

The geometry package

Hideo Umeki
latexgeometry@gmail.com

2010/07/08 v5.4

Abstract

This package provides a flexible and easy interface to page dimensions. You can change the page layout with intuitive parameters. For instance, if you want to set a margin to 2cm from each edge of the paper, you can go just `\usepackage[margin=2cm]{geometry}`. The page layout can be changed in the middle of the document with `\newgeometry` command.

1 Preface to version 5

- **Changing page layout mid-document.**

The new commands `\newgeometry{...}` and `\restoregeometry` allow users to change page dimensions in the middle of the document. `\newgeometry` is almost similar to `\geometry` except that `\newgeometry` disables all the options specified in the preamble and skips the papersize-related options: `landscape`, `portrait` and paper size options (such as `papersize`, `paper=a4paper` and so forth).

- **A new set of options to specify the layout area.**

The options specified for the area, in which the page dimensions are calculated, are added: `layout`, `layoutsiz`, `layoutwidth`, `layoutheight` and so forth. These options would help to print the specified layout to a different sized paper. For example, with `a4paper` and `layout=a5paper`, the `geometry` package uses 'A5' layout to calculate margins with the paper size still 'A4'.

- **A new driver option xetex.**

The new driver option `xetex` is added. The driver auto-detection routine has been revised so as to avoid an error with undefined control sequences. Note that 'geometry.cfg' in T_EX Live, which disables the auto-detection routine and sets `pdftex`, is no longer necessary and has no problem even though it still exists. To set `xetex` is strongly recommended with X_YL^AT_EX.

- **New paper size presets for JIS B-series and ISO C-series.**

The papersize presets `b0j` to `b6j` for JIS (Japanese Industrial Standards) B-series and `c0paper` to `c6paper` for ISO C-series (v5.4~) are added.

- **Changing default for underspecified margin.**

In the previous version, if only one margin was specified, `bottom=1cm` for example, then `geometry` set the other margin with the margin ratio (1:1 by default for the vertical dimensions) and got `top=1cm` in this case. The version 5 sets the text-body size with the default `scale` (= 0.7) and determine the unspecified margin. (See Section 6.5)

- **The option showframe works on every page.**

With `showframe` option, the page frames are shown on every page. In addition, the new option `showcrop` would print cropmarks showing the corners of the layout (the same as paper by default) on every page. Version 5.4 introduced a new `\shipout` overloading process using `atbegshi` package, so the `atbegshi` package is required when using `showframe` or `showcrop` option.

- **Loading geometry.cfg precedes processing class options.**

The previous version loaded `geometry.cfg` after processing the document class options. Now that the config file is loaded before processing the class options, you can change the behavior specified in `geometry.cfg` by adding options into `\documentclass` as well as `\usepackage` and `\geometry`.

- **Deleted options:** `compat2` and `twosideshift`. The version 5 has no longer compatibility with the previous ones. `compat2` and `twosideshift` are gone for simplicity.

2 Introduction

To set dimensions for page layout in L^AT_EX is not straightforward. You need to adjust several L^AT_EX native dimensions to place a text area where you want. If you want to center the text area in the paper you use, for example, you have to specify native dimensions as follows:

```
\usepackage{calc}
\setlength\textwidth{7in}
\setlength\textheight{10in}
\setlength\oddsidemargin{(\paperwidth-\textwidth)/2 - 1in}
\setlength\topmargin{(\paperheight-\textheight
-\headheight-\headsep-\footskip)/2 - 1in}.
```

Without package *calc*, the above example would need more tedious settings. Package *geometry* provides an easy way to set page layout parameters. In this case, what you have to do is just

```
\usepackage[text={7in,10in},centering]{geometry}.
```

Besides centering problem, setting margins from each edge of the paper is also troublesome. But *geometry* also make it easy. If you want to set each margin 1.5in, you can go

```
\usepackage[margin=1.5in]{geometry}
```

Thus, the *geometry* package has an auto-completion mechanism, in which unspecified dimensions are automatically determined. The *geometry* package will be also useful when you have to set page layout obeying the following strict instructions: for example,

The total allowable width of the text area is 6.5 inches wide by 8.75 inches high. The top margin on each page should be 1.2 inches from the top edge of the page. The left margin should be 0.9 inch from the left edge. The footer with page number should be at the bottom of the text area.

In this case, using *geometry* you can go

```
\usepackage[total={6.5in,8.75in},
top=1.2in, left=0.9in, includefoot]{geometry}.
```

Setting a text area on the paper in document preparation system has some analogy to placing a window on the background in the window system. The name ‘*geometry*’ comes from the `-geometry` option used for specifying a size and location of a window in X Window System.

3 Page geometry

Figure 1 shows the page layout dimensions defined in the *geometry* package. The page layout contains a *total body* (printable area) and *margins*. The *total body* consists of a *body* (text area) with an optional *header*, *footer* and marginal notes (*marginpar*). There are four margins: *left*, *right*, *top* and *bottom*. For twosided documents, horizontal margins should be called *inner* and *outer*.

```
paper      : total body and margins
total body : body (text area) (optional head, foot and marginpar)
margins    : left (inner), right (outer), top and bottom
```

Each margin is measured from the corresponding edge of a paper. For example, left margin (inner margin) means a horizontal distance between the left (inner) edge of the paper and that of the total body. Therefore the left and top margins defined in *geometry* are different from the native dimensions `\leftmargin` and `\topmargin`. The size of a body (text area) can be modified by `\textwidth` and `\textheight`. The dimensions for paper, total body and margins have the following relations.

$$\text{paperwidth} = \text{left} + \text{width} + \text{right} \quad (1)$$

$$\text{paperheight} = \text{top} + \text{height} + \text{bottom} \quad (2)$$

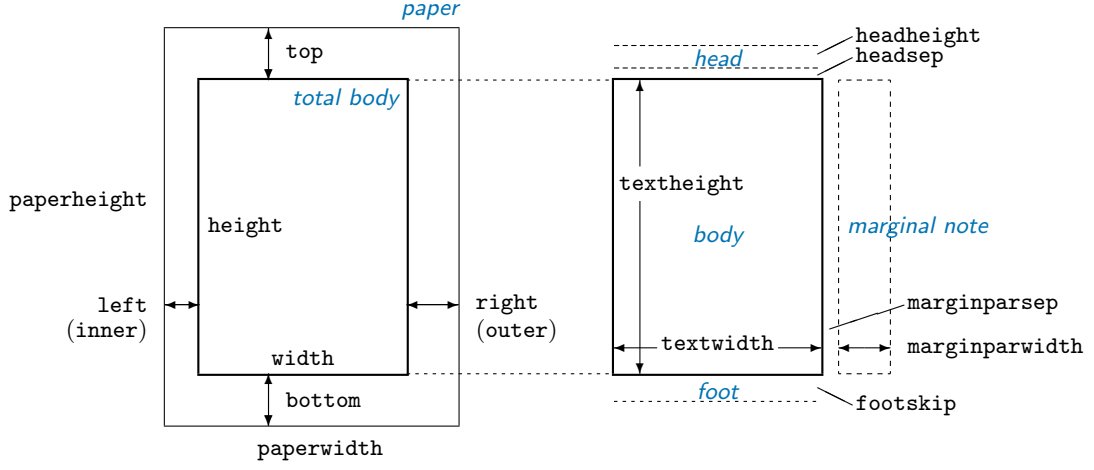


Figure 1: Dimension names used in the `geometry` package. `width = textwidth` and `height = textheight` by default. `left`, `right`, `top` and `bottom` are margins. If margins on verso pages are swapped by `twoside` option, margins specified by `left` and `right` options are used for the inside and outside margins respectively. `inner` and `outer` are aliases of `left` and `right` respectively.

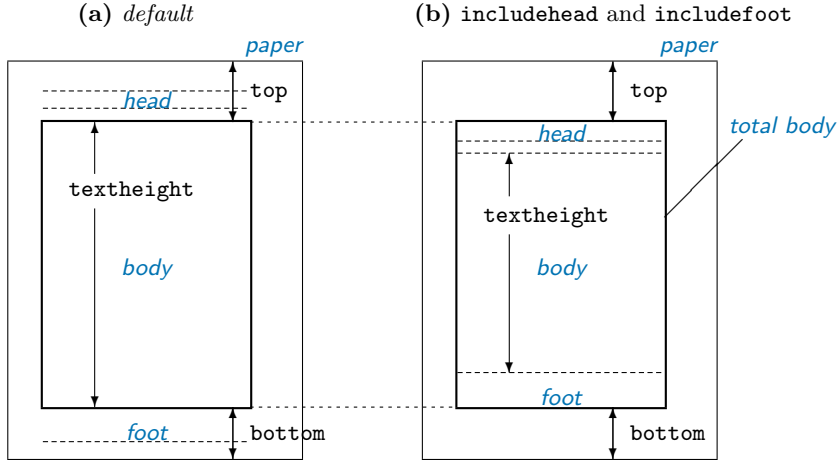


Figure 2: `includehead` and `includefoot` include the head and foot respectively into `total body`. (a) `height = textheight` (default). (b) `height = textheight + headheight + headsep + footskip` if `includehead` and `includefoot`. If the top and bottom margins are specified, `includehead` and `includefoot` result in shorter `textheight`.

The total body width and height would be defined:

$$\text{width} := \text{textwidth} (+ \text{marginparsep} + \text{marginparwidth}) \quad (3)$$

$$\text{height} := \text{textheight} (+ \text{headheight} + \text{headsep} + \text{footskip}) \quad (4)$$

In Equation (3) `width:=textwidth` by default, while `marginparsep` and `marginparwidth` are included in `width` if `includemp` option is set true. In Equation (4), `height:=textheight` by default. If `includehead` is set to true, `headheight` and `headsep` are considered as a part of `height`. In the same way, `includefoot` takes `footskip` into `height`. Figure 2 shows how these options work in the vertical direction.

Thus, the page layout consists of three parts (lengths) in each direction: one body and two margins. If the two of them are explicitly specified, the other length is obvious and no need to be specified. Figure 3 shows a simple model of page dimensions. When a length L is given and is partitioned into the body b , the margins a and c , it's obvious that

$$L = a + b + c \quad (5)$$

The specification with two of the three (a, b and c) fixed explicitly is solvable. If two or more are left unspecified or 'underspecified', Equation (5) cannot be solved without any other relation between them. If all of them are specified, then it needs to check whether or not they satisfy Equation (5), that is too much specification or 'overspecified'.

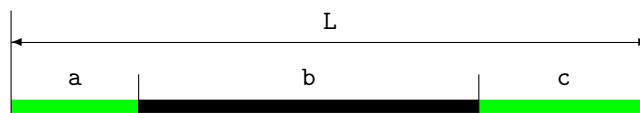


Figure 3: A simple model of page dimensions.

The `geometry` package has auto-completion mechanism that saves the trouble of specifying the page layout dimensions. For example, you can set

```
\usepackage[width=14cm, left=3cm]{geometry}
```

on A4 paper. In this case you don't have to set the right margin. The details of auto-completion will be described in Section 6.5.

4 User interface

4.1 Commands

The `geometry` package provides the following commands:

- `\geometry{<options>}`
- `\newgeometry{<options>}` and `\restoregeometry`
- `\savegeometry{<name>}` and `\loadgeometry{<name>}`

`\geometry{<options>}` changes the page layout according to the options specified in the argument. This command, if any, should be placed only in the preamble (before `\begin{document}`).

The `geometry` package may be used as part of a class or another package you use in your document. The command `\geometry` can overwrite some of the settings in the preamble. Multiple use of `\geometry` is allowed and then processed with the options concatenated. If `geometry` is not yet loaded, you can use only `\usepackage[<options>]{geometry}` instead of `\geometry`.

`\newgeometry{<options>}` changes the page layout mid-document. `\newgeometry` is almost similar to `\geometry` except that `\newgeometry` disables all the options specified by `\usepackage` and `\geometry` in the preamble and skips papersize-related options. `\restoregeometry` restores the page layout specified in the preamble. This command has no arguments. See Section 7 for details.

`\savegeometry{<name>}` saves the page dimensions as `<name>` where you put this command. `\loadgeometry{<name>}` loads the page dimensions saved as `<name>`. See Section 7 for details.

4.2 Optional argument

The `geometry` package adopts keyval interface '`<key>=<value>`' for the optional argument to `\usepackage`, `\geometry` and `\newgeometry`.

The argument includes a list of comma-separated keyval options and has basic rules as follows:

- Multiple lines are allowed, while blank lines are not.
- Any spaces between words are ignored.
- Options are basically order-independent. (There are some exceptions. See Section 6.2 for details.)

For example,

```
\usepackage[ a5paper , hmargin = { 3cm,
                                .8in } , height
              = 10in ]{geometry}
```

is equivalent to

```
\usepackage[height=10in,a5paper,hmargin={3cm,0.8in}]{geometry}
```

Some options are allowed to have sub-list, e.g. `{3cm,0.8in}`. Note that the order of values in the sub-list is significant. The above setting is also equivalent to the followings:

```
\usepackage{geometry}
\geometry{height=10in,a5paper,hmargin={3cm,0.8in}}
```

or

```
\usepackage[a5paper]{geometry}
\geometry{hmargin={3cm,0.8in},height=8in}
\geometry{height=10in}.
```

Thus, multiple use of `\geometry` just appends options.

`geometry` supports package *calc*¹. For example,

```
\usepackage{calc}
\usepackage[textheight=20\baselineskip+10pt]{geometry}
```

4.3 Option types

`geometry` options are categorized into four types:

1. Boolean type

takes a boolean value (**true** or **false**). If no value, **true** is set by default.

$\langle key \rangle = \text{true} \mid \text{false}.$
 $\langle key \rangle$ with no value is equivalent to $\langle key \rangle = \text{true}.$

Examples: `verbose=true`, `includehead`, `twoside=false`.

Paper name is the exception. The preferred paper name should be set with no values. Whatever value is given, it is ignored. For instance, `a4paper=XXX` is equivalent to `a4paper`.

2. Single-valued type

takes a mandatory value.

$\langle key \rangle = \langle value \rangle.$

Examples: `width=7in`, `left=1.25in`, `footskip=1cm`, `height=.86\paperheight`.

3. Double-valued type

takes a pair of comma-separated values in braces. The two values can be shortened to one value if they are identical.

$\langle key \rangle = \{ \langle value1 \rangle, \langle value2 \rangle \}.$
 $\langle key \rangle = \langle value \rangle$ is equivalent to $\langle key \rangle = \{ \langle value \rangle, \langle value \rangle \}.$

Examples: `hmargin={1.5in,1in}`, `scale=0.8`, `body={7in,10in}`.

4. Triple-valued type

takes three mandatory, comma-separated values in braces.

$\langle key \rangle = \{ \langle value1 \rangle, \langle value2 \rangle, \langle value3 \rangle \}$

Each value must be a dimension or null. When you give an empty value or `*`, it means null and leaves the appropriate value to the auto-completion mechanism. You need to specify at least one dimension, typically two dimensions. You can set nulls for all the values, but it makes no sense.

Examples:

`hdivide={2cm,*,1cm}`, `vdivide={3cm,19cm, }`, `divide={1in,*,1in}`.

5 Option details

This section describes all options available in `geometry`. Options with a dagger [†] are not available as arguments of `\newgeometry` (See Section 7).

¹CTAN: `macros/latex/required/tools`

5.1 Paper size

The options below set paper/media size and orientation.

[†] <code>paper</code> <code>papername</code>	specifies the paper size by name. <code>paper=<paper-name></code> . For convenience, you can specify the paper name without <code>paper=</code> . For example, <code>a4paper</code> is equivalent to <code>paper=a4paper</code> .
[†] <code>a0paper</code> , <code>a1paper</code> , <code>a2paper</code> , <code>a3paper</code> , <code>a4paper</code> , <code>a5paper</code> , <code>a6paper</code> , <code>b0paper</code> , <code>b1paper</code> , <code>b2paper</code> , <code>b3paper</code> , <code>b4paper</code> , <code>b5paper</code> , <code>b6paper</code> , <code>c0paper</code> , <code>c1paper</code> , <code>c2paper</code> , <code>c3paper</code> , <code>c4paper</code> , <code>c5paper</code> , <code>c6paper</code> , <code>b0j</code> , <code>b1j</code> , <code>b2j</code> , <code>b3j</code> , <code>b4j</code> , <code>b5j</code> , <code>b6j</code> , <code>ansipaper</code> , <code>ansipaper</code> , <code>ansicpaper</code> , <code>ansidpaper</code> , <code>ansiepaper</code> , <code>letterpaper</code> , <code>executivepaper</code> , <code>legalpaper</code>	specifies paper name. The value part is ignored even if any. For example, the followings have the same effect: <code>a5paper</code> , <code>a5paper=true</code> , <code>a5paper=false</code> and so forth. <code>a[0-6]paper</code> , <code>b[0-6]paper</code> and <code>c[0-6]paper</code> are ISO A, B and C series of paper sizes respectively. The JIS (Japanese Industrial Standards) A-series is identical to the ISO A-series, but the JIS B-series is different from the ISO B-series. <code>b[0-6]j</code> should be used for the JIS B-series.
[†] <code>screen</code>	a special paper size with (W,H) = (225mm,180mm). For presentation with PC and video projector, “ <code>screen,centering</code> ” with ‘slide’ documentclass would be useful.
[†] <code>paperwidth</code>	width of the paper. <code>paperwidth=<length></code> .
[†] <code>paperheight</code>	height of the paper. <code>paperheight=<length></code> .
[†] <code>papersize</code>	width and height of the paper. <code>papersize={<width>,<height>}</code> or <code>papersize=<length></code> .
[†] <code>landscape</code>	switches the paper orientation to landscape mode.
[†] <code>portrait</code>	switches the paper orientation to portrait mode. This is equivalent to <code>landscape=false</code> .

The options for paper names (e.g., `a4paper`) and orientation (`portrait` and `landscape`) can be set as document class options. For example, you can set `\documentclass[a4paper,landscape]{article}`, then `a4paper` and `landscape` are processed in `geometry` as well. This is also the case for `twoside` and `twocolumn` (see also Section 5.5).

5.2 Layout size

You can specify the layout area with options described in this section regardless of the paper size. The options would help to print the specified layout to a different sized paper. For example, with `a4paper` and `layout=a5paper`, the package uses ‘A5’ layout to calculate margins on ‘A4’ paper. The layout size defaults to the same as the paper. The options for the layout size are available in `\newgeometry`, so that you can change the layout size in the middle of the document. The paper size itself can’t be changed though. Figure 4 shows what the difference between `layout` and `paper` is.

<code>layout</code>	specifies the layout size by paper name. <code>layout=<paper-name></code> . All the paper names defined in <code>geometry</code> are available. See Section 5.1 for details.
<code>layoutwidth</code>	width of the layout. <code>layoutwidth=<length></code> .
<code>layoutheight</code>	height of the layout. <code>layoutheight=<length></code> .
<code>layoutsizes</code>	width and height of the layout. <code>layoutsizes={<width>,<height>}</code> or <code>layoutsizes=<length></code> .
<code>layoutoffset</code>	specifies the horizontal offset from the left edge of the paper. <code>layoutoffset=<length></code> .
<code>layoutvoffset</code>	specifies the vertical offset from the top edge of the paper. <code>layoutvoffset=<length></code> .
<code>layoutoffset</code>	specifies both horizontal and vertical offsets. <code>layoutoffset={<offset>,<voffset>}</code> or <code>layoutsizes=<length></code> .

5.3 Body size

The options specifying the size of *total body* are described in this section.

<code>hscale</code>	ratio of width of <i>total body</i> to <code>\paperwidth</code> . <code>hscale=<h-scale></code> , e.g., <code>hscale=0.8</code> is equivalent to <code>width=0.8\paperwidth</code> . (0.7 by default)
---------------------	---

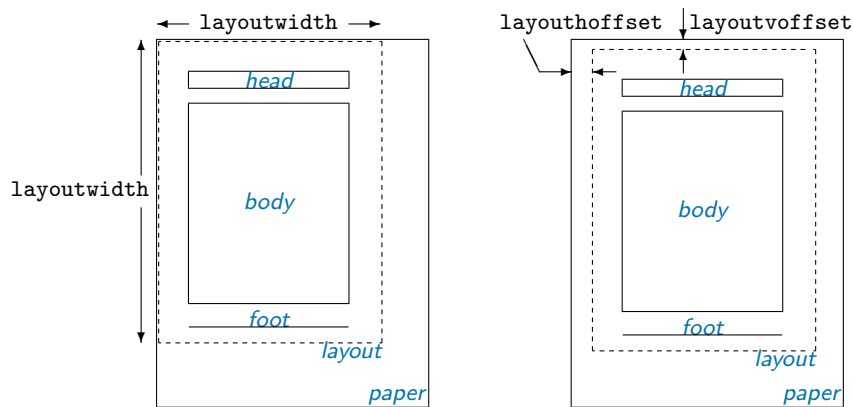


Figure 4: The dimensions related to the layout size. Note that the layout size defaults to the same size as the paper, so you don't have to specify layout-related options explicitly in most cases.

<code>vscale</code>	ratio of height of <i>total body</i> to <code>\paperheight</code> , e.g., <code>vscale=<v-scale></code> . (0.7 by default) <code>vscale=0.9</code> is equivalent to <code>height=0.9\paperheight</code> .
<code>scale</code>	ratio of <i>total body</i> to the paper. <code>scale={<h-scale>,<v-scale>}</code> or <code>scale=<scale></code> . (0.7 by default)
<code>width</code> <code>totalwidth</code>	width of <i>total body</i> . <code>width=<length></code> or <code>totalwidth=<length></code> . This dimension defaults to <code>textwidth</code> , but if <code>includemp</code> is set to <code>true</code> , <code>width ≥ textwidth</code> because <code>width</code> includes the width of the marginal notes. If <code>textwidth</code> and <code>width</code> are specified at the same time, <code>textwidth</code> takes priority over <code>width</code> .
<code>height</code> <code>totalheight</code>	height of <i>total body</i> , excluding header and footer by default. If <code>includehead</code> or <code>includefoot</code> is set, <code>height</code> includes the head or foot of the page as well as <code>textheight</code> . <code>height=<length></code> or <code>totalheight=<length></code> . If both <code>textheight</code> and <code>height</code> are specified, <code>height</code> will be ignored.
<code>total</code>	width and height of <i>total body</i> . <code>total={<width>,<height>}</code> or <code>total=<length></code> .
<code>textwidth</code>	specifies <code>\textwidth</code> , the width of <i>body</i> (the text area). <code>textwidth=<length></code> .
<code>textheight</code>	specifies <code>\textheight</code> , the height of <i>body</i> (the text area). <code>textheight=<length></code> .
<code>text</code> <code>body</code>	specifies both <code>\textwidth</code> and <code>\textheight</code> of the body of page. <code>body={<width>,<height>}</code> or <code>text=<length></code> .
<code>lines</code>	enables users to specify <code>\textheight</code> by the number of lines. <code>lines=<integer></code> .
<code>includehead</code>	includes the head of the page, <code>\headheight</code> and <code>\headsep</code> , into <i>total body</i> . It is set to <code>false</code> by default. It is opposite to <code>ignorehead</code> . See Figure 2 and Figure 5.
<code>includefoot</code>	includes the foot of the page, <code>\footskip</code> , into <i>total body</i> . It is opposite to <code>ignorefoot</code> . It is <code>false</code> by default. See Figure 2 and Figure 5.
<code>includeheadfoot</code>	sets both <code>includehead</code> and <code>includefoot</code> to <code>true</code> , which is opposite to <code>ignoreheadfoot</code> . See Figure 2 and Figure 5.
<code>includemp</code>	includes the margin notes, <code>\marginparwidth</code> and <code>\marginparsep</code> , into <i>body</i> when calculating horizontal calculation.
<code>includeall</code>	sets both <code>includeheadfoot</code> and <code>includemp</code> to <code>true</code> . See Figure 5.
<code>ignorehead</code>	disregards the head of the page, <code>headheight</code> and <code>headsep</code> , in determining vertical layout, but does not change those lengths. It is equivalent to <code>includehead=false</code> . It is set to <code>true</code> by default. See also <code>includehead</code> .
<code>ignorefoot</code>	disregards the foot of page, <code>footskip</code> , in determining vertical layout, but does not change that length. This option defaults to <code>true</code> . See also <code>includefoot</code> .
<code>ignoreheadfoot</code>	sets both <code>ignorehead</code> and <code>ignorefoot</code> to <code>true</code> . See also <code>includeheadfoot</code> .

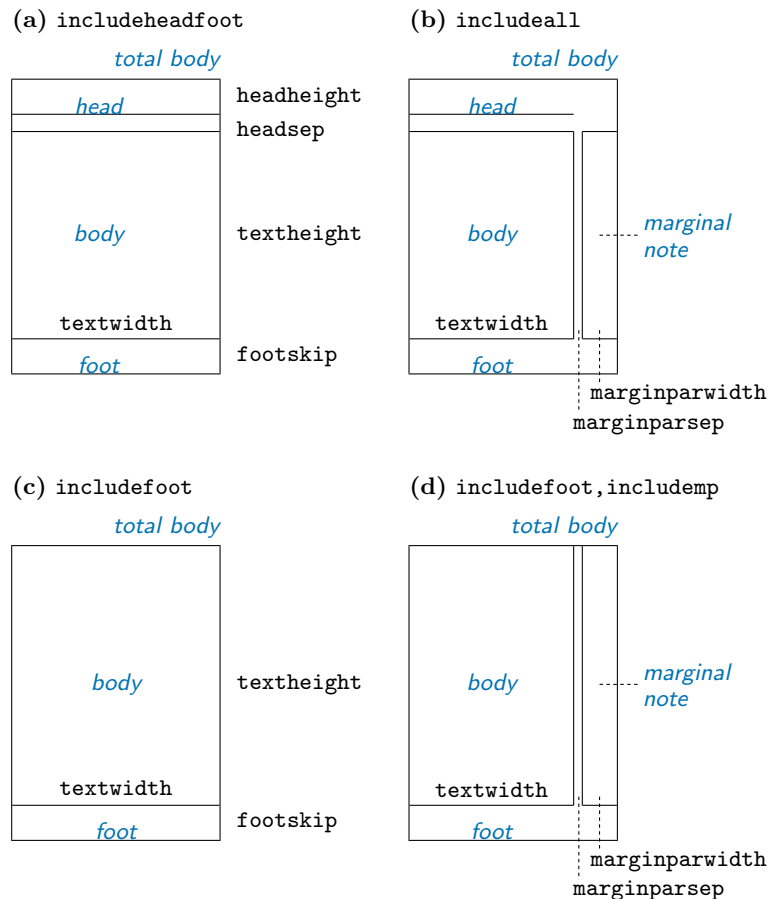


Figure 5: Sample layouts for *total body* with different switches. (a) `includeheadfoot`, (b) `includeall`, (c) `includefoot` and (d) `includefoot,includemp`. If `reversemp` is set to `true`, the location of the marginal notes are swapped on every page. Option `twoside` swaps both margins and marginal notes on verso pages. Note that the marginal note, if any, is printed despite `ignoremp` or `includemp=false` and overrun the page in some cases.

`ignoremp` disregards the marginal notes in determining the horizontal margins (defaults to `true`). If marginal notes overrun the page, the warning message will be displayed when `verbose=true`. See also `includemp` and Figure 5.

`ignoreall` sets both `ignoreheadfoot` and `ignoremp` to `true`. See also `includeall`.

`heightrounded` This option rounds `\textheight` to n -times (n : an integer) of `\baselineskip` plus `\topskip` to avoid “underfull vbox” in some cases. For example, if `\textheight` is 486pt with `\baselineskip 12pt` and `\topskip 10pt`, then

$$(39 \times 12\text{pt} + 10\text{pt}) = 478\text{pt} < 486\text{pt} < 490\text{pt} (= 40 \times 12\text{pt} + 10\text{pt}),$$

as a result `\textheight` is rounded to 490pt. `heightrounded=false` by default.

Figure 5 illustrates various layouts with different layout modes. The dimensions for a header and a footer can be controlled by `nohead` or `nofoot` mode, which sets each length to 0pt directly. On the other hand, options with the prefix `ignore` do *not* change the corresponding native dimensions.

The following options can specify body and margins simultaneously with three comma-separated values in braces.

`hdivide` horizontal partitions (left,width,right). `hdivide={⟨left margin⟩,⟨width⟩,⟨right margin⟩}`. Note that you should not specify all of the three parameters. The best way of using this option is to specify two of three and leave the rest with null(nothing) or ‘*’. For example, when you set `hdivide={2cm,15cm, }`, the margin from the right-side edge of page will be determined calculating `paperwidth-2cm-15cm`.

<code>vdivide</code>	vertical partitions (top,height,bottom). <code>vdivide={⟨top margin⟩,⟨height⟩,⟨bottom margin⟩}</code> .
<code>divide</code>	<code>divide={A,B,C}</code> is interpreted as <code>hdivide={A,B,C}</code> and <code>vdivide={A,B,C}</code> .

5.4 Margin size

The options specifying the size of the margins are listed below.

<code>left</code> <code>lmargin</code> <code>inner</code>	left margin (for oneside) or inner margin (for twoside) of <i>total body</i> . In other words, the distance between the left (inner) edge of the paper and that of <i>total body</i> . <code>left=⟨length⟩</code> . <code>inner</code> has no special meaning, just an alias of <code>left</code> and <code>lmargin</code> .
<code>right</code> <code>rmargin</code> <code>outer</code>	right or outer margin of <i>total body</i> . <code>right=⟨length⟩</code> .
<code>top</code> <code>tmargin</code>	top margin of the page. <code>top=⟨length⟩</code> . Note this option has nothing to do with the native dimension <code>\topmargin</code> .
<code>bottom</code> <code>bmargin</code>	bottom margin of the page. <code>bottom=⟨length⟩</code> .
<code>hmargin</code>	left and right margin. <code>hmargin={⟨left margin⟩,⟨right margin⟩}</code> or <code>hmargin=⟨length⟩</code> .
<code>vmargin</code>	top and bottom margin. <code>vmargin={⟨top margin⟩,⟨bottom margin⟩}</code> or <code>vmargin=⟨length⟩</code> .
<code>margin</code>	<code>margin={A,B}</code> is equivalent to <code>hmargin={A,B}</code> and <code>vmargin={A,B}</code> . <code>margin=A</code> is automatically expanded to <code>hmargin=A</code> and <code>vmargin=A</code> .
<code>hmarginratio</code>	horizontal margin ratio of <code>left</code> (inner) to <code>right</code> (outer). The value of <code>⟨ratio⟩</code> should be specified with colon-separated two values. Each value should be a positive integer less than 100 to prevent arithmetic overflow, e.g., 2:3 instead of 1:1.5. The default ratio is 1:1 for oneside, 2:3 for twoside.
<code>vmarginratio</code>	vertical margin ratio of <code>top</code> to <code>bottom</code> . The default ratio is 2:3.
<code>marginratio</code> <code>ratio</code>	horizontal and vertical margin ratios. <code>marginratio={⟨horizontal ratio⟩,⟨vertical ratio⟩}</code> or <code>marginratio=⟨ratio⟩</code> .
<code>hcentering</code>	sets auto-centering horizontally and is equivalent to <code>hmarginratio=1:1</code> . It is set to <code>true</code> by default for oneside. See also <code>hmarginratio</code> .
<code>vcentering</code>	sets auto-centering vertically and is equivalent to <code>vmarginratio=1:1</code> . The default is <code>false</code> . See also <code>vmarginratio</code> .
<code>centering</code>	sets auto-centering and is equivalent to <code>marginratio=1:1</code> . See also <code>marginratio</code> . The default is <code>false</code> . See also <code>marginratio</code> .
<code>twoside</code>	switches on twoside mode with left and right margins swapped on verso pages. The option sets <code>\@twoside</code> and <code>\@mparswitch</code> switches. See also <code>asymmetric</code> .
<code>asymmetric</code>	implements a twosided layout in which margins are not swapped on alternate pages (by setting <code>\oddsidemargin</code> to <code>\evensidemargin + bindingoffset</code>) and in which the marginal notes stay always on the same side. This option can be used as an alternative to the <code>twoside</code> option. See also <code>twoside</code> .
<code>bindingoffset</code>	removes a specified space from the lefthand-side of the page for oneside or the inner-side for twoside. <code>bindingoffset=⟨length⟩</code> . This is useful if pages are bound by a press binding (glued, stitched, stapled ...). See Figure 6.
<code>hdivide</code>	See description in Section 5.3.
<code>vdivide</code>	See description in Section 5.3.
<code>divide</code>	See description in Section 5.3.

5.5 Native dimensions

The options below overwrite L^AT_EX native dimensions and switches for page layout (See the right-hand side in Figure 1).

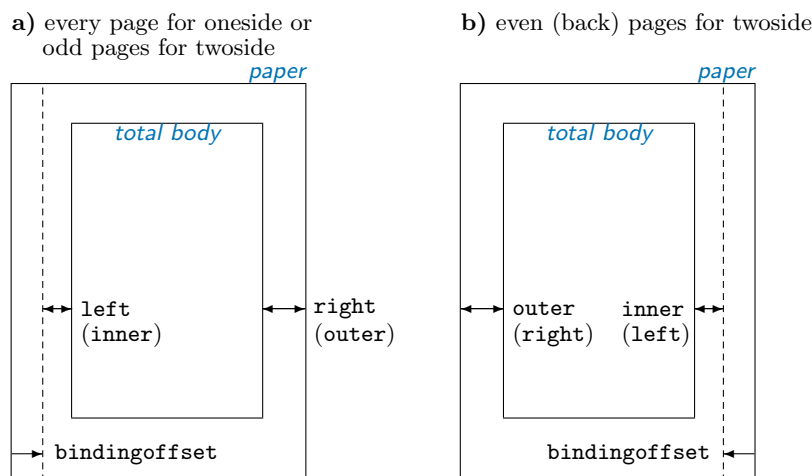


Figure 6: The option `bindingoffset` adds the specified length to the inner margin. Note that `twoside` option swaps the horizontal margins and the marginal notes together with `bindingoffset` on even pages (see **b**)), but `asymmetric` option suppresses the swap of the margins and marginal notes (but `bindingoffset` is still swapped).

<code>headheight</code>	<code> head</code> modifies <code>\headheight</code> , height of header. <code>headheight=<length></code> or <code>head=<length></code> .
<code>headsep</code>	modifies <code>\headsep</code> , separation between header and text (body). <code>headsep=<length></code> .
<code>footskip</code>	<code> foot</code> modifies <code>\footskip</code> , distance separation between baseline of last line of text and baseline of footer. <code>footskip=<length></code> or <code>foot=<length></code> .
<code>nohead</code>	eliminates spaces for the head of the page, which is equivalent to both <code>\headheight=0pt</code> and <code>\headsep=0pt</code> .
<code>nofoot</code>	eliminates spaces for the foot of the page, which is equivalent to <code>\footskip=0pt</code> .
<code>noheadfoot</code>	equivalent to <code>nohead</code> and <code>nofoot</code> , which means that <code>\headheight</code> , <code>\headsep</code> and <code>\footskip</code> are all set to <code>0pt</code> .
<code>footnotesep</code>	changes the dimension <code>\skip\footins</code> , separation between the bottom of text body and the top of footnote text.
<code>marginparwidth</code>	<code> marginpar</code> modifies <code>\marginparwidth</code> , width of the marginal notes. <code>marginparwidth=<length></code> .
<code>marginparsep</code>	modifies <code>\marginparsep</code> , separation between body and marginal notes. <code>marginparsep=<length></code> .
<code>nomarginpar</code>	shrinks spaces for marginal notes to <code>0pt</code> , which is equivalent to <code>\marginparwidth=0pt</code> and <code>\marginparsep=0pt</code> .
<code>columnsep</code>	modifies <code>\columnsep</code> , the separation between two columns in <code>twocolumn</code> mode.
<code>hoffset</code>	modifies <code>\hoffset</code> . <code>hoffset=<length></code> .
<code>voffset</code>	modifies <code>\voffset</code> . <code>voffset=<length></code> .
<code>offset</code>	horizontal and vertical offset. <code>offset={<hoffset>,<voffset>}</code> or <code>offset=<length></code> .
<code>twocolumn</code>	sets <code>twocolumn</code> mode with <code>\@twocolumntrue</code> . <code>twocolumn=false</code> denotes <code>onecolumn</code> mode with <code>\@twocolumnfalse</code> . Instead of <code>twocolumn=false</code> , you can specify <code>onecolumn</code> (which defaults to <code>true</code>)
<code>onecolumn</code>	works as <code>twocolumn=false</code> . On the other hand, <code>onecolumn=false</code> is equivalent to <code>twocolumn</code> .
<code>twoside</code>	sets both <code>\@twosidetrue</code> and <code>\@mparswitchtrue</code> . See Section 5.4.
<code>textwidth</code>	sets <code>\textwidth</code> directly. See Section 5.3.
<code>textheight</code>	sets <code>\textheight</code> directly. See Section 5.3.
<code>reversemp</code>	<code> reversemarginpar</code> makes the marginal notes appear in the left (inner) margin with <code>\@reversemargintrue</code> . The option doesn't change <code>includemp</code> mode. It's set <code>false</code> by default.

5.6 Drivers

The package supports drivers `dvips`, `dvipdfm`, `pdftex`, `xetex` and `vtex`. You can also set `dvipdfm` for `dvipdfmx` and `xdvipdfmx`. `pdftex` for `pdflatex`, and `vtex` for \TeX environment. The driver options are exclusive. The driver can be set by either `driver=<driver name>` or any of the drivers directly like `pdftex`. By default, `geometry` guesses the driver appropriate to the system in use. Therefore, you don't have to set a driver in most cases. However, if you want to use `dvipdfm`, you should specify it explicitly.

[†] <code>driver</code>	specifies the driver with <code>driver=<driver name></code> . <code>dvips</code> , <code>dvipdfm</code> , <code>pdftex</code> , <code>vtex</code> , <code>xetex</code> , <code>auto</code> and <code>none</code> are available as a driver name. The names except for <code>auto</code> and <code>none</code> can be specified directly with the name without <code>driver=</code> . <code>driver=auto</code> makes the auto-detection work whatever the previous setting is. <code>driver=none</code> disables the auto-detection and sets no driver, which may be useful when you want to let other package work out the driver setting. For example, if you want to use <code>crop</code> package with <code>geometry</code> , you should call <code>\usepackage[driver=none]{geometry}</code> before the <code>crop</code> package.
[†] <code>dvips</code>	writes the paper size in dvi output with the <code>\special</code> macro. If you use <code>dvips</code> as a DVI-to-PS driver, for example, to print a document with <code>\geometry{a3paper,landscape}</code> on A3 paper in landscape orientation, you don't need options “ <code>-t a3 -t landscape</code> ” to <code>dvips</code> .
[†] <code>dvipdfm</code>	works like <code>dvips</code> except for landscape correction. You can set this option when using <code>dvipdfmx</code> and <code>xdvipdfmx</code> to process the dvi output.
[†] <code>pdftex</code>	sets <code>\pdfpagewidth</code> and <code>\pdfpageheight</code> internally.
[†] <code>xetex</code>	is the same as <code>pdftex</code> except for ignoring <code>\pdf{h,v}origin</code> undefined in \XeLaTeX . This option is introduced in the version 5. Note that ‘ <code>geometry.cfg</code> ’ in \TeX Live, which disables the auto-detection routine and sets <code>pdftex</code> , is no longer necessary, but has no problem even though it's left undeleted. Instead of <code>xetex</code> , you can specify <code>dvipdfm</code> with \XeLaTeX if you want to use specials of <code>dvipdfm</code> . \XeLaTeX supports.
[†] <code>vtex</code>	sets dimensions <code>\mediawidth</code> and <code>\mediaheight</code> for \TeX . When this driver is selected (explicitly or automatically), <code>geometry</code> will auto-detect which output mode (DVI, PDF or PS) is selected in \TeX , and do proper settings for it.

If explicit driver setting is mismatched with the typesetting program in use, the default driver `dvips` would be selected.

5.7 Other options

The other useful options are described here.

[†] <code>verbose</code>	displays the parameter results on the terminal. <code>verbose=false</code> (default) still puts them into the log file.
[†] <code>reset</code>	sets back the layout dimensions and switches to the settings before <code>geometry</code> is loaded. Options given in <code>geometry.cfg</code> are also cleared. Note that this cannot reset <code>pass</code> and <code>mag</code> with <code>truedimen</code> . <code>reset=false</code> has no effect and cannot cancel the previous <code>reset(=true)</code> if any. For example, when you go <pre> \documentclass[landscape]{article} \usepackage[twoside,reset,left=2cm]{geometry} </pre> with <code>\ExecuteOptions{scale=0.9}</code> in <code>geometry.cfg</code> , then as a result, <code>landscape</code> and <code>left=2cm</code> remain effective, and <code>scale=0.9</code> and <code>twoside</code> are ineffective.
[†] <code>mag</code>	sets magnification value (<code>\mag</code>) and automatically modifies <code>\hoffset</code> and <code>\voffset</code> according to the magnification. <code>mag=<value></code> . Note that <code><value></code> should be an integer value with 1000 as a normal size. For example, <code>mag=1414</code> with <code>a4paper</code> provides an enlarged print fitting in <code>a3paper</code> , which is 1.414 ($=\sqrt{2}$) times larger than <code>a4paper</code> . Font enlargement needs extra disk space. Note that setting <code>mag</code> should precede any other settings with ‘true’ dimensions, such as <code>1.5truein</code>, <code>2truecm</code> and so on. See also <code>truedimen</code> option.

[†] <code>true</code> dimen	changes all internal explicit dimension values into <i>true</i> dimensions, e.g., <code>1in</code> is changed to <code>1truein</code> . Typically this option will be used together with <code>mag</code> option. Note that this is ineffective against externally specified dimensions. For example, when you set “ <code>mag=1440, margin=10pt, true</code> dimen”, margins are not ‘true’ but magnified. If you want to set exact margins, you should set like “ <code>mag=1440, margin=10truept, true</code> dimen” instead.
[†] <code>pass</code>	disables all of the geometry options and calculations except <code>verbose</code> and <code>showframe</code> . It is order-independent and can be used for checking out the page layout of the documentclass, other packages and manual settings without <code>geometry</code> .
[†] <code>showframe</code>	shows visible frames for the text area and page, and the lines for the head and foot on the first page.
[†] <code>showcrop</code>	prints cross-shape cropmarks at each corner.

6 Processing options

6.1 Order of loading

If there’s `geometry.cfg` somewhere T_EX can find it, `geometry` loads it first. For example, in `geometry.cfg` you may write `\ExecuteOptions{a4paper}`, which specifies A4 paper as the default paper. Basically you can use all the options defined in `geometry` with `\ExecuteOptions{}`.

The order of loading in the preamble of your document is as follows:

1. `geometry.cfg` if it exists.
2. Options specified with `\documentclass[⟨options⟩]{...}`.
3. Options specified with `\usepackage[⟨options⟩]{geometry}`
4. Options specified with `\geometry{⟨options⟩}`, which can be called multiple times. (`reset` option will cancel the specified options ever given in `\usepackage{geometry}` or `\geometry`.)

6.2 Order of options

The specification of `geometry` options is order-independent, and overwrites the previous one for the same setting. For example,

`[left=2cm, right=3cm]` is equivalent to `[right=3cm, left=2cm]`.

The options called multiple times overwrite the previous settings. For example,

`[verbose=true, verbose=false]` results in `verbose=false`.

`[hmargin={3cm,2cm}, left=1cm]` is the same as `hmargin={1cm,2cm}`, where the left (or inner) margin is overwritten by `left=1cm`.

`reset` and `mag` are exceptions. The `reset` option removes all the `geometry` options (except `pass`) before it. If you set

```
\documentclass[landscape]{article}
\usepackage[margin=1cm,twoside]{geometry}
\geometry{a5paper, reset, left=2cm}
```

then `margin=1cm`, `twoside` and `a5paper` are removed, and is eventually equivalent to

```
\documentclass[landscape]{article}
\usepackage[left=2cm]{geometry}
```

The `mag` option should be set in advance of any other settings with ‘true’ length, such as `left=1.5truecm`, `width=5truein` and so on. The `\mag` primitive can be set before this package is called.

6.3 Priority

There are several ways to set dimensions of the *body*: `scale`, `total`, `text` and `lines`. The `geometry` package gives higher priority to the more concrete specification. Here is the priority rule for *body*.

$$\begin{array}{c} \text{priority:} \quad \text{low} \quad \longrightarrow \quad \text{high} \\ \left\{ \begin{array}{c} \text{hscale} \\ \text{vscale} \\ \text{scale} \end{array} \right\} < \left\{ \begin{array}{c} \text{width} \\ \text{height} \\ \text{total} \end{array} \right\} < \left\{ \begin{array}{c} \text{textwidth} \\ \text{textheight} \\ \text{text} \end{array} \right\} < \text{lines.} \end{array}$$

For example,

```
\usepackage[hscale=0.8, textwidth=7in, width=18cm]{geometry}
```

is the same as `\usepackage[textwidth=7in]{geometry}`. Another example:

```
\usepackage[lines=30, scale=0.8, text=7in]{geometry}
```

results in `[lines=30, textwidth=7in]`.

6.4 Defaults

This section sums up the default settings for the auto-completion described later.

The default vertical margin ratio is 2/3, namely,

$$\text{top} : \text{bottom} = 2 : 3 \quad \text{default.} \quad (6)$$

As for the horizontal margin ratio, the default value depends on whether the document is onesided or twosided,

$$\text{left (inner)} : \text{right (outer)} = \begin{cases} 1 : 1 & \text{default for oneside,} \\ 2 : 3 & \text{default for twoside.} \end{cases} \quad (7)$$

Obviously the default horizontal margin ratio for oneside is ‘centering’.

The `geometry` package has the following default setting for *onesided* documents:

- `scale=0.7` (*body* is $0.7 \times \textit{paper}$)
- `marginratio={1:1, 2:3}` (1:1 for horizontal and 2:3 for vertical margins)
- `ignoreall` (the header, footer, marginal notes are excluded when calculating the size of *body*.)

For *twosided* document with `twoside` option, the default setting is the same as *onesided* except that the horizontal margin ratio is set 2:3 as well.

Additional options overwrite the previous specified dimensions.

6.5 Auto-completion

Figure 7 shows schematically how many specification patterns exist and how to solve the ambiguity of the specifications. Each axis shows the numbers of lengths explicitly specified for body and margins. $S(m,b)$ presents the specification with a set of numbers (*margin, body*) = (m,b) .

For example, the specification `width=14cm, left=3cm` is categorized into $S(1,1)$, which is an adequate specification. If you add `right=4cm`, it would be in $S(2,1)$ and overspecified. If only `width=14cm`, it’s in $S(0,1)$, underspecified.

The `geometry` package has the auto-completion mechanism, in which if the layout parameters are underspecified or overspecified, `geometry` works out the ambiguity using the defaults and other relations. Here are the specifications and the completion rules.

S(0,0) Nothing is specified. The `geometry` package sets *body* with the default `scale` (= 0.7).
For example, `width` is set to be $0.7 \times \textit{paperwidth}$. Thus $S(0,0)$ goes to $S(0,1)$. See $S(0,1)$.

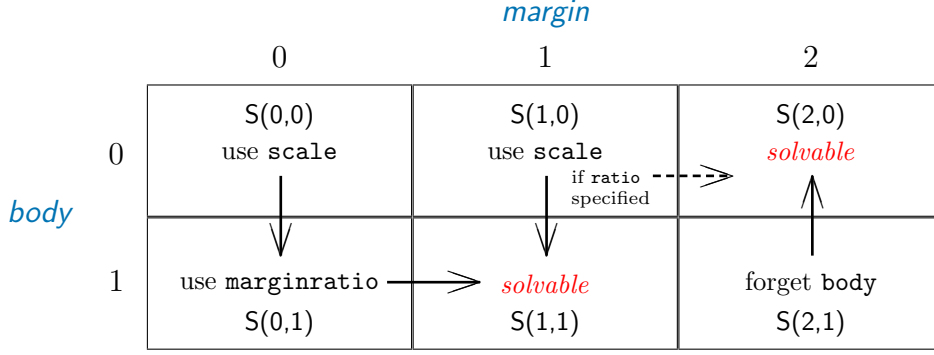


Figure 7: Specifications S(0,0) to S(2,1) and the completion rules (arrows). The horizontal and vertical denote the number of explicitly specified lengths for margin and body respectively. S(*m*,*b*) denote a specification with a set of the numbers (*margin*, *body*) = (*m*, *b*).

S(0,1) Only *body* is specified, such as `width=7in`, `lines=20`, `body={20cm,24cm}`, `scale=0.9` and so forth. Then `geometry` sets margins with the margin ratio. If the margin ratio is not specified, the default is used. The default vertical margin ratio is defined as

$$\text{top} : \text{bottom} = 2 : 3 \quad \text{default.} \quad (8)$$

As for the horizontal margin ratio, the default value depends on whether the document is onesided or twosided,

$$\text{left (inner)} : \text{right (outer)} = \begin{cases} 1 : 1 & \text{default for oneside,} \\ 2 : 3 & \text{default for twoside.} \end{cases} \quad (9)$$

For example, if `height=22cm` is specified on A4 paper, `geometry` calculates `top` margin as follows:

$$\begin{aligned} \text{top} &= (\text{paperheight} - \text{height}) \times 2/5 \\ &= (29.7 - 22) \times 2/5 = 3.08(\text{cm}) \end{aligned} \quad (10)$$

Thus `top` margin and `body height` have been determined, the specification for the vertical goes to S(1,1) and all the parameters can be solved.

S(1,0) Only one margin is specified, such as `bottom=2cm`, `left=1in`, `top=3cm`, and so forth.

- If the margin ratio is *not* specified, `geometry` sets *body* with the default `scale` (= 0.7). For example, if `top=2.4cm` is specified, `geometry` sets

$$\text{height} = 0.7 \backslash \text{paperheight},$$
then S(1,0) goes to S(1,1), in which `bottom` is calculated with `paperheight - (height + top)` and results in 6.51cm on A4 paper.
- If the margin ratio is specified, such as `hmarginratio={1:2}`, `vratio={3:4}` and so forth, `geometry` sets the other margin with the specified margin ratio. For example, if a set of options “`top=2.4cm, vratio={3:4}`” is specified, `geometry` sets `bottom` to be 3.2cm calculating

$$\text{bottom} = \text{top}/3 \times 4 = 3.2\text{cm}$$

Thus S(1,0) goes to S(2,0).

Notes that the version 4 or earlier used to set the other margin with the margin ratio. In the version 5, therefore, with the same specification, the result will be different from the one in the version 4. For example, if only `top=2.4cm` is specified, you got `bottom=2.4cm` in the version 4 or earlier, but you will get `bottom=6.51cm` in the version 5.

S(2,1) The *body* and two *margins* are all specified, such as `vdivide={1in,8in,1.5in}`, “`left=3cm,width=13cm,right=4cm`” and so forth. Since `geometry` basically gives priority to *margins* if dimensions are overspecified, `geometry` forgets and resets *body*. For example, if you specify

```
\usepackage[a4paper,left=3cm,width=13cm,right=4cm]{geometry},
```

`width` is reset to be 14cm because the width of a A4 paper is 21cm long.

7 Changing layout mid-document

The version 5 provides the new commands `\newgeometry{...}` and `\restoregeometry`, which allow you to change page dimensions in the middle of the document. Unlike `\geometry` in the preamble, `\newgeometry` is available only after `\begin{document}`, resets all the options ever specified except for the papersize-related options: `landscape`, `portrait`, and paper size options (such as `papersize`, `paper=a4paper` and so forth), which can’t be changed with `\newgeometry`.

The command `\restoregeometry` restores the page layout specified in the preamble (before `\begin{document}`) with the options to `\usepackage{geometry}` and `\geometry`.

Note that both `\newgeometry` and `\restoregeometry` insert `\clearpage` where they are called.

Below is an example of changing layout mid-document. The layout L1 specified with `hmargin=3cm` (`left` and `right` margins are 3cm long) is changed to L2 with `left=3cm`, `right=1cm` and `bottom=0.1cm`. The layout L1 is restored with `\restoregeometry`.

```
\usepackage[hmargin=3cm]{geometry}
\begin{document}
  Layout L1

  \newgeometry{left=3cm,right=1cm,bottom=0.1cm}

  Layout L2 (new)

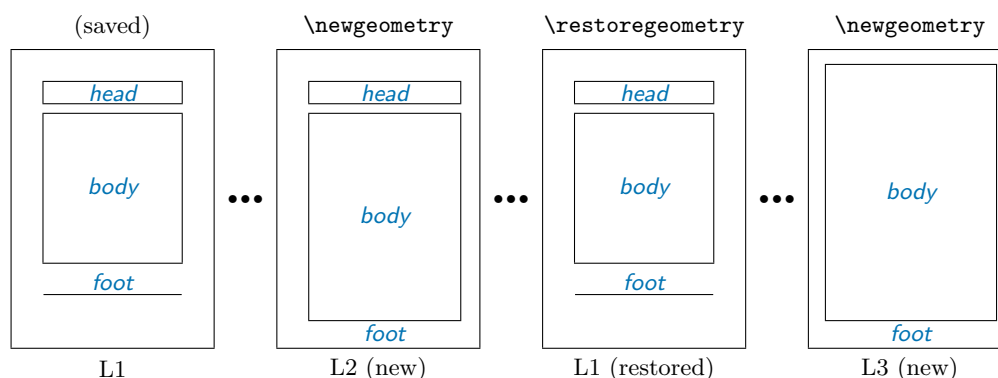
  \restoregeometry

  Layout L1 (restored)

  \newgeometry{margin=1cm,includefoot}

  Layout L3 (new)

\end{document}
```



A set of commands `\savegeometry{<name>}` and `\loadgeometry{<name>}` is handy if you want to reuse more different layouts in your document. For example,

```
\usepackage[hmargin=3cm]{geometry}
\begin{document}
  L1
  \newgeometry{left=3cm,right=1cm,bottom=0.1cm}
  \savegeometry{L2}
  L2 (new, saved)
```



```

\restoregeometry
  L1 (restored)
\newgeometry{margin=1cm,includefoot}
  L3 (new)
\loadgeometry{L2}
  L2 (loaded)
\end{document}

```

8 Examples

- A onesided page layout with the text area centered in the paper. The examples below have the same result because the horizontal margin ratio is set 1:1 for oneside by default.

```

- centering
- marginratio=1:1
- vcentering

```

- A twosided page layout with the inside offset for binding 1cm.

```

- twoside, bindingoffset=1cm

```

In this case, `textwidth` is shorter than that of the default twosided document by $0.7 \times 1\text{cm}$ ($= 0.7\text{cm}$) because the default width of `body` is set with `scale=0.7` (which means `width = 0.7\paperwidth`).

- A layout with the left, right, and top margin 3cm, 2cm and 2.5in respectively, with `textheight` of 40 lines, and with the head and foot of the page included in `total body`. The two examples below have the same result.

```

- left=3cm, right=2cm, lines=40, top=2.5in, includeheadfoot
- hmargin={3cm,2cm}, tmargin=2.5in, lines=40, includeheadfoot

```

- A layout with the height of `total body` 10in, the bottom margin 2cm, and the default width. The top margin will be calculated automatically. Each solution below results in the same page layout.

```

- vdivide={*, 10in, 2cm}
- bmargin=2cm, height=10in
- bottom=2cm, textheight=10in

```

Note that dimensions for `head` and `foot` are excluded from `height` of `total body`. An additional `includefoot` makes `\footskip` included in `totalheight`. Therefore, in the two cases below, `textheight` in the former layout is shorter than the latter (with 10in exactly) by `\footskip`. In other words, `height = textheight + footskip` when `includefoot=true` in this case.

```

- bmargin=2cm, height=10in, includefoot
- bottom=2cm, textheight=10in, includefoot

```

- A layout with `textwidth` and `textheight` 90% of the paper and with `body` centered. Each solution below results in the same page layout.

```

- scale=0.9, centering
- text={.9\paperwidth,.9\paperheight}, ratio=1:1
- width=.9\paperwidth, vmargin=.05\paperheight, marginratio=1:1
- hdivide={*,0.9\paperwidth,*}, vdivide={*,0.9\paperheight,*} (as for onesided documents)
- margin={0.05\paperwidth,0.05\paperheight}

```

You can add `heightrounded` to avoid an “underfull vbox warning” like

```
Underfull \vbox (badness 10000) has occurred while \output is active.
```

See Section 5.3 for the detail description about `heightrounded`.

- A layout with the width of marginal notes 3cm and included in the width of *total body*. The following examples are the same.

```
– marginparwidth=3cm, includemp
– marginpar=3cm, ignoremp=false
```

- A layout the full scale *body* of the paper with A5 paper in landscape. The following examples are the same.

```
– a5paper, landscape, scale=1.0
– landscape=TRUE, paper=a5paper, margin=0pt
```

- A screen size layout appropriate to presentation with PC and video projector.

```
\documentclass{slide}
\usepackage[screen,margin=0.8in]{geometry}
...
\begin{slide}
...
\end{slide}
```

- A layout with fonts and spaces both enlarged from A4 to A3. In the case below, the resulted paper size is A3.

```
– a4paper, mag=1414.
```

If you want to have a layout with two times bigger fonts, but without changing paper size, you can go

```
– letterpaper, mag=2000, truedimen.
```

You can add dvips option, that is useful to preview it with proper paper size by dviout or xdvi.

- A complex page layout.

```
\usepackage[a5paper, landscape, twocolumn, twoside,
left=2cm, hmarginratio=2:1, includemp, marginparwidth=43pt,
bottom=1cm, foot=.7cm, includefoot, textheight=11cm, heightrounded,
columnsep=1cm, dvips, verbose]{geometry}
```

Try typesetting it and checking out the result yourself. :-)

9 Known problems

- With `pdftex=true`, `mag` \neq 1000 and `truedimen`, `paperwidth` and `paperheight` shown in verbose mode are different from the real size of the resulted PDF. The PDF itself is correct anyway.
- With `pdftex=true`, `mag` \neq 1000, *no* `truedimen`, and `hyperref`, `hyperref` should be loaded by `\usepackage` before `geometry`. Otherwise the resulted PDF size will become wrong.
- With `crop` package and `mag` \neq 1000, `center` option of `crop` doesn't work well.

10 Acknowledgments

The author appreciates helpful suggestions and comments from many people including (in alphabetical order of family name): Jean-Bernard Addor, Frank Bennett, Alexis Dimitriadis, Friedrich Flender, Adrian Heathcote, Stephan Hennig, Morten Høgholm, Jonathan Kew, James Kilfiger, Jean-Marc Lasgouttes, Włodzimierz Macewicz, Frank Mittelbach, Eckhard Neber, Rolf Niepraschk, Hans Fr. Nordhaug, Heiko Oberdiek, Keith Reckdahl, Peter Riocreux, Will Robertson, Pablo Rodriguez, Nico Schlöemer, Perry C. Stearns, Frank Stengel, Plamen Tanovski, Petr Uher, Piet van Oostrum, Vladimir Volovich, Michael Vulis.

11 Implementation

1 (*package)

This package requires three other packages: keyval in L^AT_EX graphics bundle, ifpdf and ifvtex in ‘oberdiek’ bundle.

```
2 \RequirePackage{keyval}%
3 \RequirePackage{ifpdf}%
4 \RequirePackage{ifvtex}%
```

Internal switches are declared here.

```
5 \newif\ifGm@verbose
6 \newif\ifGm@landscape
7 \newif\ifGm@swap@papersize\Gm@swap@papersizefalse
8 \newif\ifGm@includehead
9 \newif\ifGm@includefoot
10 \newif\ifGm@includemp
11 \newif\ifGm@hbody
12 \newif\ifGm@vbody
13 \newif\ifGm@heightrounded
14 \newif\ifGm@showframe
15 \newif\ifGm@showcrop
16 \newif\ifGm@pass\Gm@passfalse
17 \newif\ifGm@resetpaper
18 \newif\ifGm@layout
19 \newif\ifGm@newgm
```

\Gm@cnth The counters for horizontal and vertical partitioning patterns.

```
\Gm@cntv 20 \newcount\Gm@cnth
21 \newcount\Gm@cntv
```

\c@Gm@tempcnt The counter is used to set number with calc.

```
22 \newcount\c@Gm@tempcnt
```

\Gm@bindingoffset The binding offset for the inner margin.

```
23 \newdimen\Gm@bindingoffset
```

\Gm@wd@mp Correction lengths for \textwidth, \oddsidemargin and \evensidemargin in includemp mode.

```
\Gm@odd@mp 24 \newdimen\Gm@wd@mp
\Gm@even@mp 25 \newdimen\Gm@odd@mp
26 \newdimen\Gm@even@mp
```

\Gm@layoutwidth The dimensions for the layout area.

```
\Gm@layoutheight 27 \newdimen\Gm@layoutwidth
\Gm@layouthoffset 28 \newdimen\Gm@layoutheight
\Gm@layoutvoffset 29 \newdimen\Gm@layouthoffset
30 \newdimen\Gm@layoutvoffset
```

\Gm@dimlist The token in which L^AT_EX native dimensions can be stored.

```
31 \newtoks\Gm@dimlist
```

\Gm@warning The macro to print warning messages.

```
32 \def\Gm@warning#1{\PackageWarningNoLine{geometry}{#1}}%
```

\ifGm@preamble The macro executes the option given as an argument only if it’s specified in the preamble, as the options of \usepackage and/or the argument of \geometry. Otherwise, the macro would print the warning message and ignores the option setting.

```
33 \def\ifGm@preamble#1{%
34   \ifGm@newgm
35     \Gm@warning{‘#1’: not available in ‘\string\newgeometry’; skipped}%
36   \else
37     \expandafter\@firstofone
38   \fi}%
```

`\Gm@Dhratio` The default values for the horizontal and vertical *marginalratio* are defined. `\Gm@Dhratio` denotes the default value of horizontal *marginratio* for twoside page layout with left and right margins swapped

`\Gm@Dhratio` on verso pages, which is set by `twoside`.

```

39 \def\Gm@Dhratio{1:1}% = left:right default for oneside
40 \def\Gm@Dhratio{2:3}% = inner:outer default for twoside.
41 \def\Gm@Dvratio{2:3}% = top:bottom default

```

`\Gm@Dhscale` The default values for the horizontal and vertical *scale* are defined with 0.7.

`\Gm@Dvscale`

```

42 \def\Gm@Dhscale{0.7}%
43 \def\Gm@Dvscale{0.7}%

```

`\Gm@dvi` The driver names.

`\Gm@dvi`

```

44 \def\Gm@dvi{dvips}%
45 \def\Gm@dvi{dvipdfm}%
46 \def\Gm@dvi{pdftex}%
47 \def\Gm@dvi{xetex}%
48 \def\Gm@dvi{vtex}%

```

`\Gm@true` The macros for true and false.

`\Gm@false`

```

49 \def\Gm@true{true}%
50 \def\Gm@false{false}%

```

`\Gm@orgpw` These macros keep original paper (media) size intact.

`\Gm@orgph`

```

51 \edef\Gm@orgpw{\the\paperwidth}%
52 \edef\Gm@orgph{\the\paperheight}%

```

`\Gm@savelength` The macro saves the specified length to `\Gm@restore`.

```

53 \def\Gm@savelength#1{%
54   \g@addto@macro\Gm@restore{\expandafter\noexpand\expandafter\csname
55     #1\endcsname\expandafter=\expandafter\the\csname #1\endcsname\relax}}%

```

`\Gm@saveboolean` The macro saves the specified boolean to `\Gm@restore`.

```

56 \def\Gm@saveboolean#1{%
57   \csname if#1\endcsname
58     \g@addto@macro\Gm@restore{\expandafter\noexpand\csname #1true\endcsname}%
59   \else
60     \g@addto@macro\Gm@restore{\expandafter\noexpand\csname #1false\endcsname}%
61   \fi}%

```

`\Gm@restore` The initialization for `\Gm@restore`.

```

62 \def\Gm@restore{}%

```

`\Gm@save` The definition of the macro saving the real lengths L^AT_EX options.

```

63 \def\Gm@save{%
64   \Gm@savelength{paperwidth}%
65   \Gm@savelength{paperheight}%
66   \Gm@savelength{textwidth}%
67   \Gm@savelength{textheight}%
68   \Gm@savelength{evensidemargin}%
69   \Gm@savelength{oddsidemargin}%
70   \Gm@savelength{topmargin}%
71   \Gm@savelength{headheight}%
72   \Gm@savelength{headsep}%
73   \Gm@savelength{topskip}%
74   \Gm@savelength{footskip}%
75   \Gm@savelength{baselineskip}%
76   \Gm@savelength{marginparwidth}%
77   \Gm@savelength{marginparsep}%
78   \Gm@savelength{columnsep}%
79   \Gm@savelength{hoffset}%
80   \Gm@savelength{voffset}%
81   \Gm@savelength{Gm@layoutwidth}%
82   \Gm@savelength{Gm@layoutheight}%
83   \Gm@savelength{Gm@layouthoffset}%

```

```

84 \Gm@savelength{Gm@layoutvoffset}%
85 \Gm@saveboolean{@twocolumn}%
86 \Gm@saveboolean{@twoside}%
87 \Gm@saveboolean{@mparswitch}%
88 \Gm@saveboolean{@reversemargin}}}%

\Gm@initnewgm The macro initializes the parameters for layout in \newgeometry.
89 \def\Gm@initnewgm{%
90 \Gm@dimlist={}
91 \Gm@hbodyfalse
92 \Gm@vbodyfalse
93 \Gm@heightroundedfalse
94 \Gm@includeheadfalse
95 \Gm@includefootfalse
96 \Gm@includempfalse
97 \let\Gm@width\@undefined
98 \let\Gm@height\@undefined
99 \let\Gm@textwidth\@undefined
100 \let\Gm@textheight\@undefined
101 \let\Gm@lines\@undefined
102 \let\Gm@hscale\@undefined
103 \let\Gm@vscale\@undefined
104 \let\Gm@hmarginratio\@undefined
105 \let\Gm@vmarginratio\@undefined
106 \let\Gm@lmargin\@undefined
107 \let\Gm@rmargin\@undefined
108 \let\Gm@tmargin\@undefined
109 \let\Gm@bmargin\@undefined
110 \Gm@layoutfalse
111 \Gm@layouthoffset\z@
112 \Gm@layoutvoffset\z@
113 \Gm@bindingoffset\z@}%

\Gm@initall This initialization is called as soon as the package is load It's also called as soon as reset option is
specified.
114 \def\Gm@initall{%
115 \let\Gm@driver\@empty
116 \let\Gm@truedimen\@empty
117 \let\Gm@paper\@undefined
118 \Gm@resetpaperfalse
119 \Gm@landscapefalse
120 \Gm@verbosefalse
121 \Gm@showframefalse
122 \Gm@showcropfalse
123 \Gm@newgmfalse
124 \Gm@initnewgm}%

\Gm@setdriver The macro sets the specified driver.
125 \def\Gm@setdriver#1{%
126 \expandafter\let\expandafter\Gm@driver\csname Gm@#1\endcsname}%

\Gm@unsetdriver The macro unsets the specified driver if it has been set.
127 \def\Gm@unsetdriver#1{%
128 \expandafter\ifx\csname Gm@#1\endcsname\Gm@driver\let\Gm@driver\@empty\fi}%

\Gm@setbool The macros for boolean option processing.
\Gm@setboolrev 129 \def\Gm@setbool{\@dblarg\Gm@@setbool}%
130 \def\Gm@setboolrev{\@dblarg\Gm@@setboolrev}%
131 \def\Gm@@setbool[#1]#2#3{\Gm@doif{#1}{#3}{\csname Gm@#2\Gm@bool\endcsname}}%
132 \def\Gm@@setboolrev[#1]#2#3{\Gm@doifelse{#1}{#3}%
133 {\csname Gm@#2\Gm@false\endcsname}{\csname Gm@#2\Gm@true\endcsname}}%

\Gm@doif \Gm@doif excutes the third argument #3 using a boolean value #2 of a option #1. \Gm@doifelse
\Gm@doifelse executes the third argument #3 if a boolean option #1 with its value #2 true, and executes the fourth
argument #4 if false.

```

```

134 \def\Gm@doif#1#2#3{%
135   \lowercase{\def\Gm@bool{#2}}}%
136   \ifx\Gm@bool\@empty
137     \let\Gm@bool\Gm@true
138   \fi
139   \ifx\Gm@bool\Gm@true
140   \else
141     \ifx\Gm@bool\Gm@false
142     \else
143       \let\Gm@bool\relax
144     \fi
145   \fi
146   \ifx\Gm@bool\relax
147     \Gm@warning{‘#1’ should be set to ‘true’ or ‘false’}%
148   \else
149     #3
150   \fi}%
151 \def\Gm@doifelse#1#2#3#4{%
152   \Gm@doif{#1}{#2}{\ifx\Gm@bool\Gm@true #3\else #4\fi}}%

```

\Gm@reverse The macro reverses a bool value.

```

153 \def\Gm@reverse#1{%
154   \csname ifGm@#1\endcsname
155   \csname Gm@#1false\endcsname\else\csname Gm@#1true\endcsname\fi}%

```

\Gm@defbylen Macros **\Gm@defbylen** and **\Gm@defbycnt** can be used to define **\Gm@xxxx** variables by length and counter respectively with calc package.

```

156 \def\Gm@defbylen#1#2{%
157   \begingroup\setlength\@tempdima{#2}%
158   \expandafter\xdef\csname Gm@#1\endcsname{\the\@tempdima}\endgroup}%
159 \def\Gm@defbycnt#1#2{%
160   \begingroup\setcounter{Gm@tempcnt}{#2}%
161   \expandafter\xdef\csname Gm@#1\endcsname{\the\value{Gm@tempcnt}}\endgroup}%

```

\Gm@set@ratio The macro parses the value of options specifying marginal ratios, which is used in **\Gm@setbyratio** macro.

```

162 \def\Gm@sep@ratio#1:#2{\@tempcnta=#1\@tempcntb=#2}%

```

\Gm@setbyratio The macro determines the dimension specified by **#4** calculating $\text{#3} \times a/b$, where a and b are given by **\Gm@mratio** with $a : b$ value. If **#1** in brackets is **b**, a and b are swapped. The second argument with **h** or **v** denoting horizontal or vertical is not used in this macro.

```

163 \def\Gm@setbyratio[#1]#2#3#4{% determine #4 by ratio
164   \expandafter\Gm@sep@ratio\Gm@mratio\relax
165   \if#1b
166     \edef\@tempa{\the\@tempcnta}%
167     \@tempcnta=\@tempcntb
168     \@tempcntb=\@tempa\relax
169   \fi
170   \expandafter\setlength\expandafter\@tempdimb\expandafter
171     {\csname Gm@#3\endcsname}%
172   \ifnum\@tempcntb>\z@
173     \multiply\@tempdimb\@tempcnta
174     \divide\@tempdimb\@tempcntb
175   \fi
176   \expandafter\edef\csname Gm@#4\endcsname{\the\@tempdimb}}%

```

\Gm@detiv This macro determines the fourth length(**#4**) from **#1**(layoutwidth or layoutheight), **#2** and **#3**. It is used in **\Gm@detall** macro.

```

177 \def\Gm@detiv#1#2#3#4{% determine #4.
178   \expandafter\setlength\expandafter\@tempdima\expandafter
179     {\csname Gm@layout#1\endcsname}%
180   \expandafter\setlength\expandafter\@tempdimb\expandafter
181     {\csname Gm@#2\endcsname}%
182   \addtolength\@tempdima{-\@tempdimb}%

```

```

183 \expandafter\setlength\expandafter\@tempdimb\expandafter
184   {\csname Gm@#3\endcsname}%
185 \addtolength\@tempdima{-\@tempdimb}%
186 \ifdim\@tempdima<z@
187   \Gm@warning{'#4' results in NEGATIVE (\the\@tempdima).%
188   ^^J\@spaces '#2' or '#3' should be shortened in length}%
189 \fi
190 \expandafter\edef\csname Gm@#4\endcsname{\the\@tempdima}}%

```

\Gm@detiandiii This macro determines #2 and #3 from #1 with the first argument (#1) can be width or height, which is expanded into dimensions of paper and total body. It is used in \Gm@detall macro.

```

191 \def\Gm@detiandiii#1#2#3{% determine #2 and #3.
192   \expandafter\setlength\expandafter\@tempdima\expandafter
193     {\csname Gm@layout#1\endcsname}%
194   \expandafter\setlength\expandafter\@tempdimb\expandafter
195     {\csname Gm@#1\endcsname}%
196   \addtolength\@tempdima{-\@tempdimb}%
197   \ifdim\@tempdima<z@
198     \Gm@warning{'#2' and '#3' result in NEGATIVE (\the\@tempdima).%
199     ^^J\@spaces '#1' should be shortened in length}%
200   \fi
201   \ifx\Gm@mratio\undefined
202     \expandafter\Gm@sep@ratio\Gm@Dmratio\relax
203   \else
204     \expandafter\Gm@sep@ratio\Gm@mratio\relax
205     \ifnum\@tempcntb>z@\else
206       \Gm@warning{margin ratio a:b should be non-zero; default used}%
207       \expandafter\Gm@sep@ratio\Gm@Dmratio\relax
208     \fi
209   \fi
210   \@tempdimb=\@tempdima
211   \advance\@tempcntb\@tempcnta
212   \divide\@tempdima\@tempcntb
213   \multiply\@tempdima\@tempcnta
214   \advance\@tempdimb-\@tempdima
215   \expandafter\edef\csname Gm@#2\endcsname{\the\@tempdima}%
216   \expandafter\edef\csname Gm@#3\endcsname{\the\@tempdimb}}%

```

\Gm@detall This macro determines partition of each direction. The first argument (#1) should be h or v, the second (#2) width or height, the third (#3) lmargin or top, and the last (#4) rmargin or bottom.

```

217 \def\Gm@detall#1#2#3#4{%
218   \@tempcnta\z@
219   \if#1h
220     \let\Gm@mratio\Gm@hmarginratio
221     \edef\Gm@Dmratio{\if@twoside\Gm@Dhratio\else\Gm@Dratio\fi}%
222   \else
223     \let\Gm@mratio\Gm@vmarginratio
224     \edef\Gm@Dmratio{\Gm@Dvratio}%
225   \fi

```

\@tempcnta is treated as a three-digit binary value with top, middle and bottom denoted left(top), width(height) and right(bottom) margins user specified respectively.

```

226   \if#1h
227     \ifx\Gm@lmargin\undefined\else\advance\@tempcnta4\relax\fi
228     \ifGm@hbody\advance\@tempcnta2\relax\fi
229     \ifx\Gm@rmargin\undefined\else\advance\@tempcnta1\relax\fi
230     \Gm@cnth\@tempcnta
231   \else
232     \ifx\Gm@tmargin\undefined\else\advance\@tempcnta4\relax\fi
233     \ifGm@vbody\advance\@tempcnta2\relax\fi
234     \ifx\Gm@bmargin\undefined\else\advance\@tempcnta1\relax\fi
235     \Gm@cntv\@tempcnta
236   \fi

```

Case the value is 000 (=0) with nothing fixed (default):

```

237   \ifcase\@tempcnta

```



```

238 \if#1h
239 \Gm@defbylen{width}{\Gm@Dhscale\Gm@layoutwidth}%
240 \else
241 \Gm@defbylen{height}{\Gm@Dvscale\Gm@layoutheight}%
242 \fi
243 \Gm@detiandiii{#2}{#3}{#4}%

```

Case 001 (=1) with right(bottom) fixed:

```

244 \or
245 \ifx\Gm@ratio\@undefined
246 \if#1h
247 \Gm@defbylen{width}{\Gm@Dhscale\Gm@layoutwidth}%
248 \else
249 \Gm@defbylen{height}{\Gm@Dvscale\Gm@layoutheight}%
250 \fi
251 \setlength\@tempdimc{\@nameuse{Gm@#4}}%
252 \Gm@detiandiii{#2}{#3}{#4}%
253 \expandafter\let\csname Gm@#2\endcsname\@undefined
254 \Gm@defbylen{#4}{\@tempdimc}%
255 \else
256 \Gm@setbyratio[f]{#1}{#4}{#3}%
257 \fi
258 \Gm@detiv{#2}{#3}{#4}{#2}%

```

Case 010 (=2) with width(height) fixed:

```

259 \or\Gm@detiandiii{#2}{#3}{#4}%

```

Case 011 (=3) with both width(height) and right(bottom) fixed:

```

260 \or\Gm@detiv{#2}{#2}{#4}{#3}%

```

Case 100 (=4) with left(top) fixed:

```

261 \or
262 \ifx\Gm@ratio\@undefined
263 \if#1h
264 \Gm@defbylen{width}{\Gm@Dhscale\Gm@layoutwidth}%
265 \else
266 \Gm@defbylen{height}{\Gm@Dvscale\Gm@layoutheight}%
267 \fi
268 \setlength\@tempdimc{\@nameuse{Gm@#3}}%
269 \Gm@detiandiii{#2}{#4}{#3}%
270 \expandafter\let\csname Gm@#2\endcsname\@undefined
271 \Gm@defbylen{#3}{\@tempdimc}%
272 \else
273 \Gm@setbyratio[b]{#1}{#3}{#4}%
274 \fi
275 \Gm@detiv{#2}{#3}{#4}{#2}%

```

Case 101 (=5) with both left(top) and right(bottom) fixed:

```

276 \or\Gm@detiv{#2}{#3}{#4}{#2}%

```

Case 110 (=6) with both left(top) and width(height) fixed:

```

277 \or\Gm@detiv{#2}{#2}{#3}{#4}%

```

Case 111 (=7) with all fixed though it is over-specified:

```

278 \or\Gm@warning{Over-specification in '#1'-direction.%
279 \hspace{#2}(\@nameuse{Gm@#2}) is ignored}%
280 \Gm@detiv{#2}{#3}{#4}{#2}%
281 \else\fi}%

```

`\Gm@clean` The macro for setting unspecified dimensions to be `\@undefined`. This is used by `\geometry` macro.

```

282 \def\Gm@clean{%
283 \ifnum\Gm@cnth<4\let\Gm@lmargin\@undefined\fi
284 \ifodd\Gm@cnth\else\let\Gm@rmargin\@undefined\fi
285 \ifnum\Gm@cntv<4\let\Gm@tmargin\@undefined\fi
286 \ifodd\Gm@cntv\else\let\Gm@bmargin\@undefined\fi
287 \ifGm@hbody\else
288 \let\Gm@hscale\@undefined
289 \let\Gm@width\@undefined

```

```

290 \let\Gm@textwidth\@undefined
291 \fi
292 \ifGm@vbody\else
293 \let\Gm@vscale\@undefined
294 \let\Gm@height\@undefined
295 \let\Gm@textheight\@undefined
296 \fi
297 }%

```

`\Gm@parse@divide` The macro parses (h,v)divide options.

```

298 \def\Gm@parse@divide#1#2#3#4{%
299 \def\Gm@star{*}%
300 \@tempcnta\z@
301 \@for\Gm@tmp:=#1\do{%
302 \expandafter\KV@sp@def\expandafter\Gm@frag\expandafter{\Gm@tmp}%
303 \edef\Gm@value{\Gm@frag}%
304 \ifcase\@tempcnta\relax\edef\Gm@key{#2}%
305 \or\edef\Gm@key{#3}%
306 \else\edef\Gm@key{#4}%
307 \fi
308 \@nameuse{\Gm@set\Gm@key false}%
309 \ifx\empty\Gm@value\else
310 \ifx\Gm@star\Gm@value\else
311 \setkeys{Gm}{\Gm@key=\Gm@value}%
312 \fi\fi
313 \advance\@tempcnta\@ne}%
314 \let\Gm@star\relax}%

```

`\Gm@branch` The macro splits a value into the same two values.

```

315 \def\Gm@branch#1#2#3{%
316 \@tempcnta\z@
317 \@for\Gm@tmp:=#1\do{%
318 \KV@sp@def\Gm@frag{\Gm@tmp}%
319 \edef\Gm@value{\Gm@frag}%
320 \ifcase\@tempcnta\relax% cnta == 0
321 \setkeys{Gm}{#2=\Gm@value}%
322 \or% cnta == 1
323 \setkeys{Gm}{#3=\Gm@value}%
324 \else\fi
325 \advance\@tempcnta\@ne}%
326 \ifnum\@tempcnta=\@ne
327 \setkeys{Gm}{#3=\Gm@value}%
328 \fi}%

```

`\Gm@magtooffset` This macro is used to adjust offsets by `\mag`.

```

329 \def\Gm@magtooffset{%
330 \@tempdima=\mag\Gm@truedimen sp%
331 \@tempdimb=1\Gm@truedimen in%
332 \divide\@tempdimb\@tempdima
333 \multiply\@tempdimb\@m
334 \addtolength{\hoffset}{1\Gm@truedimen in}%
335 \addtolength{\voffset}{1\Gm@truedimen in}%
336 \addtolength{\hoffset}{-\the\@tempdimb}%
337 \addtolength{\voffset}{-\the\@tempdimb}%

```

`\Gm@setlength` This macro stores L^AT_EX native dimensions, which are stored and set afterwards.

```

338 \def\Gm@setlength#1#2{%
339 \let\Gm@len=\relax\let\Gm@td=\relax
340 \edef\addtolist{\noexpand\Gm@dimlist=}
341 {\the\Gm@dimlist \Gm@len{#1}{#2}}\addtolist}%

```

`\Gm@expandlengths` This macro processes `\Gm@dimlist`.

```

342 \def\Gm@expandlengths{%
343 \def\Gm@td{\Gm@truedimen}%
344 \def\Gm@len##1##2{\setlength{##1}{##2}}%
345 \the\Gm@dimlist}%

```

`\Gm@setsize` The macro sets `paperwidth` and `paperheight` dimensions using `\Gm@setlength` macro.

```
346 \def\Gm@setsize#1(#2,#3)#4{%
347   \let\Gm@td\relax
348   \expandafter\Gm@setlength\csname #1width\endcsname{#2\Gm@td #4}%
349   \expandafter\Gm@setlength\csname #1height\endcsname{#3\Gm@td #4}%
350   \ifGm@landscape\Gm@swap@papersizetrue\else\Gm@swap@papersizefalse\fi}%
```

`\Gm@setpaper@ifpre` The macro changes the paper size.

```
351 \def\Gm@setpaper@ifpre#1{%
352   \ifGm@preamble{#1}\def\Gm@paper{#1}\@nameuse{Gm@#1}{paper}}}%
```

Various paper size are defined here.

```
353 \@namedef{Gm@a0paper}#1{\Gm@setsize{#1}(841,1189){mm}}% ISO A0
354 \@namedef{Gm@a1paper}#1{\Gm@setsize{#1}(594,841){mm}}% ISO A1
355 \@namedef{Gm@a2paper}#1{\Gm@setsize{#1}(420,594){mm}}% ISO A2
356 \@namedef{Gm@a3paper}#1{\Gm@setsize{#1}(297,420){mm}}% ISO A3
357 \@namedef{Gm@a4paper}#1{\Gm@setsize{#1}(210,297){mm}}% ISO A4
358 \@namedef{Gm@a5paper}#1{\Gm@setsize{#1}(148,210){mm}}% ISO A5
359 \@namedef{Gm@a6paper}#1{\Gm@setsize{#1}(105,148){mm}}% ISO A6
360 \@namedef{Gm@b0paper}#1{\Gm@setsize{#1}(1000,1414){mm}}% ISO B0
361 \@namedef{Gm@b1paper}#1{\Gm@setsize{#1}(707,1000){mm}}% ISO B1
362 \@namedef{Gm@b2paper}#1{\Gm@setsize{#1}(500,707){mm}}% ISO B2
363 \@namedef{Gm@b3paper}#1{\Gm@setsize{#1}(353,500){mm}}% ISO B3
364 \@namedef{Gm@b4paper}#1{\Gm@setsize{#1}(250,353){mm}}% ISO B4
365 \@namedef{Gm@b5paper}#1{\Gm@setsize{#1}(176,250){mm}}% ISO B5
366 \@namedef{Gm@b6paper}#1{\Gm@setsize{#1}(125,176){mm}}% ISO B6
367 \@namedef{Gm@c0paper}#1{\Gm@setsize{#1}(917,1297){mm}}% ISO C0
368 \@namedef{Gm@c1paper}#1{\Gm@setsize{#1}(648,917){mm}}% ISO C1
369 \@namedef{Gm@c2paper}#1{\Gm@setsize{#1}(458,648){mm}}% ISO C2
370 \@namedef{Gm@c3paper}#1{\Gm@setsize{#1}(324,458){mm}}% ISO C3
371 \@namedef{Gm@c4paper}#1{\Gm@setsize{#1}(229,324){mm}}% ISO C4
372 \@namedef{Gm@c5paper}#1{\Gm@setsize{#1}(162,229){mm}}% ISO C5
373 \@namedef{Gm@c6paper}#1{\Gm@setsize{#1}(114,162){mm}}% ISO C6
374 \@namedef{Gm@b0j}#1{\Gm@setsize{#1}(1030,1456){mm}}% JIS B0
375 \@namedef{Gm@b1j}#1{\Gm@setsize{#1}(728,1030){mm}}% JIS B1
376 \@namedef{Gm@b2j}#1{\Gm@setsize{#1}(515,728){mm}}% JIS B2
377 \@namedef{Gm@b3j}#1{\Gm@setsize{#1}(364,515){mm}}% JIS B3
378 \@namedef{Gm@b4j}#1{\Gm@setsize{#1}(257,364){mm}}% JIS B4
379 \@namedef{Gm@b5j}#1{\Gm@setsize{#1}(182,257){mm}}% JIS B5
380 \@namedef{Gm@b6j}#1{\Gm@setsize{#1}(128,182){mm}}% JIS B6
381 \@namedef{Gm@ansipaper}#1{\Gm@setsize{#1}(8.5,11){in}}%
382 \@namedef{Gm@ansibpaper}#1{\Gm@setsize{#1}(11,17){in}}%
383 \@namedef{Gm@ansicpaper}#1{\Gm@setsize{#1}(17,22){in}}%
384 \@namedef{Gm@ansidpaper}#1{\Gm@setsize{#1}(22,34){in}}%
385 \@namedef{Gm@ansiepaper}#1{\Gm@setsize{#1}(34,44){in}}%
386 \@namedef{Gm@letterpaper}#1{\Gm@setsize{#1}(8.5,11){in}}%
387 \@namedef{Gm@legalpaper}#1{\Gm@setsize{#1}(8.5,14){in}}%
388 \@namedef{Gm@executivepaper}#1{\Gm@setsize{#1}(7.25,10.5){in}}%
389 \@namedef{Gm@screen}#1{\Gm@setsize{#1}(225,180){mm}}%
```

`'paper'` paper takes a paper name as its value.

```
390 \define@key{Gm}{paper}{\setkeys{Gm}{#1}}%
391 \let\KV@Gm@papername\KV@Gm@paper
```

`'a[0-6]paper'` The following paper names are available.

```
'b[0-6]paper' 392 \define@key{Gm}{a0paper}[true]{\Gm@setpaper@ifpre{a0paper}}%
'b[0-6]j' 393 \define@key{Gm}{a1paper}[true]{\Gm@setpaper@ifpre{a1paper}}%
'ansi[a-e]paper' 394 \define@key{Gm}{a2paper}[true]{\Gm@setpaper@ifpre{a2paper}}%
'letterpaper' 395 \define@key{Gm}{a3paper}[true]{\Gm@setpaper@ifpre{a3paper}}%
'legalpaper' 396 \define@key{Gm}{a4paper}[true]{\Gm@setpaper@ifpre{a4paper}}%
'executivepaper' 397 \define@key{Gm}{a5paper}[true]{\Gm@setpaper@ifpre{a5paper}}%
'screen' 398 \define@key{Gm}{a6paper}[true]{\Gm@setpaper@ifpre{a6paper}}%
399 \define@key{Gm}{b0paper}[true]{\Gm@setpaper@ifpre{b0paper}}%
400 \define@key{Gm}{b1paper}[true]{\Gm@setpaper@ifpre{b1paper}}%
401 \define@key{Gm}{b2paper}[true]{\Gm@setpaper@ifpre{b2paper}}%
```

```

402 \define@key{Gm}{b3paper}[true]{\Gm@setpaper@ifpre{b3paper}}%
403 \define@key{Gm}{b4paper}[true]{\Gm@setpaper@ifpre{b4paper}}%
404 \define@key{Gm}{b5paper}[true]{\Gm@setpaper@ifpre{b5paper}}%
405 \define@key{Gm}{b6paper}[true]{\Gm@setpaper@ifpre{b6paper}}%
406 \define@key{Gm}{c0paper}[true]{\Gm@setpaper@ifpre{c0paper}}%
407 \define@key{Gm}{c1paper}[true]{\Gm@setpaper@ifpre{c1paper}}%
408 \define@key{Gm}{c2paper}[true]{\Gm@setpaper@ifpre{c2paper}}%
409 \define@key{Gm}{c3paper}[true]{\Gm@setpaper@ifpre{c3paper}}%
410 \define@key{Gm}{c4paper}[true]{\Gm@setpaper@ifpre{c4paper}}%
411 \define@key{Gm}{c5paper}[true]{\Gm@setpaper@ifpre{c5paper}}%
412 \define@key{Gm}{c6paper}[true]{\Gm@setpaper@ifpre{c6paper}}%
413 \define@key{Gm}{b0j}[true]{\Gm@setpaper@ifpre{b0j}}%
414 \define@key{Gm}{b1j}[true]{\Gm@setpaper@ifpre{b1j}}%
415 \define@key{Gm}{b2j}[true]{\Gm@setpaper@ifpre{b2j}}%
416 \define@key{Gm}{b3j}[true]{\Gm@setpaper@ifpre{b3j}}%
417 \define@key{Gm}{b4j}[true]{\Gm@setpaper@ifpre{b4j}}%
418 \define@key{Gm}{b5j}[true]{\Gm@setpaper@ifpre{b5j}}%
419 \define@key{Gm}{b6j}[true]{\Gm@setpaper@ifpre{b6j}}%
420 \define@key{Gm}{ansipaper}[true]{\Gm@setpaper@ifpre{ansipaper}}%
421 \define@key{Gm}{ansibpaper}[true]{\Gm@setpaper@ifpre{ansibpaper}}%
422 \define@key{Gm}{ansicpaper}[true]{\Gm@setpaper@ifpre{ansicpaper}}%
423 \define@key{Gm}{ansidpaper}[true]{\Gm@setpaper@ifpre{ansidpaper}}%
424 \define@key{Gm}{ansiepaper}[true]{\Gm@setpaper@ifpre{ansiepaper}}%
425 \define@key{Gm}{letterpaper}[true]{\Gm@setpaper@ifpre{letterpaper}}%
426 \define@key{Gm}{legalpaper}[true]{\Gm@setpaper@ifpre{legalpaper}}%
427 \define@key{Gm}{executivepaper}[true]{\Gm@setpaper@ifpre{executivepaper}}%
428 \define@key{Gm}{screen}[true]{\Gm@setpaper@ifpre{screen}}%

```

‘paperwidth’ Direct specification for paper size is also possible.

```

‘paperheight’ 429 \define@key{Gm}{paperwidth}{\ifGm@preamble{paperwidth}{%
‘papersize’ 430 \def\Gm@paper{custom}\Gm@setlength\paperwidth{#1}}}%
431 \define@key{Gm}{paperheight}{\ifGm@preamble{paperheight}{%
432 \def\Gm@paper{custom}\Gm@setlength\paperheight{#1}}}%
433 \define@key{Gm}{papersize}{\ifGm@preamble{papersize}{%
434 \def\Gm@paper{custom}\Gm@branch{#1}{paperwidth}{paperheight}}}%

```

‘layout’ Direct specification for layout size is also possible.

```

‘layoutwidth’ 435 \define@key{Gm}{layout}{\Gm@layouttrue\@nameuse{Gm@#1}{Gm@layout}}%
‘layoutheight’ 436 \let\KV@Gm@layoutname\KV@Gm@layout
‘layoutsizes’ 437 \define@key{Gm}{layoutwidth}{\Gm@layouttrue\Gm@setlength\Gm@layoutwidth{#1}}%
438 \define@key{Gm}{layoutheight}{\Gm@layouttrue\Gm@setlength\Gm@layoutheight{#1}}%
439 \define@key{Gm}{layoutsizes}{\Gm@branch{#1}{layoutwidth}{layoutheight}}%

```

‘landscape’ Paper orientation setting.

```

‘portrait’ 440 \define@key{Gm}{landscape}[true]{\ifGm@preamble{landscape}{%
441 \Gm@doifelse{landscape}{#1}%
442 {\ifGm@landscape\else\Gm@landscapetrue\Gm@reverse{swap@papersize}\fi}%
443 {\ifGm@landscape\Gm@landscapefalse\Gm@reverse{swap@papersize}\fi}}}%
444 \define@key{Gm}{portrait}[true]{\ifGm@preamble{portrait}{%
445 \Gm@doifelse{portrait}{#1}%
446 {\ifGm@landscape\Gm@landscapefalse\Gm@reverse{swap@papersize}\fi}%
447 {\ifGm@landscape\else\Gm@landscapetrue\Gm@reverse{swap@papersize}\fi}}}%

```

‘hscale’ These options can determine the length(s) of *total body* giving *scale(s)* against the paper size.

```

‘vscale’ 448 \define@key{Gm}{hscale}{\Gm@hbodytrue\edef\Gm@hscale{#1}}%
‘scale’ 449 \define@key{Gm}{vscale}{\Gm@vbodytrue\edef\Gm@vscale{#1}}%
450 \define@key{Gm}{scale}{\Gm@branch{#1}{hscale}{vscale}}%

```

‘width’ These options give concrete dimension(s) of *total body*. totalwidth and totalheight are aliases of
‘height’ width and height respectively.

```

‘total’ 451 \define@key{Gm}{width}{\Gm@hbodytrue\Gm@defbylen{width}{#1}}%
‘totalwidth’ 452 \define@key{Gm}{height}{\Gm@vbodytrue\Gm@defbylen{height}{#1}}%
‘totalheight’ 453 \define@key{Gm}{total}{\Gm@branch{#1}{width}{height}}%
454 \let\KV@Gm@totalwidth\KV@Gm@width
455 \let\KV@Gm@totalheight\KV@Gm@height

```

‘textwidth’ These options directly sets the dimensions `\textwidth` and `\textheight`. `body` is an alias of `text`.

‘textheight’ 456 `\define@key{Gm}{textwidth}{\Gm@hbodytrue\Gm@defbylen{textwidth}{#1}}%`
‘text’ 457 `\define@key{Gm}{textheight}{\Gm@vbodytrue\Gm@defbylen{textheight}{#1}}%`
‘body’ 458 `\define@key{Gm}{text}{\Gm@branch{#1}{textwidth}{textheight}}%`
459 `\let\KV@Gm@body\KV@Gm@text`

‘lines’ The option sets `\textheight` with the number of lines.

460 `\define@key{Gm}{lines}{\Gm@vbodytrue\Gm@defbycnt{lines}{#1}}%`

‘includehead’ The options take the corresponding dimensions as part of *body*.

‘includefoot’ 461 `\define@key{Gm}{includehead}[true]{\Gm@setbool{includehead}{#1}}%`
‘includeheadfoot’ 462 `\define@key{Gm}{includefoot}[true]{\Gm@setbool{includefoot}{#1}}%`
‘includemp’ 463 `\define@key{Gm}{includeheadfoot}[true]{\Gm@doifelse{includeheadfoot}{#1}}%`
‘includeall’ 464 `{\Gm@includeheadtrue\Gm@includefoottrue}%`
465 `{\Gm@includeheadfalse\Gm@includefootfalse}}%`
466 `\define@key{Gm}{includemp}[true]{\Gm@setbool{includemp}{#1}}%`
467 `\define@key{Gm}{includeall}[true]{\Gm@doifelse{includeall}{#1}}%`
468 `{\Gm@includeheadtrue\Gm@includefoottrue\Gm@includemptrue}%`
469 `{\Gm@includeheadfalse\Gm@includefootfalse\Gm@includempfalse}}%`

‘ignorehead’ These options exclude *head*, *foot* and *marginpars* when determining *body*.

‘ignorefoot’ 470 `\define@key{Gm}{ignorehead}[true]{%`
‘ignoreheadfoot’ 471 `\Gm@setboolrev[ignorehead]{includehead}{#1}}%`
‘ignoremp’ 472 `\define@key{Gm}{ignorefoot}[true]{%`
‘ignoreall’ 473 `\Gm@setboolrev[ignorefoot]{includefoot}{#1}}%`
474 `\define@key{Gm}{ignoreheadfoot}[true]{\Gm@doifelse{ignoreheadfoot}{#1}}%`
475 `{\Gm@includeheadfalse\Gm@includefootfalse}%`
476 `{\Gm@includeheadtrue\Gm@includefoottrue}}%`
477 `\define@key{Gm}{ignoremp}[true]{%`
478 `\Gm@setboolrev[ignoremp]{includemp}{#1}}%`
479 `\define@key{Gm}{ignoreall}[true]{\Gm@doifelse{ignoreall}{#1}}%`
480 `{\Gm@includeheadfalse\Gm@includefootfalse\Gm@includempfalse}%`
481 `{\Gm@includeheadtrue\Gm@includefoottrue\Gm@includemptrue}}%`

‘heightrounded’ The option rounds `\textheight` to n-times of `\baselineskip` plus `\topskip`.

482 `\define@key{Gm}{heightrounded}[true]{\Gm@setbool{heightrounded}{#1}}%`

‘hdivide’ The options are useful to specify partitioning in each direction of the paper.

‘vdivide’ 483 `\define@key{Gm}{hdivide}{\Gm@parse@divide{#1}{lmargin}{width}{rmargin}}%`
‘divide’ 484 `\define@key{Gm}{vdivide}{\Gm@parse@divide{#1}{tmargin}{height}{bmargin}}%`
485 `\define@key{Gm}{divide}{\Gm@parse@divide{#1}{lmargin}{width}{rmargin}}%`
486 `\Gm@parse@divide{#1}{tmargin}{height}{bmargin}}%`

‘lmargin’ These options set *margins*. *left*, *inner*, *innermargin* are aliases of *lmargin*. *right*, *outer*, *outermargin* are aliases of *rmargin*. *top* and *bottom* are aliases of *tmargin* and *bmargin* respectively.

‘bmargin’ 487 `\define@key{Gm}{lmargin}{\Gm@defbylen{lmargin}{#1}}%`
‘left’ 488 `\define@key{Gm}{rmargin}{\Gm@defbylen{rmargin}{#1}}%`
‘inner’ 489 `\let\KV@Gm@left\KV@Gm@lmargin`
‘innermargin’ 490 `\let\KV@Gm@inner\KV@Gm@lmargin`
‘right’ 491 `\let\KV@Gm@innermargin\KV@Gm@lmargin`
‘outer’ 492 `\let\KV@Gm@right\KV@Gm@rmargin`
‘outermargin’ 493 `\let\KV@Gm@outer\KV@Gm@rmargin`
‘top’ 494 `\let\KV@Gm@outermargin\KV@Gm@rmargin`
‘bottom’ 495 `\define@key{Gm}{tmargin}{\Gm@defbylen{tmargin}{#1}}%`
496 `\define@key{Gm}{bmargin}{\Gm@defbylen{bmargin}{#1}}%`
497 `\let\KV@Gm@top\KV@Gm@tmargin`
498 `\let\KV@Gm@bottom\KV@Gm@bmargin`

‘hmargin’ These options are shorthands for setting *margins*.

‘vmargin’ 499 `\define@key{Gm}{hmargin}{\Gm@branch{#1}{lmargin}{rmargin}}%`
‘margin’ 500 `\define@key{Gm}{vmargin}{\Gm@branch{#1}{tmargin}{bmargin}}%`
501 `\define@key{Gm}{margin}{\Gm@branch{#1}{lmargin}{tmargin}}%`
502 `\Gm@branch{#1}{rmargin}{bmargin}}%`

‘hmarginratio’ Options specifying the margin ratios.

```

‘hmarginratio’ 503 \define@key{Gm}{hmarginratio}{\edef\Gm@hmarginratio{#1}}%
‘marginratio’ 504 \define@key{Gm}{vmarginratio}{\edef\Gm@vmarginratio{#1}}%
‘hratio’ 505 \define@key{Gm}{marginratio}{\Gm@branch{#1}{hmarginratio}{vmarginratio}}%
‘vratio’ 506 \let\KV@Gm@hratio\KV@Gm@hmarginratio
‘ratio’ 507 \let\KV@Gm@vratio\KV@Gm@vmarginratio
508 \let\KV@Gm@ratio\KV@Gm@marginratio

‘hcentering’ Useful shorthands to place body centered.
‘vcentering’ 509 \define@key{Gm}{hcentering}[true]{\Gm@doifelse{hcentering}{#1}}%
‘centering’ 510 {\def\Gm@hmarginratio{1:1}}{}%
511 \define@key{Gm}{vcentering}[true]{\Gm@doifelse{vcentering}{#1}}%
512 {\def\Gm@vmarginratio{1:1}}{}%
513 \define@key{Gm}{centering}[true]{\Gm@doifelse{centering}{#1}}%
514 {\def\Gm@hmarginratio{1:1}\def\Gm@vmarginratio{1:1}}{}%

‘twoside’ If twoside=true, \@twoside and \@mparswitch is set to true.
515 \define@key{Gm}{twoside}[true]{\Gm@doifelse{twoside}{#1}}%
516 {\@twoside true \@mparswitch true}{\@twoside false \@mparswitch false}}%

‘asymmetric’ asymmetric sets \@mparswitch false and \@twoside true A asymmetric=false has no effect.
517 \define@key{Gm}{asymmetric}[true]{\Gm@doifelse{asymmetric}{#1}}%
518 {\@twoside true \@mparswitch false}}{}%

‘bindingoffset’ The macro adds the specified space to the inner margin.
519 \define@key{Gm}{bindingoffset}{\Gm@setlength\Gm@bindingoffset{#1}}%

‘headheight’ The direct settings of head and/or foot dimensions.
‘headsep’ 520 \define@key{Gm}{headheight}{\Gm@setlength\headheight{#1}}%
‘footskip’ 521 \define@key{Gm}{headsep}{\Gm@setlength\headsep{#1}}%
‘head’ 522 \define@key{Gm}{footskip}{\Gm@setlength\footskip{#1}}%
‘foot’ 523 \let\KV@Gm@head\KV@Gm@headheight
524 \let\KV@Gm@foot\KV@Gm@footskip

‘nohead’ They are only shorthands to set head and/or foot to be 0pt.
‘nofoot’ 525 \define@key{Gm}{nohead}[true]{\Gm@doifelse{nohead}{#1}}%
‘noheadfoot’ 526 {\Gm@setlength\headheight\z@\Gm@setlength\headsep\z@}{}%
527 \define@key{Gm}{nofoot}[true]{\Gm@doifelse{nofoot}{#1}}%
528 {\Gm@setlength\footskip\z@}{}%
529 \define@key{Gm}{noheadfoot}[true]{\Gm@doifelse{noheadfoot}{#1}}%
530 {\Gm@setlength\headheight\z@\Gm@setlength\headsep\z@}{}%
531 {\Gm@setlength\footskip\z@}{}%

‘footnotesep’ The option directly sets a native dimension \footnotesep.
532 \define@key{Gm}{footnotesep}{\Gm@setlength\footnotesep{#1}}%

‘marginparwidth’ They directly set native dimensions \marginparwidth and \marginparsep.
‘marginpar’ 533 \define@key{Gm}{marginparwidth}{\Gm@setlength\marginparwidth{#1}}%
‘marginparsep’ 534 \let\KV@Gm@marginpar\KV@Gm@marginparwidth
535 \define@key{Gm}{marginparsep}{\Gm@setlength\marginparsep{#1}}%

‘nomarginpar’ The macro is a shorthand for \marginparwidth=0pt and \marginparsep=0pt.
536 \define@key{Gm}{nomarginpar}[true]{\Gm@doifelse{nomarginpar}{#1}}%
537 {\Gm@setlength\marginparwidth\z@\Gm@setlength\marginparsep\z@}{}%

‘columnsep’ The option sets a native dimension \columnsep.
538 \define@key{Gm}{columnsep}{\Gm@setlength\columnsep{#1}}%

‘hoffset’ The former two options set native dimensions \hoffset and \voffset. offset can set both of them
‘voffset’ with the same value.
‘offset’ 539 \define@key{Gm}{hoffset}{\Gm@setlength\hoffset{#1}}%
540 \define@key{Gm}{voffset}{\Gm@setlength\voffset{#1}}%
541 \define@key{Gm}{offset}{\Gm@branch{#1}{hoffset}{voffset}}%

```

```

'layoutoffset'
'layoutvoffset' 542 \define@key{Gm}{layoutoffset}{\Gm@setlength\Gm@layoutoffset{#1}}%
'layoutoffset' 543 \define@key{Gm}{layoutvoffset}{\Gm@setlength\Gm@layoutvoffset{#1}}%
544 \define@key{Gm}{layoutoffset}{\Gm@branch{#1}{layoutoffset}{layoutvoffset}}%

'twocolumn' The option sets \twocolumn switch.
545 \define@key{Gm}{twocolumn}[true]{%
546 \Gm@doif{twocolumn}{#1}{\csname @twocolumn\Gm@bool\endcsname}}%

'onecolumn' This option has the reverse effect of twocolumn option.
547 \define@key{Gm}{onecolumn}[true]{%
548 \Gm@doifelse{onecolumn}{#1}{\@twocolumnfalse}{\@twocolumntrue}}%

'reversemp' The both options set \reversemargin.
'reversemarginpar' 549 \define@key{Gm}{reversemp}[true]{%
550 \Gm@doif{reversemp}{#1}{\csname @reversemargin\Gm@bool\endcsname}}%
551 \define@key{Gm}{reversemarginpar}[true]{%
552 \Gm@doif{reversemarginpar}{#1}{\csname @reversemargin\Gm@bool\endcsname}}%

'driver'
553 \define@key{Gm}{driver}{\ifGm@preamble{driver}{%
554 \edef\@tempa{#1}\edef\@auto{auto}\edef\@none{none}%
555 \ifx\@tempa\@empty\let\Gm@driver\relax\else
556 \ifx\@tempa\@none\let\Gm@driver\relax\else
557 \ifx\@tempa\@auto\let\Gm@driver\@empty\else
558 \setkeys{Gm}{#1}\fi\fi\fi\let\@auto\relax\let\@none\relax}}%

'dvips' The geometry package supports dvips, dvipdfm, pdflatex and vtex. dvipdfm works like dvips.
'dvipdfm' 559 \define@key{Gm}{dvips}[true]{\ifGm@preamble{dvips}{%
'pdftex' 560 \Gm@doifelse{dvips}{#1}{\Gm@setdriver{dvips}}{\Gm@unsetdriver{dvips}}}%
'xetex' 561 \define@key{Gm}{dvipdfm}[true]{\ifGm@preamble{dvipdfm}{%
'vtex' 562 \Gm@doifelse{dvipdfm}{#1}{\Gm@setdriver{dvipdfm}}{\Gm@unsetdriver{dvipdfm}}}%
563 \define@key{Gm}{pdftex}[true]{\ifGm@preamble{pdftex}{%
564 \Gm@doifelse{pdftex}{#1}{\Gm@setdriver{pdftex}}{\Gm@unsetdriver{pdftex}}}%
565 \define@key{Gm}{xetex}[true]{\ifGm@preamble{xetex}{%
566 \Gm@doifelse{xetex}{#1}{\Gm@setdriver{xetex}}{\Gm@unsetdriver{xetex}}}%
567 \define@key{Gm}{vtex}[true]{\ifGm@preamble{vtex}{%
568 \Gm@doifelse{vtex}{#1}{\Gm@setdriver{vtex}}{\Gm@unsetdriver{vtex}}}%

'verbose' The verbose mode.
569 \define@key{Gm}{verbose}[true]{\ifGm@preamble{verbose}{\Gm@setbool{verbose}{#1}}}%

'reset' The option cancels all the options specified before reset, except pass. mag ( $\neq$  1000) with truedimen
cannot be also reset.
570 \define@key{Gm}{reset}[true]{\ifGm@preamble{reset}{%
571 \Gm@doifelse{reset}{#1}{\Gm@restore@org\Gm@initall
572 \ProcessOptionsKV[c]{Gm}\Gm@setdefaultpaper}{}}}%

'resetpaper' If resetpaper is set to true, the paper size redefined in the package is discarded and the original one
is restored. This option may be useful to print nonstandard sized documents with normal printers
and papers.
573 \define@key{Gm}{resetpaper}[true]{\ifGm@preamble{resetpaper}{%
574 \Gm@setbool{resetpaper}{#1}}}%

'mag' mag is expanded immediately when it is specified. So reset can't reset mag when it is set with
truedimen.
575 \define@key{Gm}{mag}{\ifGm@preamble{mag}{\mag=#1}}%

'truedimen' If truedimen is set to true, all of the internal explicit dimensions is changed to true dimensions,
e.g., 1in is changed to 1truein.
576 \define@key{Gm}{truedimen}[true]{\ifGm@preamble{truedimen}{%
577 \Gm@doifelse{truedimen}{#1}{\let\Gm@truedimen\Gm@true}%
578 {\let\Gm@truedimen\@empty}}%

```


‘pass’ The option makes all the options specified ineffective except verbose switch.

```
579 \define@key{Gm}{pass}[true]{\ifGm@preamble{pass}{\Gm@setbool{pass}{#1}}}%
```

‘showframe’ The showframe option prints page frames to help you understand what the resulting layout is like.

```
580 \define@key{Gm}{showframe}[true]{\Gm@setbool{showframe}{#1}}%
```

‘showcrop’ The showcrop option prints cropmarks at the corners.

```
581 \define@key{Gm}{showcrop}[true]{\Gm@setbool{showcrop}{#1}}%
```

\Gm@setdefaultpaper The macro stores paper dimensions. This macro should be called after `\ProcessOptionsKV[c]{Gm}`. If the landscape option in `\documentclass` is specified, the class immediately swaps the paper dimensions.

```
582 \def\Gm@setdefaultpaper{%
583   \ifx\Gm@paper\undefined
584     \Gm@setsize{paper}(\strip@pt\paperwidth,\strip@pt\paperheight){pt}%
585     \Gm@setsize{Gm@layout}(\strip@pt\paperwidth,\strip@pt\paperheight){pt}%
586     \Gm@swap@papersizefalse
587   \fi}%
```

\Gm@adjustpaper The macro checks if paperwidth/height is larger than 0pt, which is used in `\Gm@process`. The paper dimensions can be swapped when paper orientation is changed over by `landscape` and `portrait` options.

```
588 \def\Gm@adjustpaper{%
589   \ifdim\paperwidth>\p@else
590     \PackageError{geometry}{%
591       \string\paperwidth\space(\the\paperwidth) too short}{%
592       Set a paper type (e.g., ‘a4paper’).}%
593   \fi
594   \ifdim\paperheight>\p@else
595     \PackageError{geometry}{%
596       \string\paperheight\space(\the\paperheight) too short}{%
597       Set a paper type (e.g., ‘a4paper’).}%
598   \fi
599   \ifGm@swap@papersize
600     \setlength\@tempdima{\paperwidth}%
601     \setlength\paperwidth{\paperheight}%
602     \setlength\paperheight{\@tempdima}%
603   \fi
604   \ifGm@layout\else
605     \setlength\Gm@layoutwidth{\paperwidth}%
606     \setlength\Gm@layoutheight{\paperheight}%
607   \fi}%
```

\Gm@checkmp The macro checks whether or not the marginpars overrun the page.

```
608 \def\Gm@checkmp{%
609   \ifGm@includemp\else
610     \@tempcnta\z@\@tempcntb\@ne
611     \if@twocolumn
612       \@tempcnta\@ne
613     \else
614       \if@reversemargin
615         \@tempcnta\@ne\@tempcntb\z@
616       \fi
617     \fi
618     \@tempdima\marginparwidth
619     \advance\@tempdima\marginparsep
620     \ifnum\@tempcnta=\@ne
621       \@tempdimc\@tempdima
622       \setlength\@tempdimb{\Gm@lmargin}%
623       \advance\@tempdimc-\@tempdimb
624       \ifdim\@tempdimc>\z@
625         \Gm@warning{The marginal notes overrun the paper edge.^^J
626           \spaces Add \the\@tempdimc\space and more to the left margin}%
627       \fi
```

```

628 \fi
629 \ifnum\@tempcntb=\@ne
630 \@tempdimc\@tempdima
631 \setlength\@tempdimb{\Gm@rmargin}%
632 \advance\@tempdimc-\@tempdimb
633 \ifdim\@tempdimc>\z@
634 \Gm@warning{The marginal notes overrun the paper.^^J
635 \spaces Add \the\@tempdimc\space and more to the right margin}%
636 \fi
637 \fi
638 \fi}%

```

`\Gm@adjustmp` The macro sets marginpar correction when `includemp` is set, which is used in `\Gm@process`. The variables `\Gm@wd@mp`, `\Gm@odd@mp` and `\Gm@even@mp` are set here. Note that `\Gm@even@mp` should be used only for twoside layout.

```

639 \def\Gm@adjustmp{%
640 \ifGm@includemp
641 \@tempdimb\marginparwidth
642 \advance\@tempdimb\marginparsep
643 \Gm@wd@mp\@tempdimb
644 \Gm@odd@mp\z@
645 \Gm@even@mp\z@
646 \if@twocolumn
647 \Gm@wd@mp2\@tempdimb
648 \Gm@odd@mp\@tempdimb
649 \Gm@even@mp\@tempdimb
650 \else
651 \if@reversemargin
652 \Gm@odd@mp\@tempdimb
653 \if@mparswitch\else
654 \Gm@even@mp\@tempdimb
655 \fi
656 \else
657 \if@mparswitch
658 \Gm@even@mp\@tempdimb
659 \fi
660 \fi
661 \fi
662 \fi}%

```

`\Gm@adjustbody` If the horizontal dimension of *body* is specified by user, `\Gm@width` is set properly here.

```

663 \def\Gm@adjustbody{
664 \ifGm@hbody
665 \ifx\Gm@width\@undefined
666 \ifx\Gm@hscale\@undefined
667 \Gm@defbylen{width}{\Gm@Dhscale\Gm@layoutwidth}%
668 \else
669 \Gm@defbylen{width}{\Gm@hscale\Gm@layoutwidth}%
670 \fi
671 \fi
672 \ifx\Gm@textwidth\@undefined\else
673 \setlength\@tempdima{\Gm@textwidth}%
674 \ifGm@includemp
675 \advance\@tempdima\Gm@wd@mp
676 \fi
677 \edef\Gm@width{\the\@tempdima}%
678 \fi
679 \fi

```

If the vertical dimension of *body* is specified by user, `\Gm@height` is set properly here.

```

680 \ifGm@vbody
681 \ifx\Gm@height\@undefined
682 \ifx\Gm@vscale\@undefined
683 \Gm@defbylen{height}{\Gm@Dvscale\Gm@layouthheight}%
684 \else

```

```

685     \Gm@defbylen{height}{\Gm@vscale\Gm@layoutheight}%
686     \fi
687 \fi
688 \ifx\Gm@lines\@undefined\else

```

\topskip has to be adjusted so that the formula “ $\text{textheight} = (\text{lines} - 1) \times \text{baselineskip} + \text{topskip}$ ” to be correct even if large font sizes are specified by users. If \topskip is smaller than \ht\strutbox, then \topskip is set to \ht\strutbox.

```

689     \ifdim\topskip<\ht\strutbox
690         \setlength\@tempdima{\topskip}%
691         \setlength\topskip{\ht\strutbox}%
692         \Gm@warning{noexpand\topskip was changed from \the\@tempdima\space
693             to \the\topskip}%
694     \fi
695     \setlength\@tempdima{\baselineskip}%
696     \multiply\@tempdima\Gm@lines
697     \addtolength\@tempdima{\topskip}%
698     \addtolength\@tempdima{-\baselineskip}%
699     \edef\Gm@textheight{\the\@tempdima}%
700 \fi
701 \ifx\Gm@textheight\@undefined\else
702     \setlength\@tempdima{\Gm@textheight}%
703     \ifGm@includehead
704         \addtolength\@tempdima{\headheight}%
705         \addtolength\@tempdima{\headsep}%
706     \fi
707     \ifGm@includefoot
708         \addtolength\@tempdima{\footskip}%
709     \fi
710     \edef\Gm@height{\the\@tempdima}%
711 \fi
712 \fi}%

```

\Gm@process The main macro processing the specified dimensions is defined.

```

713 \def\Gm@process{%
    If pass is set, the original dimensions and switches are restored and process is ended here.
714 \ifGm@pass
715     \Gm@restore@org
716 \else
717     \Gm@@process
718 \fi}%

```

The main processing macro.

```

719 \def\Gm@@process{%
720     \Gm@expandlengths
721     \Gm@adjustpaper
722     \addtolength\Gm@layoutwidth{-\Gm@bindingoffset}%
723     \Gm@adjustmp
724     \Gm@adjustbody
725     \Gm@detall{h}{width}{lmargin}{rmargin}%
726     \Gm@detall{v}{height}{tmargin}{bmargin}%

```

The real dimensions are set properly according to the result of the auto-completion calculation.

```

727     \setlength\textwidth{\Gm@width}%
728     \setlength\textheight{\Gm@height}%
729     \setlength\topmargin{\Gm@tmargin}%
730     \setlength\oddsidemargin{\Gm@lmargin}%
731     \addtolength\oddsidemargin{-1\Gm@truedimen in}%

```

If includemp is set to true, \textwidth and \oddsidemargin are adjusted.

```

732 \ifGm@includemp
733     \advance\textwidth-\Gm@wd@mp
734     \advance\oddsidemargin\Gm@odd@mp
735 \fi

```

Determining `\evensidemargin`. In the twoside page layout, the right margin value `\Gm@rmargin` is used. If the marginal note width is included, `\evensidemargin` should be corrected by `\Gm@even@mp`.

```

736 \if@mparswitch
737   \setlength\evensidemargin{\Gm@rmargin}%
738   \addtolength\evensidemargin{-1\Gm@truedimen in}%
739   \ifGm@includemp
740     \advance\evensidemargin\Gm@even@mp
741   \fi
742 \else
743   \evensidemargin\oddsidemargin
744 \fi

```

The bindingoffset correction for `\oddsidemargin`.

```

745 \advance\oddsidemargin\Gm@bindingoffset
746 \addtolength\topmargin{-1\Gm@truedimen in}%

```

If the head of the page is included in *total body*, `\headheight` and `\headsep` are removed from `\textheight`, otherwise from `\topmargin`.

```

747 \ifGm@includehead
748   \addtolength\textheight{-\headheight}%
749   \addtolength\textheight{-\headsep}%
750 \else
751   \addtolength\topmargin{-\headheight}%
752   \addtolength\topmargin{-\headsep}%
753 \fi

```

If the foot of the page is included in *total body*, `\footskip` is removed from `\textheight`.

```

754 \ifGm@includefoot
755   \addtolength\textheight{-\footskip}%
756 \fi

```

If `heightrounded` is set, `\textheight` is rounded.

```

757 \ifGm@heightrounded
758   \setlength\@tempdima{\textheight}%
759   \addtolength\@tempdima{-\topskip}%
760   \@tempcnta\@tempdima
761   \@tempcntb\baselineskip
762   \divide\@tempcnta\@tempcntb
763   \setlength\@tempdimb{\baselineskip}%
764   \multiply\@tempdimb\@tempcnta
765   \advance\@tempdima-\@tempdimb
766   \multiply\@tempdima\tw@
767   \ifdim\@tempdima>\baselineskip
768     \addtolength\@tempdimb{\baselineskip}%
769   \fi
770   \addtolength\@tempdimb{\topskip}%
771   \textheight\@tempdimb
772 \fi

```

The paper width is set back by adding `\Gm@bindingoffset`.

```

773 \advance\oddsidemargin\Gm@layouthoffset%
774 \advance\evensidemargin\Gm@layouthoffset%
775 \advance\topmargin\Gm@layoutvoffset%
776 \addtolength\Gm@layoutwidth{\Gm@bindingoffset}%
777 }% end of \Gm@@process

```

`\Gm@detectdriver` The macro checks the typeset environment and changes the driver option if necessary. To make the engine detection more robust, the macro is rewritten in the version 4 with packages `ifpdf` and `ifvtex`.

```

778 \def\Gm@detectdriver{%

```

If the driver option is not specified explicitly, then driver auto-detection works.

```

779 \ifx\Gm@driver\@empty
780   \typeout{*geometry* driver: auto-detecting}%
   \ifpdf is defined in ifpdf package in 'oberdiek' bundle.

```

```

781   \ifpdf
782     \Gm@setdriver{pdftex}%

```

```

783     \else
784         \Gm@setdriver{dvips}%
785     \fi

    \ifvtex is defined in ifvtex package in ‘oberdiek’ bundle.

786     \ifvtex
787         \Gm@setdriver{vtex}%
788     \fi

    xetex

789     \@ifundefined{XeTeXversion}{\Gm@setdriver{xetex}}%

    When the driver option is set by the user, check if it is valid or not.

790     \else
791         \ifx\Gm@driver\Gm@xetex %%
792             \@ifundefined{XeTeXversion}{\Gm@warning{%
793                 Wrong driver setting: ‘xetex’; trying ‘pdftex’ driver}%
794                 \Gm@setdriver{pdftex}}{}%
795         \fi
796         \ifx\Gm@driver\Gm@vtex
797             \ifvtex\else
798                 \Gm@warning{Wrong driver setting: ‘vtex’; trying ‘dvips’ driver}%
799                 \Gm@setdriver{dvips}%
800             \fi
801         \fi
802     \fi
803     \ifx\Gm@driver\relax
804         \typeout{*geometry* detected driver: <none>}%
805     \else
806         \typeout{*geometry* detected driver: \Gm@driver}%
807     \fi}%

```

\Gm@showparams Prints the resulted parameters and dimensions to STDOUT if verbose is true. \Gm@width and \Gm@height are expanded to get the real size.

```

808 \def\Gm@showparams#1{%
809     \ifGm@verbose\expandafter\typeout\else\expandafter\wlog\fi
810     {\Gm@logcontent{#1}}}%
811 \def\Gm@showdim#1{* \string#1=\the#1^^J}%
812 \def\Gm@showbool#1{\@nameuse{ifGm#1}#1\space\fi}%

```

\Gm@logcontent The content of geometry parameters and native dimensions for the page layout.

```

813 \def\Gm@logcontent#1{%
814     *geometry* verbose mode - [ #1 ] result:^^J%
815     \ifGm@pass * pass: disregarded the geometry package!^^J%
816     \else
817         * driver: \if\Gm@driver<none>\else\Gm@driver\fi^^J%
818         * paper: \ifx\Gm@paper\@undefined<default>\else\Gm@paper\fi^^J%
819         * layout: \ifGm@layout<custom>\else<same size as paper>\fi^^J%
820         \ifGm@layout
821             * layout(width,height): (\the\Gm@layoutwidth,\the\Gm@layoutheight)^^J%
822         \fi
823         * layoutoffset:(h,v)=(\the\Gm@layoutoffset,\the\Gm@layoutvoffset)^^J%
824         \@ifundefined{Gm@lines}{* lines: \Gm@lines^^J}%
825         \@ifundefined{Gm@hmarginratio}{* hratio: \Gm@hmarginratio^^J}%
826         \@ifundefined{Gm@vmarginratio}{* vratio: \Gm@vmarginratio^^J}%
827         \ifdim\Gm@bindingoffset=z@\else
828             * bindingoffset: \the\Gm@bindingoffset^^J\fi
829         * modes: %
830         \Gm@showbool{landscape}%
831         \Gm@showbool{includehead}%
832         \Gm@showbool{includefoot}%
833         \Gm@showbool{includemp}%
834         \if@twoside twoside\space\fi%
835         \if@mparswitch\else\if@twoside asymmetric\space\fi\fi%
836         \Gm@showbool{heightrounded}%
837         \ifx\Gm@truedimen\empty\else truedimen\space\fi%

```

```

838 ^^J%
839 * h-part:(L,W,R)=(\Gm@lmargin, \Gm@width, \Gm@rmargin)^J%
840 * v-part:(T,H,B)=(\Gm@tmargin, \Gm@height, \Gm@bmargin)^J%
841 \fi
842 \Gm@showdim{\paperwidth}%
843 \Gm@showdim{\paperheight}%
844 \Gm@showdim{\textwidth}%
845 \Gm@showdim{\textheight}%
846 \Gm@showdim{\oddsidemargin}%
847 \Gm@showdim{\evensidemargin}%
848 \Gm@showdim{\topmargin}%
849 \Gm@showdim{\headheight}%
850 \Gm@showdim{\headsep}%
851 \Gm@showdim{\topskip}%
852 \Gm@showdim{\footskip}%
853 \Gm@showdim{\marginparwidth}%
854 \Gm@showdim{\marginparsep}%
855 \Gm@showdim{\columnsep}%
856 * \string\skip\string\footins=\the\skip\footins^^J%
857 \Gm@showdim{\hoffset}%
858 \Gm@showdim{\voffset}%
859 \Gm@showdim{\mag}%
860 * \string@twocolumn@if@twocolumn true\else false\fi^^J%
861 * \string@twoside@if@twoside true\else false\fi^^J%
862 * \string@mparswitch@if@mparswitch true\else false\fi^^J%
863 * \string@reversemargin@if@reversemargin true\else false\fi^^J%
864 * (1in=72.27pt=25.4mm, 1cm=28.453pt)^J%

```

Macros for the page frames and cropmarks.

```

865 \def\Gm@cropmark(#1,#2,#3,#4){%
866   \begin{picture}(0,0)
867     \setlength\unitlength{1trueem}%
868     \linethickness{0.2pt}%
869     \put(0,0){\line(#1,#2){5}}%
870     \put(0,0){\line(#3,#4){5}}%
871   \end{picture}}%
872 \providecommand*{\vb@xt@{\vbox to}}%
873 \def\Gm@vrule{\vrule width 0.2pt height\textheight depth\z@}%
874 \def\Gm@hrule{\hrule height 0.2pt depth\z@ width\textwidth}%
875 \def\Gm@hruled{\hrule height\z@ depth0.2pt width\textwidth}%
876 \newcommand*{\Gm@vrules@mpi}{%
877   \hb@xt@{\tempdima}{\llap{\Gm@vrule}\ignorespaces
878   \hskip \textwidth\Gm@vrule\hskip \marginparsep
879   \llap{\Gm@vrule}\hfil\Gm@vrule}}%
880 \newcommand*{\Gm@vrules@mpii}{%
881   \hb@xt@{\tempdima}{\hskip-\marginparwidth\hskip-\marginparsep
882   \llap{\Gm@vrule}\ignorespaces
883   \hskip \marginparwidth\rlap{\Gm@vrule}\hskip \marginparsep
884   \llap{\Gm@vrule}\hskip\textwidth\rlap{\Gm@vrule}\hss}}%
885 \newcommand*{\Gm@pageframes}{%
886   \vb@xt@{\z@{%
887     \ifGm@showcrop
888       \vb@xt@{\z@{\vskip-1\Gm@truedimen in\vskip\Gm@layoutvoffset%
889       \hb@xt@{\z@{\hskip-1\Gm@truedimen in\hskip\Gm@layouthoffset%
890       \vb@xt@\Gm@layoutheight{%
891         \let\protect\relax
892         \hb@xt@\Gm@layoutwidth{\Gm@cropmark(1,0,0,-1)\hfil\Gm@cropmark(-1,0,0,-1)}}%
893         \vfil
894         \hb@xt@\Gm@layoutwidth{\Gm@cropmark(1,0,0,1)\hfil\Gm@cropmark(-1,0,0,1)}}%
895       \hss}}%
896     \vss}%
897   \fi%
898   \ifGm@showframe
899     \if@twoside
900       \ifodd\count\z@

```

```

901 \let\@themargin\oddsidemargin
902 \else
903 \let\@themargin\evensidemargin
904 \fi
905 \fi
906 \moveright\@themargin%
907 \vb@xt@\z{%
908 \vskip\topmargin\vb@xt@\z{\vss\Gm@hrule}%
909 \vskip\headheight\vb@xt@\z{\vss\Gm@hruled}%
910 \vskip\headsep\vb@xt@\z{\vss\Gm@hrule}%
911 \@tempdima\textwidth
912 \advance\@tempdima by \marginparsep
913 \advance\@tempdima by \marginparwidth
914 \if@mparswitch
915 \ifodd\count\z@
916 \Gm@vrules@mpi
917 \else
918 \Gm@vrules@mpii
919 \fi
920 \else
921 \Gm@vrules@mpi
922 \fi
923 \vb@xt@\z{\vss\Gm@hrule}%
924 \vskip\footskip\vb@xt@\z{\vss\Gm@hruled}%
925 \vss}%
926 \fi%
927 }}%

```

\ProcessOptionsKV This macro can process class and package options using ‘key=value’ scheme. Only class options are processed with an optional argument ‘c’, package options with ‘p’, and both of them by default.

```

928 \def\ProcessOptionsKV{\@ifnextchar[%]
929 {\@ProcessOptionsKV}{\@ProcessOptionsKV[]}}%
930 \def\@ProcessOptionsKV[#1]#2{%
931 \let\@tempa\@empty
932 \@tempcnta\z@
933 \if#1p\@tempcnta\@ne\else\if#1c\@tempcnta\tw\fi\fi
934 \ifodd\@tempcnta
935 \edef\@tempa{\@optionlist{\@currname.\@current}}%
936 \else
937 \@for\CurrentOption:=\@classoptionslist\do{%
938 \ifundefined{KV@#2@\CurrentOption}%
939 {\@edef\@tempa{\@tempa,\CurrentOption,}}}%
940 \ifnum\@tempcnta=\z@
941 \edef\@tempa{\@tempa,\@optionlist{\@currname.\@current}}%
942 \fi
943 \fi
944 \edef\@tempa{\noexpand\setkeys{#2}{\@tempa}}%
945 \@tempa
946 \AtEndOfPackage{\let\@unprocessedoptions\relax}}%
947 \def\Gm@setkeys{\setkeys{Gm}}%

```

\Gm@processconf \ExecuteOptions is replaced with \Gm@setkey to make it possible to deal with ‘<key>=<value>’ as its argument.

```

948 \def\Gm@processconfig{%
949 \let\Gm@origExecuteOptions\ExecuteOptions
950 \let\ExecuteOptions\Gm@setkeys
951 \InputIfFileExists{geometry.cfg}{-}{-}
952 \let\ExecuteOptions\Gm@origExecuteOptions}%

```

The original page layout before loading geometry is saved here. \Gm@restore@org is defined here for reset option.

```

953 \Gm@save
954 \edef\Gm@restore@org{\Gm@restore}%
955 \Gm@initall

```


Processing config file.

956 \Gm@processconfig

The optional arguments to \documentclass are processed here.

957 \ProcessOptionsKV[c]{Gm}%

Paper dimensions given by class default are stored.

958 \Gm@setdefaultpaper

The optional arguments to \usepackage are processed here.

959 \ProcessOptionsKV[p]{Gm}%

Actual settings and calculation for layout dimensions are processed.

960 \Gm@process

\AtBeginDocument The processes for `verbose`, `showframe` and drivers are added to \AtBeginDocument. \Gm@restore@org is redefined here with the paper size specified in the preamble for \newgeometry to use it. This should be done before magnifying the paper size with \mag because the layout calculation would be affected by changing the paper size.

961 \AtBeginDocument{%

962 \Gm@savelength{paperwidth}%

963 \Gm@savelength{paperheight}%

964 \edef\Gm@restore@org{\Gm@restore}%

The original paper size is used if `resetpaper`.

965 \ifGm@resetpaper

966 \edef\Gm@pw{\Gm@orgpw}%

967 \edef\Gm@ph{\Gm@orgph}%

968 \else

969 \edef\Gm@pw{the\paperwidth}%

970 \edef\Gm@ph{the\paperheight}%

971 \fi

If `pass` is not set, the paper size is multiplied according to the specified `mag`.

972 \ifGm@pass\else

973 \ifnum\mag=\@m\else

974 \Gm@magtooffset

975 \divide\paperwidth\@m

976 \multiply\paperwidth\the\mag

977 \divide\paperheight\@m

978 \multiply\paperheight\the\mag

979 \fi

980 \fi

Checking the driver options.

981 \Gm@detectdriver

If `xetex` and \pdfpagewidth is defined, \pdfpagewidth and \pdfpageheight would be set.

982 \ifx\Gm@driver\Gm@xetex

983 \@ifundefined{pdfpagewidth}{}{%

984 \setlength\pdfpagewidth{\Gm@pw}%

985 \setlength\pdfpageheight{\Gm@ph}}%

986 \ifnum\mag=\@m\else

987 \ifx\Gm@truedimen\Gm@true

988 \setlength\paperwidth{\Gm@pw}%

989 \setlength\paperheight{\Gm@ph}}%

990 \fi

991 \fi

992 \fi

If `pdftex` is set to `true`, pdf-commands are set properly. To avoid `pdftex` magnification problem, \pdfhorigin and \pdfvorigin are adjusted for \mag.

993 \ifx\Gm@driver\Gm@pdftex

994 \@ifundefined{pdfpagewidth}{}{%

995 \setlength\pdfpagewidth{\Gm@pw}%

996 \setlength\pdfpageheight{\Gm@ph}}%

997 \ifnum\mag=\@m\else

998 \@tempdima=\mag sp%

```

999      \@ifundefined{pdfhorigin}{\%
1000      \divide\pdfhorigin\@tempdima
1001      \multiply\pdfhorigin\@m
1002      \divide\pdfvorigin\@tempdima
1003      \multiply\pdfvorigin\@m}%
1004      \ifx\Gm@truedimen\Gm@true
1005      \setlength\paperwidth{\Gm@pw}%
1006      \setlength\paperheight{\Gm@ph}%
1007      \fi
1008      \fi
1009      \fi

```

With V_TE_X environment, V_TE_X variables are set here.

```

1010      \ifx\Gm@driver\Gm@vtex
1011      \@ifundefined{mediawidth}{\%
1012      \mediawidth=\paperwidth
1013      \mediaheight=\paperheight}%
1014      \ifvtexdvi
1015      \AtBeginDvi{\special{papersize=\the\paperwidth,\the\paperheight}}%
1016      \fi
1017      \fi

```

If dvips or dvipdfm is specified, paper size is embedded in dvi file with `\special`. For dvips, a landscape correction is added because a landscape document converted by dvips is upside-down in PostScript viewers.

```

1018      \ifx\Gm@driver\Gm@dvips
1019      \AtBeginDvi{\special{papersize=\the\paperwidth,\the\paperheight}}%
1020      \ifx\Gm@driver\Gm@dvips\ifGm@landscape
1021      \AtBeginDvi{\special{! /landplus90 true store}}%
1022      \fi\fi

```

If dvipdfm is specified and atbegshi package in ‘oberdiek’ bundle is loaded, `\AtBeginShipoutFirst` is used instead of `\AtBeginDvi` for compatibility with hyperref and dvipdfm program.

```

1023      \else\ifx\Gm@driver\Gm@dvipdfm
1024      \ifcase\ifx\AtBeginShipoutFirst\relax\@ne\else
1025      \ifx\AtBeginShipoutFirst\@undefined\@ne\else\z@\fi\fi
1026      \AtBeginShipoutFirst{\special{papersize=\the\paperwidth,\the\paperheight}}%
1027      \or
1028      \AtBeginDvi{\special{papersize=\the\paperwidth,\the\paperheight}}%
1029      \fi
1030      \fi\fi

```

Page frames are shipped out when `showframe=true`, cropmarks for `showcrop=true` on each page. The atbegshi package is used for overloading `\shipout`.

```

1031      \@tempwafalse
1032      \ifGm@showframe
1033      \@tempwattrue
1034      \else\ifGm@showcrop
1035      \@tempwattrue
1036      \fi\fi
1037      \if@tempswa
1038      \RequirePackage{atbegshi}%
1039      \AtBeginShipout{\setbox\AtBeginShipoutBox=\vbox{%
1040      \baselineskip\z@skip\lineskip\z@skip\lineskiplimit\z@
1041      \Gm@pageframes\box\AtBeginShipoutBox}}%
1042      \fi

```

The layout dimensions for `\restoregeometry` are saved at the end of the `\AtBeginDocument`.

```

1043      \Gm@save
1044      \edef\Gm@restore@pkg{\Gm@restore}%

```

The package checks whether or not the marginpars overrun the page, if `verbose` and unless `pass`.

```

1045      \ifGm@verbose\ifGm@pass\else\Gm@checkmp\fi\fi

```

`\Gm@showparams` puts the resulting parameters and dimensions into the log file. With `verbose`, they are shown on the terminal as well.

```

1046      \Gm@showparams{preamble}%

```

The following lines free the memories no longer needed.

```
1047 \let\Gm@pw\relax
1048 \let\Gm@ph\relax
1049 }% end of \AtBeginDocument
```

\geometry The macro `\geometry` can be called multiple times in the preamble (before `\begin{document}`).

```
1050 \newcommand{\geometry}[1]{%
1051   \Gm@clean
1052   \setkeys{Gm}{#1}%
1053   \Gm@process}%
1054 \@onlypreamble\geometry
```

\Gm@changelayout The macro, which can be called from `\newgeometry`, `\restoregeometry` and `\loadgeometry`, changes the layout in the middle of the document.

```
1055 \DeclareRobustCommand\Gm@changelayout{%
1056   \setlength{\@colht}{\textheight}
1057   \setlength{\@colroom}{\textheight}%
1058   \setlength{\vsize}{\textheight}
1059   \setlength{\columnwidth}{\textwidth}%
1060   \if@twocolumn%
1061     \advance\columnwidth-\columnsep
1062     \divide\columnwidth\tw@%
1063     \@firstcolumntrue%
1064   \fi%
1065   \setlength{\hsize}{\columnwidth}%
1066   \setlength{\linewidth}{\hsize}}%
```

\newgeometry The macro `\newgeometry`, which changes the layout, can be used only in the document. It would reset the options specified in the preamble except for paper size options and `\mag`.

```
1067 \newcommand{\newgeometry}[1]{%
1068   \clearpage
1069   \Gm@restore@org
1070   \Gm@initnewgm
1071   \Gm@newgmtrue
1072   \setkeys{Gm}{#1}%
1073   \Gm@newgmfalse
1074   \Gm@process
1075   \ifnum\mag=\@m\else\Gm@magtooffset\fi
1076   \Gm@changelayout
1077   \Gm@showparams{newgeometry}}%
```

\restoregeometry The macro restores the resulting layout specified in the preamble, namely the first-page layout right after `\begin{document}`.

```
1078 \newcommand{\restoregeometry}{%
1079   \clearpage
1080   \Gm@restore@pkg
1081   \Gm@changelayout}%

```

\savegeometry The macro saves the layout with the name specified with the argument. The saved layout can be loaded with `\loadgeometry{<name>}`.

```
1082 \newcommand*{\savegeometry}[1]{%
1083   \Gm@save
1084   \expandafter\edef\csname Gm@restore@@#1\endcsname{\Gm@restore}}%
```

\loadgeometry The macro loads the layout saved with `\savegeometry{<name>}`. If the name is not found, the macro would warn it and do nothing for the layout.

```
1085 \newcommand*{\loadgeometry}[1]{%
1086   \clearpage
1087   \ifundefined{Gm@restore@@#1}{%
1088     \PackageError{geometry}{%
1089       \string\loadgeometry : name ‘#1’ undefined}{%
1090       The name ‘#1’ should be predefined with \string\savegeometry}%
1091   }{\@nameuse{Gm@restore@@#1}%
1092   \Gm@changelayout}}%
1093 \end{package}
```

12 Config file

In the configuration file `geometry.cfg`, one can use `\ExecuteOptions` to set the site or user default settings.

```
1094 (*config)
1095 %<<SAVE_INTACT
1096
1097 % Uncomment and edit the line below to set default options.
1098 %\ExecuteOptions{a4paper}
1099
1100 %SAVE_INTACT
1101 (/config)
```

13 Sample file

Here is a sample document for the `geometry` package.

```
1102 (*samples)
1103 %<<SAVE_INTACT
1104 \documentclass[12pt]{article}% uses letterpaper by default
1105 % \documentclass[12pt,a4paper]{article}% for A4 paper
1106 %-----
1107 % Edit and uncomment one of the settings below
1108 %-----
1109 % \usepackage{geometry}
1110 % \usepackage[centering]{geometry}
1111 % \usepackage[width=10cm,vscale=.7]{geometry}
1112 % \usepackage[margin=1cm, papersize={12cm,19cm}, resetpaper]{geometry}
1113 % \usepackage[margin=1cm,includeheadfoot]{geometry}
1114 % \usepackage[margin=1cm,includeheadfoot,includemp]{geometry}
1115 % \usepackage[margin=1cm,bindingoffset=1cm,twoside]{geometry}
1116 % \usepackage[hmarginratio=2:1, vmargin=2cm]{geometry}
1117 % \usepackage[hscale=0.5,twoside]{geometry}
1118 % \usepackage[hscale=0.5,asymmetric]{geometry}
1119 % \usepackage[hscale=0.5,heightrounded]{geometry}
1120 % \usepackage[left=1cm,right=4cm,top=2cm,includefoot]{geometry}
1121 % \usepackage[lines=20,left=2cm,right=6cm,top=2cm,twoside]{geometry}
1122 % \usepackage[width=15cm, marginparwidth=3cm, includemp]{geometry}
1123 % \usepackage[hdivide={1cm,,2cm}, vdivide={3cm,8in,}, nohead]{geometry}
1124 % \usepackage[headsep=20pt, head=40pt,foot=20pt,includeheadfoot]{geometry}
1125 % \usepackage[text={6in,8in}, top=2cm, left=2cm]{geometry}
1126 % \usepackage[centering,includemp,twoside,landscape]{geometry}
1127 % \usepackage[mag=1414,margin=2cm]{geometry}
1128 % \usepackage[mag=1414,margin=2truecm,truedimen]{geometry}
1129 % \usepackage[a5paper, landscape, twocolumn, twoside,
1130 % left=2cm, hmarginratio=2:1, includemp, marginparwidth=43pt,
1131 % bottom=1cm, foot=.7cm, includefoot, textheight=11cm, heightrounded,
1132 % columnsep=1cm,verbose]{geometry}
1133 %-----
1134 % No need to change below
1135 %-----
1136 \geometry{verbose,showframe}% the options appended.
1137 \usepackage{lipsum}% for dummy text of 150 paragraphs
1138 \newcommand\mynote{\marginpar[\raggedright
1139 A sample margin note in the left side.]}%
1140 {\raggedright A sample margin note.}}%
1141 \newcommand\myfootnote{\footnote{This is a sample footnote text.}}
1142 \begin{document}
1143 \lipsum[1-2]\mynote\lipsum[3-4]\mynote
1144 \lipsum[5-11]\mynote\lipsum[12]\myfootnote
1145 \lipsum[13-22]\mynote\lipsum[23-32]
1146 \end{document}
1147 %SAVE_INTACT
1148 (/samples)
```