The layouts package: Code*

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Abstract

The layouts package provides facilities for document designers to experiment with various aspects of the layout of LaTeXed documents. There is a separate user manual for the package.

Contents

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*This file (`layouts.dtx`) has version number v2.6d, last revised 2009/09/02.

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1   Introduction

This document provides the commented source for a LaTeX package file developed as part of a suite designed for the typesetting of documents according to the rules for ISO international standards [Wil96]. A separate document provides the user manual.

Section 2 describes a package to assist in the design of new LaTeX classes and packages by graphically depicting the layout[1] of various logical elements of a document. This package has general applicability and is not restricted to typesetting ISO documents.

This manual is typeset according to the conventions of the LaTeX DOC-STRIP utility which enables the automatic extraction of the LaTeX macro source files [GMS94].

2   The **layouts** package

Announce the name and version of the package which requires LaTeX 2_ε.

```
1 ⟨∗lays⟩
2 \NeedsTeXFormat{LaTeX2e}
3 \ProvidesPackage{layouts}[2009/09/02 v2.6d graphical depiction of document elements]
4
```

The layouts package provides means of graphically displaying the layout of various logical elements of a document such as section headings, lists, floats, and others.

3   Counters and such

First we define some commands, counters, etc., that will be useful later on.

\bs   We will be doing a lot of printing of LaTeX commands, so we need a short command to print a backslash.

```
5 \@ifundefined{bs}{\newcommand{\bs}{\texttt{\char`\\}}}%
6   {\renewcommand{\bs}{\texttt{\char`\\}}}
7
```

---

[1]With thanks to Frank Mittelbach for noticing some problems with version 2.4 and suggesting additional features.

`\l@yoneinch`
`\l@yeighthalfinch`
`\l@yteninch`
`\l@yeleveninch`
`\l@yonepoint`

Some generally useful values. `\l@yonepoint` is set to 65536 sp and all the others are set to a value in pts.

```
 8 \newcommand{\l@yoneinch}{72}
 9 \newcommand{\l@yeighthalfinch}{615}
10 \newcommand{\l@yteninch}{723}
11 \newcommand{\l@yeleveninch}{795}
12 \newcommand{\l@yonepoint}{65536}
```

`\l@youtscale`

Internal command that stores the drawing scale factor. Initialised to half scale.

```
13 \newcommand{\l@youtscale}{0.5}
14
```

`\l@ylen`

A length.

```
15 \newlength{\l@ylen}
```

`\layoutsbox`

A box for storing something. There seems to be no reason why the user should not be able to use this.

```
16 \newsavebox{\layoutsbox}
```

`\l@youtunitlength`

This will be used for setting the `\unitlength` for a `picture`.

```
17 \newlength{\l@youtunitlength}
```

`\l@youtlinethick`
`\l@youtlinethickii`

These will be used as parameters to a `\linethickness` command.

```
18 \newlength{\l@youtlinethick}
19 \newlength{\l@youtlinethickii}
20
```

`\l@ysetupparskip`
`\l@ysetupbaselineskip`

Used for storing the document's `\parskip` and `\baselineskip`.

```
21 \newlength{\l@ysetupparskip}
22 \newlength{\l@ysetupbaselineskip}
23
```

`\l@yonem`
`\l@yonex`

Used for storing the document's value for 1em and 1ex.

```
24 \newlength{\l@yonem}
25 \newlength{\l@yonex}
26
```

`\l@ylmarg`
`\l@yrmarg`
`\l@yitmindent`
`\l@ylblwidth`
`\l@ylblsep`
`\l@ylparindent`
`\l@ytsep`
`\l@ypskip`
`\l@yptsep`
`\l@ypsep`
`\l@yitmsep`

We need to store a list environment's values for use when tabulating the actual list values.

```
27 \newlength{\l@ylmarg}
28 \newlength{\l@yrmarg}
29 \newlength{\l@yitmindent}
30 \newlength{\l@ylblwidth}
31 \newlength{\l@ylblsep}
32 \newlength{\l@ylparindent}
33 \newlength{\l@ytsep}
34 \newlength{\l@ypskip}
35 \newlength{\l@yptsep}
```

```
36 \newlength{\l@ypsep}
37 \newlength{\l@yitmsep}
38
```

\l@ytok   A useful token

```
39 \newtoks\l@ytok
40
```

\l@youtpw   We use these for storing the page width and height.
\l@youtph
```
41 \newcount\l@youtpw
42 \newcount\l@youtph
43
```

\l@youthpi   Counters for horizontal drawing parameters.
\l@youthpii
\l@youthpiii   ```
\l@youthpiv   44 \newcount\l@youthpi
\l@youthpv   45 \newcount\l@youthpii
\l@youthpvi   46 \newcount\l@youthpiii
\l@youthpvii   47 \newcount\l@youthpiv
               48 \newcount\l@youthpv
               49 \newcount\l@youthpvi
               50 \newcount\l@youthpvii
               51
               ```

\l@youtparskip Counters for vertical drawing parameters.
\l@youtvpi
\l@youtvpii    ```
\l@youtvpiii   52 \newcount\l@youtparskip
\l@youtvpiv    53 \newcount\l@youtvpi
\l@youtvpv     54 \newcount\l@youtvpii
\l@youtvpvi    55 \newcount\l@youtvpiii
\l@youtvpvii   56 \newcount\l@youtvpiv
               57 \newcount\l@youtvpv
               58 \newcount\l@youtvpvi
               59 \newcount\l@youtvpvii
               60
               ```

\l@youthdo   Horizontal dimensions.
\l@youthdi
\l@youthdii   ```
\l@youthdiii   61 \newcount\l@youthdo
\l@youthdiv   62 \newcount\l@youthdi
\l@youthdv   63 \newcount\l@youthdii
\l@youthdvi   64 \newcount\l@youthdiii
\l@youthdvii   65 \newcount\l@youthdiv
               66 \newcount\l@youthdv
               67 \newcount\l@youthdvi
               68 \newcount\l@youthdvii
               69
               ```

\l@youtvdo     Vertical dimensions.
\l@youtvdi
\l@youtvdii    ```
\l@youtvdiii   70 \newcount\l@youtvdo
\l@youtvdiv    71 \newcount\l@youtvdi
\l@youtvdv
\l@youtvdvi
\l@youtvdvii
\l@youtvdviii
```

```
72 \newcount\l@youtvdii
73 \newcount\l@youtvdiii
74 \newcount\l@youtvdiv
75 \newcount\l@youtvdv
76 \newcount\l@youtvdvi
77 \newcount\l@youtvdvii
78 \newcount\l@youtvdviii
79
```

\l@youtxci   X coordinates.
\l@youtxcii
\l@youtxciii
\l@youtxciv
\l@youtxcv
\l@youtxcvi

```
80 \newcount\l@youtxci
81 \newcount\l@youtxcii
82 \newcount\l@youtxciii
83 \newcount\l@youtxciv
84 \newcount\l@youtxcv
85 \newcount\l@youtxcvi
86
```

\l@youtyci   Y coordinates.
\l@youtycii
\l@youtyciii
\l@youtyciv
\l@youtycv
\l@youtycvi
\l@youtycvii
\l@youtycviii

```
87 \newcount\l@youtyci
88 \newcount\l@youtycii
89 \newcount\l@youtyciii
90 \newcount\l@youtyciv
91 \newcount\l@youtycv
92 \newcount\l@youtycvi
93 \newcount\l@youtycvii
94 \newcount\l@youtycviii
95
```

\l@youtxco   For the (X,Y) coordinates of the bottom left hand corner of the page.
\l@youtyco

```
96 \newcount\l@youtxco
97 \newcount\l@youtyco
98
```

4   Initialisations

The following are used to set up default conditions.

\ifoddpagelayout   Set TRUE to draw an oddside page.

```
99 \newif\ifoddpagelayout
100   \oddpagelayouttrue
```

\iftwocolumnlayout   Set TRUE to draw a two column page.

```
101 \newif\iftwocolumnlayout
102   \twocolumnlayoutfalse
```

\ifdrawmarginpars   Set TRUE to draw marginpars on a page.

```
103 \newif\ifdrawmarginpars
104   \drawmarginparstrue
```

\ifdrawparameters   Set TRUE to draw a layout with marked dimension lines.

```
105 \newif\ifdrawparameters
106   \drawparameterstrue
```

\iflistaspara   Set TRUE to draw lists as stand-alone paragraph.

```
107 \newif\iflistaspara
108   \listasparatrue
```

\ifruninhead   Set TRUE to draw a run-in heading.

```
109 \newif\ifruninhead
110   \runinheadfalse
```

\ifprintparameters   Set TRUE to print table of actual parameter values

```
111 \newif\ifprintparameters
112   \printparameterstrue
```

\ifdrawdimensions   Set TRUE to draw dimension lines

```
113 \newif\ifdrawdimensions
114   \drawdimensionsfalse
```

\ifprintheadings   Set TRUE to print text about dashed lines.

```
115 \newif\ifprintheadings
116   \printheadingstrue
```

\ifl@ytempif   A scratch \if.

```
117 \newif\ifl@ytempif
```

\l@yor   \l@yor{$\langle ifA\rangle$}{$\langle ifB\rangle$} sets \ifl@ytempif to TRUE unless $\langle ifA\rangle$ is FALSE and $\langle ifB\rangle$ is FALSE (i.e., \ifl@tempif $= \langle ifA\rangle$ OR $\langle ifB\rangle$).

```
118 \newcommand{\l@yor}[2]{%
119   \l@ytempiftrue
120   #1
121   \else
122     #2
123     \else
124       \l@ytempiffalse
125     \fi
126   \fi}
```

\l@ynnand   \l@ynnand{$\langle ifA\rangle$}{$\langle ifB\rangle$} sets \ifl@ytempif to FALSE unless $\langle ifA\rangle$ is FALSE and $\langle ifB\rangle$ is TRUE

```
127 \newcommand{\l@ynnand}[2]{%
128   \l@ytempiffalse
129   #1
130   \else
131     #2
132       \l@ytempiftrue
133     \fi
134   \fi}
```

\l@ynox   \l@ynox{⟨*ifA*⟩}{⟨*ifB*⟩} sets \ifl@ytempif to TRUE unless ⟨*ifA*⟩ is TRUE and ⟨*ifB*⟩ is FALSE.

```
135 \newcommand{\l@ynox}[2]{%
136   \l@ytempiftrue
137   #1
138     #2
139     \else
140       \l@ytempiffalse
141     \fi
142   \fi}
```

\testdrawdimensions
\testprintparameters

```
143 \newcommand{\testdrawdimensions}{%
144   \l@yor{\ifdrawparameters}{\ifdrawdimensions}}
145 \newcommand{\testprintparameters}{%
146   \l@ynnand{\ifdrawparameters}{\ifprintparameters}}
147
```

\setlabelfont   The font for labels in the diagrams.
\l@ylabelfont

```
148 \newcommand{\setlabelfont}[1]{\renewcommand{\l@ylabelfont}{#1}}
149   \newcommand{\l@ylabelfont}{\normalfont}
```

\setparametertextfont   The font size for parameters.
\l@yparamfont

```
150 \newcommand{\setparametertextfont}[1]{\renewcommand{\l@yparamfont}{#1}}
151   \newcommand{\l@yparamfont}{\footnotesize}
```

\setvaluestextsize   The font size for value tables.
\l@yvalsize

```
152 \newcommand{\setvaluestextsize}[1]{\renewcommand{\l@yvalsize}{#1}}
153   \newcommand{\l@yvalsize}{\normalsize}
```

\setlayoutscale   A user command to set the drawing scale. The scale is initialised to half size.

```
154 \newcommand{\setlayoutscale}[1]{\setlength{\l@youtunitlength}{1pt}
155   \l@youtunitlength = #1\l@youtunitlength
156   \renewcommand{\l@youtscale}{#1}
157   \PackageWarning{layouts}{Layout scale set to #1}}
158 %%%\setlayoutscale{0.5}
```

\setuplayouts   The \setuplayouts command should be called immediately at the \begin{document}. It must be called before any command that changes font sizes or makes any change to the document layout. It stores relevant skips.

```
159 \newcommand{\setuplayouts}{%
160   \setlength{\l@ysetupparskip}{\parskip}
161   \setlength{\l@ysetupbaselineskip}{\baselineskip}
162   \setlength{\l@yonem}{1em}
163   \setlength{\l@yonex}{1ex}
164   \setlayoutscale{0.5}
165 %%%  \PackageWarning{layouts}{Layout scale set to 0.5}
166 }
167 \AtBeginDocument{\setuplayouts}
```

5 Utility commands

A variety of utility commands.

\l@yltoc   \l@yltoc{⟨*length*⟩}{⟨*counter*⟩} converts a length into a counter value. The
counter value is to the nearest pt of the length.

```
168 \newcommand{\l@yltoc}[2]{\setlength{\l@ylen}{#1}%
169                         \ifdim\l@ylen > \z@ \advance\l@ylen by 0.5\p@ \else
170                           \ifdim\l@ylen < \z@ \advance\l@ylen by -0.5\p@
171                           \fi
172                         \fi
173                         #2=\l@ylen
174                         \divide #2 by \l@yonepoint\relax}
```

\l@yvuda   \l@yvuda{⟨*x*⟩}{⟨*y*⟩}{⟨*distance*⟩} draws a line vertically upwards from (⟨*x*⟩,⟨*y*⟩) a
\l@yhrda   ⟨*distance*⟩ with an outward pointing arrowhead at each end of the line. \l@yhrda
is similar except that a horizontal line is drawn to the right. Simplistically, the
commands produce something like <---->.

```
175 \newcommand{\l@yvuda}[3]{\put(#1,#2){\vector(0,1){#3}}
176                         \put(#1,#2){\vector(0,-1){0}}}
177 \newcommand{\l@yhrda}[3]{\put(#1,#2){\vector(1,0){#3}}
178                         \put(#1,#2){\vector(-1,0){0}}}
```

\l@yvudia   \l@yvudia{⟨*x*⟩}{⟨*y*⟩}{⟨*distance*⟩} draws two vertical arrowheads pointing to each
\l@yhrdia   other. One is at (⟨*x*⟩,⟨*y*⟩) and the other is at (⟨*x*⟩,⟨*y + distance*⟩). \l@yhrdia is
similar except that the arrowheads are horizontal. Simplistically, the commands
produce something like >   <.

```
179 \newcommand{\l@yvudia}[3]{\begingroup
180                           \l@youthpvii=#1\relax
181                           \l@youtvpvii=#2\relax
182                           \l@youthdvii=#3\relax
183                           \put(\l@youthpvii,\l@youtvpvii){\vector(0,1){0}}
184                           \advance\l@youtvpvii by \l@youthdvii
185                           \put(\l@youthpvii,\l@youtvpvii){\vector(0,-1){0}}
186                           \endgroup}
187 \newcommand{\l@yhrdia}[3]{\begingroup
188                           \l@youthpvii=#1\relax
189                           \l@youtvpvii=#2\relax
190                           \l@youthdvii=#3\relax
191                           \put(\l@youthpvii,\l@youtvpvii){\vector(1,0){0}}
192                           \advance\l@youthpvii by \l@youthdvii
193                           \put(\l@youthpvii,\l@youtvpvii){\vector(-1,0){0}}
194                           \endgroup}
```

\l@ypcmd   \l@ypcmd{⟨*cmdname*⟩} typesets a command ⟨*cmdname*⟩ (which does not include
\l@ycmd   the backslash) (in a picture). For example, \l@ypcmd{fred} prints \fred. The
font size is given by \l@yparamfont. The \l@ycmd macro is similar but does not
set the font size.

```
195 \newcommand{\l@ypcmd}[1]{{\l@yparamfont\textttt{\bs #1}}}
196 \newcommand{\l@ycmd}[1]{\textttt{\bs #1}}
197
```

\printinunitsof \quad \printinunitsof{⟨unit⟩} sets \l@yunits to the value of ⟨unit⟩ and \l@yunitperpt
\l@yunitperpt \quad to the number of ⟨unit⟩ in 1pt.
\l@yunits

```
198 \newcommand{\printinunitsof}[1]{%
199     \def\l@yunitperpt{1.0}\def\l@yunits{pt}%
200     \def\l@yta{#1}\def\l@ytb{pt}%
201     \ifx \l@yta\l@ytb
202       \def\l@yunitperpt{1.0}\def\l@yunits{pt}%
203     \else
204       \def\l@ytb{pc}%
205       \ifx \l@yta\l@ytb
206         \def\l@yunitperpt{0.083333}\def\l@yunits{pc}%
207       \else
208         \def\l@ytb{in}%
209         \ifx \l@yta\l@ytb
210           \def\l@yunitperpt{0.013837}\def\l@yunits{in}%
211         \else
212           \def\l@ytb{mm}%
213           \ifx \l@yta\l@ytb
214             \def\l@yunitperpt{0.351459}\def\l@yunits{mm}%
215           \else
216             \def\l@ytb{cm}%
217             \ifx \l@yta\l@ytb
218               \def\l@yunitperpt{0.0351459}\def\l@yunits{cm}%
219             \else
220               \def\l@ytb{bp}%
221               \ifx \l@yta\l@ytb
222                 \def\l@yunitperpt{0.996264}\def\l@yunits{bp}%
223               \else
224                 \def\l@ytb{dd}%
225                 \ifx \l@yta\l@ytb
226                   \def\l@yunitperpt{0.9345718}\def\l@yunits{dd}%
227                 \else
228                   \def\l@ytb{cc}%
229                   \ifx \l@yta\l@ytb
230                     \def\l@yunitperpt{0.0778809}\def\l@yunits{cc}%
231                   \else
232                     \def\l@ytb{PT}%
233                     \ifx \l@yta\l@ytb
234                       \def\l@yunitperpt{1.0}\def\l@yunits{PT}%
235                     \fi
236                   \fi
237                 \fi
238               \fi
239             \fi
240           \fi
241         \fi
```

```
242      \fi
243   \fi
244 }
245 \printinunitsof{pt}
246
```

\l@ytempdima \l@ytempdima is a scratch length. \prntlen{⟨*length*⟩} prints the value of ⟨*length*⟩
\prntlen   in the units set by \printinunitsof.

```
247 \newlength{\l@ytempdima}
248 \newcommand{\prntlen}[1]{%
249   \def\l@yta{pt}\ifx\l@yta\l@yunits\the#1\else
250     \def\l@yta{PT}%
251     \l@ytempdima=\l@yunitperpt #1\relax\strip@pt\l@ytempdima
252       \ifx\l@yta\l@yunits pt\else\l@yunits\fi\fi}
253
```

\l@yval \l@yval{⟨*lcmd*⟩} prints a value of the (length) command ⟨*lcmd*⟩ (which includes
         the backslash); for example \l@yval{\mylength}.

```
254 %%% \newcommand{\l@yval}[1]{\the#1}
255 \newcommand{\l@yval}[1]{\prntlen{#1}}
256
```

6   Drawing the layout of a page

A variety of commands are used to draw the layout of a page.
        First some utility commands for setting the layout dimensions.

\trypaperwidth Sets the paperwidth and stores the result in \l@youtpw.

```
257 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
258 %%%%    PAGE LAYOUT
259 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
260 \newcommand{\trypaperwidth}[1]{\l@yltoc{#1}{\l@youtpw}}
```

\trypaperheight Sets the paperheight and stores the result in \l@youtph.

```
261 \newcommand{\trypaperheight}[1]{\l@yltoc{#1}{\l@youtph}}
```

\tryhoffset Sets the hoffset and stores the result in \l@youthpi.

```
262 \newcommand{\tryhoffset}[1]{\l@yltoc{#1}{\l@youthpi}}
```

\tryvoffset Sets the voffset and stores the result in \l@youtvpi.

```
263 \newcommand{\tryvoffset}[1]{\l@yltoc{#1}{\l@youtvpi}}
```

\trytopmargin Sets the topmargin and stores the result in \l@youtvpii.

```
264 \newcommand{\trytopmargin}[1]{\l@yltoc{#1}{\l@youtvpii}}
```

\tryheadheight Sets the headheight and stores the result in \l@youtvpiii.

```
265 \newcommand{\tryheadheight}[1]{\l@yltoc{#1}{\l@youtvpiii}}
```

\tryheadsep — Sets the `headsep` and stores the result in `\l@youtvpiv`.

266 `\newcommand{\tryheadsep}[1]{\l@yltoc{#1}{\l@youtvpiv}}`

\trytextheight — Sets the `textheight` and stores the result in `\l@youtvpv`.

267 `\newcommand{\trytextheight}[1]{\l@yltoc{#1}{\l@youtvpv}}`

\tryfootskip — Sets the `footskip` and stores the result in `\l@youtvpvi`.

268 `\newcommand{\tryfootskip}[1]{\l@yltoc{#1}{\l@youtvpvi}}`

\tryoddsidemargin — Sets the `oddsidemargin` and stores the result in `\l@youthpv`.

269 `\newcommand{\tryoddsidemargin}[1]{\l@yltoc{#1}{\l@youthpv}}`

\tryevensidemargin — Sets the `evensidemargin` and stores the result in `\l@youthpiv`.

270 `\newcommand{\tryevensidemargin}[1]{\l@yltoc{#1}{\l@youthpiv}}`

\trytextwidth — Sets the `textwidth` and stores the result in `\l@youthpii`.

271 `\newcommand{\trytextwidth}[1]{\l@yltoc{#1}{\l@youthpii}}`

\trymarginparsep — Sets the `marginparsep` and stores the result in `\l@youthpvi`.

272 `\newcommand{\trymarginparsep}[1]{\l@yltoc{#1}{\l@youthpvi}}`

\trymarginparwidth — Sets the `marginparwidth` and stores the result in `\l@youthpvii`.

273 `\newcommand{\trymarginparwidth}[1]{\l@yltoc{#1}{\l@youthpvii}}`

\trymarginparpush — Sets the `marginparpush` and stores the result in `\l@youtvpvii`.

274 `\newcommand{\trymarginparpush}[1]{\l@yltoc{#1}{\l@youtvpvii}}`

\trycolumnsep — Sets the `columnsep` and stores the result in `\l@youthpiii`.

275 `\newcommand{\trycolumnsep}[1]{\l@yltoc{#1}{\l@youthpiii}}`

\trycolumnseprule — Sets the `columnseprule` and stores the result in `\l@youtlinethick`.

276 `\newcommand{\trycolumnseprule}[1]{\setlength{\l@youtlinethick}{#1}}`

\setfootbox — Sets the height and depth of the footer box and stores the results in `\l@youtvdv` and `\l@youtvdvi`.

277 `\newcommand{\setfootbox}[2]{\l@yltoc{#1}{\l@youtvdv}\l@yltoc{#2}{\l@youtvdvi}}`

\ifreversemarginpar — Flags for where marginpars should go.
\ifmarginparswitch

278 `\newif\ifreversemarginpar`
279 `  \reversemarginparfalse`
280 `\newif\ifmarginparswitch`
281 `  \marginparswitchtrue`
282

\ifl@yrightmpars — Internal flag for marginpar location

283 `\newif\ifl@yrightmpars`
284 `  \l@yrightmparstrue`

\currentpage   This routine sets the layout page parameters to those specified for the document, specifically as on the current page.

```
285 \newcommand{\currentpage}{%
286   \@ifundefined{paperwidth}{\trypaperwidth{8.5in}}%
287     {\trypaperwidth{\paperwidth}}%
288   \@ifundefined{paperheight}{\trypaperheight{11in}}%
289     {\trypaperheight{\paperheight}}%
290   \tryhoffset{\hoffset}%                 % typically 0pt
291   \tryvoffset{\voffset}%                 % typically 0pt
292   \tryoddsidemargin{\oddsidemargin}%     % typically 21-63pt
293   \tryevensidemargin{\evensidemargin}%   % typically 39-82pt
294   \trytopmargin{\topmargin}%             % typically 27pt
295   \commonl@ypage%
296 }
```

\commonl@ypage   This routine sets the layout page parameters common to both the standard and memoir classes, to those specified for the document, specifically as on the current page.

```
297 \newcommand{\commonl@ypage}{%
298   \trymarginparwidth{\marginparwidth}% % typically 68-107pt
299   \trymarginparsep{\marginparsep}%       % typically 10-11pt
300   \trymarginparpush{\marginparpush}%     % typically 5-7pt
301   \tryheadheight{\headheight}%           % typically 12pt
302   \tryheadsep{\headsep}%                 % typically 25pt
303   \tryfootskip{\footskip}%               % typically 30pt
304   \trytextheight{\textheight}%           % typically 36-43 times baselineskip
305   \trytextwidth{\textwidth}%             % typically 345-390pt
306   \trycolumnsep{\columnsep}%             % typically 10pt
307   \trycolumnseprule{\columnseprule}%     % typically 0pt
308   \setfootbox{\baselineskip}{0pt}%       % footheight = 1 line
309   \reversemarginparfalse                 % reversemargin
310   \if@reversemargin \reversemarginpartrue \fi
311   \marginparswitchfalse                  % mparswitch
312   \if@mparswitch \marginparswitchtrue \fi
313   \twocolumnlayoutfalse
314   \if@twocolumn \twocolumnlayouttrue \fi
315   \oddpagelayouttrue
316   \if@twoside
317     \ifodd\count\z@
318     \else
319       \oddpagelayoutfalse
320     \fi
321   \fi
322 }
```

\drawpage   This routine draws a page layout.

```
323 \newcommand{\drawpage}{%
```

First set some default vertical and horizontal dimension values.

```
324  \l@youtvdiii=\l@yteninch\relax
325    \divide\l@youtvdiii by 24\relax
326  \l@youthdii=\l@youtvdiii
327  \ifdrawparameters
```

When `drawparameters` is TRUE, we draw a generic layout showing the controlling layout variables.

```
328    \l@youtph=\l@yeleveninch\relax     % page height
329    \l@youtpw=\l@yeighthalfinch\relax  % page width
330    \l@youtvpi=\z@                      % voffset
331    \l@youtvpii=\l@youtvdiii           % topmargin
332    \l@youtvpiii=\l@youtvdiii          % headheight
333    \l@youtvpiv=\l@youtvdiii           % headsep
334    \l@youtvpv=\l@yoneinch\relax       % textheight
335      \multiply\l@youtvpv by 6\relax
336    \l@youtvpvi=\l@youtvdiii           % footskip
337      \multiply\l@youtvpvi by \tw@
338    \l@youtvdv=\l@youtvdiii            % default footboxheight
339    \l@youtvdvi=\z@                    % default footboxdepth
340    \l@youtvpvii=\l@youtvdiii          % marginparpush
341    \l@youthpi=\z@              % hoffset
342    \l@youthpii=\l@youthdii    % textwidth
343      \multiply\l@youthpii by 13\relax
344    \l@youthpiii=\l@youthdii  % columnsep
345    \l@youthpiv=\l@youthdii   % evensidemargin
346    \l@youthpv=\l@youthdii    % oddsidemargin
347    \l@youthpvi=\l@youthdii   % marginparsep
348    \l@youthpvii=\l@youthdii  % marginparwidth
349      \multiply\l@youthpvii by \tw@
350  \fi
```

Calculate coordinates for use in the drawing.

```
351  \l@youtycvi=\l@youtph                    % one inch below top of page
352    \advance\l@youtycvi by -\l@yoneinch\relax
353  \l@youtxci=\l@youthpi                     % hofref
354    \advance\l@youtxci by \l@yoneinch\relax
355  \l@youtycv=\l@youtycvi                    % vofref
356    \advance\l@youtycv by -\l@youtvpi
357  \l@youtyciv=\l@youtycv                    % headref
358    \advance\l@youtyciv by -\l@youtvpii
359    \advance\l@youtyciv by -\l@youtvpiii
360  \l@youtycii=\l@youtyciv                   % bodyref
361    \advance\l@youtycii by -\l@youtvpiv
362    \advance\l@youtycii by -\l@youtvpv
363  \ifnum\l@youtvdv>\l@youtvpvi
364    \PackageWarning{layouts}{The footbox is higher than the footskip}
365    \l@youtvdv=\l@youtvpvi
366  \fi
367  \l@youtyci=\l@youtycii                    % footref
368    \advance\l@youtyci by -\l@youtvpvi
```

```
369     \advance\l@youtyci by -\l@youtvdvi    % box depth
370   \l@youtvdvii=\l@youtvdv                 % box height
371     \advance\l@youtvdvii by \l@youtvdvi   % plus depth
372   \l@youtvdii=\l@youtvpv                   % noteheight
373     \divide\l@youtvdii by 4\relax
374   \l@youtyciii=\l@youtycii                 % noteref
375     \advance\l@youtyciii by \l@youtvdii
376     \advance\l@youtyciii by \l@youtvpvii
377   \l@youtxcii=\l@youtxci                   % marginref
378   \ifoddpagelayout
```

Some values are different on odd and even pages

```
379     \advance\l@youtxcii by \l@youthpv
380   \else
381     \advance\l@youtxcii by \l@youthpiv
382   \fi
383   \l@youtxciv=\l@youtxcii                  % margnoteref
```

The next part of the code was supplied by Frank Mittelbach[2] to add facilities for reversed marginpars. Now find where the marginpars go. `\@tempcnta = (1 —` right, -1 — left) corresponds to the treatment in the kernel.

```
384   \@tempcnta\@ne
385   \ifmarginparswitch
386     \ifoddpagelayout \else \@tempcnta\m@ne \fi
387   \fi
388   \ifreversemarginpar \@tempcnta -\@tempcnta \fi
```

Change layout values to suit.

```
389   \ifnum\@tempcnta > \z@
390     \l@yrightmparstrue
391     \advance\l@youtxciv by \l@youthpii
392     \advance\l@youtxciv by \l@youthpvi
393   \else
394     \l@yrightmparsfalse
395     \advance\l@youtxciv by -\l@youthpvi
396     \advance\l@youtxciv by -\l@youthpvii
397   \fi
```

Back to my code. Do column dependent values.

```
398   \l@youthdi=\l@youthpii                   % columnwidth
399   \l@youtxciii=\l@youtxcii                 % colref
400   \iftwocolumnlayout
401     \advance\l@youthdi by -\l@youthpiii
402     \divide\l@youthdi by \tw@
403     \advance\l@youtxciii by \l@youthdi
404     \advance\l@youtxciii by \l@youthpiii
405     \l@youtxcv=\l@youthpiii               % centre of gutter
406       \divide\l@youtxcv by \tw@
407       \advance\l@youtxcv by \l@youtxcii
408       \advance\l@youtxcv by \l@youthdi
```

---

[2]Email dated 2002/05/18.

```
409   \fi
```

Print the caption for the top of the drawing.

```
410   \l@yor{\ifdrawparameters}{\ifprintheadings}
411   \begin{center}
412   \ifl@ytempif
413   \begin{small} The circle is at 1 inch from the top and left of the
414     page. Dashed lines represent (\texttt{\bs hoffset + 1 inch}) and
415     (\texttt{\bs voffset + 1 inch}) from the top and left of the
416     page.
417   \end{small} \\
418   \medskip
419   \fi
```

Draw the picture!

```
420   \setlength{\unitlength}{\l@youtunitlength}
421   \begin{picture}(\l@youtpw,\l@youtph)
422     \thicklines
```

Either reference lines for the page top and side, or the page.

```
423     \ifdrawparameters
424       \put(0,0){\line(0,1){\l@youtph}}
425       \put(0,\l@youtph){\line(1,0){\l@youtpw}}
426     \else
427       \put(0,0){\framebox(\l@youtpw,\l@youtph){}}
428     \fi
```

Draw the offset lines and a circle 1 inch from the top LH corner of the page.

```
429     \put(\l@yoneinch,\l@youtycvi){\circle{12}}
430     \put(0,\l@youtycv){\dashbox{10}(\l@youtpw,0){}}
431     \put(\l@youtxci,0){\dashbox{10}(0,\l@youtph){}}
```

Draw the header. `put(marginref,headref){framebox(textwidth,headheight)}`

```
432     \put(\l@youtxcii,\l@youtyciv){\framebox(\l@youthpii,\l@youtvpiii)%
433       {\l@ylabelfont Header}}
```

Draw the body.

```
434     \iftwocolumnlayout
```

`put(marginref,bodyref){framebox(columnwidth,textheight)}` and
`put(colref,bodyref){framebox(columnwidth,textheight)}`.

```
435       \put(\l@youtxcii,\l@youtycii){\framebox(\l@youthdi,\l@youtvpv)%
436         {\l@ylabelfont Col. 1}}
437       \put(\l@youtxciii,\l@youtycii){\framebox(\l@youthdi,\l@youtvpv)%
438         {\l@ylabelfont Col. 2}}
439       \linethickness{\l@youtscale\l@youtlinethick}
440       \put(\l@youtxcv,\l@youtycii){\line(0,1){\l@youtvpv}}
441       \thicklines
442     \else
```

`put(marginref,bodyref){framebox(textwidth,textheight)}`.

```
443       \put(\l@youtxcii,\l@youtycii){\framebox(\l@youthpii,\l@youtvpv)%
```

```
444          {\l@ylabelfont Body}}
445     \fi
```

Draw the footer. `put(marginref,footref){framebox(textwidth,footheight)}`
Draw this as an open box as there is no defined height for this.

```
446     \put(\l@youtxcii,\l@youtyci){\framebox(\l@youthpii,\l@youtvdvii)%
447          {\l@ylabelfont Footer}}
```

Marginal notes (two examples), if asked for.
`put(margnoteref,bodyref){framebox(marginparwidth,noteheight)}` and
`put(margnoteref,noteref){framebox(marginparwidth,noteheight)}`.

```
448     \ifdrawmarginpars
449        \ifdrawparameters
450        \put(\l@youtxciv,\l@youtycii){\framebox(\l@youthpvii,\l@youtvdii){}}
451        \put(\l@youtxciv,\l@youtyciii){\framebox(\l@youthpvii,\l@youtvdii)%
452           {\l@ylabelfont\shortstack{Margin\\Note}}}
453        \else
454        \put(\l@youtxciv,\l@youtycii){\framebox(\l@youthpvii,\l@youtvdii)%
455           {\l@ylabelfont Note}}
456        \put(\l@youtxciv,\l@youtyciii){\framebox(\l@youthpvii,\l@youtvdii)%
457           {\l@ylabelfont Margin}}
458        \fi
459     \fi
```

If the footbox has a depth, draw a dashed line to mark the footskip.

```
460     \ifnum\l@youtvdvi > \z@
461        \thinlines
462        \advance\l@youtyci by \l@youtvdvi
463        \put(\l@youtxcii,\l@youtyci){\dashbox{10}(\l@youthpii,0){}}
464     \fi
```

We now draw labelled vectors indicating the layout parameters. Life gets tedious
as we have to calculate a few more coordinate and length values. The code below
is fairly incomprehensible as we are trying to minimise the number of counters.

```
465     \testdrawdimensions
466     \ifl@ytempif
467        \thinlines
```

Calculate more coordinates

```
468        \l@youtxcv=\l@youtxcii            % X coord for vertical dimensions
469           \advance\l@youtxcv by \l@youthdii
470        \l@youtxcvi=\l@youthpvii          % X coord for marginparpush
471           \divide\l@youtxcvi by \tw@
472           \advance\l@youtxcvi by \l@youtxciv
473        \l@youtvdviii=\l@youtvdiii         % half l@youtvdiii
474           \divide\l@youtvdviii by \tw@
475        \l@youtycvii=\l@youtycii          % Y coord for low dimensions
476           \advance\l@youtycvii by \l@youtvdiii
477        \l@youtycviii=\l@youtycvii          % Y coord for mid dimensions
478           \advance\l@youtycviii by \l@youtvdiii
479        \l@youtvdi=\l@youtvpv             % Y coord for top dimensions
```

```
480          \multiply\l@youtvdi by \tw@
481          \divide\l@youtvdi by 3\relax
482          \advance\l@youtvdi by \l@youtycii
```

Draw the vertical dimensional parameters.

Topmargin. `put(x,voffset){vector(0,-1){topmargin}}`

```
483          \put(\l@youtxcv,\l@youtycv){\vector(0,-1){\l@youtvpii}}
484          \put(\l@youtxcv,\l@youtycv){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
485          \put(\l@youtvdviii,-\l@youtvdviii){\l@ypcmd{topmargin}}
486          \end{picture}}
```

Headheight. `put(x,voffset-topmargin){vector(0,-1){headheight}}`

```
487          \put(\l@youtxcv,\l@youtyciv){\line(0,1){\l@youtvpiii}}
488          \put(\l@youtxcv,\l@youtyciv){\vector(0,-1){0}}
489          \put(\l@youtxcv,\l@youtyciv){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
490          \put(\l@youtvdviii,\l@youtvdviii){\l@ypcmd{headheight}}
491          \end{picture}}
```

Headsep. `put(x,headref){vector(0,-1){headsep}}`

```
492          \put(\l@youtxcv,\l@youtyciv){\vector(0,-1){\l@youtvpiv}}
493          \put(\l@youtxcv,\l@youtyciv){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
494          \put(\l@youtvdviii,-\l@youtvdviii){\l@ypcmd{headsep}}
495          \end{picture}}
```

Textheight. `put(x,top_of_text){vector(0,-1){textheight}}`

```
496          \put(\l@youtxcv,\l@youtycii){\line(0,1){\l@youtvpv}}
497          \put(\l@youtxcv,\l@youtycii){\vector(0,-1){0}}
498          \put(\l@youtxcv,\l@youtycii){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
499          \put(\l@youtvdviii,\l@youtvdviii){\l@ypcmd{textheight}}
500          \end{picture}}
```

Footskip. `put(x,bodyref){vector(0,-1){footskip}}`

```
501          \put(\l@youtxcv,\l@youtycii){\vector(0,-1){\l@youtvpvi}}
502          \put(\l@youtxcv,\l@youtycii){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
503          \put(\l@youtvdviii,-\l@youtvdviii){\l@ypcmd{footskip}}
504          \end{picture}}
```

Marginparpush. `put(X,noteref){vector(0,-1){marginparpush}}` where
`X = margnoteref + 1/2 notewidth.`

```
505          \ifdrawmarginpars
506          \put(\l@youtxcvi,\l@youtyciii){\vector(0,-1){\l@youtvpvii}}
507          \put(\l@youtxcvi,\l@youtyciii){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
508           \put(\l@youtvdviii,-\l@youtvdviii){\l@ypcmd{marginparpush}}
509           \end{picture}}
510          \fi
```

Now for all the horizontal dimensions.

Marginparwidth. `put(margnoteref,low){vector(1,0){marginparwidth}`

```
511          \ifdrawmarginpars
512          \put(\l@youtxciv,\l@youtycvii){\vector(1,0){\l@youthpvii}}
513          \put(\l@youtxciv,\l@youtycvii){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
514           \put(\l@youtvdviii,\l@youtvdviii){\l@ypcmd{marginparwidth}}
```

```
515          \end{picture}}
516        \fi
```

Different placements for marginwidth depending on the oddness of the page.
Odd page — `put(hoffref,mid){\vector(1,0){oddsidemargin}`
Even page — `put(hoffref,mid){\vector(1,0){evensidemargin}`.

```
517        \ifoddpagelayout
518          \put(\l@youtxci,\l@youtvdi){\vector(1,0){\l@youthpv}}
519        \else
520          \put(\l@youtxci,\l@youtvdi){\vector(1,0){\l@youthpiv}}
521        \fi
522        \put(\l@youtxci,\l@youtvdi){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
523        \ifoddpagelayout
524          \put(\l@youtvdviii,\l@youtvdviii){\l@ypcmd{oddsidemargin}}
525        \else
526          \put(\l@youtvdviii,\l@youtvdviii){\l@ypcmd{evensidemargin}}
527        \fi
528          \end{picture}}
```

Different placements for marginparsep, depending on the particular margin.
Right margin — `put(margnoteref-marginparsep,mid){vector(1,0){marginparsep}`
Left margin — `put(marginref,top){vector(-1,0){marginparsep}`

```
529        \ifdrawmarginpars
530          \ifl@yrightmpars
531            \put(\l@youtxciv,\l@youtycviii){\line(-1,0){\l@youthpvi}}
532            \put(\l@youtxciv,\l@youtycviii){\vector(1,0){0}}
533            \put(\l@youtxciv,\l@youtycviii){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
534              \put(-\l@youtvdviii,\l@youtvdviii){\l@ypcmd{marginparsep}}
535              \end{picture}}
536          \else
537            \put(\l@youtxcii,\l@youtycviii){\vector(-1,0){\l@youthpvi}}
538            \put(\l@youtxcii,\l@youtycviii){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
539              \put(-\l@youtvdviii,\l@youtvdviii){\l@ypcmd{marginparsep}}
540              \end{picture}}
541          \fi
542        \fi
```

Textwidth. `put(marginref,noteref){vector(1,0){textwidth}}`

```
543        \put(\l@youtxcii,\l@youtyciii){\vector(1,0){\l@youthpii}}
544        \put(\l@youtxcv,\l@youtyciii){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
545          \put(\l@youtvdviii,\l@youtvdviii){\l@ypcmd{textwidth}}
546          \end{picture}}
```

Columnsep. `put(colref-colsep,mid){vector(1,0){colsep}}`

```
547        \iftwocolumnlayout
548          \put(\l@youtxciii,\l@youtvdi){\line(-1,0){\l@youthpiii}}
549          \put(\l@youtxciii,\l@youtvdi){\vector(1,0){0}}
550          \put(\l@youtxciii,\l@youtvdi){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
551            \put(-\l@youtvdviii,\l@youtvdviii){\l@ypcmd{columnsep}}
552            \end{picture}}
553        \fi
```

Have finished drawing the parameters.

```
554      \fi
555      \end{picture}
556      \end{center}
557      \setlength{\unitlength}{1pt}
```

Print the actual parameter values.

```
558      \testprintparameters
559      \ifl@ytempif
560        \begin{center}
561        \begin{footnotesize}
562          Lengths are to the nearest pt. \\
563        \begin{ttfamily}
564        \begin{tabular}{l@{\hspace{20pt}}l}
565        \textrm{page height}    = \number\l@youtph pt &
566        \textrm{page width}     = \number\l@youtpw pt   \\
567        \l@ycmd{hoffset}        = \number\l@youthpi pt          &
568        \l@ycmd{voffset}        = \number\l@youtvpi pt          \\
569        \ifoddpagelayout
570          \l@ycmd{oddsidemargin} = \number\l@youthpv pt
571        \else
572          \l@ycmd{evensidemargin} = \number\l@youthpiv pt
573        \fi
574        & \l@ycmd{topmargin}    = \number\l@youtvpii pt     \\
575        \l@ycmd{headheight}     = \number\l@youtvpiii pt    &
576        \l@ycmd{headsep}        = \number\l@youtvpiv pt         \\
577        \l@ycmd{textheight}     = \number\l@youtvpv pt       &
578        \l@ycmd{textwidth}      = \number\l@youthpii pt        \\
579        \l@ycmd{footskip}       = \number\l@youtvpvi pt         &
580        \l@ycmd{marginparsep}   = \number\l@youthpvi pt    \\
581        \l@ycmd{marginparpush}  = \number\l@youtvpvii pt &
582        \l@ycmd{columnsep}      = \number\l@youthpiii pt       \\
583        \l@ycmd{columnseprule}  = \the\l@youtlinethick & \\
584        \end{tabular}
585        \end{ttfamily}\end{footnotesize}
586        \end{center}
587      \fi
```

The end of the definition for \drawpage.

```
588  }
589
```

\pagediagram   Shorthands.
\pagedesign   `590 \newcommand{\pagediagram}{\drawparameterstrue\drawpage}`
`591 \newcommand{\pagedesign}{\drawparametersfalse\drawpage}`
`592`

\pagevalues   This macro produces a table of the current page layout actual values.
`593 \newcommand{\pagevalues}{%`
`594 %%  \begin{center}`

```
595   \ifprintheadings
596     Actual page layout values.\\[\baselineskip]
597   \fi
598   \begingroup\l@yvalsize
599   \begin{tabular}{l@{\hspace{20pt}}l}
600   \l@ycmd{paperheight} = \@ifundefined{paperheight}{??}{\l@yval{\paperheight}}  &
601   \l@ycmd{paperwidth}  = \@ifundefined{paperwidth}{??}{\l@yval{\paperwidth}}   \\
602   \l@ycmd{hoffset}        = \l@yval{\hoffset}         &
603   \l@ycmd{voffset}        = \l@yval{\voffset}          \\
604   \l@ycmd{evensidemargin} = \l@yval{\evensidemargin} &
605   \l@ycmd{oddsidemargin}  = \l@yval{\oddsidemargin}  \\
606   \l@ycmd{topmargin}      = \l@yval{\topmargin}       &
607   \l@ycmd{headheight}     = \l@yval{\headheight}      \\
608   \l@ycmd{headsep}        = \l@yval{\headsep}         &
609   \l@ycmd{textheight}     = \l@yval{\textheight}      \\
610   \l@ycmd{textwidth}      = \l@yval{\textwidth}       &
611   \l@ycmd{footskip}       = \l@yval{\footskip}        \\
612   \l@ycmd{marginparsep}   = \l@yval{\marginparsep}    &
613   \l@ycmd{marginparpush}  = \l@yval{\marginparpush}   \\
614   \l@ycmd{columnsep}      = \l@yval{\columnsep}       &
615   \l@ycmd{columnseprule}  = \l@yval{\columnseprule}  \\
616   1em = \l@yval{\l@yonem}  & 1ex = \l@yval{\l@yonex} \\
617   \end{tabular}
618   \endgroup
619 %%  \end{center}
620 }
621
```

7   Drawing the layout of a memoir page

A variety of commands are used to draw the layout of a page as defined in the memoir class. We can reuse quite a lot from the previous page layout code.

```
622
623 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
624 %%%%    STOCK LAYOUT
625 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
626
```

\stockwidth   The memoir class has some page layout parameters that are not in the standard
\stockwidth   classes. Provide these so the package will at least compile with the standard classes
\trimedge   but is highly likely to die at runtime if this part of the code is used in other than
\trimtop   the memoir class.

\uppermargin
\spinemargin

```
627 \@ifundefined{stockwidth}{\newlength{\stockwidth}}{}
628 \@ifundefined{stockheight}{\newlength{\stockheight}}{}
629 \@ifundefined{trimedge}{\newlength{\trimedge}}{}
630 \@ifundefined{trimtop}{\newlength{\trimtop}}{}
631 \@ifundefined{uppermargin}{\newlength{\uppermargin}}{}
632 \@ifundefined{spinemargin}{\newlength{\spinemargin}}{}
```

633

Now some utility commands for setting the layout dimensions.

\trystockwidth   Sets the `stockwidth` and stores the result in `\l@youthdo`.

634 `\newcommand{\trystockwidth}[1]{\l@yltoc{#1}{\l@youthdo}}`

\trystockheight   Sets the `stockheight` and stores the result in `\l@youtvdo`.

635 `\newcommand{\trystockheight}[1]{\l@yltoc{#1}{\l@youtvdo}}`

\trytrimedge   Sets the `trimedge` and stores the result in `\l@youthpi`.

636 `\newcommand{\trytrimedge}[1]{\l@yltoc{#1}{\l@youthpi}}`

\trytrimtop   Sets the `trimtop` and stores the result in `\l@youtvpi`.

637 `\newcommand{\trytrimtop}[1]{\l@yltoc{#1}{\l@youtvpi}}`

\tryuppermargin   Sets the `uppermargin` and stores the result in `\l@youtvpii`.

638 `\newcommand{\tryuppermargin}[1]{\l@yltoc{#1}{\l@youtvpii}}`

\tryspinemargin   Sets the `spinemargin` and stores the result in `\l@youthpv`.

639 `\newcommand{\tryspinemargin}[1]{\l@yltoc{#1}{\l@youthpv}}`
640

\currentstock   This routine sets the stock layout page parameters to those specified for the document.

```
641 \newcommand{\currentstock}{%
642   \trystockwidth{\stockwidth}%        % typically 8.5in
643   \trystockheight{\stockheight}%      % typically 11in
644   \trypaperwidth{\paperwidth}%        % typically 8.5in
645   \trypaperheight{\paperheight}%      % typically 11in
646   \trytrimedge{\trimedge}%            % typically 0pt
647   \trytrimtop{\trimtop}%              % typically 0pt
648   \tryspinemargin{\spinemargin}%      % typically 110pt
649   \tryuppermargin{\uppermargin}%      % typically 125pt
650   \commonl@ypage
651 }
652
```

\drawstock   This routine draws a stock page layout.

653 `\newcommand{\drawstock}{%`

First set some default vertical and horizontal dimension values.

```
654   \l@youtvdiii=\l@yteninch\relax
655     \divide\l@youtvdiii by 24\relax
656   \l@youthdii=\l@youtvdiii
657
658   \ifdrawparameters
```

When `drawparameters` is TRUE, we draw a generic layout showing the controlling layout variables.

```
659    \l@youtvdo=\l@yeleveninch\relax            % stock height
660    \l@youthdo=\l@yeighthalfinch\relax         % stock width
661    \l@youtvpi=\z@                             % trimtop
662      \advance\l@youtvpi by \l@youtvdiii
663    \l@youthpi=\z@                             % trimedge
664      \advance\l@youthpi by \l@youtvdiii
665    \l@youtph=\l@youtvdo                       % page height (= stock height)
666      \advance\l@youtph by -\l@youtvpi           % minus trimtop
667      \advance\l@youtph by -\l@youtvpi           % minus trimtop
668      \advance\l@youtph by -\l@youtvpi           % minus trimtop
669    \l@youtpw=\l@youthdo                       % page width (= stock width)
670      \advance\l@youtpw by -\l@youthpi           % minus trimedge
671      \advance\l@youtpw by -\l@youthpi           % minus trimedge
672      \advance\l@youtpw by -\l@youthpi           % minus trimedge
673    \l@youtvpiii=\l@youtvdiii                  % headheight
674    \l@youtvpiv=\l@youtvdiii                   % headsep
675    \l@youtvpii=\l@youtvdiii                   % uppermargin
676      \advance\l@youtvpii by \l@yoneinch          % plus 1in
677      \advance\l@youtvpii by \l@youtvpiii        % plus headheight
678      \advance\l@youtvpii by \l@youtvpiv         % plus headsep
679    \l@youtvpv=\l@yoneinch\relax               % textheight
680      \multiply\l@youtvpv by 6\relax
681    \l@youtvpvi=\l@youtvdiii                   % footskip
682      \multiply\l@youtvpvi by \tw@
683    \l@youtvdv=\l@youtvdiii                    % default footboxheight
684    \l@youtvdvi=\z@                            % default footboxdepth
685    \l@youtvpvii=\l@youtvdiii                  % marginparpush
686    \l@youthpii=\l@youthdii                    % textwidth
687      \multiply\l@youthpii by 12\relax
688    \l@youthpv=\l@youthdii                     % spine margin
689      \advance\l@youthpv by \l@yoneinch           % plus 1in
690      \multiply\l@youthpv by 7\relax             % and take 70%
691      \divide\l@youthpv by 10\relax
692    \l@youthpiii=\l@youthdii                   % columnsep
693    \l@youthpvi=\l@youthdii   % marginparsep
694    \l@youthpvii=\l@youthdii  % marginparwidth
695      \multiply\l@youthpvii by \tw@
696  \fi
697
```

Calculate coordinates for use in the drawing. Some of these X coordinates depend on whether the page is odd or even.

```
698    \ifoddpagelayout
699      \l@youtxco=\l@youthdo                    % X coord of page bottom left (= stockwidth)
700        \advance\l@youtxco by -\l@youthpi      % minus trimedge
701        \advance\l@youtxco by -\l@youtpw       % minus page width
702    \else
703      \l@youtxco=\l@youthpi                    % X coord of page bottom left = trimedge
```

```
704  \fi
705  \l@youtyco=\l@youtvdo                    % Y coord of page bottom left (= stockheight)
706     \advance\l@youtyco by -\l@youtvpi     % minus trimtop
707     \advance\l@youtyco by -\l@youtph      % minus page height
708  \l@youtxcii=\l@youtxco                    % X coord of left of textblock (= left of page)
709  \ifoddpagelayout
710     \advance\l@youtxcii by \l@youthpv     % plus spinemargin
711  \else
712     \advance\l@youtxcii by \l@youtpw      % plus pagewidth
713     \advance\l@youtxcii by -\l@youthpv    % minus spinemargin
714     \advance\l@youtxcii by -\l@youthpii   % minus textwidth
715  \fi
716     \l@youtxciv=\l@youtxcii               % X coord of left of marginnote (= left of textblock)
717  \l@youtxciv=\l@youtxcii
718  \@tempcnta\@ne
719  \ifmarginparswitch
720     \ifoddpagelayout \else \@tempcnta\m@ne \fi
721  \fi
722  \ifreversemarginpar \@tempcnta -\@tempcnta \fi
723  \ifnum\@tempcnta >\z@
724     \l@yrightmparstrue
725     \advance\l@youtxciv by \l@youthpii    % plus textwidth
726     \advance\l@youtxciv by \l@youthpvi    % plus marginnotesep
727  \else
728     \l@yrightmparsfalse
729     \advance\l@youtxciv by -\l@youthpvii % minus marginparwidth
730     \advance\l@youtxciv by -\l@youthpvi  % minus marginnotesep
731  \fi
732  \l@youtycii=\l@youtvdo                    % Y coord of bottom of text (= stockheight)
733     \advance\l@youtycii by -\l@youtvpi    % minus trimtop
734     \advance\l@youtycii by -\l@youtvpii   % minus uppermargin
735     \advance\l@youtycii by -\l@youtvpv    % minus textheight
736  \ifnum\l@youtvdv>\l@youtvpvi
737     \PackageWarning{layouts}{The footbox is higher than the footskip}
738     \l@youtvdv=\l@youtvpvi
739  \fi
740  \l@youtyci=\l@youtycii                    % Y coord of bottom of footer (= bottom of text)
741     \advance\l@youtyci by -\l@youtvpvi    % minus footskip
742     \advance\l@youtyci by -\l@youtvdvi    % minus box depth
743  \l@youtvdvii=\l@youtvdv                   % box height
744     \advance\l@youtvdvii by \l@youtvdvi   % plus depth
745  \l@youtyciv=\l@youtycii                   % Y coord of bottom of header (= bottom of text)
746     \advance\l@youtyciv by \l@youtvpv     % plus textheight
747     \advance\l@youtyciv by \l@youtvpiv    % plus headsep
748
749  \l@youtvdii=\l@youtvpv                    % height of a marginal note
750     \divide\l@youtvdii by 4\relax
751  \l@youtyciii=\l@youtycii                  % Y coord of bottom of top note (= bottom of bottom note)
752     \advance\l@youtyciii by \l@youtvdii   % plus note height
753     \advance\l@youtyciii by \l@youtvpvii  % plus marginparpush
```

Now for column dependent values.

```
754  \l@youthdi=\l@youthpii                % columnwidth = textwidth
755  \l@youtxciii=\l@youtxcii              % X coord of right col
756  \iftwocolumnlayout
757    \advance\l@youthdi by -\l@youthpiii % colwidth = textwidth - colsep
758    \divide\l@youthdi by \tw@           % divided in half
759    \advance\l@youtxciii by \l@youthdi  % X coord of right col X coord of text + col
760      \advance\l@youtxciii by \l@youthpiii % plus colsep
761    \l@youtxcv=\l@youthpiii             % centre of gutter
762      \divide\l@youtxcv by \tw@
763      \advance\l@youtxcv by \l@youtxcii
764      \advance\l@youtxcv by \l@youthdi
765  \fi
```

Print the caption for the top of the drawing.

```
766  \begin{center}
767  \l@yor{\ifdrawparameters}{\ifprintheadings}
768  \ifl@ytempif
769    \begin{small} Dashed lines represent the actual page size after trimming
770                  the stock. \end{small} \\
771    \medskip
772  \fi
```

Draw the picture!

```
773  \setlength{\unitlength}{\l@youtunitlength}
774  \begin{picture}(\l@youthdo,\l@youtvdo)
775    \thicklines
```

Draw the stock, paper, etc.

```
776    \put(0,0){\framebox(\l@youthdo,\l@youtvdo){}}                     % the stock
777    \put(\l@youtxco,\l@youtyco){\dashbox{10}(\l@youtpw,\l@youtph){}}   % the page
778    \put(\l@youtxcii,\l@youtyciv){\framebox(\l@youthpii,\l@youtvpiii)% % the header
779      {\l@ylabelfont Header}}
```

Draw the body, either one or two columns, then the footer.

```
780    \iftwocolumnlayout
781      \put(\l@youtxcii,\l@youtycii){\framebox(\l@youthdi,\l@youtvpv)% % col 1
782        {\l@ylabelfont Col. 1}}
783      \put(\l@youtxciii,\l@youtycii){\framebox(\l@youthdi,\l@youtvpv)% % col2
784        {\l@ylabelfont Col. 2}}
785      \linethickness{\l@youtscale\l@youtlinethick}
786      \put(\l@youtxcv,\l@youtycii){\line(0,1){\l@youtvpv}}            % rule
787      \linethickness{1pt}
788    \else
789      \put(\l@youtxcii,\l@youtycii){\framebox(\l@youthpii,\l@youtvpv)% % one col
790        {\l@ylabelfont Body}}
791    \fi
792    \put(\l@youtxcii,\l@youtyci){\framebox(\l@youthpii,\l@youtvdvii)% % footer
793      {\l@ylabelfont Footer}}
```

Marginal notes (two examples), if asked for

```
794    \ifdrawmarginpars
795      \ifdrawparameters
796        \put(\l@youtxciv,\l@youtycii){\framebox(\l@youthpvii,\l@youtvdii){}}
797        \put(\l@youtxciv,\l@youtyciii){\framebox(\l@youthpvii,\l@youtvdii)%
798          {\l@ylabelfont\shortstack{Margin\\Note}}}
799      \else
800        \put(\l@youtxciv,\l@youtycii){\framebox(\l@youthpvii,\l@youtvdii)%
801          {\l@ylabelfont Note}}
802        \put(\l@youtxciv,\l@youtyciii){\framebox(\l@youthpvii,\l@youtvdii)%
803          {\l@ylabelfont Margin}}
804      \fi
805    \fi
806
```

If the footbox has a depth, draw a dashed line to mark the footskip.

```
807    \ifnum\l@youtvdvi > \z@
808      \thinlines
809      \advance\l@youtyci by \l@youtvdvi
810      \put(\l@youtxcii,\l@youtyci){\dashbox{10}(\l@youthpii,0){}}
811    \fi
```

That finishes the general drawing. We may have to now draw the parameters

```
812    \testdrawdimensions
813    \ifl@ytempif
814      \thinlines
```

We now draw labelled vectors indicating the layout parameters. Life gets tedious as we have to calculate a few more coordinate and length values. The code below is fairly incomprehensible as we are trying to minimise the number of counters.

```
815      \l@youtycv=\l@youtyco              % Y coord of top of page (= page bottom)
816        \advance\l@youtycv by \l@youtph    % plus pageheight
817      \l@youtvdviii=\l@youtvdiii          % half l@youtvdiii (a small distance)
818        \divide\l@youtvdviii by \tw@
819      \l@youtxcv=\l@youtxcii             % X coord for vertical dimensions
820        \advance\l@youtxcv by \l@youthdii   % for 'standard' vertical vectors
821 %% do headheight
822      \put(\l@youtxcv,\l@youtyciv){\vector(0,1){\l@youtvpiii}}
823      \put(\l@youtxcv,\l@youtyciv){\vector(0,-1){0}}
824      \put(\l@youtxcv,\l@youtyciv){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
825        \put(\l@youtvdviii,\l@youtvdviii){\l@ypcmd{headheight}}
826        \end{picture}}
827 %% do headsep
828      \put(\l@youtxcv,\l@youtyciv){\vector(0,-1){\l@youtvpiv}}
829      \put(\l@youtxcv,\l@youtyciv){\vector(0,1){0}}
830      \put(\l@youtxcv,\l@youtyciv){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
831        \put(\l@youtvdviii,-\l@youtvdviii){\l@ypcmd{headsep}}
832        \end{picture}}
833 %% do textheight
834      \put(\l@youtxcv,\l@youtycii){\vector(0,1){\l@youtvpv}}
835      \put(\l@youtxcv,\l@youtycii){\vector(0,-1){0}}
836      \put(\l@youtxcv,\l@youtycii){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
```

```
837        \put(\l@youtvdviii,\l@youtvdviii){\l@ypcmd{textheight}}
838       \end{picture}}
839 %% do footskip
840       \put(\l@youtxcv,\l@youtycii){\vector(0,-1){\l@youtvpvi}}
841       \put(\l@youtxcv,\l@youtycii){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
842       \put(\l@youtvdviii,-\l@youtvdviii){\l@ypcmd{footskip}}
843       \end{picture}}
844      \ifdrawmarginpars
845      \l@youtxcv=\l@youthpvii                  % X coord for marginparpush
846        \divide\l@youtxcv by \tw@
847        \advance\l@youtxcv by \l@youtxciv
848 %% do marginparpush
849       \put(\l@youtxcv,\l@youtyciii){\vector(0,-1){\l@youtvpvii}}
850       \put(\l@youtxcv,\l@youtyciii){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
851        \put(\l@youtvdviii,-\l@youtvdviii){\l@ypcmd{marginparpush}}
852       \end{picture}}
853     \fi
854 %% calculate X coord for uppermargin/trimtop parameters
855      \ifoddpagelayout
856       \ifl@yrightmpars
857        \l@youtxcv=\l@youtxciv                  % X coord for uppermargin, etc (= edge o
858       \else
859        \l@youtxcv=\l@youtxciv
860          \advance\l@youtxcv by \l@youthpvii  % plus marginparwidth
861       \fi
862      \else
863       \ifl@yrightmpars
864        \l@youtxcv=\l@youtxciv
865       \else
866        \l@youtxcv=\l@youtxciv
867          \advance\l@youtxcv by \l@youthpvii  % plus marginparwidth
868       \fi
869      \fi
870 %% do uppermargin
871      \put(\l@youtxcv,\l@youtycv){\vector(0,-1){\l@youtvpii}}
872      \put(\l@youtxcv,\l@youtycv){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
873       \put(\l@youtvdviii,-\l@youtvdviii){\l@ypcmd{uppermargin}}
874      \end{picture}}
875 %% do trimtop
876      \put(\l@youtxcv,\l@youtvdo){\vector(0,-1){\l@youtvpi}}
877      \put(\l@youtxcv,\l@youtvdo){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
878       \put(\l@youtvdviii,-\l@youtvdviii){\l@ypcmd{trimtop}}
879      \end{picture}}
880 %% X coord for stock height
881      \ifoddpagelayout
882       \ifl@yrightmpars
883        \l@youtxcv=\l@youtxco                 % X coord for stock height
884          \divide\l@youtxcv by \tw@           % 1/2 stock/paper left edges
885       \else
886        \l@youtxcv=\l@youtxco                 % X coord for stock height
```

```
887            \advance\l@youtxcv by \l@youtpw      % plus page width
888            \advance\l@youtxcv by \l@youthpi     % plus trimedge
889         \fi
890      \else
891        \ifl@yrightmpars
892          \l@youtxcv=\l@youtxco                  % X coord for stock height
893            \divide\l@youtxcv by \tw@            % 1/2 stock/paper left edges
894        \else
895          \l@youtxcv=\l@youtxco                  % X coord for stock height
896            \advance\l@youtxcv by \l@youtpw      % plus page width
897            \advance\l@youtxcv by \l@youthpi     % plus trimedge
898        \fi
899      \fi
900  %% do stockheight
901      \put(\l@youtxcv,0){\vector(0,1){\l@youtvdo}}
902      \put(\l@youtxcv,0){\vector(0,-1){0}}
903      \put(\l@youtxcv,\l@youtvdo){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
904        \put(\l@youtvdviii,-\l@youtvdviii){\l@ypcmd{stockheight}}
905        \end{picture}}
906  %% X coord for paper height
907      \ifoddpagelayout
908        \ifl@yrightmpars
909          \l@youtxcv=\l@youtxco                  % X coord for paper height
910            \advance\l@youtxcv by \l@youtxcii    % plus left edge of text
911            \divide\l@youtxcv by \tw@
912        \else
913          \l@youtxcv=\l@youtxco                  % X coord for paper height
914            \advance\l@youtxcv by \l@youtpw      % plus page width
915            \advance\l@youtxcv by \l@youtxcii    % plus left edge of text
916            \advance\l@youtxcv by \l@youthpii    % plus text width
917            \divide\l@youtxcv by \tw@
918        \fi
919      \else
920        \ifl@yrightmpars
921          \l@youtxcv=\l@youtxco                  % X coord for paper height
922            \advance\l@youtxcv by \l@youtxcii    % plus left edge of text
923            \divide\l@youtxcv by \tw@
924        \else
925          \l@youtxcv=\l@youtxco                  % X coord for paper height
926            \advance\l@youtxcv by \l@youtpw      % plus page width
927            \advance\l@youtxcv by \l@youtxcii    % plus left edge of text
928            \advance\l@youtxcv by \l@youthpii    % plus text width
929            \divide\l@youtxcv by \tw@
930        \fi
931      \fi
932  %% do paperheight
933      \put(\l@youtxcv,\l@youtyco){\vector(0,1){\l@youtph}}
934      \put(\l@youtxcv,\l@youtyco){\vector(0,-1){0}}
935      \put(\l@youtxcv,\l@youtycv){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
936        \put(\l@youtvdviii,-\l@youtvdviii){\l@ypcmd{paperheight}}
```

```
937          \end{picture}}
938
939      \l@youtvpiii=\l@youtycii                % Y coord for low dimensions
940        \advance\l@youtvpiii by \l@youtvdiii
941      \l@youtvpiv=\l@youtvpiii                % Y coord for mid dimensions
942        \advance\l@youtvpiv by \l@youtvdiii
943      \l@youtvdi=\l@youtvpv                   % Y coord for top dimensions
944        \multiply\l@youtvdi by \tw@         % 2/3 of text height
945        \divide\l@youtvdi by 3\relax
946        \advance\l@youtvdi by \l@youtycii
947      \ifdrawmarginpars
948  %% do marginparwidth
949        \put(\l@youtxciv,\l@youtvpiii){\vector(1,0){\l@youthpvii}}
950        \put(\l@youtxciv,\l@youtvpiii){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
951          \put(\l@youtvdviii,\l@youtvdviii){\l@ypcmd{marginparwidth}}
952          \end{picture}}
953      \fi
954      \ifoddpagelayout
955  %% do spinemargin
956        \put(\l@youtxco,\l@youtvdi){\vector(1,0){\l@youthpv}}
957        \put(\l@youtxco,\l@youtvdi){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
958          \put(\l@youtvdviii,\l@youtvdviii){\l@ypcmd{spinemargin}}
959          \end{picture}}
960  %% do trimedge
961        \put(\l@youthdo,\l@youtyciv){\vector(-1,0){\l@youthpi}}
962        \put(\l@youthdo,\l@youtyciv){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
963          \put(-\l@youtvdviii,\l@youtvdviii){\l@ypcmd{trimedge}}
964          \end{picture}}
965      \else
966        \l@youtxcv=\l@youtxcii             % X coord of right edge of text
967          \advance\l@youtxcv by \l@youthpii
968  %% do spinemargin
969        \put(\l@youtxcv,\l@youtvdi){\line(1,0){\l@youthpv}}
970        \put(\l@youtxcv,\l@youtvdi){\vector(-1,0){0}}
971        \put(\l@youtxcv,\l@youtvdi){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
972          \put(\l@youtvdviii,\l@youtvdviii){\l@ypcmd{spinemargin}}
973          \end{picture}}
974  %% do trimedge
975        \put(0,\l@youtyciv){\vector(1,0){\l@youthpi}}
976        \put(0,\l@youtyciv){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
977          \put(\l@youtvdviii,\l@youtvdviii){\l@ypcmd{trimedge}}
978          \end{picture}}
979      \fi
980   %% marginal elements
981      \ifdrawmarginpars
982  %% do marginparsep
983        \ifl@yrightmpars
984        \put(\l@youtxciv,\l@youtvpiv){\line(-1,0){\l@youthpvi}}
985        \put(\l@youtxciv,\l@youtvpiv){\vector(1,0){0}}
986        \put(\l@youtxciv,\l@youtvpiv){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
```

```
987         \put(-\l@youtvdviii,\l@youtvdviii){\l@ypcmd{marginparsep}}
988           \end{picture}}
989       \else
990         \put(\l@youtxcii,\l@youtvpiv){\vector(-1,0){\l@youthpvi}}
991         \put(\l@youtxcii,\l@youtvpiv){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
992           \put(-\l@youtvdviii,\l@youtvdviii){\l@ypcmd{marginparsep}}
993           \end{picture}}
994       \fi
995     \fi
996
997     \l@youtxcv=\l@youtxcii           % X coord for mid textwidth
998       \multiply\l@youtxcv by \tw@
999       \advance\l@youtxcv by \l@youthpii
1000      \divide\l@youtxcv by \tw@
1001 %% do textwidth
1002      \put(\l@youtxcii,\l@youtyciii){\vector(1,0){\l@youthpii}}
1003      \put(\l@youtxcii,\l@youtyciii){\vector(-1,0){0}}
1004      \put(\l@youtxcv,\l@youtyciii){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
1005      \put(\l@youtvdviii,\l@youtvdviii){\l@ypcmd{textwidth}}
1006      \end{picture}}
1007     \iftwocolumnlayout
1008 %% do columnsep
1009      \put(\l@youtxciii,\l@youtvdi){\vector(-1,0){\l@youthpiii}}
1010      \put(\l@youtxciii,\l@youtvdi){\vector(1,0){0}}
1011      \put(\l@youtxciii,\l@youtvdi){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
1012        \put(-\l@youtvdviii,\l@youtvdviii){\l@ypcmd{columnsep}}
1013        \end{picture}}
1014     \fi
1015
1016     \l@youtxcv=\l@youthdo            % X coord of middle of picture
1017       \divide\l@youtxcv by \tw@
1018 %% do stockwidth
1019     \l@youtvpiii=\l@youtyco        % Y coord for stockwidth
1020       \divide\l@youtvpiii by 3\relax
1021     \put(0,\l@youtvpiii){\vector(1,0){\l@youthdo}}
1022     \put(0,\l@youtvpiii){\vector(-1,0){0}}
1023     \put(\l@youtxcv,\l@youtvpiii){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
1024       \put(\l@youtvdviii,\l@youtvdviii){\l@ypcmd{stockwidth}}
1025       \end{picture}}
1026 %% do paperwidth
1027     \l@youtvpiii=\l@youtyci        % Y coord for paperwidth
1028       \advance\l@youtvpiii by -\l@youtyco
1029       \multiply\l@youtvpiii by 3\relax
1030       \divide\l@youtvpiii by 10\relax
1031       \advance\l@youtvpiii by \l@youtyco
1032     \put(\l@youtxco,\l@youtvpiii){\vector(1,0){\l@youtpw}}
1033     \put(\l@youtxco,\l@youtvpiii){\vector(-1,0){0}}
1034     \put(\l@youtxcv,\l@youtvpiii){\begin{picture}(\l@youtvdviii,\l@youtvdviii)
1035       \put(\l@youtvdviii,\l@youtvdviii){\l@ypcmd{paperwidth}}
1036       \end{picture}}
```

```
1037        \fi
```
Have finished drawing the parameters.
```
1038     \end{picture}
1039     \end{center}
1040     \setlength{\unitlength}{1pt}
1041
1042     \testprintparameters
1043     \ifl@ytempif
```
Print the actual parameter values.
```
1044       \begin{center}
1045       \begin{footnotesize}
1046         Lengths are to the nearest pt. \\
1047       \begin{ttfamily}
1048       \begin{tabular}{l@{\hspace{20pt}}l}
1049       \l@ycmd{stockheight}   = \number\l@youtvdo pt      &
1050       \l@ycmd{stockwidth}    = \number\l@youthdo pt        \\
1051       \l@ycmd{pageheight}    = \number\l@youtph pt        &
1052       \l@ycmd{pagewidth}     = \number\l@youtpw pt         \\
1053       \l@ycmd{textheight}    = \number\l@youtvpv pt       &
1054       \l@ycmd{textwidth}     = \number\l@youthpii pt        \\
1055       \l@ycmd{trimtop}       = \number\l@youtvpi pt          &
1056       \l@ycmd{trimedge}      = \number\l@youthpi pt           \\
1057       \l@ycmd{uppermargin}   = \number\l@youtvpii pt      &
1058       \l@ycmd{spinemargin}   = \number\l@youthpv pt         \\
1059       \l@ycmd{headheight}    = \number\l@youtvpiii pt      &
1060       \l@ycmd{headsep}       = \number\l@youtvpiv pt           \\
1061       \l@ycmd{footskip}      = \number\l@youtvpvi pt         &
1062       \l@ycmd{marginparsep}  = \number\l@youthpvi pt     \\
1063       \l@ycmd{marginparpush} = \number\l@youtvpvii pt &
1064       \l@ycmd{columnsep}     = \number\l@youthpiii pt       \\
1065       \l@ycmd{columnseprule} = \the\l@youtlinethick  &  \\
1066       \end{tabular}
1067       \end{ttfamily}\end{footnotesize}
1068       \end{center}
1069     \fi
```
The end of the definition for \drawstock.
```
1070 }
1071
```

\stockdiagram   Shorthands.
\stockdesign
```
1072 \newcommand{\stockdiagram}{\drawparameterstrue\drawstock}
1073 \newcommand{\stockdesign}{\drawparametersfalse\drawstock}
1074
```

\stockvalues   This macro produces a table of the current page layout actual values.
```
1075 \newcommand{\stockvalues}{%
1076 %%  \begin{center}
1077   \ifprintheadings
```

```
1078     Actual stock page layout values.\\[\baselineskip]
1079   \fi
1080   \begingroup
1081     \l@yvalsize
1082   \begin{tabular}{l@{\hspace{20pt}}l}
1083   \l@ycmd{stockheight}    = \l@yval{\stockheight}      &
1084   \l@ycmd{stockwidth}     = \l@yval{\stockwidth}          \\
1085   \l@ycmd{paperheight}    = \l@yval{\paperheight}       &
1086   \l@ycmd{paperwidth}     = \l@yval{\paperwidth}           \\
1087   \l@ycmd{textheight}     = \l@yval{\textheight}      &
1088   \l@ycmd{textwidth}      = \l@yval{\textwidth}        \\
1089   \l@ycmd{trimtop}        = \l@yval{\trimtop}         &
1090   \l@ycmd{trimedge}       = \l@yval{\trimedge}        \\
1091   \l@ycmd{uppermargin}    = \l@yval{\uppermargin}       &
1092   \l@ycmd{spinemargin}    = \l@yval{\spinemargin}        \\
1093   \l@ycmd{headheight}     = \l@yval{\headheight}      &
1094   \l@ycmd{headsep}        = \l@yval{\headsep}          \\
1095   \l@ycmd{footskip}       = \l@yval{\footskip}        &
1096   \l@ycmd{marginparsep}   = \l@yval{\marginparsep}    \\
1097   \l@ycmd{marginparpush}  = \l@yval{\marginparpush}  &
1098   \l@ycmd{columnsep}      = \l@yval{\columnsep}        \\
1099   \l@ycmd{columnseprule}  = \l@yval{\columnseprule}  & \\
1100   1em = \l@yval{\l@yonem}  & 1ex = \l@yval{\l@yonex} \\
1101   \end{tabular}
1102   \endgroup
1103 }
1104
```

8 Drawing the layout of a list

We provide a facility for drawing the layout of a LaTeX `list` environment.
First the `\try...` commands for setting trial list parameters.

`\tryitemindent` Sets a trial value for `itemindent` and stores the result in `\l@youthpi`.

```
1105
1106 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1107 %%%%   LIST LAYOUT
1108 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1109
1110 \newcommand{\tryitemindent}[1]{\l@yltoc{#1}{\l@youthpi}}
```

`\trylabelwidth` Sets a trial value for `labelwidth` and stores the result in `\l@youthpii`.

```
1111 \newcommand{\trylabelwidth}[1]{\l@yltoc{#1}{\l@youthpii}}
```

`\trylabelsep` Sets a trial value for `labelsep` and stores the result in `\l@youthpiii`.

```
1112 \newcommand{\trylabelsep}[1]{\l@yltoc{#1}{\l@youthpiii}}
```

`\tryleftmargin` Sets a trial value for `leftmargin` and stores the result in `\l@youthpiv`.

```
1113 \newcommand{\tryleftmargin}[1]{\l@yltoc{#1}{\l@youthpiv}
```

But the left margin must not be less than zero.

```
1114                         \ifnum\l@youthpiv < \z@
1115                           \l@youthpiv = \z@
1116                         \fi}
```

\tryrightmargin   Sets a trial value for `rightmargin` and stores the result in `\l@youthpv`.

```
1117 \newcommand{\tryrightmargin}[1]{\l@yltoc{#1}{\l@youthpv}}
```

\trylistparindent   Sets a trial value for `listparindent` and stores the result in `\l@youthpvi`.

```
1118 \newcommand{\trylistparindent}[1]{\l@yltoc{#1}{\l@youthpvi}}
```

\trytopsep   Sets a trial value for `topsep` and stores the result in `\l@youtvpi`.

```
1119 \newcommand{\trytopsep}[1]{\l@yltoc{#1}{\l@youtvpi}}
```

\tryparskip   Sets a trial value for `parskip` and stores the result in `\l@youtparskip`.

```
1120 \newcommand{\tryparskip}[1]{\l@yltoc{#1}{\l@youtparskip}}
```

\trypartopsep   Sets a trial value for `partopsep` and stores the result in `\l@youtvpiii`.

```
1121 \newcommand{\trypartopsep}[1]{\l@yltoc{#1}{\l@youtvpiii}}
```

\tryparsep   Sets a trial value for `parsep` and stores the result in `\l@youtvpiv`.

```
1122 \newcommand{\tryparsep}[1]{\l@yltoc{#1}{\l@youtvpiv}}
```

\tryitemsep   Sets a trial value for `itemsep` and stores the result in `\l@youtvpv`.

```
1123 \newcommand{\tryitemsep}[1]{\l@yltoc{#1}{\l@youtvpv}}
1124
```

\currentlist   This routine sets the trial list parameters to be those of the current list environment.

```
1125 \newcommand{\currentlist}{%
1126   \tryitemindent{\itemindent}        % typically 0pt
1127   \trylabelwidth{\labelwidth}        % typically  pt
1128   \trylabelsep{\labelsep}            % typically 0.5em
1129   \tryleftmargin{\leftmargin}        % typically  pt
1130   \tryrightmargin{\rightmargin}      % typically  pt
1131   \trylistparindent{\listparindent}  % typically 0pt
1132   \trytopsep{\topsep}                % typically  pt
1133   \tryparskip{\l@ysetupparskip}      % typically  pt
1134   \trypartopsep{\partopsep}          % typically  pt
1135   \tryparsep{\parsep}                % typically  pt
1136   \tryitemsep{\itemsep}              % typically  pt
1137 }
1138
```

\drawlist   This routine draws the layout of a `list` environment.

```
1139 \newcommand{\drawlist}{%
```

First set some some default vertical and horizontal dimensions.

```
1140   \l@youthdo=\l@yoneinch\relax
1141   \l@youtvdo=\l@yoneinch\relax
1142     \multiply\l@youtvdo by 12\relax
1143     \divide\l@youtvdo by 10\relax
1144   \l@youthdi=\l@yeighthalfinch\relax  % major textwidth
1145   \ifdrawparameters
```

When `drawparameters` is TRUE, we draw a generic layout showing the controlling layout variables.

```
1146     \l@youthpi=60\relax                 % itemindent
1147     \l@youthpii=80\relax                % labelwidth
1148     \l@youthpiii=\l@youthpi             % labelsep
1149       \divide\l@youthpiii by \tw@
1150     \l@youthpiv=\l@youthpi              % leftmargin
1151       \advance\l@youthpiv by \l@youthpii
1152       \advance\l@youthpiv by \l@youthpiii
1153     \l@youthpv=\l@youthpiv              % rightmargin
1154       \multiply\l@youthpv by \tw@
1155       \divide\l@youthpv by \thr@@
1156     \l@youthpvi=\l@youthpi              % listparindent
1157       \multiply\l@youthpvi by 4\relax
1158       \divide\l@youthpvi by \thr@@
1159     \l@youtvpi=40\relax                 % topsep
1160     \l@youtparskip=\l@youtvpi           % parskip
1161     \l@youtvpiii=\l@youtvpi             % partopsep
1162     \l@youtvpiv=\l@youtvpi              % parsep
1163     \l@youtvpv=\l@youtvpi               % itemsep
1164   \fi
```

Finished with the set up for drawing parameters. Continue calculating other dimensions and coordinates.

```
1165   \l@youtvdvii=\l@youtvpi              % topsep + parskip (+ partopsep)
1166     \advance\l@youtvdvii by \l@youtparskip
1167     \iflistaspara
1168       \advance\l@youtvdvii by \l@youtvpiii
1169     \fi
1170   \l@youtvdvi=\l@youtvpv               % itemsep + parsep
1171     \advance\l@youtvdvi by \l@youtvpiv
1172   \l@youtyci=\l@yoneinch\relax          % Y coord of base of item 2
1173     \advance\l@youtyci by \l@youtvdvii
1174   \l@youtxci=\z@                       % X coord of LH list text
1175     \advance\l@youtxci by \l@youthpiv
1176   \l@youthdii=\l@youthdi               % major width of item text
1177     \advance\l@youthdii by -\l@youthpiv
1178     \advance\l@youthdii by -\l@youthpv
1179   \l@youthdiii=\l@youthpi              % inset of labelled list line
1180   \l@youtvdii=\l@youtvdo               % vertical dim of short inset line
1181     \divide\l@youtvdii by 4\relax
1182   \l@youthdiv=\l@youthdii              % X dim of item 2 box top
```

```
1183      \advance\l@youthdiv by -\l@youthdiii
1184   \l@youtvdi=\l@youtvdo                      % Y dim of RH item box
1185      \advance\l@youtvdi by \l@youtvdii
1186   \l@youtvdiii=\l@youtvdii                    % height of label box
1187      \multiply\l@youtvdiii by \thr@@
1188      \divide\l@youtvdiii by 4\relax
1189   \l@youtxcii=\l@youthdiii                    % X coord of BL of label box
1190      \advance\l@youtxcii by -\l@youthpiii
1191      \advance\l@youtxcii by -\l@youthpii
1192   \l@youtycii=\l@youtvdi                      % Y coord of BL of label box
1193      \advance\l@youtycii by -\l@youtvdiii
1194   \l@youtyciii=\l@youtyci                     % Y coord of base of para
1195      \advance\l@youtyciii by \l@youtvdi
1196      \advance\l@youtyciii by \l@youtvdvi
1197   \l@youthdv=\l@youthdii                      % Hor. dim of top of para box
1198      \advance\l@youthdv by -\l@youthpvi
1199   \l@youtyciv=\l@youtyciii                    % Y coord of base of item 1
1200      \advance\l@youtyciv by \l@youtvdi
1201      \advance\l@youtyciv by \l@youtvpiv
1202   \l@youtycv=\l@youtyciv                      % Y coord of base of preceding text
1203      \advance\l@youtycv by \l@youtvdi
1204      \advance\l@youtycv by \l@youtvdvii
1205   \l@youtvdiv=\l@youtycv                      % Height of picture
1206      \advance\l@youtvdiv by \l@yoneinch\relax
1207   \l@youtxciii=\l@youtxci                     % X coord of vertical lines
1208      \advance\l@youtxciii by \l@youtxci
1209      \advance\l@youtxciii by \l@youthdii
1210      \divide\l@youtxciii by \tw@
1211   \l@youtycvi=\l@youtvdi                      % Y coord for margin lines
1212      \divide\l@youtycvi by \tw@
1213   \l@youtvdv=\l@youtvpiv                      % small dimension (1/2 parsep)
1214      \divide\l@youtvdv by \tw@
1215   \l@youtxciv=\l@youtycii                     % Y coord for labelwidth (note XCIV)
1216      \advance\l@youtxciv by \l@youtvdiii
1217      \advance\l@youtxciv by \l@youtvdv
```

    Draw the picture!

```
1218   \begin{center}
1219   \setlength{\unitlength}{\l@youtunitlength}
1220   \begin{picture}(\l@yeighthalfinch,\l@youtvdiv)
1221      \thinlines
```

  Draw a box (`textwidth,height`) representing the page.

```
1222      \put(0,0){\dashbox{10}(\l@youthdi,\l@youtvdiv){}}
1223      \thicklines
```

  Draw successor text box 1 inch deep.

```
1224      \put(0,0){\framebox(\l@youthdi,\l@yoneinch){\l@ylabelfont Following Text}}
```

    Draw item box 2

```
1225      \put(\l@youtxci,\l@youtyci){\begin{picture}(\l@youthdii,\l@youtvdi)
```

The LH horizontal and vertical lines.

```
1226        \put(0,0){\line(1,0){\l@youthdii}}
1227        \put(0,0){\line(0,1){\l@youtvdo}}
```

The lines for the inset (which may be positive or negative).

```
1228        \ifnum\l@youthdiii > \z@
1229          \put(\l@youthdiii,\l@youtvdo){\line(-1,0){\l@youthdiii}}
1230        \else
1231          \put(\l@youthdiii,\l@youtvdo){\line(1,0){-\l@youthdiii}}
1232        \fi
1233        \put(\l@youthdiii,\l@youtvdo){\line(0,1){\l@youtvdii}}
```

The top and RH sides. Also add the text.

```
1234        \put(\l@youthdii,\l@youtvdi){\line(0,-1){\l@youtvdi}}
1235        \put(\l@youthdii,\l@youtvdi){\line(-1,0){\l@youthdiv}}
1236        \put(0,0){\makebox(\l@youthdii,\l@youtvdi){\l@ylabelfont Item 2}}
```

Finish off with the label box.

```
1237        \put(\l@youtxcii,\l@youtycii){\framebox(\l@youthpii,\l@youtvdiii){}}
1238        \put(\l@youtxcii,\l@youtycii){\makebox(\l@youthpii,\l@youtvdiii)[r]%
1239           {\l@ylabelfont Label}}
1240        \end{picture}}
```

Draw the paragraph box.

```
1241      \put(\l@youtxci,\l@youtyciii){\begin{picture}(\l@youthdii,\l@youtvdi)
```

The LH horizontal and vertical lines.

```
1242        \put(0,0){\line(1,0){\l@youthdii}}
1243        \put(0,0){\line(0,1){\l@youtvdo}}
```

The inset lines.

```
1244        \ifnum\l@youthpvi < \z@
1245          \put(\l@youthpvi,\l@youtvdo){\line(1,0){-\l@youthpvi}}
1246        \else
1247          \put(\l@youthpvi,\l@youtvdo){\line(-1,0){\l@youthpvi}}
1248        \fi
1249        \put(\l@youthpvi,\l@youtvdo){\line(0,1){\l@youtvdii}}
```

The top and RH side lines. Also the text.

```
1250        \put(\l@youthdii,\l@youtvdi){\line(0,-1){\l@youtvdi}}
1251        \put(\l@youthdii,\l@youtvdi){\line(-1,0){\l@youthdv}}
1252        \put(0,0){\makebox(\l@youthdii,\l@youtvdi){\l@ylabelfont Item 1, Paragraph 2}}
1253        \testdrawdimensions
1254        \ifl@ytempif
```

Add in the dimensions if asked for. First the `listparindent`.

```
1255          \put(0,\l@youtvdi){\vector(1,0){\l@youthpvi}}
1256          \put(0,\l@youtvdi){\begin{picture}(\l@youtvdv,\l@youtvdv)
1257            \put(0,\l@youtvdv){\l@ypcmd{listparindent}}
1258          \end{picture}}
```

Then the `leftmargin`.

```
1259          \put(-\l@youthpiv,\l@youtycvi){\vector(1,0){\l@youthpiv}}
```

```
1260        \put(-\l@youthpiv,\l@youtycvi){\begin{picture}(\l@youtvdv,\l@youtvdv)
1261          \put(\l@youtvdv,\l@youtvdv){\l@ypcmd{leftmargin}}
1262          \end{picture}}
```

And finally the `rightmargin`.

```
1263        \ifnum\l@youthpv < \z@
1264          \put(\l@youthdii,\l@youtycvi){\line(-1,0){-\l@youthpv}}
1265        \else
1266          \put(\l@youthdii,\l@youtycvi){\line(1,0){\l@youthpv}}
1267        \fi
1268        \put(\l@youthdii,\l@youtycvi){\vector(-1,0){0}}
1269        \put(\l@youthdii,\l@youtycvi){\begin{picture}(\l@youtvdv,\l@youtvdv)
1270          \put(\l@youtvdv,\l@youtvdv){\l@ypcmd{rightmargin}}
1271          \end{picture}}
1272      \fi
1273      \end{picture}}
```

Draw item box 1. This is very similar to drawing item box 2.

```
1274      \put(\l@youtxci,\l@youtyciv){\begin{picture}(\l@youthdii,\l@youtvdi)
1275        \put(0,0){\line(1,0){\l@youthdii}}
1276        \put(0,0){\line(0,1){\l@youtvdo}}
1277        \ifnum\l@youthdiii > \z@
1278          \put(\l@youthdiii,\l@youtvdo){\line(-1,0){\l@youthdiii}}
1279        \else
1280          \put(\l@youthdiii,\l@youtvdo){\line(1,0){-\l@youthdiii}}
1281        \fi
1282        \put(\l@youthdiii,\l@youtvdo){\line(0,1){\l@youtvdii}}
1283        \put(\l@youthdii,\l@youtvdi){\line(0,-1){\l@youtvdi}}
1284        \put(\l@youthdii,\l@youtvdi){\line(-1,0){\l@youthdiv}}
1285        \put(0,0){\makebox(\l@youthdii,\l@youtvdi){\l@ylabelfont Item 1}}
1286        \put(\l@youtxcii,\l@youtycii){\framebox(\l@youthpii,\l@youtvdiii){}}
1287        \put(\l@youtxcii,\l@youtycii){\makebox(\l@youthpii,\l@youtvdiii)[r]%
1288          {\l@ylabelfont Label}}
1289 %%      \ifdrawparameters
1290        \testdrawdimensions
1291        \ifl@ytempif
```

However, if requested, dimensions are drawn for item box 1. First, for `itemindent`.

```
1292        \ifnum\l@youthpi > \z@
1293          \put(0,\l@youtycvi){\vector(1,0){\l@youthpi}}
1294        \else
1295          \put(0,\l@youtycvi){\vector(-1,0){-\l@youthpi}}
1296        \fi
1297        \put(0,\l@youtycvi){\begin{picture}(\l@youtvdv,\l@youtvdv)
1298          \put(0,-\l@youtvdv){\l@ypcmd{itemindent}}
1299          \end{picture}}
```

Then for `labelsep`.

```
1300        \put(\l@youthdiii,\l@youtvdi){\vector(-1,0){\l@youthpiii}}
1301        \put(\l@youthdiii,\l@youtvdi){\begin{picture}(\l@youtvdv,\l@youtvdv)
```

```
1302        \put(0,\l@youtvdv){\l@ypcmd{labelsep}}
1303        \end{picture}}
```

And finish up with `labelwidth`.

```
1304        \put(\l@youtxcii,\l@youtxciv){\line(1,0){\l@youthpii}}
1305        \put(\l@youtxcii,\l@youtxciv){\vector(-1,0){0}}
1306        \put(\l@youtxcii,\l@youtxciv){\begin{picture}(\l@youtvdv,\l@youtvdv)
1307        \put(0,\l@youtvdv){\l@ypcmd{labelwidth}}
1308        \end{picture}}
1309     \fi
1310     \end{picture}}
```

Draw the predeccessor text box 1 inch deep.

```
1311     \put(0,\l@youtycv){\framebox(\l@youthdi,\l@yoneinch){\l@ylabelfont Preceding Text}}
1312 %%     \ifdrawparameters
1313     \testdrawdimensions
1314     \ifl@ytempif
```

We finish off the drawing with any requested vertical spacing parameters. First between item2 and the suceeding text.

```
1315        \put(\l@youtxciii,\l@youtyci){\vector(0,-1){\l@youtvdvii}}
1316        \put(\l@youtxciii,\l@youtyci){\begin{picture}(\l@youtvdv,\l@youtvdv)
1317        \put(\l@youtvdv,-\l@youtvdv){%
1318        \l@yparamfont\texttt{\bs topsep + \bs parskip [+ \bs partopsep]}}
1319        \end{picture}}
```

Between item1, paragraph 2 and item 2.

```
1320        \put(\l@youtxciii,\l@youtyciii){\vector(0,-1){\l@youtvdvi}}
1321        \put(\l@youtxciii,\l@youtyciii){\begin{picture}(\l@youtvdv,\l@youtvdv)
1322        \put(\l@youtvdv,-\l@youtvdv){%
1323        \l@yparamfont\texttt{\bs itemsep + \bs parsep}}
1324        \end{picture}}
```

Between the two paragraphs of item 1.

```
1325        \put(\l@youtxciii,\l@youtyciv){\vector(0,-1){\l@youtvpiv}}
1326        \put(\l@youtxciii,\l@youtyciv){\begin{picture}(\l@youtvdv,\l@youtvdv)
1327        \put(\l@youtvdv,-\l@youtvdv){\l@ypcmd{parsep}}
1328        \end{picture}}
```

And finally between the preceding text and item 1.

```
1329        \put(\l@youtxciii,\l@youtycv){\vector(0,-1){\l@youtvdvii}}
1330        \put(\l@youtxciii,\l@youtycv){\begin{picture}(\l@youtvdv,\l@youtvdv)
1331        \put(\l@youtvdv,-\l@youtvdv){%
1332        \l@yparamfont\texttt{\bs topsep + \bs parskip [+ \bs partopsep]}}
1333        \end{picture}}
1334     \fi
1335     \end{picture}
1336     \end{center}
1337     \setlength{\unitlength}{1pt}
```

Last of all, we list the values of the parameters if requested.

```
1338     \testprintparameters
```

```
1339    \ifl@ytempif
1340     \begin{center}
1341     \begin{footnotesize}
1342       Lengths are to the nearest pt. \\
1343     \begin{ttfamily}
1344     \begin{tabular}{l@{\hspace{20pt}}l}
1345     \l@ycmd{leftmargin}    = \number\l@youthpiv pt    &
1346     \l@ycmd{rightmargin}   = \number\l@youthpv pt      \\
1347     \l@ycmd{itemindent}    = \number\l@youthpi pt      &
1348     \l@ycmd{labelwidth}    = \number\l@youthpii pt     \\
1349     \l@ycmd{labelsep}      = \number\l@youthpiii pt      &
1350     \l@ycmd{listparindent} = \number\l@youthpvi pt \\
1351     \l@ycmd{topsep}        = \number\l@youtvpi pt             &
1352     \l@ycmd{parskip}       = \number\l@youtparskip pt     \\
1353     \l@ycmd{partopsep}     = \number\l@youtvpiii pt     &
1354     \l@ycmd{parsep}        = \number\l@youtvpiv pt            \\
1355     \l@ycmd{itemsep}       = \number\l@youtvpv pt  &        \\
1356     \end{tabular}
1357     \end{ttfamily}\end{footnotesize}
1358     \end{center}
1359    \fi
```

The end of the definition for \drawlist.

```
1360 }
1361
```

\listdiagram   Shorthands.

\listdesign
```
1362 \newcommand{\listdiagram}{\drawparameterstrue\drawlist}
1363 \newcommand{\listdesign}{\drawparametersfalse\drawlist}
1364
```

\listvalues   This macro produces a table of the current list layout actual values. Be careful to
get the external environment's values, not those of the centered tabular.

```
1365 \newcommand{\listvalues}{%
1366   \setlength{\l@ylmarg}{\leftmargin}
1367   \setlength{\l@yrmarg}{\rightmargin}
1368   \setlength{\l@yitmindent}{\itemindent}
1369   \setlength{\l@ylblwidth}{\labelwidth}
1370   \setlength{\l@ylblsep}{\labelsep}
1371   \setlength{\l@ylparindent}{\listparindent}
1372   \setlength{\l@ytsep}{\topsep}
1373   \setlength{\l@ypskip}{\parskip}
1374   \setlength{\l@yptsep}{\partopsep}
1375   \setlength{\l@ypsep}{\parsep}
1376   \setlength{\l@yitmsep}{\itemsep}
1377   \ifprintheadings
1378     Actual list layout values.\\[\baselineskip]
1379   \fi
1380   \begingroup\l@yvalsize
1381   \begin{tabular}{l@{\hspace{20pt}}l}
```

```
1382    \l@ycmd{leftmargin}     = \l@yval{\l@ylmarg}      &
1383    \l@ycmd{rightmargin}    = \l@yval{\l@yrmarg}        \\
1384    \l@ycmd{itemindent}     = \l@yval{\l@yitmindent}  &
1385    \l@ycmd{labelwidth}     = \l@yval{\l@ylblwidth}     \\
1386    \l@ycmd{labelsep}       = \l@yval{\l@ylblsep}      &
1387    \l@ycmd{listparindent}  = \l@yval{\l@ylparindent} \\
1388    \l@ycmd{topsep}         = \l@yval{\l@ytsep}        &
1389    \l@ycmd{parskip}        = \l@yval{\l@ypskip}         \\
1390    \l@ycmd{partopsep}      = \l@yval{\l@yptsep}       &
1391    \l@ycmd{parsep}         = \l@yval{\l@ypsep}          \\
1392    \l@ycmd{itemsep}        = \l@yval{\l@yitmsep}     &  \\
1393    1em = \l@yval{\l@yonem}  & 1ex = \l@yval{\l@yonex} \\
1394    \end{tabular}
1395    \endgroup
1396 }
1397
```

9   Drawing the layout of footnotes

We provide a facility for drawing the layout of footnotes.

First the \try... commands for setting trial values of the footnote parameters.

\tryfootins   Sets the trial value for footins and stores the result in \l@youtvpi.

```
1398
1399 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1400 %%%%    FOOTNOTE LAYOUT
1401 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1402
1403 \newcommand{\tryfootins}[1]{\l@yltoc{#1}{\l@youtvpi}}
```

\tryfootnotesep   Sets the trial value for footnotesep and stores the result in \l@youtvpii.

```
1404 \newcommand{\tryfootnotesep}[1]{\l@yltoc{#1}{\l@youtvpii}}
```

\tryfootnotebaseline   Sets the trial value for footnotebaseline and stores the result in \l@youtvpiii.

```
1405 \newcommand{\tryfootnotebaseline}[1]{\l@yltoc{#1}{\l@youtvpiii}}
```

\tryfootruleheight   Sets the trial value for footruleheight and stores the result in \l@youtlinethick.

```
1406 \newcommand{\tryfootruleheight}[1]{\setlength{\l@youtlinethick}{#1}}
```

\tryfootrulefrac   Sets the trial value for footrulefrac and stores the result in \l@youthdvii.

```
1407 \newcommand{\tryfootrulefrac}[1]{\setlength{\l@ylen}{8.5in}
1408          \l@ytok={#1}
1409          \l@ylen = #1\l@ylen
1410          \l@youthdvii=\l@ylen
1411      \divide\l@youthdvii by \l@yonepoint}
1412
```

\currentfootnote   This routine sets the trial footnote parameters to be those specified for the cur-
rent document. Some parameters have the values embedded as numbers in the
class/options files; for these we make an educated guess at a typical value.

```
1413 \newcommand{\currentfootnote}{%
1414   \tryfootins{\skip\footins}
1415   \tryfootnotesep{\footnotesep}
1416   \tryfootnotebaseline{10pt}
1417   \tryfootruleheight{0.4pt}
1418   \tryfootrulefrac{0.25}
1419 }
1420
```

\drawfootnote   This routine draws the layout of a footnote.

```
1421 \newcommand{\drawfootnote}{%
```

Set some default values.

```
1422   \l@youtvdo=4\relax                    % vertical scale factor
1423   \l@youthdi=\l@yeighthalfinch\relax    % textwidth
1424   \l@youtvdi=\l@yoneinch\relax          % small height of note box
1425   \ifdrawparameters
```

When drawparameters is TRUE we use a generic layout. Set the dimensions and
coordinates.

```
1426     \l@youtvpi=20\relax                 %  \skip\footins
1427     \l@youtvpii=30\relax                %  footenotesep
1428     \l@youtvpiii=10\relax               %  footnote baseline
1429     \setlength{\l@youtlinethick}{0.4pt} % rule thickness
1430     \l@youthdvii=\l@yeighthalfinch\relax   % rule length
1431       \multiply\l@youthdvii by 4\relax
1432       \divide\l@youthdvii by 10\relax
1433     \l@youtvdii=\l@youtvpiii             % vertical box inset
1434       \multiply\l@youtvdii by \l@youtvdo
1435   \else
```

Continue calculating the drawing parameters.

```
1436     \l@youtvdii=\l@youtvpiii             % vertical box inset
1437       \multiply\l@youtvdii by \l@youtvdo
1438       \multiply\l@youtvdii by 8\relax
1439       \divide\l@youtvdii by 10\relax
1440   \fi
1441   \multiply\l@youtvdii by 3\relax
1442   \divide\l@youtvdii by 4\relax
1443   \l@youtvdv=\l@youtvpi                  % Y dim of footins
1444     \multiply\l@youtvdv by \l@youtvdo
1445   \l@youthdii=\l@youtvdii                % horizontal box inset
1446   \l@youtvdiii=\l@youtvdi                % box height
1447     \advance\l@youtvdiii by \l@youthdii
1448   \l@youthdiii=\l@youthdi                % box top length
1449     \advance\l@youthdiii by -\l@youthdii
1450   \l@youtvdiv=\l@youtvpii                % vertical note spacing
```

```
1451     \ifnum\l@youtvdiv < \l@youtvpiii
1452       \l@youtvdiv=\l@youtvpiii
1453     \fi
1454     \multiply\l@youtvdiv by \l@youtvdo
1455   \l@youtyci=\l@youtvdi                    % Y coord of 1st box base
1456     \advance\l@youtyci by \l@youtvdiv
1457   \l@youtycii=\l@youtyci                   % Y coord of rule
1458     \advance\l@youtycii by \l@youtyci
1459   \l@youtyciii=\l@youtycii                 %  Y coord of text base
1460     \advance\l@youtyciii by \l@youtvdv
1461   \l@youtyciv=\l@youtyciii                 % top of main text box
1462     \advance\l@youtyciv by \l@yoneinch\relax
1463   \l@youthdiv=\l@youthdvii                 % length of rule
1464   \l@youtvdvi=\l@youtvpiv                  % height of rule
1465     \multiply\l@youtvdvi by \l@youtvdo
1466   \l@youthdv=\l@youthdii                   % small value (1/2 box inset)
1467     \divide\l@youthdv by \tw@
1468   \l@youthdvi=\l@youthdv                   % 1/2 l@youthdv
1469     \divide\l@youthdvi by \tw@
```

Draw the picture!

```
1470   \begin{center}
1471   \setlength{\unitlength}{\l@youtunitlength}
1472   \begin{picture}(\l@youthdi,\l@youtyciv)
1473     \thicklines
```

Draw box 2. First the major bottom and LH side lines.

```
1474     \put(0,0){\begin{picture}(\l@youthdi,\l@youtvdiii)
1475       \put(0,0){\line(1,0){\l@youthdi}}
1476       \put(0,0){\line(0,1){\l@youtvdi}}
```

The inset lines

```
1477       \put(\l@youthdii,\l@youtvdi){\line(-1,0){\l@youthdii}}
1478       \put(\l@youthdii,\l@youtvdi){\line(0,1){\l@youtvdii}}
```

The top and RH side lines.

```
1479       \put(\l@youthdi,\l@youtvdiii){\line(-1,0){\l@youthdiii}}
1480       \put(\l@youthdi,\l@youtvdiii){\line(0,-1){\l@youtvdiii}}
```

Finish with the marker.

```
1481       \put(\l@youthdv,\l@youtvdiii){\makebox(0,0)[t]{2}}
1482     \end{picture}}
```

The drawing of box 1 is similar.

```
1483     \put(0,\l@youtyci){\begin{picture}(\l@youthdi,\l@youtvdiii)
1484       \put(0,0){\line(1,0){\l@youthdi}}
1485       \put(0,0){\line(0,1){\l@youtvdi}}
1486       \put(\l@youthdii,\l@youtvdi){\line(-1,0){\l@youthdii}}
1487       \put(\l@youthdii,\l@youtvdi){\line(0,1){\l@youtvdii}}
1488       \put(\l@youthdi,\l@youtvdiii){\line(-1,0){\l@youthdiii}}
1489       \put(\l@youthdi,\l@youtvdiii){\line(0,-1){\l@youtvdiii}}
1490       \put(\l@youthdv,\l@youtvdiii){\makebox(0,0)[t]{1}}
1491     \end{picture}}
```

Draw the rule.

```
1492     \multiply\l@youtlinethick by \l@youtvdo
1493     \linethickness{\l@youtlinethick}
1494     \put(0,\l@youtycii){\line(1,0){\l@youthdvii}}
1495     \thicklines
```

Draw the main text box

```
1496     \put(0,\l@youtyciii){\framebox(\l@youthdi,\l@yoneinch){\l@ylabelfont MAIN TEXT}}
1497     \testdrawdimensions
1498     \ifl@ytempif
1499       \thinlines
```

We finish off the drawing with spacing parameters, if requested.

Bottom `footnotesep`.

```
1500     \put(\l@youthdvi,\l@youtyci){\vector(0,-1){\l@youtvdiv}}
1501     \put(\l@youthdvi,\l@youtyci){\begin{picture}(\l@youthdv,\l@youthdv)
1502       \put(\l@youthdvi,-\l@youthdv){\l@ypcmd{footnotesep}}
1503     \end{picture}}
```

Top `footnotesep`.

```
1504     \put(\l@youthdvi,\l@youtycii){\vector(0,-1){\l@youtvdiv}}
1505     \put(\l@youthdvi,\l@youtycii){\begin{picture}(\l@youthdv,\l@youthdv)
1506       \put(\l@youthdvi,-\l@youthdv){\l@ypcmd{footnotesep}}
1507     \end{picture}}
```

The `\skip\footins`.

```
1508     \put(\l@youthdii,\l@youtyciii){\vector(0,-1){\l@youtvdv}}
1509     \put(\l@youthdii,\l@youtyciii){\begin{picture}(\l@youthdv,\l@youthdv)
1510       \put(\l@youthdvi,-\l@youthdv){\l@ypcmd{skip}\l@ypcmd{footins}}
1511     \end{picture}}
```

The rule.

```
1512     \put(\l@youthdiv,\l@youtycii){\begin{picture}(\l@youthdv,\l@youthdv)
1513       \put(\l@youthdv,0){\l@ypcmd{footnoterule}}
1514     \end{picture}}
1515     \fi
```

Finish off the picture.

```
1516     \end{picture}
1517   \end{center}
1518   \setlength{\unitlength}{1pt}
```

Print the value table if appropriate.

```
1519     \testprintparameters
1520     \ifl@ytempif
1521     \begin{center}
1522     \begin{footnotesize}
1523       Lengths are to the nearest pt. \\
1524     \begin{ttfamily}
1525     \begin{tabular}{l@{\hspace{20pt}}l}
1526     \l@ycmd{footins}          = \number\l@youtvpi pt &
1527     \l@ycmd{footnotesep}      = \number\l@youtvpii pt \\
```

```
1528      \l@ycmd{baselineskip}    = \number\l@youtvpiii pt &
1529      \textrm{note separation} = \number\l@youtvdiv pt \\
1530      \textrm{rule thickness}  = \the\l@youtlinethick & \\
1531      \multicolumn{2}{c}{\textrm{rule length} = \the\l@ytok{} times the \bs textwidth} \\
1532      \end{tabular}
1533      \end{ttfamily}\end{footnotesize}
1534      \end{center}
1535    \fi
```

The end of the definition of \drawfootnote.

```
1536 }
1537
```

\footnotediagram Shorthands.
\footnotedesign
```
1538 \newcommand{\footnotediagram}{\drawparameterstrue\drawfootnote}
1539 \newcommand{\footnotedesign}{\drawparametersfalse\drawfootnote}
1540
```

\footnotevalues   This macro produces a table of the current footnote layout actual values.
```
1541 \newcommand{\footnotevalues}{%
1542   \setlength{\l@ylen}{\columnwidth}
1543     \l@ylen = .4\l@ylen
1544   \ifprintheadings
1545     Actual footnote layout values.\\[\baselineskip]
1546   \fi
1547   \begingroup\l@yvalsize
1548   \begin{tabular}{l@{\hspace{20pt}}l}
1549   \l@ycmd{footins}     = \l@yval{\skip\footins} &
1550   \l@ycmd{footnotesep} = \l@yval{\footnotesep}  \\
1551   rule thickness       = ??                &
1552   rule length          = ??        \\
1553   1em = \l@yval{\l@yonem}  & 1ex = \l@yval{\l@yonex} \\
1554   \end{tabular}
1555   \endgroup
1556 }
1557
```

10   Drawing the layout of paragraphs

We provide a facility for drawing the layout of paragraphs.

First the \try... commands for setting trial values of the paragraph parameters.

\tryparindent   Sets the trial value for \parindent and stores the result in \l@youthdii.
```
1558
1559 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1560 %%%%    PARAGRAPH LAYOUT
1561 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1562
```

```
1563 \newcommand{\tryparindent}[1]{\l@yltoc{#1}{\l@youthdii}}
```

\tryparlinewidth Sets the trial value for `\linewidth` and stores the result in `\l@youthdi`.

```
1564 \newcommand{\tryparlinewidth}[1]{\l@yltoc{#1}{\l@youthdi}}
```

\tryparbaselineskip Sets the trial value for `\baselineskip` and stores the result in `\l@youtvdii`.

```
1565 \newcommand{\tryparbaselineskip}[1]{\l@yltoc{#1}{\l@youtvdii}}
1566
```

\currentparagraph This routine sets the trial paragraph parameters to be those specified for the current document.

```
1567 \newcommand{\currentparagraph}{%
1568     \tryparindent{\parindent}
1569     \tryparskip{\parskip}
1570     \tryparlinewidth{\linewidth}
1571     \tryparbaselineskip{\baselineskip}
1572 }
1573
```

\drawparagraph This routine draws the layout of a paragraph.

```
1574 \newcommand{\drawparagraph}{%
```

Set some default values.

```
1575     \l@youtvdi=\l@yoneinch\relax               % height of bottom of inset box
1576     \ifdrawparameters
```

When `drawparameters` is TRUE we use a generic layout. Set the dimensions and coordinates.

```
1577         \l@youtvdii=15\relax                   % \baselineskip
1578         \l@youthdii=40\relax                   % \parindent
1579         \l@youtparskip=30\relax                % \parskip
1580         \l@youthdi=\l@yeighthalfinch\relax     % linewidth
1581     \fi
```

Continue calculating the drawing parameters.

```
1582     \l@youtvdiii=\l@youtvdi                    % total height of para box
1583         \advance\l@youtvdiii by \l@youtvdii
1584     \l@youtvdiv=\l@youtvdiii                   % bottom of Preceding box
1585         \advance\l@youtvdiv by \l@youtparskip
1586     \l@youtvdv=\l@youtvdiv                     % total picture height
1587         \advance\l@youtvdv by \l@yoneinch\relax
1588     \l@youthdiii=\l@youthdi                    % length of top of para box
1589         \advance\l@youthdiii by -\l@youthdii
1590     \l@youtxci=\l@youthdi                      % x coord of middle of picture
1591         \divide\l@youtxci by \tw@
1592   \l@youthdv=10\relax                          % small value
1593   \l@youthdvi=5\relax                          % 1/2 l@youthdv
```

Draw the picture!

```
1594   \begin{center}
1595   \setlength{\unitlength}{\l@youtunitlength}
```

```
1596    \begin{picture}(\l@youthdi,\l@youtvdv)
1597      \thicklines
```

Draw paragraph box. First the major bottom and LH side lines.

```
1598      \put(0,0){\begin{picture}(\l@youthdi,\l@youtvdiii)
1599        \put(0,0){\line(1,0){\l@youthdi}}
1600        \put(0,0){\line(0,1){\l@youtvdi}}
```

The inset lines

```
1601        \ifnum\l@youthdii < \z@
1602          \l@youthdv=-\l@youthdii
1603          \put(\l@youthdii,\l@youtvdi){\line(1,0){\l@youthdv}}
1604        \else
1605          \put(\l@youthdii,\l@youtvdi){\line(-1,0){\l@youthdii}}
1606        \fi
1607        \put(\l@youthdii,\l@youtvdi){\line(0,1){\l@youtvdii}}
```

The top and RH side lines.

```
1608        \put(\l@youthdi,\l@youtvdiii){\line(-1,0){\l@youthdiii}}
1609        \put(\l@youthdi,\l@youtvdiii){\line(0,-1){\l@youtvdiii}}
1610      \end{picture}}
```

Now for the top box.

```
1611      \put(0,\l@youtvdiv){\framebox(\l@youthdi,\l@yoneinch){\l@ylabelfont Preceding Text}}
```

Finished the main drawing.

```
1612      \testdrawdimensions
1613      \ifl@ytempif
1614        \thinlines
```

We finish off the drawing with spacing parameters, if requested. The \parskip.

```
1615      \put(\l@youtxci,\l@youtvdiv){\begin{picture}(\l@youthdv,\l@youthdv)
1616        \put(0,0){\vector(0,-1){\l@youtparskip}}
1617        \put(\l@youthdvi,-\l@youthdv){\l@ypcmd{parskip}}
1618      \end{picture}}
```

The \parindent.

```
1619      \put(0,\l@youtvdiii){\begin{picture}(\l@youthdv,\l@youthdv)
1620        \ifnum\l@youthdii < \z@
1621          \put(0,0){\vector(-1,0){-\l@youthdii}}
1622          \put(0,0){\vector(1,0){0}}
1623        \else
1624          \put(0,0){\vector(1,0){\l@youthdii}}
1625        \fi
1626        \put(0,\l@youthdv){\l@ypcmd{parindent}}
1627      \end{picture}}
1628      \fi
```

Finish off the picture.

```
1629    \end{picture}
1630  \end{center}
1631  \setlength{\unitlength}{1pt}
```

Print the value table if appropriate.

```
1632  \testprintparameters
1633  \ifl@ytempif
1634    \begin{center}
1635    \begin{footnotesize}
1636      Lengths are to the nearest pt. \\
1637    \begin{ttfamily}
1638    \begin{tabular}{l@{\hspace{20pt}}l}
1639    \l@ycmd{parindent}    = \number\l@youthdii pt &
1640    \l@ycmd{parskip}      = \number\l@youtparskip pt \\
1641    \l@ycmd{baselineskip} = \number\l@youtvdii pt &
1642    \l@ycmd{linewidth}    = \number\l@youthdi pt \\
1643    \end{tabular}
1644    \end{ttfamily}\end{footnotesize}
1645    \end{center}
1646  \fi
```

The end of the definition of \drawparagraph.

```
1647 }
1648
```

\paragraphdiagram   Shorthands.
\paragraphdesign
```
1649 \newcommand{\paragraphdiagram}{\drawparameterstrue\drawparagraph}
1650 \newcommand{\paragraphdesign}{\drawparametersfalse\drawparagraph}
1651
```

\paragraphvalues   This macro produces a table of the current paragraph layout actual values. Be
careful to get the global, not local, values.

```
1652 \newcommand{\paragraphvalues}{%
1653   \setlength{\l@ylen}{\parindent}
1654   \ifprintheadings
1655     Actual paragraph layout values.\\[\baselineskip]
1656   \fi
1657   \begingroup\l@yvalsize
1658   \begin{tabular}{l@{\hspace{20pt}}l}
1659   \l@ycmd{parindent}    = \l@yval{\l@ylen}              &
1660   \l@ycmd{parskip}      = \l@yval{\l@ysetupparskip}       \\
1661   \l@ycmd{baselineskip} = \l@yval{\l@ysetupbaselineskip} &
1662   \l@ycmd{linewidth}    = \l@yval{\linewidth}            \\
1663   1em = \l@yval{\l@yonem}  & 1ex = \l@yval{\l@yonex} \\
1664   \end{tabular}
1665   \endgroup
1666 }
1667
```

11   Drawing the layout of section headings

We provide a facility for illustrating the layout of sectional headings.

First the \try... commands for setting trial values for the heading parameters.

\trybeforeskip Sets the trial value for `beforeskip` and stores the result in `\l@youtvpi`.

```
1668
1669 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1670 %%%%    SECTION HEADING LAYOUT
1671 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1672
1673 \newcommand{\trybeforeskip}[1]{\l@yltoc{#1}{\l@youtvpi}}
```

\tryafterskip Sets the trial value for `afterskip` and stores the result in `\l@youtvpii`.

```
1674 \newcommand{\tryafterskip}[1]{\l@yltoc{#1}{\l@youtvpii}}
```

\tryindent Sets the trial value for `indent` and stores the result in `\l@youthpi`.

```
1675 \newcommand{\tryindent}[1]{\l@yltoc{#1}{\l@youthpi}}
1676
```

\currentheading This routine sets the trial heading parameters to some predefined values that, hopefully, are reasonably representative.

```
1677 \newcommand{\currentheading}{%
1678    \trybeforeskip{2\l@ysetupbaselineskip}
1679    \tryafterskip{\l@ysetupbaselineskip}
1680    \tryindent{2\l@ysetupbaselineskip}
1681    \tryparskip{\l@ysetupparskip}
1682 }
1683
```

\drawheading This routine draws the layout of a sectional heading. The command takes a single parameter, `\drawheading{⟨font style⟩}`, which specifies the size and style of the heading font. For example,
`\drawheading{\Large\sffamily}`

```
1684 \newcommand{\drawheading}[1]{%
```

Some default values first.

```
1685    \l@yltoc{\textwidth}{\l@youthdi}              % textwidth
1686    \l@yltoc{\baselineskip}{\l@youtvdi}           % baselineskip
1687    \ifdrawparameters
```

When `drawparameters` is TRUE we use a generic layout. Set the dimensions and coordinates.

```
1688       \Huge \l@youtvdii=\baselineskip \normalsize % Heading baselineskip
1689        \divide\l@youtvdii by \l@yonepoint
1690    \l@yltoc{40pt}{\l@youtvpi}                    % beforeskip
1691    \ifruninhead
```

We need different values for the afterskip and indent depending on whether we are drawing a run-in heading or an ordinary one.

```
1692       \l@yltoc{-72pt}{\l@youtvpii}              % afterskip
1693       \l@yltoc{50pt}{\l@youthpi}                % indent
1694    \else
1695       \l@yltoc{45pt}{\l@youtvpii}              % afterskip
1696       \l@yltoc{72pt}{\l@youthpi}                % indent
1697    \fi
```

Calculate the width of a sample heading title text.

```
1698    \setbox0 = \hbox{{\Huge 3.5 Heading Title }}
1699    \l@yltoc{\wd0}{\l@youthdv}  % width of heading text
1700  \else
```

When `drawparameters` is FALSE, we calculate the heading `baselineskip` and width of the text in the trial font.

```
1701    {#1 \l@youtvdii=\baselineskip\normalfont\normalsize} % heading baselineskip
1702      \divide\l@youtvdii by \l@yonepoint
1703    \setbox0 = \hbox{{#1 3.5 Heading Title }}
1704    \l@yltoc{\wd0}{\l@youthdv}  % width of heading text
1705  \fi
```

Now continue setting all the other drawing lengths and coordinates.

```
1706  \l@youtvdiii=\l@youtvpii            % afterskip + parskip + textbaselineskip
1707    \advance\l@youtvdiii by \l@youtparskip
1708    \advance\l@youtvdiii by \l@youtvdi
1709  \l@youtvdiv=\l@youtvpi              % beforeskip + parskip + headbaselineskip
1710    \ifnum\l@youtvdiv < \z@
```

A negative value for the `indent` signals no indentation of the first line of text after the heading.

```
1711      \l@youtvdiv = -\l@youtvdiv
1712    \fi
1713    \advance\l@youtvdiv by \l@youtparskip
1714    \advance\l@youtvdiv by \l@youtvdii
1715  \l@youtyci=\l@youtvdi               % Y coord of base of after text
1716  \l@youtycii=\l@youtyci              % Y coord of base of heading text
1717    \advance\l@youtycii by \l@youtvdiii
```

We have to handle the case of a negative `afterskip` indicating a run-in heading. `l@youthdiv` is set to either zero of the absolute value of the negative `afterskip`.

```
1718  \l@youthdiv=\z@                     % 0 or abs(-afterskip)
1719  \ifnum\l@youtvpii < \z@
1720    \l@youthdiv = -\l@youtvpii
1721    \l@youtvdiii=\l@youtvdi            %  textbaselineskip
1722    \l@youtxci=\l@youthpi              % X coord of end of heading text
1723      \advance\l@youtxci by \l@youthdv
1724    \l@youtxcii=\l@youtxci             % X coord of start of after text
1725      \advance\l@youtxcii by \l@youthdiv
1726    \l@youtycii=\l@youtvdi             % Y coord of base of heading text
1727  \fi
```

Continue.

```
1728  \l@youtyciii=\l@youtycii            % Y coord of base of prior text
1729    \advance\l@youtyciii by \l@youtvdiv
1730  \l@youtyciv=\l@youtyciii            % Y coord of top of prior text
1731    \advance\l@youtyciv by \l@youtvdi
1732  \l@youtycv=\l@youtyciv              % 2*l@youtvdi + l@youtyciv
1733    \advance\l@youtycv by \l@youtvdi
1734    \advance\l@youtycv by \l@youtvdi
```

```
1735    \l@youthdii=\l@youtvdi                 % a small amount
1736    \l@youthdiii=\l@youthdii               % half a small amount
1737      \divide\l@youthdiii by \tw@
```

Draw the picture!

```
1738    \begin{center}
1739    \setlength{\unitlength}{\l@youtunitlength}
1740    \begin{picture}(\l@youthdi,\l@youtycv)
1741      \ifnum\l@youtvpii < \z@
1742        \put(0,\l@youtyci){\begin{picture}(\l@youthdi,\l@youtyciv)
```

When the `afterskip` is negative we have a run-in heading.

Draw the bottom text line

```
1743        \put(0,0){\l@ylabelfont second line of text following the heading \ldots}
```

Draw the heading

```
1744        \ifdrawparameters
1745          \put(\l@youthpi,\l@youtycii){{\Huge 3.5 Heading Title}}
1746        \else
1747          \put(\l@youthpi,\l@youtycii){{#1 3.5 Heading Title}}
1748        \fi
```

Draw the first line of text after the heading, and the preceding text line.

```
1749        \put(\l@youtxcii,\l@youtycii){\l@ylabelfont Start of text \ldots}
1750        \put(0,\l@youtyciii){\l@ylabelfont \ldots end of last line of preceding text.}
1751 %%       \ifdrawparameters
1752        \testdrawdimensions
1753        \ifl@ytempif
```

Draw the dimensions if required. First the before skips.

```
1754          \put(0,\l@youtyciii){\vector(0,-1){\l@youtvdiv}}
1755          \put(0,\l@youtyciii){\begin{picture}(\l@youthdii,\l@youthdii)
1756            \put(\l@youthdiii,-\l@youthdii){\makebox(0,0)[tl]%
1757              {\l@yparamfont \textit{$\|$beforeskip$\|$} +
1758              \l@ypcmd{parskip} (of text font) + \l@ypcmd{baselineskip}
1759                (of heading font)}}
1760          \end{picture}}
```

The indent.

```
1761          \put(0,\l@youtycii){\vector(1,0){\l@youthpi}}
1762          \put(0,\l@youtycii){\begin{picture}(\l@youthdii,\l@youthdii)
1763            \put(\l@youthdii,\l@youthdiii){\l@yparamfont \textit{indent}}
1764          \end{picture}}
```

And finish with the negative afterskip

```
1765          \put(\l@youtxci,\l@youtycii){\vector(1,0){\l@youthdiv}}
1766          \put(\l@youtxci,\l@youtycii){\begin{picture}(\l@youthdii,\l@youthdii)
1767            \put(\l@youthdiii,\l@youthdii){\l@yparamfont \textit{afterskip} ($< 0$)}
1768          \end{picture}}
1769        \fi
1770      \end{picture}}
1771    \else
1772      \put(0,\l@youtyci){\begin{picture}(\l@youthdi,\l@youtyciv)
```

The aftterskip is positive, so we draw a normal heading.

    Draw the two after heading text lines

```
1773        \put(0,0){\l@ylabelfont second line of text following the heading \ldots}
1774        \put(0,\l@youtyci){\l@ylabelfont This is the start of the after-heading text,
1775                         which continues on \ldots}
```

  Draw the heading

```
1776        \ifdrawparameters
1777          \put(\l@youthpi,\l@youtycii){{\Huge 3.5 Heading Title}}
1778        \else
1779          \put(\l@youthpi,\l@youtycii){{#1 3.5 Heading Title}}
1780        \fi
```

  Draw the text line preceding the heading.

```
1781        \put(0,\l@youtyciii){\l@ylabelfont \ldots end of last line of preceding text.}
1782 %%       \ifdrawparameters
1783        \testdrawdimensions
1784        \ifl@ytempif
```

  Draw the dimensions if required. First the before skips.

```
1785          \put(0,\l@youtyciii){\vector(0,-1){\l@youtvdiv}}
1786          \put(0,\l@youtyciii){\begin{picture}(\l@youthdii,\l@youthdii)
1787            \put(\l@youthdiii,-\l@youthdii){\makebox(0,0)[tl]%
1788              {\l@yparamfont \textit{$\|$beforeskip$\|$} +
1789               \l@ypcmd{parskip} (of text font) + \l@ypcmd{baselineskip}
1790                (of heading font)}}
1791          \end{picture}}
```

  The indent.

```
1792          \put(0,\l@youtycii){\vector(1,0){\l@youthpi}}
1793          \put(0,\l@youtycii){\begin{picture}(\l@youthdii,\l@youthdii)
1794            \put(\l@youthdii,\l@youthdiii){\l@yparamfont \textit{indent}}
1795          \end{picture}}
```

  And finish with the afterskips

```
1796          \put(0,\l@youtycii){\vector(0,-1){\l@youtvdiii}}
1797          \put(0,\l@youtycii){\begin{picture}(\l@youthdii,\l@youthdii)
1798            \put(\l@youthdiii,-\l@youthdii){\makebox(0,0)[tl]%
1799              {\l@yparamfont \textit{afterskip} +
1800               \l@ypcmd{parskip} (of heading font) + \l@ypcmd{baselineskip}
1801                (of text font)}}
1802          \end{picture}}
1803        \fi
1804      \end{picture}}
1805    \fi
```

  Draw rules.

```
1806      \put(0,0){\line(1,0){\l@youthdi}}
1807      \put(0,\l@youtycv){\line(1,0){\l@youthdi}}
1808    \end{picture}
1809   \end{center}
1810   \setlength{\unitlength}{1pt}
```

```
1811 %%     \ifdrawparameters\else
1812     \testprintparameters
1813     \ifl@ytempif
```

Write out the table of values if required.

```
1814       \begin{center}
1815       \begin{footnotesize}
1816         Lengths are to the nearest pt. \\
1817       \begin{ttfamily}
1818       \begin{tabular}{l@{\hspace{20pt}}l}
1819       \textit{beforeskip}      = \number\l@youtvpi pt &
1820       \textit{afterskip}       = \number\l@youtvpii pt \\
1821       \textit{indent}          = \number\l@youthpi pt &
1822       \textrm{(heading font)}
1823         \l@ycmd{baselineskip} = \number\l@youtvdii pt \\
1824       \l@ycmd{parskip}         = \number\l@youtparskip pt &
1825       \textrm{heading font}   = \string#1 \\
1826       \end{tabular}
1827       \end{ttfamily}\end{footnotesize}
1828       \end{center}
1829     \fi
```

The end of the definition of \drawheading.

```
1830 }
1831
```

\headingdiagram   Shorthands.
\headingdesign
```
1832 \newcommand{\headingdiagram}[1]{\drawparameterstrue\drawheading{#1}}
1833 \newcommand{\headingdesign}[1]{\drawparametersfalse\drawheading{#1}}
1834
```

\headingvalues   This doesn't do anything — it's just provided for symmetry.

```
1835 \newcommand{\headingvalues}{%
1836   \PackageWarning{layouts}{The \protect\headingvalues\space command does nothing}}
1837
```

12   Drawing the layouts of floats

We provide facilities for illustrating the parameters controlling the layout of floats. Respectively these show the layout of an individual float, and the page layout for floats.

12.0.1   Individual float layout

The code in this section enables the illustration of the parameters of a single float environment.

Start off with the \try... commands for setting trial parameter values.

\trytextfloatsep   Sets the trial value for `textfloatsep` and stores the result in `\l@youtvpi`.

```
1838
1839 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1840 %%%%    INDIVIDUAL FLOAT LAYOUT
1841 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1842
1843 \newcommand{\trytextfloatsep}[1]{\l@yltoc{#1}{\l@youtvpi}}
```

\tryfloatsep   Sets the trial value for `floatsep` and stores the result in `\l@youtvpii`.

```
1844 \newcommand{\tryfloatsep}[1]{\l@yltoc{#1}{\l@youtvpii}}
```

\tryintextsep   Sets the trial value for `intextsep` and stores the result in `\l@youtvpiii`.

```
1845 \newcommand{\tryintextsep}[1]{\l@yltoc{#1}{\l@youtvpiii}}
```

\trytopfigrule   Sets the trial value for `topfigrule` and stores the result in `\l@youtlinethick`.

```
1846 \newcommand{\trytopfigrule}[1]{\setlength{\l@youtlinethick}{#1}}
```

\trybotfigrule   Sets the trial value for `botfigrule` and stores the result in `\l@youtlinethickii`.

```
1847 \newcommand{\trybotfigrule}[1]{\setlength{\l@youtlinethickii}{#1}}
1848
```

\currentfloat   This sets the trial float parameter values to those currently set in the document, or makes a guesstimate where the value is hard-coded.

```
1849 \newcommand{\currentfloat}{%
1850   \trytextfloatsep{\textfloatsep}
1851   \tryfloatsep{\floatsep}
1852   \tryintextsep{\intextsep}
1853   \trytopfigrule{0pt}        % guesstimate
1854   \trybotfigrule{0pt}        % guesstimate
1855 }
1856
```

\drawfloat   The command to draw the picture of float parameters.

```
1857 \newcommand{\drawfloat}{%
1858   \ifdrawparameters
```

Set up the lengths and coordinates for drawing the parameters.

```
1859     \l@yltoc{40pt}{\l@youtvpi}            % textfloatsep
1860     \l@yltoc{40pt}{\l@youtvpii}           % floatsep
1861     \l@yltoc{40pt}{\l@youtvpiii}          % intextsep
1862     \setlength{\l@youtlinethick}{1pt}     % toprule height
1863     \setlength{\l@youtlinethickii}{2pt}   % botrule height
1864   \fi
```

And the general drawing coodinates and lengths.

```
1865 % \l@youthdo=\textwidth                   % textwidth
1866 %   \divide\l@youthdo by \l@yonepoint
1867   \l@yltoc{\textwidth}{\l@youthdo}
1868     \multiply\l@youthdo by 8\relax
```

```
1869     \divide\l@youthdo by 10\relax
1870   \l@yltoc{\baselineskip}{\l@youtvdvii}  % baselineskip
1871   \l@youthdi=\l@youthdo                   % width of floats
1872     \divide\l@youthdi by \tw@
1873   \l@youtvdi=\l@youthdi                   % float box height
1874     \divide\l@youtvdi by 4\relax
1875   \l@youtvdii=\l@youtvdvii                 % text box height
1876     \multiply\l@youtvdii by \thr@@
1877   \l@youtvdvi=\l@youtvdvii                  % height of top text line
1878     \multiply\l@youtvdvi by \tw@
1879   \l@youtxci=\l@youthdo                    % X coord of LH of float
1880     \advance\l@youtxci by -\l@youthdi
1881     \divide\l@youtxci by \tw@
1882   \l@youtxcii=\l@youthdo                   % X coord of vertical dims.
1883     \divide\l@youtxcii by \tw@
1884   \l@youtyci=\l@youtvdi                    % Y coord of top of BFl-n
1885   \l@youtycii=\l@youtyci                   % Y coord of bottom of text
1886     \advance\l@youtycii by \l@youtvpi
1887   \l@youtyciii=\l@youtycii                 % Y coord of bottom of HF box
1888     \advance\l@youtyciii by \l@youtvdii
1889     \advance\l@youtyciii by \l@youtvpiii
1890   \l@youtyciv=\l@youtyciii                 % Y coord of bottom top text box
1891     \advance\l@youtyciv by \l@youtvdi
1892     \advance\l@youtyciv by \l@youtvpiii
1893   \l@youtycv=\l@youtyciv                   % Y coord of bottom of TFl-2 box
1894     \advance\l@youtycv by \l@youtvdii
1895     \advance\l@youtycv by \l@youtvpi
1896   \l@youtycvi=\l@youtycv                   % Y coord of bottom of TFl-1 box
1897     \advance\l@youtycvi by \l@youtvdi
1898     \advance\l@youtycvi by \l@youtvpii
1899   \l@youtvdo=\l@youtycvi                   % Y dim of text on page
1900     \advance\l@youtvdo by \l@youtvdi
1901   \l@youthdii=\l@youtvpi                   % a small amount
1902     \divide\l@youthdii by \tw@
1903   \l@youthdiii=\l@youthdii                 % half a small amount
1904     \divide\l@youthdiii by \tw@
```

Draw the picture!

```
1905   \begin{center}
1906 %%%  \setlayoutscale{1}
1907   \setlength{\unitlength}{\l@youtunitlength}
1908   \begin{picture}(\l@youthdo,\l@youtvdo)
1909     \thicklines
```

A bottom float.

```
1910     \put(\l@youtxci,0){\framebox(\l@youthdi,\l@youtvdi){\l@ylabelfont A BOTTOM FLOAT}}
```

Bottom text.

```
1911     \put(0,\l@youtycii){\begin{picture}(\l@youthdo,\l@youtvdii)
1912       \put(0,0){\makebox(\l@youthdo,0)[br]{\l@ylabelfont \ldots last text line before bottom floa
1913       \put(0,\l@youtvdvi){\l@ylabelfont First text line after 'here' float \ldots}
```

1914   \end{picture}}

Draw a 'here' float.

1915   \put(\l@youtxci,\l@youtyciii){\framebox(\l@youthdi,\l@youtvdi){\l@ylabelfont A 'HE

Top text.

1916   \put(0,\l@youtyciv){\begin{picture}(\l@youthdo,\l@youtvdii)
1917   \put(0,0){\makebox(\l@youthdo,0)[br]{\l@ylabelfont \ldots last text line before
1918   \put(0,\l@youtvdvi){\l@ylabelfont First text line after top float \ldots}
1919   \end{picture}}

The lowest top float (TFl-2).

1920   \put(\l@youtxci,\l@youtycv){\framebox(\l@youthdi,\l@youtvdi){\l@ylabelfont A TOP F

The highest top float (TFl-1).

1921   \put(\l@youtxci,\l@youtycvi){\framebox(\l@youthdi,\l@youtvdi){\l@ylabelfont A TOP

Whole page text.

1922   \thinlines
1923   \put(0,0){\dashbox{10}(\l@youthdo,\l@youtvdo){}}

The top and bottom rules

1924   \linethickness{\l@youtlinethick}
1925   \put(0,\l@youtycv){\line(1,0){\l@youthdo}}
1926   \linethickness{\l@youtlinethickii}
1927   \put(0,\l@youtyci){\line(1,0){\l@youthdo}}
1928   \thinlines
1929   \testdrawdimensions
1930   \ifl@ytempif

Draw the parameter lines if required. Start with the bottom textfloatsep.

1931   \put(\l@youtxcii,\l@youtycii){\vector(0,-1){\l@youtvpi}}
1932   \put(\l@youtxcii,\l@youtycii){\begin{picture}(\l@youthdii,\l@youthdii)
1933   \put(\l@youthdiii,-\l@youthdii){\l@ypcmd{textfloatsep}}
1934   \end{picture}}

Lower intextsep.

1935   \put(\l@youtxcii,\l@youtyciii){\vector(0,-1){\l@youtvpiii}}
1936   \put(\l@youtxcii,\l@youtyciii){\begin{picture}(\l@youthdii,\l@youthdii)
1937   \put(\l@youthdiii,-\l@youthdii){\l@ypcmd{intextsep}}
1938   \end{picture}}

Upper intextsep.

1939   \put(\l@youtxcii,\l@youtyciv){\vector(0,-1){\l@youtvpiii}}
1940   \put(\l@youtxcii,\l@youtyciv){\begin{picture}(\l@youthdii,\l@youthdii)
1941   \put(\l@youthdiii,-\l@youthdii){\l@ypcmd{intextsep}}
1942   \end{picture}}

Top textfloatsep.

1943   \put(\l@youtxcii,\l@youtycv){\vector(0,-1){\l@youtvpi}}
1944   \put(\l@youtxcii,\l@youtycv){\begin{picture}(\l@youthdii,\l@youthdii)
1945   \put(\l@youthdiii,-\l@youthdii){\l@ypcmd{textfloatsep}}
1946   \end{picture}}

Top `floatsep`.

```
1947      \put(\l@youtxcii,\l@youtycvi){\vector(0,-1){\l@youtvpii}}
1948      \put(\l@youtxcii,\l@youtycvi){\begin{picture}(\l@youthdii,\l@youthdii)
1949        \put(\l@youthdiii,-\l@youthdii){\l@ypcmd{floatsep}}
1950      \end{picture}}
```

Top rule.

```
1951      \put(\l@youthdo,\l@youtycv){\begin{picture}(\l@youthdii,\l@youthdii)
1952        \put(-\l@youthdiii,\l@youthdii){\vector(0,-1){\l@youthdii}}
1953        \put(-\l@youthdii,\l@youthdii){\makebox(0,0)[tr]{\l@ypcmd{topfigrule}}}
1954      \end{picture}}
```

And finally the bottom rule.

```
1955      \put(\l@youthdo,\l@youtyci){\begin{picture}(\l@youthdii,\l@youthdii)
1956        \put(-\l@youthdiii,-\l@youthdii){\vector(0,1){\l@youthdii}}
1957        \put(-\l@youthdii,-\l@youthdii){\makebox(0,0)[br]{\l@ypcmd{botfigrule}}}
1958      \end{picture}}
1959    \fi
1960    \end{picture}
1961  \end{center}
1962  \setlength{\unitlength}{1pt}
1963  \testprintparameters
1964  \ifl@ytempif
```

Print the table of values.

```
1965    \begin{center}
1966    \begin{footnotesize}
1967      Lengths are to the nearest pt. \\
1968    \begin{ttfamily}
1969    \begin{tabular}{l@{\hspace{20pt}}l}
1970    \l@ycmd{floatsep}     = \number\l@youtvpii pt    &
1971    \l@ycmd{textfloatsep} = \number\l@youtvpi pt \\
1972    \l@ycmd{intextsep}    = \number\l@youtvpiii pt  &
1973    \textrm{topfigrule thickness} = \the\l@youtlinethick \\
1974    \textrm{botfigrule thickness} = \the\l@youtlinethickii &  \\
1975    \end{tabular}
1976    \end{ttfamily}\end{footnotesize}
1977    \end{center}
1978  \fi
```

End of the definition of `\drawfloat`.

```
1979 }
1980
```

`\floatdiagram` Shorthands.
`\floatdesign`
```
1981 \newcommand{\floatdiagram}{\drawparameterstrue\drawfloat}
1982 \newcommand{\floatdesign}{\drawparametersfalse\drawfloat}
1983
```

`\floatvalues` This macro produces a table of the current float layout actual values.

```
1984 \newcommand{\floatvalues}{%
```

```
1985   \ifprintheadings
1986     Actual float layout values.\\[\baselineskip]
1987   \fi
1988   \begingroup\l@yvalsize
1989   \begin{tabular}{l@{\hspace{20pt}}l}
1990   \l@ycmd{floatsep}            = \l@yval{\floatsep}      &
1991   \l@ycmd{textfloatsep}        = \l@yval{\textfloatsep}   \\
1992   \l@ycmd{intextsep}           = \l@yval{\intextsep}     &  \\
1993   topfig rule thickness       = ??                       &
1994   botfig rule thickness       = ??                        \\
1995   \l@ycmd{topnumber}           = \the\c@topnumber & % \l@yval{\c@topnumber}    &
1996   \l@ycmd{topfraction}         = \topfraction               \\
1997   \l@ycmd{bottomnumber}        = \the\c@bottomnumber & % \l@yval{\c@bottomnumber} &
1998   \l@ycmd{bottomfraction}      = \bottomfraction          \\
1999   \l@ycmd{totalnumber}         = \the\c@totalnumber & % \l@yval{\c@totalnumber}  &
2000   \l@ycmd{textfraction}        = \textfraction             \\
2001   \l@ycmd{dblfloatsep}         = \l@yval{\dblfloatsep}    &
2002   \l@ycmd{dbltextfloatsep}     = \l@yval{\dbltextfloatsep} \\
2003   \l@ycmd{dbltopnumber}        = \the\c@dbltopnumber & % \l@yval{\c@dbltopnumber} &
2004   \l@ycmd{dbltopfraction}      = \dbltopfraction           \\
2005   \l@ycmd{dblfloatpagefraction} = \dblfloatpagefraction    &
2006   \l@ycmd{floatpagefraction}   = \floatpagefraction        \\
2007   1em = \l@yval{\l@yonem}  & 1ex = \l@yval{\l@yonex} \\
2008   \end{tabular}
2009   \endgroup
2010 }
2011
```

12.0.2   Floats on a page

The code in this section illustrates the parameters controlling how one or more floats may be apportioned on a page.

Start off with the \try... commands for setting trial parameter values.

\trytotalnumber   Sets the trial value for totalnumber and stores the result in \l@youtvpvi.

```
2012
2013 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
2014 %%%%    FLOAT PAGE LAYOUT
2015 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
2016
2017 \newcommand{\trytotalnumber}[1]{\l@youtvpvi = #1}
```

\trytopnumber   Sets the trial value for topnumber and stores the result in \l@youtvpv.

```
2018 \newcommand{\trytopnumber}[1]{\l@youtvpv = #1}
```

\trybottomnumber   Sets the trial value for bottomnumber and stores the result in \l@youtvpi.

```
2019 \newcommand{\trybottomnumber}[1]{\l@youtvpi = #1}
```

\trytopfraction Sets the trial value for topfraction and stores the results in \l@youtvpiv and \l@youthdiv.

```
2020 \newcommand{\trytopfraction}[1]{\setlength{\l@ylen}{10in}
2021         \l@ylen = #1\l@ylen
2022         \l@youtvpiv=\l@ylen
2023         \divide\l@youtvpiv by \l@yonepoint
2024         \setlength{\l@ylen}{1000sp}
2025         \l@ylen=#1\l@ylen
2026         \l@youthdiv=\l@ylen}
```

\trytextfraction Sets the trial value for textfraction and stores the results in \l@youtvpiii and \l@youthdv.

```
2027 \newcommand{\trytextfraction}[1]{\setlength{\l@ylen}{10in}
2028         \l@ylen = #1\l@ylen
2029         \l@youtvpiii=\l@ylen
2030         \divide\l@youtvpiii by \l@yonepoint
2031         \setlength{\l@ylen}{1000sp}
2032         \l@ylen=#1\l@ylen
2033         \l@youthdv=\l@ylen}
```

\trybottomfraction Sets the trial value for bottomfraction and stores the results in \l@youtvpii and \l@youthdvi.

```
2034 \newcommand{\trybottomfraction}[1]{\setlength{\l@ylen}{10in}
2035         \l@ylen = #1\l@ylen
2036         \l@youtvpii=\l@ylen
2037         \divide\l@youtvpii by \l@yonepoint
2038         \setlength{\l@ylen}{1000sp}
2039         \l@ylen=#1\l@ylen
2040         \l@youthdvi=\l@ylen}
2041
```

\currentfloatpage Sets the floatpage parameter trial values to those in the current document, or makes a guesstimate when these are hard-coded.

```
2042 \newcommand{\currentfloatpage}{%
2043   \trytotalnumber{\value{totalnumber}}   % typically 3
2044   \trytopnumber{\value{topnumber}}       % typically 2
2045   \trytopfraction{0.7}                    % typically 0.7
2046   \trytextfraction{0.2}                   % typically 0.2
2047   \trybottomfraction{0.3}                 % typically 0.3
2048   \trybottomnumber{\value{bottomnumber}} % typically 1
2049 }
2050
```

\drawfloatpage The command to draw a picture of the float page layout and parameters.

```
2051 \newcommand{\drawfloatpage}{%
2052   \ifdrawparameters
```

Calculate values for parameter drawing.

```
2053       \l@youtvpvi=\thr@@          % total number
```

```
2054     \l@youtvpv=\tw@              % topnumber
2055     \l@youthdiv=300\relax        % 1000 times topfraction
2056     \setlength{\l@ylen}{10in}
2057     \l@ylen=0.3\l@ylen
2058     \l@yltoc{\l@ylen}{\l@youtvpiv}  % topfraction
2059     \l@youthdv=200\relax         % 1000 times textfraction
2060     \setlength{\l@ylen}{10in}
2061     \l@ylen=0.2\l@ylen
2062     \l@yltoc{\l@ylen}{\l@youtvpiii}  % textfraction
2063     \l@youthdvi=300\relax        % 1000 times botfraction
2064     \setlength{\l@ylen}{10in}
2065     \l@ylen=0.3\l@ylen
2066     \l@yltoc{\l@ylen}{\l@youtvpii}  % bottomfraction
2067     \l@youtvpi=\@ne              % bottomnumber
2068   \fi
```

Continue with the general picture coordinates and lengths.

```
2069   \l@youtvdo=\l@yteninch\relax                    % textheight
2070   \l@youthdo=\l@yeighthalfinch\relax              % textwidth
2071   \l@youthdi=\l@youthdo                % width of text box
2072     \multiply\l@youthdi by 8\relax
2073     \divide\l@youthdi by 10\relax
2074   \l@youtyci=\l@youtvdo                % Y coord of base of textfraction
2075     \advance\l@youtyci by -\l@youtvpiii
2076     \divide\l@youtyci by \tw@
2077   \l@youtycii=\l@youtvpii              % Y coord of top of bottomfraction
2078   \l@youtyciii=\l@youtvdo              % Y coord of base of topfraction
2079     \advance\l@youtyciii by -\l@youtvpiv
2080   \l@youtyciv=\l@youtyci              % Y coord of top of textfraction
2081     \advance\l@youtyciv by \l@youtvpiii
2082   \l@youtycv=\l@youtyci              % Y coord of centre of text box
2083     \advance\l@youtycv by \l@youtyciv
2084     \divide\l@youtycv by \tw@
2085   \l@youtxcii=\l@youthdo              % X coord of centre dims
2086     \divide\l@youtxcii by \tw@
2087   \l@youtxci=\l@youtxcii              % X coord of LH dims
2088     \divide\l@youtxci by \tw@
2089   \l@youtxciii=\l@youtxcii            % X coord of RH dims
2090     \advance\l@youtxciii by \l@youtxci
2091   \l@youtxciv=\l@youthdo              % X coord of LH of text box
2092     \advance\l@youtxciv by -\l@youthdi
2093     \divide\l@youtxciv by \tw@
2094   \l@youthdii=\l@youtxciv              % a small dimension
2095   \l@youthdiii=\l@youthdii            % half a small dimension
2096     \divide\l@youthdiii by \tw@
```

Draw the picture!

```
2097   \begin{center}
2098   \setlength{\unitlength}{\l@youtunitlength}
2099   \begin{picture}(\l@youthdo,\l@youtvdo)
2100     \thicklines
```

Draw the page boundaries.

```
2101      \put(0,0){\framebox(\l@youthdo,\l@youtvdo){}}
```

The bottom fraction.

```
2102      \put(0,\l@youtycii){\dashbox{10}(\l@youthdo,0){}}
2103 %%%    \ifdrawparameters
2104      \put(0,0){\makebox(\l@youthdo,\l@youtvpii){\l@ypcmd{bottomnumber}}}
2105      \thinlines
2106      \put(\l@youtxciii,0){\vector(0,1){\l@youtvpii}}
2107      \thicklines
2108 %%%    \fi
```

The text fraction.

```
2109      \put(\l@youtxciv,\l@youtyci){\framebox(\l@youthdi,\l@youtvpiii){}}
```

The top fraction.

```
2110      \put(0,\l@youtyciii){\dashbox{10}(\l@youthdo,0){}}
2111 %%%    \ifdrawparameters
2112      \put(0,\l@youtyciii){\makebox(\l@youthdo,\l@youtvpiv){\l@ypcmd{topnumber}}}
2113      \thinlines
2114      \put(\l@youtxci,\l@youtvdo){\vector(0,-1){\l@youtvpiv}}
2115      \thicklines
2116 %%%    \fi
2117      \thinlines
2118      \testdrawdimensions
2119      \ifl@ytempif
```

Draw the dimensions. First the bottom fraction.

```
2120      \put(\l@youtxciii,0){\begin{picture}(\l@youthdii,\l@youthdii)
2121        \put(-\l@youthdiii,\l@youthdiii){%
2122          \makebox(0,0)[br]{\l@ypcmd{bottomfraction}}}
2123        \end{picture}}
```

The text fraction.

```
2124      \put(\l@youtxcii,\l@youtyci){\vector(0,1){\l@youtvpiii}}
2125      \put(\l@youtxcii,\l@youtyci){\vector(0,-1){0}}
2126      \put(\l@youtxcii,\l@youtycv){\begin{picture}(\l@youthdii,\l@youthdii)
2127        \put(\l@youthdiii,0){%
2128          \makebox(0,0)[l]{\l@ypcmd{textfraction}}}
2129        \end{picture}}
```

Finally the top fraction.

```
2130      \put(\l@youtxci,\l@youtvdo){\begin{picture}(\l@youthdii,\l@youthdii)
2131        \put(\l@youthdiii,-\l@youthdiii){%
2132          \makebox(0,0)[tl]{\l@ypcmd{topfraction}}}
2133        \end{picture}}
2134      \fi
2135      \end{picture}
2136    \end{center}
2137    \setlength{\unitlength}{1pt}
2138    \testprintparameters
2139    \ifl@ytempif
```

Print the parameter value table.

```
2140     \begin{center}
2141     \begin{footnotesize}\begin{ttfamily}
2142     \begin{tabular}{l@{\hspace{20pt}}l}
2143     \l@ycmd{topnumber}      = \number\l@youtvpv &
2144     \l@ycmd{topfraction}    = 0.\number\l@youthdiv \\
2145     \l@ycmd{bottomnumber}   = \number\l@youtvpi &
2146     \l@ycmd{bottomfraction} = 0.\number\l@youthdvi \\
2147     \l@ycmd{totalnumber}    = \number\l@youtvpvi &
2148     \l@ycmd{textfraction}   = 0.\number\l@youthdv \\
2149     \end{tabular}
2150     \end{ttfamily}\end{footnotesize}
2151     \end{center}
2152   \fi
```

End of the definition of `\drawfloatpage`.

```
2153 }
2154
```

`\floatpagediagram` Shorthands.
`\floatpagedesign`
```
2155 \newcommand{\floatpagediagram}{\drawparameterstrue\drawfloatpage}
2156 \newcommand{\floatpagedesign}{\drawparametersfalse\drawfloatpage}
2157
```

`\floatpagevalues` The same as the `\floatvalues` command.
```
2158 \newcommand{\floatpagevalues}{\floatvalues}
2159
```

13   Drawing the layout of a Table of Contents entry

We provide means of illustrating the layout of a sectional title in a Table of Contents.

As usual, start off with the `\try...` commands for setting trial values of the parameters.

`\trytocindent` Sets the trial value for `tocindent` and stores the result in `\l@youthpi`.
```
2160
2161 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
2162 %%%%    TOC LAYOUT
2163 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
2164
2165 \newcommand{\trytocindent}[1]{\l@yltoc{#1}{\l@youthpi}}
```

`\trytocnumwidth` Sets the trial value for `tocnumwidth` and stores the result in `\l@youthpii`.
```
2166 \newcommand{\trytocnumwidth}[1]{\l@yltoc{#1}{\l@youthpii}}
```

\trytoclinewidth   Sets the trial value for `toclinewidth` and stores the result in `\l@youthdo`.

```
2167 \newcommand{\trytoclinewidth}[1]{\l@yltoc{#1}{\l@youthdo}}
```

\trytocrmarg   Sets the trial value for `tocrmarg` and stores the result in `\l@youthpiii`.

```
2168 \newcommand{\trytocrmarg}[1]{\l@yltoc{#1}{\l@youthpiii}}
```

\trytocpnumwidth   Sets the trial value for `tocpnumwidth` and stores the result in `\l@youthpiv`.

```
2169 \newcommand{\trytocpnumwidth}[1]{\l@yltoc{#1}{\l@youthpiv}}
```

\l@ydotsep   Stores the actual value for the ToC dotsep.

```
2170 \newcommand{\l@ydotsep}{\@dotsep}
```

\trytocdotsep   Sets the trial value for `tocdotsep` and stores the result in `\l@youthpv`.

```
2171 \newcommand{\trytocdotsep}[1]{\renewcommand{\l@ydotsep}{#1}
2172           \setlength{\l@ylen}{1em}
2173           \l@ylen = #1\l@ylen
2174           \divide\l@ylen by 18\relax    % 18mu = 1em
2175           \addtolength{\l@ylen}{0.4pt}  % small addition for the dot width
2176           \l@yltoc{\l@ylen}{\l@youthpv}}
2177
```

\currenttoc   This routine sets the trial ToC parameters to those specified for the current document. For those values that are hard-coded it guesstimates typical values (actually I use the values for `\subsection` entries in the article class).

```
2178 \newcommand{\currenttoc}{%
2179   \trytocindent{1.5em}                 % guesstimate
2180   \trytocnumwidth{2.3em}               % guesstimate
2181   \trytoclinewidth{\textwidth}
2182   \trytocrmarg{\@tocrmarg}
2183   \trytocpnumwidth{\@pnumwidth}
2184   \trytocdotsep{\@dotsep}
2185 }
2186
```

\drawtoc   The command to draw the layout of a ToC entry.

```
2187 \newcommand{\drawtoc}{%
2188   \ifdrawparameters
```

Calculate drawing lengths and coordinates for picturing the parameters.

```
2189     \l@yltoc{100pt}{\l@youthpi}         % indent
2190     \l@yltoc{50pt}{\l@youthpii}         % numwidth
2191     \l@yltoc{100pt}{\l@youthpiii}       % tocrmarg
2192     \l@yltoc{60pt}{\l@youthpiv}         % pnumwidth
2193     \l@yltoc{20pt}{\l@youthpv}          % dotsep
2194     \l@yltoc{6.5in}{\l@youthdo}         % linewidth
2195   \fi
```

Continue with the general lengths and coordinate values.

```
2196   \l@yltoc{20pt}{\l@youtvdi}          % baselineskip
2197   \l@youtvdii=\l@youtvdi                    % twice baselineskip
2198     \multiply\l@youtvdii by \tw@
2199   \l@youtvdiii=\l@youtvdi                     % three times baselineskip
2200     \multiply\l@youtvdiii by \thr@@
2201   \l@youtvdiv=\l@youtvdi                   % four times baselineskip
2202     \multiply\l@youtvdiv by 4\relax
2203   \l@youtxci=\l@youthpi                  % X coord of start of numwidth
2204   \l@youtxcii=\l@youtxci                 % X coord of start of text
2205     \advance\l@youtxcii by \l@youthpii
2206   \l@youtxciii=\l@youthdo                 % X coord of start of pnumwidth
2207     \advance\l@youtxciii by -\l@youthpiv
2208   \l@youtxciv=\l@youthdo                 % X coord of start of tocrmarg
2209     \advance\l@youtxciv by -\l@youthpiii
2210   \l@youtxcv=\l@youtxciv                 % X coord of penultimate dot
2211     \advance\l@youtxcv by -\l@youthpv
2212   \l@youtyci=\z@                     % Y coord of base of dotsep text
2213   \l@youtycii=\l@youtyci                 % dotsep vector
2214     \advance\l@youtycii by \l@youtvdii
2215   \l@youtyciii=\l@youtycii                   % Y coord of base of bottom text
2216     \advance\l@youtyciii by \l@youtvdii
2217   \l@youtyciv=\l@youtyciii                   % Y coord of base of middle text
2218     \advance\l@youtyciv by \l@youtvdi
2219   \l@youtycv=\l@youtyciv                 % Y coord of base of top text
2220     \advance\l@youtycv by \l@youtvdi
2221   \l@youtycvi=\l@youtycv                 % Y coord of top vectors
2222     \advance\l@youtycvi by \l@youtvdi
2223     \advance\l@youtycvi by \l@youtvdi
2224   \l@youtvdo=\l@youtycvi                 % picture height
2225     \advance\l@youtvdo by \l@youtvdii
2226   \l@youthdii=\l@youtxciv                  % width of title text
2227     \advance\l@youthdii by -\l@youtxcii
2228   \l@youthdiii=\l@youtvdi                 % a small amount
2229   \l@youthdiv=\l@youthdiii                  % half a small amount
2230     \divide\l@youthdiv by \tw@
```

Draw the picture!

```
2231   \begin{center}
2232   \setlength{\unitlength}{\l@youtunitlength}
2233   \begin{picture}(\l@youthdo,\l@youtvdo)
2234     \thinlines
2235     \put(0,0){\framebox(\l@youthdo,\l@youtvdo){}}
```

The top text line.

```
2236     \put(\l@youtxci,\l@youtycv){\l@ylabelfont \textbf{3.5}}
2237     \put(\l@youtxcii,\l@youtycv){\l@ylabelfont Heading \ldots}
2238     \put(\l@youtxciv,\l@youtycv){\makebox(0,0)[br]{\l@ylabelfont \ldots title}}
```

The middle text line.

```
2239     \put(\l@youtxcii,\l@youtyciv){\l@ylabelfont continue \ldots}
2240     \put(\l@youtxciv,\l@youtyciv){\makebox(0,0)[br]{\l@ylabelfont \ldots title}}
```

The bottom text line.

```
2241     \put(\l@youtxcii,\l@youtyciii){\l@ylabelfont title end}     % end of title heading
2242     \put(\l@youthdo,\l@youtyciii){\makebox(0,0)[br]{\l@ylabelfont 487}} % page number
```

Calculate the number of dots required for the dotted leader, then draw the leader. The length of the 'title end' text is a true length so we have to divide it by the drawing scale factor to convert it to the picture length.

```
2243 %     \settowidth{\l@ylen}{title end\quad}
2244     \settowidth{\l@ylen}{\l@ylabelfont title end\space}
2245     \l@yltoc{\l@ylen}{\l@youthdv}                % width of 'title end' text
2246      \l@youthpvi=\l@youtunitlength
2247      \multiply\l@youthdv by \l@yonepoint\relax
2248      \divide\l@youthdv by \l@youthpvi\relax
2249     \l@youthdvi=\l@youtxciv                      % space for dots
2250      \advance\l@youthdvi by -\l@youtxcii
2251      \advance\l@youthdvi by -\l@youthdv
2252     \l@youthdvii=\l@youthdvi                     % number of dots
2253      \divide\l@youthdvii by \l@youthpv
```

Use \multiput for dot drawing if we are drawing the parameters and the values calculated above. Otherwise multiply the dotsep by 4 to give a more realistic rendition; also make sure that we don't print just one dot.

```
2254     \ifdrawparameters
2255      \multiput(\l@youtxciv,\l@youtyciii)(-\l@youthpv,0){\l@youthdvii}%
2256         {\makebox(0,0)[r]{.}}                  % draw the dots
2257     \else
2258      \multiply\l@youthpv by 4\relax
2259      \l@youthdvii=\l@youthdvi
2260       \divide\l@youthdvii by \l@youthpv
2261       \advance\l@youthdvii by \@ne
2262      \ifnum\l@youthdvii >\@ne
2263      \multiput(\l@youtxciv,\l@youtyciii)(-\l@youthpv,0){\l@youthdvii}%
2264         {\makebox(0,0)[r]{.}}                  % draw the dots
2265      \fi
2266     \fi
2267 %%     \ifdrawparameters
2268     \testdrawdimensions
2269     \ifl@ytempif
```

Draw the parameters if requested.

The top vectors (which we put into their own picture).

```
2270       \put(0,\l@youtycvi){\begin{picture}(\l@youthdo,\l@yoneinch)
```

The indent.

```
2271       \put(0,0){\vector(1,0){\l@youthpi}}
2272       \put(\l@youtxci,0){\line(0,-1){\l@youthdiii}}
2273       \put(0,0){\begin{picture}(\l@youthdiii,\l@youthdiii)
2274        \put(\l@youthdiv,\l@youthdiv){\l@yparamfont\textit{indent}}
2275        \end{picture}}
```

The numwidth.

```
2276        \put(\l@youtxci,0){\vector(1,0){\l@youthpii}}
2277        \put(\l@youtxcii,0){\line(0,-1){\l@youthdiii}}
2278        \put(\l@youtxci,0){\begin{picture}(\l@youthdiii,\l@youthdiii)
2279          \put(\l@youthdiv,\l@youthdiv){\l@yparamfont\textit{numwidth}}
2280          \end{picture}}
```

Lastly, the pnumwidth.

```
2281        \put(\l@youthdo,0){\vector(-1,0){\l@youthpiv}}
2282        \put(\l@youtxciii,0){\line(0,-1){\l@youthdiii}}
2283        \put(\l@youthdo,0){\begin{picture}(\l@youthdiii,\l@youthdiii)
2284          \put(-\l@youthdiv,\l@youthdiv){\makebox(0,0)[br]%
2285            {\l@ypcmd{@pnumwidth}}}
2286          \end{picture}}
2287        \end{picture}}
```

Now do the linewidth.

```
2288        \thicklines
2289        \put(0,\l@youtvdo){\vector(1,0){\l@youthdo}}
2290        \thinlines
2291        \put(0,\l@youtvdo){\begin{picture}(\l@youthdiii,\l@youthdiii)
2292          \put(\l@youtxcii,-\l@youthdiv){\makebox(0,0)[tl]%
2293            { \quad  \l@ypcmd{linewidth}}}
2294          \end{picture}}
```

The bottom vectors (which we put into their own picture).

```
2295        \put(0,\l@youtycii){\begin{picture}(\l@youthdo,\l@yoneinch)
```

The tocrmarg.

```
2296        \put(\l@youthdo,0){\vector(-1,0){\l@youthpiii}}
2297        \put(\l@youtxciv,0){\line(0,1){\l@youthdiii}}
2298        \put(\l@youthdo,0){\begin{picture}(\l@youthdiii,\l@youthdiii)
2299          \put(-\l@youthdiv,-\l@youthdiv){\makebox(0,0)[tr]%
2300            {\l@ypcmd{@tocrmarg}}}
2301          \end{picture}}
```

Finish with the dotsep.

```
2302        \put(\l@youtxciv,0){\vector(-1,0){\l@youthpv}}
2303        \put(\l@youtxciv,0){\vector(1,0){0}}
2304        \put(\l@youtxcv,0){\line(0,1){\l@youthdiii}}
2305        \put(\l@youtxciv,0){\begin{picture}(\l@youthdiii,\l@youthdiii)
2306          \put(0,-\l@youthdiv){\makebox(0,0)[tr]%
2307            {\l@ypcmd{@dotsep}}}
2308          \end{picture}}
2309        \end{picture}}
2310      \fi
2311    \end{picture}
2312  \end{center}
2313  \setlength{\unitlength}{1pt}
2314 %%  \ifdrawparameters\else
2315  \testprintparameters
2316  \ifl@ytempif
```

Print the table of parameter values.

```
2317    \begin{center}
2318    \begin{footnotesize}
2319      Lengths are to the nearest pt. \\
2320    \begin{ttfamily}
2321    \begin{tabular}{l@{\hspace{20pt}}l}
2322    \textit{indent}    = \number\l@youthpi pt &
2323    \textit{numwidth}  = \number\l@youthpii pt \\
2324    \l@ycmd{@tocrmarg}  = \number\l@youthpiii pt &
2325    \l@ycmd{@pnumwidth} = \number\l@youthpiv pt \\
2326    \l@ycmd{@dotsep}    = \l@ydotsep &   \\
2327    \end{tabular}
2328    \end{ttfamily}\end{footnotesize}
2329    \end{center}
2330  \fi
```

The end of the definition of \drawtoc.

```
2331 }
2332
```

\tocdiagram   Shorthands.
\tocdesign

```
2333 \newcommand{\tocdiagram}{\drawparameterstrue\drawtoc}
2334 \newcommand{\tocdesign}{\drawparametersfalse\drawtoc}
2335
```

\tocvalues   This macro produces a table of the current ToC layout actual values.

```
2336 \newcommand{\tocvalues}{%
2337   \ifprintheadings
2338     Actual ToC layout values.\\[\baselineskip]
2339   \fi
2340   \begingroup\l@yvalsize
2341   \begin{tabular}{l@{\hspace{20pt}}l}
2342   \l@ycmd{@tocrmarg}  = \@tocrmarg  &
2343   \l@ycmd{@pnumwidth} = \@pnumwidth \\
2344   \l@ycmd{@dotsep}    = \@dotsep    &
2345   \textit{indent}     = ??     \\
2346   \textit{numwidth}   = ??    & \\
2347   1em = \l@yval{\l@yonem}  & 1ex = \l@yval{\l@yonex} \\
2348   \end{tabular}
2349   \endgroup
2350 }
2351
```

14   Drawing a spread

We provide a facility for drawing a simple double page spread.

\drawaspread   This command takes eight (8) parameters. These are:

1. The ratio of the height of the foot to the width of the spine. If this is zero then the foot height is calculated from the other vertical spacings.

2. The width of a page (as a length).

3. The ratio of the height of the page to its width.

4. The ratio of the height of the text to the width of the text.

5. The ratio of the width of the spine to the width of the page.

6. The ratio of the height of the top to the width of the spine.

7. The ratio of the width of the fore edge to the width of the spine.

8. The ratio of the width of the gutter to the spine (for a two column layout). If this is zero, then a single column layout is drawn.

```
2352
2353 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
2354 %%%%    SPREAD PAGE LAYOUT
2355 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
2356
2357 \newcommand{\drawaspread}[8][0]{%
2358   \begingroup
2359   \setlength{\unitlength}{1pt}
```

Get the pagewidth as all values depend on this. Store it in \l@youthdo. Also use \l@youtunitlength to hold it temporarily.

```
2360   \setlength{\l@youtunitlength}{#2}
2361   \l@yltoc{\l@youtunitlength}{\l@youthdo}  % page width
2362   \l@youthdiv=\l@youthdo                   % total width of double spread
2363     \advance\l@youthdiv by \l@youthdo
```

The height of a page is kept in \l@youtvdo.

```
2364   \setlength{\l@ylen}{#3\l@youtunitlength}
2365   \l@yltoc{\l@ylen}{\l@youtvdo}            % page height
```

The width of the spine is kept in \l@youthdiii. We also use \l@youtunitlength as a temporary store for the spine width.

```
2366   \setlength{\l@ylen}{#5\l@youtunitlength}
2367   \l@yltoc{\l@ylen}{\l@youthdiii}          % spine width
2368   \setlength{\l@youtunitlength}{\l@ylen}
```

The width of the fore edge is kept in \l@youthdi.

```
2369   \setlength{\l@ylen}{#7\l@youtunitlength}
2370   \l@yltoc{\l@ylen}{\l@youthdi}            % fore edge width
```

Calculate the text width and store it in \l@youthdii.

```
2371   \l@youthdii=\l@youthdo                   % text width
2372     \advance\l@youthdii by -\l@youthdi
2373     \advance\l@youthdii by -\l@youthdiii
```

The X coordinate of the left-hand side of the text box on the right-hand page is stored in `\l@youtxci`.

```
2374    \l@youtxci=\l@youthdo
2375      \advance\l@youtxci by \l@youthdiii
```

The height of the top margin is stored in `\l@youtvdiii`

```
2376    \setlength{\l@ylen}{#6\l@youtunitlength}
2377    \l@yltoc{\l@ylen}{\l@youtvdiii}          % top margin
```

The height of the bottom margin is stored in `\l@youtvdi`.

```
2378    \setlength{\l@ylen}{#1\l@youtunitlength}
2379    \l@yltoc{\l@ylen}{\l@youtvdi}            % bottom margin
```

The text height is stored in `\l@youtvdii`.

```
2380    \setlength{\l@ylen}{\l@youthdii pt}
2381    \setlength{\l@ylen}{#4\l@ylen}
2382    \l@yltoc{\l@ylen}{\l@youtvdii}           % text height
```

The height of the bottom margin was stored in `\l@youtvdi`. If the value is zero then we calculate the height from the page, text and top margin height values already obtained.

```
2383    \ifnum\l@youtvdi=\z@
2384      \l@youtvdi=\l@youtvdo
2385      \advance\l@youtvdi by -\l@youtvdiii
2386      \advance\l@youtvdi by -\l@youtvdii
2387    \fi
```

We store the gutter width in `\l@youthdv`.

```
2388    \setlength{\l@ylen}{#8\l@youtunitlength}
2389    \l@yltoc{\l@ylen}{\l@youthdv}            % gutter width
```

Now we can draw a single column spread.

```
2390    \ifnum\l@youthdv=\z@
2391      \begin{picture}(\l@youthdiv,\l@youtvdo)
2392        \thicklines
2393        \put(0,0){\framebox(\l@youthdiv,\l@youtvdo){}} % spread pages
2394        \put(\l@youthdo,0){\line(0,1){\l@youtvdo}}     % the spine
2395        \thinlines
2396        \put(\l@youthdi,\l@youtvdi){\framebox(\l@youthdii,\l@youtvdii){}} % LH text
2397        \put(\l@youtxci,\l@youtvdi){\framebox(\l@youthdii,\l@youtvdii){}} % RH text
2398      \end{picture}
2399    \else
```

We have two columns. Calculate some additional lengths and coordinates.
Store the column width in `\l@youthdvi`.

```
2400      \l@youthdvi=\l@youthdii      % column width
2401        \advance\l@youthdvi by -\l@youthdv
2402        \divide\l@youthdvi by \tw@
```

We also need the positions of the x coordinate of the LH inner column (store in `\l@youtxcii`) and of the RH outer column (store in `\l@youtxciii`).

```
2403      \l@youtxcii=\l@youthdi            % X coord of LH inner column
```

```
2404        \advance\l@youtxcii by \l@youthdvi
2405        \advance\l@youtxcii by \l@youthdv
2406     \l@youtxciii=\l@youtxci              % X coord of RH outer column
2407        \advance\l@youtxciii by \l@youthdvi
2408        \advance\l@youtxciii by \l@youthdv
```

Now draw the two column spread.

```
2409     \begin{picture}(\l@youthdiv,\l@youtvdo)
2410        \thicklines
2411        \put(0,0){\framebox(\l@youthdiv,\l@youtvdo){}} % spread pages
2412        \put(\l@youthdo,0){\line(0,1){\l@youtvdo}}     % the spine
2413        \thinlines
2414        \put(\l@youthdi,\l@youtvdi){\framebox(\l@youthdvi,\l@youtvdii){}} % LH LH col
2415        \put(\l@youtxcii,\l@youtvdi){\framebox(\l@youthdvi,\l@youtvdii){}} % LH RH col
2416        \put(\l@youtxci,\l@youtvdi){\framebox(\l@youthdvi,\l@youtvdii){}} % RH LH col
2417        \put(\l@youtxciii,\l@youtvdi){\framebox(\l@youthdvi,\l@youtvdii){}} % RH RH col
2418     \end{picture}
2419  \fi
```

End of the definition of `\drawaspread`.

```
2420 \endgroup
2421 }
2422
```

15   Drawing a font box

We provide a facility for drawing a box around some text. This can also be used
in a picture environment as `\put(x,y){\frametext{text}}`. The `\unitlength`
must be 1pt!

```
2423
2424 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
2425 %%%%   FONT LAYOUT
2426 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
2427
```

`\drawfontframe` Draws a tightly fitting box with the text reference point marked and a dotted line
along the baseline.

```
2428 \newcommand{\drawfontframe}[1]{%
```

Save the (text) argument.

```
2429    \savebox{\layoutsbox}{#1}%
```

Save the width in `\l@youthdo`, height in `\l@youtvdii` and depth in `\l@youtvdi`.

```
2430    \l@yltoc{\wd\layoutsbox}{\l@youthdo}%
2431    \l@yltoc{\ht\layoutsbox}{\l@youtvdii}%
2432    \l@yltoc{\dp\layoutsbox}{\l@youtvdi}%
```

Save the total height in `\l@youtvdo`.

```
2433    \l@youtvdo=\l@youtvdi
2434    \advance\l@youtvdo by \l@youtvdii
```

Save half the width in \l@youtxci.

```
2435    \l@youtxci=\l@youthdo
2436    \divide\l@youtxci by \tw@
```

Draw a picture, with origin at the box's baseline. Use \qbezier to draw a dotted line with a dot at intervals of 2pt.

```
2437    \begin{picture}(\l@youthdo,\l@youtvdii)
2438      \thinlines
2439      \put(0,0){\usebox{\layoutsbox}}
2440      \put(0,0){\circle*{2}}
2441      \qbezier[\l@youtxci](0,0)(\l@youtxci,0)(\l@youthdo,0)
2442      \put(0,-\l@youtvdi){\framebox(\l@youthdo,\l@youtvdo){}}}
2443    \end{picture}%
2444 }
2445
```

\drawfontframelabel   Draws a tightly fitting box with the text reference point marked and a dotted line along the baseline and marks the width, height and depth.

```
2446 \newcommand{\drawfontframelabel}[1]{%
```

Save the (text) argument.

```
2447    \savebox{\layoutsbox}{#1}%
```

Save the width in \l@youthdo, height in \l@youtvdii and depth in \l@youtvdi.

```
2448    \l@yltoc{\wd\layoutsbox}{\l@youthdo}%
2449    \l@yltoc{\ht\layoutsbox}{\l@youtvdii}%
2450    \l@yltoc{\dp\layoutsbox}{\l@youtvdi}%
```

Save the total height in \l@youtvdo.

```
2451    \l@youtvdo=\l@youtvdi
2452    \advance\l@youtvdo by \l@youtvdii
```

Save half the width in \l@youtxci.

```
2453    \l@youtxci=\l@youthdo
2454    \divide\l@youtxci by \tw@
```

Set \l@youtdvi to be space between dimensions and labels.

```
2455    \l@youthdvi=5\relax
```

Add 2\l@youthdvi plus 7pt (i.e. 17pt) to the box height to allow for width label, and add 2\l@youthdvi plus 25pt (i.e 35pt) to the box width to allow for height label.

```
2456    \l@youtycv=\l@youtvdii
2457    \advance\l@youtycv by 17\relax
2458    \l@youtxcii=\l@youthdo
2459    \advance\l@youtxcii by 35\relax
```

Draw a picture, with origin at the box's baseline. Use \qbezier to draw a dotted line with a dot at intervals of 2pt.

```
2460    \begin{picture}(\l@youtxcii,\l@youtycv)
2461      \thinlines
2462      \put(0,0){\usebox{\layoutsbox}}
```

```
2463      \put(0,0){\circle*{2}}
2464      \qbezier[\l@youtxci](0,0)(\l@youtxci,0)(\l@youthdo,0)
2465      \put(0,-\l@youtvdi){\framebox(\l@youthdo,\l@youtvdo){}}
```

Add the dimension lines and labels (in tiny print). Mark the reference point on the left of the box.

```
2466      \begin{tiny}
2467      \put(-\l@youthdvi,0){\makebox(0,0)[r]{reference}}
```

Draw the width dimension above the box and the label above the dimension.

```
2468      \l@youtycv=\l@youtvdii
2469      \advance\l@youtycv by \l@youthdvi
2470      \ifnum\l@youthdo > 6\relax
2471        \l@yhrda{0}{\l@youtycv}{\l@youthdo}
2472      \else
2473        \l@yhrdia{0}{\l@youtycv}{\l@youthdo}
2474      \fi
2475      \advance\l@youtycv by \l@youthdvi
2476      \put(\l@youtxci,\l@youtycv){\makebox(0,0)[b]{width}}
```

Draw the height dimension and label on the right of the box. `\l@youtxcii` is the x coordinate of the dimension line(s) and `\l@youtxciii` is the x coordinate of the right side label(s).

```
2477      \l@youtxcii=\l@youthdo
2478      \advance\l@youtxcii by \l@youthdvi
2479      \l@youtxciii=\l@youtxcii
2480      \advance\l@youtxciii by \l@youthdvi
2481      \ifnum\l@youtvdii > \z@
```

The height is positive, so draw it, putting the label at the center of the dimension line.

```
2482        \ifnum\l@youtvdii > 6\relax
2483          \l@yvuda{\l@youtxcii}{0}{\l@youtvdii}
2484        \else
2485          \l@yvudia{\l@youtxcii}{0}{\l@youtvdii}
2486        \fi
2487        \divide\l@youtvdii by \tw@
2488        \put(\l@youtxciii,\l@youtvdii){\makebox(0,0)[l]{height}}
2489      \fi
2490      \ifnum\l@youtvdi > \z@
```

The depth is positive, so draw it putting the label at the center of the dimension line.

```
2491        \ifnum\l@youtvdi > 6\relax
2492          \l@yvuda{\l@youtxcii}{-\l@youtvdi}{\l@youtvdi}
2493        \else
2494          \l@yvudia{\l@youtxcii}{-\l@youtvdi}{\l@youtvdi}
2495        \fi
2496        \divide\l@youtvdi by \tw@
2497        \put(\l@youtxciii,-\l@youtvdi){\makebox(0,0)[l]{depth}}
2498      \fi
```

This finishes the picture. Print the values if asked for.

```
2499    \end{tiny}
2500  \end{picture}
2501  \ifprintparameters
2502    \begin{center}\begin{footnotesize}\begin{ttfamily}
2503      \begin{tabular}{lll}
2504        \textrm{width} = \the\wd\layoutsbox &
2505        \textrm{height} = \the\ht\layoutsbox &
2506        \textrm{depth} = \the\dp\layoutsbox \\
2507      \end{tabular}
2508    \end{ttfamily}\end{footnotesize}\end{center}
2509  \fi
```

All done.

```
2510 }
2511
```

The end of this package.

```
2512 ⟨/lays⟩
```

References

[GMS94] Michel Goossens, Frank Mittelbach, and Alexander Samarin. *The LaTeX Companion.* Addison-Wesley Publishing Company, 1994.

[Wil96] Peter R. Wilson. *LaTeX for standards: The LaTeX package files user manual.* NIST Report NISTIR, June 1996.

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