 }%
59 \setbox\@leftcolumn\vbox to\@tempdima{%
60 \vbox to\@tempdimb{\unvbox\@ccc}%
61 \hrule\@height\@nd@page@rule
62 \vss
63 }%
64 \setbox\@outputbox\vbox to\@tempdima{%
65 \vbox to\@tempdimb{%
66 \unvbox\@tempboxa
67 \vfilneg
68 \vskip\@extra@skip
69 }%
70 \hrule\@height\@nd@page@rule
71 \vss
72 }%
73 \setbox\@outputbox \vbox {%
74 \hb@xt@\textwidth {%
75 \hb@xt@\columnwidth {\box\@leftcolumn \hss}%
76 \hfil
77 \vrule \@width\columnseprule
78 \hfil
79 \hb@xt@\columnwidth {\box\@outputbox \hss}%
80 }%
81 }%
82 \else
83 \setbox\@outputbox \vbox {%
84 \hb@xt@\textwidth {%
85 \hb@xt@\columnwidth {\box\@leftcolumn \hss}%
86 \hfil
87 \vrule \@width\columnseprule
88 \hfil
89 \hb@xt@\columnwidth {\box\@outputbox \hss}%
90 }%
91 }%
92 \fi
93 \ifvoid\hold@viper
94 \else
95 \setbox\@outputbox \vbox{\box\hold@viper\box\@outputbox}%
96 \fi

```

```

97     \@combinedblfloats
98     \@outputpage
99     \beginngroup
100     \@dblfloatplacement
101     \@startdblcolumn
102     \@whiles\if@fcolmade \fi
103     {\@outputpage \@startdblcolumn}%
104     \ifvoid\@viper
105     \else
106     \global\setbox\@viper\vbox{%
107     \vskip-\stripsep
108     \unvbox\@viper
109     }%
110     \@viperoutput
111     \fi
112     \endgroup
113 \fi
114 }

115 \let\prev@enddocument\enddocument
116 \newif\if@lastpage \@lastpagefalse

\enddocument

117 \def\enddocument{%
118     \global\@lastpagetrue
119     \let\@outputdblcol\last@outputdblcol
120     \prev@enddocument
121 }

\raggedend

122 \def\raggedend{\global\let\enddocument\prev@enddocument}

\flushend

123 \def\flushend{%
124     \gdef\enddocument{%
125         \global\@lastpagetrue
126         \let\@outputdblcol\last@outputdblcol
127         \prev@enddocument
128     }%
129 }

\showcolsendrule

130 \def\showcolsendrule{\global\@nd@page@rule=.4pt}

131 %\endinput

```