KOMA-Script

a versatile $\mathrm{\LaTeX}\,2_\varepsilon$ bundle

The Guide

KOMA-Script

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Free screen version without any optimization of paragraph and page breaks

To All Friends of Typography!

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Introduction

1.1. Preface

The KOMA-Script bundle is actually several packages and classes. It provides counterparts or replacements for the standard LaTeX classes such as *article*, *book*, etc. (see chapter 3), but offers many additional features and its own unique look and feel.

The KOMA-Script user guide is intended to serve the advanced as well as the inexperienced LaTeX user and is accordingly quite large. The result is a compromise and we hope that you will keep this in mind when using it. Your suggestions for improvement are, of course, always welcome.

1.2. Structure of the Guide

The KOMA-Script user guide is not intended to be a LaTeX primer. Those new to LaTeX should look at *The Not So Short Introduction to LaTeX 2ε* [OPHS99] or *LaTeX 2ε for Authors* [Tea01] or a LaTeX reference book. You will also find useful information in the many LaTeX FAQs, including the *TeX Frequently Asked Questions on the Web* [FAQ].

In this guide you will find supplemental information about LaTeX and KOMA-Script in (sans serif) paragraphs like this one. The information given in these explanatory sections is not essential for using KOMA-Script, but if you experience problems you should take a look at it — particularly before sending a bug report.

If you are only interested in using a single KOMA-Script class or package you can probably successfully avoid reading the entire guide. Each class and package typically has its own chapter; however, the three main classes (scrbook, scrrprt, and scrartcl) are introduced together in chapter three. Where an example or note only applies to one or two of the three classes,

Like it is called out in the margin.

this. The primary documentation for KOMA-Script is in German and has been translated for your convenience; like most of the LaTeX world, its commands, environments, options, etc., are in English. In a few cases, the name of a command may sound a little strange, but even so, we hope and believe that with the help of this guide KOMA-Script will be usable and useful to you.

1.3. History of KOMA-Script

In the early 1990s, Frank Neukam needed a method to publish an instructor's lecture notes. At that time LaTeX was LaTeX2.09 and there was no distinction between classes and packages — there were only *styles*. Frank felt that the standard document styles were not good enough for his work; he wanted additional commands and environments. At the same time he was interested in typography and, after reading Tschichold's *Ausgewählte Aufsätze über Fragen der Gestalt des Buches und der Typographie* (Selected Articles on the Problems of Book Design and Typography) [Tsc87], he decided to write his own document style — and not just a one-time solution to his lecture notes, but an entire style family, one specifically designed for European and German typography. Thus Script was born.

Markus Kohm, the developer of KOMA-Script, came across Script in December 1992 and added an option to use the A5 paper format. This and other changes were then incorporated into Script-2, released by Frank in December 1993.

Beginning in mid-1994, LaTeX 2_ε became available and brought with it many changes. Users of Script-2 were faced with either limiting their usage to LaTeX 2_ε's compatibility mode or giving up Script altogether. This situation led Markus to put together a new LaTeX 2_ε package, released on 7 July 1994 as KOMA-Script; a few months later Frank declared KOMA-Script to be the official successor to Script. KOMA-Script originally provided no *letter* class, but this deficiency was soon remedied by Axel Kielhorn, and the result became part of KOMA-Script in December 1994. Axel also wrote the first true German-language user guide, which was followed by an English-language guide by Werner Lemberg.

Since then much time has passed. LaTeX has changed in only minor ways, but the LaTeX landscape has changed a great deal; many new packages and classes are now available and KOMA-Script itself has grown far beyond what it was in 1994. The initial goal was to provide good LaTeX classes for German-language authors, but today its primary purpose is to provide more-flexible alternatives to the standard classes. KOMA-Script's success has led to e-mail from users all over the world, and this has led to many new macros — all needing documentation; hence this "small guide."

1.4. Special Thanks

Acknowledgements in the introduction? No, the proper acknowledgements can be found in the addendum. My comments here are not intended for

the authors of this guide — and those thanks should rightly come from you, the reader, anyhow. I, the author of KOMA-Script, would like to extend my personal thanks to Frank Neukam. Without his Script family, KOMA-Script would not have come about. I am indebted to the many persons who have contributed to KOMA-Script, but with their indulgence, I would like to specifically mention Jens-Uwe Morawski and Torsten Krüger. The English translation of the guide is, among many other things, due to Jens's untiring commitment. Torsten was the best beta-tester I ever had. His work has particularly enhanced the usability of scrlttr2 und scrpage2. Many thanks to all who encouraged me to go on, to make things better and less error-prone, or to implement additional features.

Thanks go as well to DANTE, Deutschsprachige Anwendervereinigung TeX e.V, (the German-Language TeX User Group). Without the DANTE server, KOMA-Script could not have been released and distributed. Thanks as well to everybody in the TeX newsgroups and mailing lists who answer questions and have helped me to provide support for KOMA-Script.

1.5. Legal Notes

KOMA-Script was released under the LaTeX Project Public License. You will find it in the file lppl.txt. An unofficial German-language translation is also available in lppl-de.txt and is valid for all German-speaking countries.

This document and the KOMA-Script bundle are provided "as is" and without warranty of any kind.

1.6. Installation

Installation information can be found in the file INSTALL.txt. You should also read the documentation that comes with the TeX distribution you are using.

1.7. Bugreports and Other Requests

If you think you have found an error in the documentation or a bug in one of the KOMA-Script classes, one of the KOMA-Script packages, or another part of KOMA-Script, please do the following: first have a look on CTAN to see if a newer version of KOMA-Script is available; in this case install the applicable section and try again.

   If you are using the most recent version of KOMA-Script and still have
a bug, please provide a short LaTeX document that demonstrates the prob-
lem. You should only use the packages and definitions needed to demon-
strate the problem; do not use any unusual packages.

   By preparing such an example it often becomes clear whether the prob-
lem is truly a KOMA-Script bug or something else. Please report KOMA-
Script (only) bugs to the author of KOMA-Script. Please use komabug.tex,
an interactive LaTeX document, to generate your bug report and send it
to the address you may find at komabug.tex.

   If you want to ask your question in a newsgroup or mailing list, you
should also include such an example as part of your question, but in this
case, using komabug.tex is not necessary. To find out the version numbers
of all packages in use, simply put \listfiles in the preamble of your
example and read the end of the log-file.

1.8. Additional Information

Once you become an experienced KOMA-Script user you may want to look
at some more advanced examples and information. These you will find on
the KOMA-Script documentation web site [KDP]. The main language of
the site is German, but nevertheless English is welcome.

Construction of the Page Layout with typearea

2.1. Fundamentals of Page Layout

If you look at a single page of a book or other printed materials, you will see that it consists of top, foot, left and right margins, a (running) head area, the text block and a (running) foot area. Looking closer, there is space between the head area and the text block and between the text block and the foot area. The relations between these areas are called the *page layout*.

The literature offers and discusses different algorithms and heuristic approaches for constructing a good page layout. Often, mentioned is an approach which involves diagonals and their intersections. The result is a page where the text block proportions are related to the proportions of the *page*. In a single-sided document, the left and the right margin should have equal widths. The relation of the upper margin to the lower margin should be 1:2. In a double-sided document (e. g. a book) however, the complete inner margin (the margin at the spine) should be the same as each of the two outer margins.

In the previous paragraph, we mentioned and emphasized the *page*. Erroneously, it is often thought that the format of the page means the format of the paper. However, if you look at a bound document, it is obvious that part of the paper vanishes in the binding and that is not part of the visible page. It is not the format of the paper which is important in the layout of a page, it is the impression of the visible page to the reader. Therefore, it is clear that the calculation of the page layout must account for the "lost" paper in the binding and add this amount to the width of the inner margin. This is called the *binding correction*.

The binding correction depends on the process of actually producing the document and thus cannot be calculated in general. Every production process needs its own parameter. In professional binding, this parameter is not too important since the printing is done on oversized paper which is then cropped to the right size. The cropping is done in a way so that the relations for the visible double-sided page are as explained above.

Now we know about the relations of the individual parts of a page. However, we do not yet know about the width and the height of the text block. Once we know one of these values, we can calculate all the other values from the

paper format and the page format or the binding correction.

$$
\begin{aligned}
\textit{textblock height} : \textit{textblock width} &= \textit{page height} : \textit{page width} \\
\textit{page width} &= \textit{paper width} - \textit{binding correction} \\
\textit{top margin} + \textit{foot margin} &= \textit{page height} - \textit{textblock height} \\
\textit{top margin} : \textit{foot margin} &= 1 : 2 \\
\textit{left margin} : \textit{right margin} &= 1 : 1 \\
\textit{half inner margin} &= \frac{1}{2}\textit{outer margin} + \textit{binding correction}
\end{aligned}
$$

The values *left margin* and *right margin* only exist in a single-sided document while *inner margin* and *outer margin* only exist in a double-sided document. In these equations, we work with *half inner margin* since the full inner margin belongs to a double-page. Thus, one page has half of the inner margin.

The question of the width of the textblock is also discussed in the literature. The optimum width depends on several factors:

- size, width, type of the used font

- line spacing

- word length

- available room

The importance of the font becomes clear once you think about serifs. Serifs are fine lines finishing off the letters. Letters whose main strokes run orthogonal to the text line disturb the flow more than they lead the eye along the line. Those letters have serifs at the ends of the vertical strokes, however, so the horizontal serifs lead the eye horizontally too. In addition, it helps the eye to find the beginning of the next line. Thus, the line length for a serif font can be slightly longer than for a sans serif font.

In LaTeX, the line spacing is about 20% of the font size. With commands like \linespread or, better, packages like setspace, the line spacing can be changed. A wider line spacing helps the eye to follow the line. A very wide line spacing, on the other hand, disturbs reading because the eye has to move a wide distance between lines. Also, the reader gets uncomfortable because of the visible stripe effect. The uniform gray value of the page gets spoiled. Still, with a wider line spacing, the lines can be longer.

The literature gives different values for good line lengths, depending on the author. To some extent, this is due to the native language of the author.

Since the eye jumps from word to word, short words make this task easier. Not considering language and font, a line length of 60 to 70 letters, including spaces and punctuation, is a usable compromise. This requires well-chosen line spacing, but LaTeX's default is usually good enough.

Before looking at the actual construction of the page layout, there are some minor things to know. LaTeX doesn't start the first line of the text block at the upper edge of the text block, but with a defined distance from it. Also, LaTeX knows the commands \raggedbottom and \flushbottom. \raggedbottom specifies that the last line of a page should be positioned wherever it was calculated. This means that the position of this line can be different on each page, up to the height of one line. In double-sided documents this is usually undesirable. \flushbottom makes sure that the last line is always at the lower edge of the text block. To achieve this, LaTeX sometimes needs to stretch vertical glue more than allowed. Paragraph skip is such a stretchable, vertical glue, even when set to zero. In order to not stretch the paragraph skip on normal pages where it is the only stretchable glue, the height of the text block should be a multiple of the height of the text line, including the distance from the upper edge of the text block to the first line.

This concludes the introduction to page layout as handled by KOMA-Script. Now, we can begin with the actual construction.

2.2. Page Layout Construction by Dividing

The easiest way to make sure that the text area has the same ratios as the page is as follows: First, you subtract the binding correction *BCOR* from the inner edge of the paper. Then you divide the rest of the page vertically into *DIV* rows of equal height. Next, you divide the page horizontally into the same number (*DIV*) of columns. Then you take the uppermost row as the upper margin and the two lowermost rows as the lower margin. If you print double-sided, you also take the innermost column as the inner margin and the two outermost columns as the outer margin. Then, you add the binding correction *BCOR* to the inner margin. The remainder of the page is the text area. The width and the height of the text area result automatically from the number of rows and columns *DIV*. Since the margins always need three rows/columns, *DIV* must be necessarily greater than three. In order that the text area occupy at least twice as much space as the margins, *DIV* should really be equal to or greater than 9. With this value, the construction is known as the *classical division factor of 9*.

In KOMA-Script, this kind of construction is implemented in the typearea package. For A4 paper, *DIV* is predefined according to the font size (see

table 2.2). If there is no binding correction ($BCOR = 0\,\text{pt}$), the results roughly match the values of table 2.1.

In addition to the predefined values, you can specify *BCOR* and *DIV* as options when loading the package (see section 2.4). There is also a command to explicitly calculate the type area by providing these values as parameters (also see section 2.4).

The typearea package can determine the optimal value of *DIV* for the font used automatically. Again, see section 2.4.

2.3. Page Layout Construction by Drawing a Circle

In addition to the construction method previously described, a somewhat more classical method can be found in the literature. The aim of this method is not only identical ratios in the page proportions, but it is considered optimal when the height of the text block is the same the width of the page. The exact method is described in [Tsc87].

A disadvantage of this late Dark Ages method is that the width of the text area is no longer dependent on the font. Thus, one doesn't choose the text area to match the font, but the author or typesetter has to choose the font according to the text area. This can be considered a "must".

In the typearea package this construction is changed slightly. By using a special (normally meaningless) *DIV* value or a special package option, a *DIV* value is chosen to match the perfect values as closely as possible. See also section 2.4.

2.4. Options and Macros to Influence the Page Layout

The package typearea offers two different user interfaces to influence type area construction. The first method is to load the package with options. For information on how to load packages and to give package options, please refer to the LaTeX literature, e. g. [OPHS99] and [Tea01], or the examples given here. Since the typearea package is loaded automatically when using the KOMA-Script main classes, the package options can be given as class options (see section 3.1).

| BCOR*Correction* |

With the BCOR*Correction* option you specify the absolute value of the binding correction, i. e., the width of the area that is used for the binding, thus "lost" from the paper width.

This value will be used in the layout calculation automatically and will be added to the inner or left margin respectively. You can use any valid TeX unit for `Correction`.

Example: Assume you want to produce a financial report, which is to be printed on A4 paper and bound in a folder. The rim of the folder covers 7.5 mm. Since the report is thin, only an additional 0.75 mm are lost by folding when leafing through the pages. You would use the following commands:

```
\documentclass[a4paper]{report}
\usepackage[BCOR8.25mm]{typearea}
```

or, using a KOMA-Script class:

```
\documentclass[a4paper,BCOR8.25mm]{scrreprt}
```

Please note: if you use one of the KOMA-Script classes, this option must be given as a class option. If you use another class, this only works if the class has explicit support for typearea. So when using the standard classes, you need to give the option when you load typearea. You can also use `\PassOptionsToPackage` (see [Tea99]) before you are loading typearea, this always works.

DIV*Factor*

DIV*Factor* defines the number of stripes the page is split into when the page layout is constructed. The exact method can be found in section 2.2, but the most important thing is this: the higher *Factor*, the bigger the resulting text area, and the smaller the margins. For *Factor*, you can use any integer value larger than 4. Please note that depending on your other options a very high value for *Factor* can result in problems: for instance, in extreme cases, the running title might be outside the actual page area. So if you use DIV*Factor*, it is your own responsibility to choose a typographically acceptable line length and to pay attention to the other parameters.

In table 2.1 you'll find some page layout values for the page format A4 without binding correction, with varying *DIV* factors. Font size is not taken into account.

Example: Imagine you are writing meeting minutes with the protocol[1]

---

[1]The class protocol is hypothetical. This manual considers the ideal case where you have a special class for every use.

Table 2.1.: Page layout values depending on *DIV* for A4

	Text area		Margins	
DIV	Width [mm]	Height [mm]	upper [mm]	inner [mm]
6	105.00	148.50	49.50	35.00
7	120.00	169.71	42.43	30.00
8	131.25	185.63	37.13	26.25
9	140.00	198.00	33.00	23.33
10	147.00	207.90	29.70	21.00
11	152.73	216.00	27.00	19.09
12	157.50	222.75	24.75	17.50
13	161.54	228.46	22.85	16.15
14	165.00	233.36	21.21	15.00
15	168.00	237.60	19.80	14.00

class. The whole thing is supposed to be double-sided. In your company, the Bookman font in 12 pt is used. This standard PostScript font is activated in LaTeX with the command \usepackage{*bookman*}. Bookman runs very wide, that means, the characters are wide in relation to its height. Because of that, the default for the *DIV* value in typearea is too small for you. Instead of 12, you want 15. The minutes will not be bound but punched and filed into a folder, so you don't need any binding correction. Thus, you write:

```
\documentclass[a4paper,twoside]{protocol}
\usepackage{bookman}
\usepackage[DIV15]{typearea}
```

After you are done you are told that the minutes will be collected and bound as a book at the end of the year. The binding will be a simple glue binding carried out in a copy shop, since it is done just for ISO 9000 anyway and nobody will ever bother to look at the minutes again. For binding you need 12 mm in average. So you change the options for typearea accordingly and use the ISO 9000 document class:

```
\documentclass[a4paper,twoside]{iso9000p}
\usepackage{bookman}
```

Table 2.2.: *DIV* defaults for A4

Base font size:	10 pt	11 pt	12 pt
DIV:	8	10	12

```
\usepackage[DIV15,BCOR12mm]{typearea}
```

Of course, you can also use a KOMA-Script class here:

```
\documentclass[twoside,DIV15,BCOR12mm]{scrartcl↩
    }
\usepackage{bookman}
```

The option a4paper was omitted using class scrartcl, because it is the default for all KOMA-Script classes.

Please note: if you use one of the KOMA-Script classes, BCOR must be given as a class option. If you use another class, this only works if the class has explicit support for typearea. So when using the standard classes, you need to give BCOR when you load typearea. You can use \PassOptionsToPackage (see [Tea99]) too before you are loading typearea, this always works.

```
DIVcalc
DIVclassic
```

As mentioned in section 2.2, only paper format A4 has fixed defaults for the *DIV* value. These are listed in table 2.2. If you choose a different paper format, typearea calculates a good *DIV* value itself. Of course, you can also have it calculate that for A4: use DIVcalc instead of DIV*Factor*. This works for all other paper formats as well. If you want to use the automatic calculation, this is even very useful, since you can then override the defaults that are given in a configuration file (see section 2.7) with this option.

The classic construction method as described in section 2.3 can also be selected (with the difference that a good *DIV* value is chosen). In this case, instead of DIV*Factor* or DIVcalc, use the option DIVclassic.

Example: In the example for DIV*Factor* which used the Bookman font, there was the problem that we needed a *DIV* value which suited the font better. As a modification of the first example, this calculation can be left to typearea:

```
\documentclass[a4paper,twoside]{protocol}
\usepackage{bookman}
\usepackage[DIVcalc]{typearea}
```

> `\typearea[BCOR]{DIV}`

If you followed the examples till here, you'll ask yourself how one can make the calculation of DIV depend on the selected font when one uses one of the KOMA-Script classes. In that case the options to typearea would have to be made before loading the e. g. bookman package. So typearea could only calculate the page layout for the standard font, but not for the Bookman font which is really to be used. Therefore, after evaluating the options, typearea calculates the page layout by using the \typearea[$BCOR$]{DIV} command. Here, the chosen $BCOR$ value is given as an optional parameter and DIV as a parameter. With the option DIVcalc, the (normally invalid) value 1 is given; with the option DIVclassic the (normally invalid) value 3. You can also call \typearea explicitly in the preamble.

Example: Let us assume again that we want to calculate a good page layout for the Bookman font. We also want to use a KOMA-Script class. This is possible using the \typearea command with DIVcalc = 1 as DIV parameter:

```
\documentclass[BCOR12mm,DIVcalc,twoside]{↩
    scrartcl}
\usepackage{bookman}
\typearea[12mm]{1}% same as class options above
```

Again option a4paper was not used explicitly, because it's the default of the KOMA-Script class scrartcl.

It would be ridiculous if one had to use the \typearea command with some pseudo-values, while the DIV option allows the use of DIVcalc and DIVclassic. Thus the \typearea also accepts symbolic values for the parameter DIV which are listed in table 2.3.

The \typearea also understands the symbolic values for the parameter $BCOR$ shown in table 2.4. Thus it is not neccesary to re-enter the current value.

Example: Thus calculating a good page layout for the Bookman font and a KOMA-Script class is easy when we use symbolic parameter values for $BCOR$ and DIV:

Table 2.3.: Available symbolic *DIV* values for `\typearea[BCOR]{DIV}`

`calc`

      re-calculate page layout and determine *DIV*.

`classic`

      re-calculate page layout using the classical method (circle).

`current`

      re-calculate page layout with current value of *DIV*.

`default`

      re-calculate page layout with default values for the current page and font size. If no default values exist, apply `calc`.

`last`

      re-calculate page layout using the same *DIV* argument, which was set last time.

```
\documentclass[BCOR12mm,DIVcalc,twoside]{←
    scrartcl}
\usepackage{bookman}
\typearea[current]{calc}
```

If we want to use a fixed value for *DIV* we can use either:

```
\documentclass[BCOR12mm,DIV11,twoside]{scrartcl←
    }
\usepackage{bookman}
\typearea[current]{last}
```

or the old method:

```
\documentclass[a4paper,twoside]{scrartcl}
\usepackage{bookman}
\typearea[12mm]{11}
```

Table 2.4.: Available symbolic *BCOR* values for `\typearea[BCOR]{DIV}`

`current`

      Re-calculate page layout using the current value for *BCOR*.

In the end it is a matter of personal taste which of these solutions you want to use.

Frequently the re-calculation of the page layout is necessary because the line spacing was changed. Since it is essential that an integer number of lines fit into the text area, any change in line spacing requires a re-calculation of page layout.

Example: Assume you want to write a thesis and university regulations require a font size of 10 pt with one and a half line spacing. LaTeX uses by default a line spacing of 2 pt at font size 10 pt (a line spacing of 1.2). Thus a stretch-factor of 1.25 is required. Let us also assume that binding correction needs 12 mm. Then you might use:

```
\documentclass[10pt,twoside,%
               BCOR12mm,DIVcalc]{scrreprt}
\linespread{1.25}
\typearea[current]{last}
```

\typearea automaticly calls \normalsize. So it is not neccessary to use \selectfont after \linespread to activate the changed line spacing before re-calculation of the page layout.

The same example again, using the setspace package (see [Tob00]):

```
\documentclass[10pt,twoside,%
               BCOR12mm,DIVcalc]{scrreprt}
\usepackage{setspace}
\onehalfspacing
\typearea[current]{last}
```

Using the setspace package simplifies things, because you no longer need to calculate the correct stretch-factor, and you no longer need the \selectfont macro.

In this context it is appropriate to point out that the line spacing should be reset for the title page. A complete example therefore would look like this:

```
\documentclass[10pt,twoside,%
               BCOR12mm,DIVcalc]{scrreprt}
\usepackage{setspace}
```

```
\onehalfspacing
\typearea[current]{last}
\begin{document}
\title{Title}
\author{Markus Kohm}
\begin{spacing}{1}
  \maketitle
  \tableofcontents
\end{spacing}
\chapter{Ok}
\end{document}
```

See also the notes in .

The command \typearea is currently defined in such a way that it is possible to change the page layout in the middle of a text. This however makes assumptions about the inner workings of the LaTeX kernel and changes some internal values and definitions of that kernel. There is some probability, but no guarantee that this will also work in future versions of LaTeX. It must be assumed that this method will not give correct results in LaTeX3. However, as author of KOMA-Script I expect considerable incompatibilities when we change to LaTeX3.

```
headinclude
headexclude
footinclude
footexclude
```

So far we have discussed how the page layout is calculated and what the ratios are between the borders and between borders and text area. However, one important question has not been answered: What constitutes the borders? This question appears trivial: Borders are those parts on the right, left, top and bottom which remain empty. But this is only half of it. Borders are not always empty. There could be marginals, for example (for the \marginpar command refer to [OPHS99] or section 3.6.5).

One could also ask, whether headers and footers belong to the upper and lower borders or to the text. This can not be answered unambiguously. Of course an empty footer or header belong to the borders, since they can not be distinguished from the rest of the border. A header or footer, that contains only a page number, will optically appear more like border. For the optical appearance it is not important whether headers or footers are easily recognised as such during reading. Important is only, how a well filled page appears when

viewed out of focus. You could use the glasses of your far-sighted grand parents, or, lacking those, adjust your vision to infinity and look at the page with one eye only. Those wearing spectacles will find this much easier, of course. If the footer contains not only the page number, but other material like a copyright notice, it will optically appear more like a part of the text body. This needs to be taken into account when calculating text layout.

For the header this is even more complicated. The header frequently contains running headings . In case of running headings with long chapter and section titles the header lines will be very long and appear to be part of the text body. This effect becomes even more significant when the header contains not only the chapter or section title but also the page number. With material on the right and left side, the header will no longer appear as empty border. If the length of the titles varies, the header may appear as border on one page and as text on another. However, this pages should not be treated differently under any circumstances, as this would lead to jumping headers. In this case it is probably best to count the header with the text.

The decision is easy when text and header or footer are separated from the text body by a line. This will give a "closed" appearance and header or footer become part of the text body. Remember: It is irrelevant that the line improves the optical separation of text and header or footer, important is only the appearance when viewed out of focus.

The typearea package can not make the decision whether or not to count headers and footers to the text body or the border. Options `headinclude` and `footinclude` cause the header or footer to be counted as text, options `headexclude` and `footexclude` cause them to be counted as border. If you are unsure about the correct setting, re-read above explanations. Default is usually `headexclude` and `footexclude`., but this can change depending on KOMA-Script class and KOMA-Script packages used (see).

> ```
> mpinclude
> mpexclude
> ```

v2.8q Besides documents where the head and foot is part of the text area, there are also documents where the margin-note area must be counted to the text body as well. The option `mpinclude` does exactly this. The effect is that one width-unit of the text body is taken for the margin-note area. Using option `mpexclude`, the default setting, then the normal margin is used for the margin-note area. The width of that area is one or one and a half width-unit, depending on whether one-sided or double-sided page layout has been chosen. The option `mpinclude` is mainly for experts and

so not recommended.

In the cases where the option `mpinclude` is used often a wider margin-note area is required. In many cases not the whole margin-note width should be part of the text area, for example if the margin is used for quotations. Such quotations are typeset as ragged text with the flushed side where the text body is. Since ragged text gives no homogeneous optical impression the long lines can reach right into the normal margin. This can be done using option `mpinclude` and by an enlargement of length `\marginparwidth` after the type area has been setup. The length can be easily enlarged with the command `\addtolength`. How much the the length has to be enlarged depends on the special situation and it requires some flair. Therefore the option is primarily for experts. Of course one can setup the margin-width to reach a third right into the normal margin, for example using

```
\setlength{\marginparwidth}{1.5\marginparwidth}
```

gives the desired result.

Currently there is no option to enlarge the margin by a given amount. The only solution is that the option `mpinclude` is not used, but after the type area has been calculated one reduces the width of the text body `\textwidth` and enlarges the margin width `\marginparwidth` by the same amount. Unfortunately, this can not be attended when automatic calculation of the *DIV* value is used. In contrast `DIVcalc` heeds `mpinclude`.

$\boxed{\textit{Value}\texttt{headlines}}$

We have seen how to calculate the text layout and how to specify whether header and footer are part of the text body or the borders. However, we still have to specify the height in particular of the header. This is achieved with the option `headlines`, which is preceded by the number of lines in the header. typearea uses a default of 1.25. This is a compromise, large enough for underlined headers (see) and small enough that the relative weight of the top border is not affected too much when the header is not underlined. Thus in most cases you may leave `headlines` at its default value and adapt it only in special cases.

Example: Assume that you want to use a header with two lines. Normally this would result in a "`overfull \vbox`" warning for each page. To prevent this from happening, the typearea package is told to calculate an appropriate page layout:

```
\documentclass[a4paper]{article}
\usepackage[2.1headlines]{typearea}
```

If you use a KOMA-Script class this must be given as a class option:

```
\documentclass[a4paper,2.1headlines]{scrartcl}
```

A tool that can be used to define the contents of a header with two lines is described in chapter 4.

If you use a KOMA-Script class, this option must be given as class option. With other classes this works only, if these classes explicitly supports typearea. If you use the standard classes, the option must be given when loading typearea. \PassOptionsToPackage will work in both cases (see also [Tea99]).

```
\areaset[BCOR]{Width}{Height}
```

So far we have seen how a good or even very good page layout is calculated and how the typearea package can support these calculations, giving you at the same time the freedom to adapt the layout to your needs. However, there are cases where the text body has to fit exactly into specified dimensions. At the same time the borders should be well spaced and a binding correction should be possible. The typearea package offers the command \areaset for this purpose. As parameters this command accepts the binding correction and the width and height of the text body. Width and position of the borders will then be calculated automatically, taking account of the options headinclude, headexclude, footinclude and footexclude where needed.

Example: Assume a text, printed on A4 paper, should have a width of exactly 60 characters of typewriter font and a height of exactly 30 lines. This could be achieved as follows:

```
\documentclass[a4paper,11pt]{article}
\usepackage{typearea}
\newlength{\CharsLX}% Width of 60 characters
\newlength{\LinesXXX}% Height of 30 lines
\settowidth{\CharsLX}{\texttt{1234567890}}
\setlength{\CharsLX}{6\CharsLX}
\setlength{\LinesXXX}{\topskip}
\addtolength{\LinesXXX}{29\baselineskip}
\areaset{\CharsLX}{\LinesXXX}
```

> You need only 29 instead of 30, because the base line of the topmost text line is \topskip below the top margin of the type area.
>
> A poetry book with a square text body with a page length of 15 cm and a binding correction of 1 cm could be achieved like this:
>
> ```
> \documentclass{gedichte}
> \usepackage{typearea}
> \areaset[1cm]{15cm}{15cm}
> ```

The typearea package was not made to set up predefined margin values. If you have to do so you may use package geometry (see [Ume00]).

2.5. Options and Macros for Paper Format Selection

The LaTeX standard classes support the options a4paper, a5paper, b5paper, letterpaper, legalpaper and executivepaper.

```
letterpaper
legalpaper
executivepaper
aXpaper
bXpaper
cXpaper
dXpaper
landscape
\isopaper[series]{number}
```

The three American formats are supported by typearea in the same way. In addition, all ISO A-, ISO B-, ISO C- and ISO D-formats are supported and derived from their basic sizes A0, B0, C0 and D0. They may be selected directly with options a0paper, a1paper and so on. Landscape orientation is selected with the landscape option just as in the standard classes.

Alternatively the paper size can be adjusted with the macro \isopaper. This however required re-calculation of the text layout with \typearea or \areaset. I do not recommend the use of \isopaper.

Example: Assume you want to print on ISO A8 file cards in landscape orientation. Borders should be very small, no header or footer will be used.

```
\documentclass{article}
\usepackage[headexclude,footexclude,
            a8paper,landscape]{typearea}
\areaset{7cm}{5cm}
\pagestyle{empty}
\begin{document}
\section*{Paper Size Options}
letterpaper, legalpaper, executivepaper, ←
    a0paper,
a1paper \dots\ b0paper, b1paper \dots\ c0paper,
c1paper \dots\ d0paper, d1paper \dots
\end{document}
```

All a*X*paper, b*X*paper, c*X*paper and d*X*paper options need to be given as class options when KOMA-Script classes are used. For other classes this works only if they support typearea. For the standard LATEX classes these options need to be declared when typearea is loaded. \PassOptionsToPackage (see [Tea99]) works in both cases.

| \paperwidth |
| \paperheight |

Particularly exotic paper sizes can be defined using the lengths \paperwidth and \paperheight. This requires the re-calculation of the text layout using the commands \typearea or \areaset.

Example: Assume you want to print on endless paper with the dimensions $8\frac{1}{4}$ inch $\times$ 12 inch. This format is not directly supported by typearea. Thus you have to define it befor calculating the text layout:

```
\documentclass{article}
\usepackage{typearea}
\setlength{\paperwidth}{8.25in}
\setlength{\paperheight}{12in}
\typearea{1}
```

| dvips |
| pdftex |
| pagesize |

These mechanisms will set internal LATEX dimensions to values that header, text body and footer can be printed on paper of the given size. However, the

specifications of the DVI format do not allow the paper format to be specified. If DVI is translated directly into a low level printer language like PCL (Hewlett-Packard printers) or Esc-P (Epson), this is usually not important, because in all these cases the origin is the upper left corner. If however the DVI source is translated into languages like PostScript or PDF, that have an origin in a different position and also contain the paper size explicitly, the required information is not available in the DVI file. To solve this problem the DVI driver will use the default paper size, which the user may set per option or in the TeX source. In case of the DVI driver `dvips` this can be done with a `\special` command. For pdfTeX two dimensions are set instead.

The option `dvips` writes the paper size as a `\special` into the DVI file. This macro is then evaluated by `dvips`. `pdftex` on the other hand writes the paper size into the pdfTeX page register at the beginning of the document, so that the correct paper size is used when the resulting PDF file is viewed or printed. The option `pagesize` is more flexible and uses the correct mechanism if either a PDF or DVI file is produced.

Example: Assume you want to create a DVI file from a document and an online version in PDF. Then the preamble could look like this:

```
\documentclass{article}
\usepackage[a4paper,pagesize]{typearea}
```

If the file is run through pdfTeX then the lengths `\pdfpagewidth` and `\pdfpageheight` will be set to appropriate values. If on the other hand you create a DVI file — either with LaTeX or pdfLaTeX — a `\special` will be written to the beginning of the file.

2.6. Odd Bits without Direct Relevance to Text Layout

```
\ifpdfoutput{then}{else}
```

Sometimes it would be nice if certain things would be done differently in a file, depending on output format. TeX normally uses DVI as output format. With pdfTeX however we now have the option to create PDF files directly. The command `\ifpdfoutput` is a branching command. If PDF output is active, the *then* branch will be executed, if PDF output is inactive or pdfTeX is not used at all, the *else* branch.

Example: As you may know pdfLATEX will produce a DVI file instead of a PDF file, if the counter `\pdfoutput` is assigned the value 0. Only is the counter is assigned a value different from 0 output is switched to PDF. Since `\pdfoutput` is unknown when LATEX is used instead of pdfLATEX, `\pdfoutput` can not be set to 0 generally, if you want DVI output. A simple solution to this problem is to execute following command:

```
\ifpdfoutput{\pdfoutput=0}{}
```

This only works after loading typearea package. If you want the line above to be executed after a package, which sets `\pdfoutput` to 1 whenever the counter exists, you may combine it with the `\AfterPackage` command from scrlfile package (see).

2.7. Local Defaults in the File `typearea.cfg`

Even before the packet options are used, typearea will check for the presence of the file `typearea.cfg` and, if found, load it. Thus it is possible to define in this file the parameters for additional paper sizes.

```
\SetDIVList{List}
```

The `\SetDIVList` parameter was also intended for use in this file. Before the option `DIVcalc` was introduced this was the only possibility to define *DIV* values for different paper and font sizes. This list consists of a number of values in curly parentheses. The leftmost value is the font size, $10\,\mathrm{pt}$, the next for $11\,\mathrm{pt}$, the third for $12\,\mathrm{pt}$ and so on. If you don't use `\SetDIVList` the predefined `\SetDIVList{{8}{10}{12}}` will be used. If no default value is given for a particular font size, 10 will be used.

This command should no longer be used, automatic calculation of text layout is recommended instead (see).

2.8. Hints

In particular for theses many rules exist that violate even the most elementary rules of typography. The reasons for such rules include typographical incompetence of those making them, but also the fact that they were originally meant for mechanical typewriters. With a typewriter or a primitive text processor

dating back to the early ´80s it is not possible to produce typographically correct output without extreme effort. Thus rules were created that appeared to be achievable and still allowed easy correction. To avoid short lines made worse by ragged margins the borders were kept narrow, and the line spacing increased to 1.5 for corrections. In a single spaced document even correction signs would have been difficult to add. When computers became widely available for text processing, some students tried to use a particularly "nice" font to make their work look better than it really was. They forgot however that such fonts are often more difficult to read and therefore unsuitable for this purpose. Thus two bread-and-butter fonts became widely used which neither fit together nor are particularly suitable for the job. In particular Times is a relatively narrow font which was developed at the beginning of the 20th century for the narrow columns of British newspapers. Modern versions usually are somewhat improved. But still the Times font required in many rules does not really fit to the border sizes prescribed.

LaTeX already uses sufficient line spacing, and the borders are wide enough for corrections. Thus a page will look generous, even when quite full of text. With typearea this is even more true, especially if the calculation of line length is left to typearea too. For fonts that are sensitive to long lines the line length can easily be reduced.

To some extend the questionable rules are difficult to implement in LaTeX. A fixed number of characters per line can be kept only when a non-proportional font is used. There are very few good non-proportional fonts around. Hardly a text typeset in this way looks really good. In many cases font designers try to increase the serifs on the 'i' or 'l' to compensate for the different character width. This can not work and results in a fragmented and agitated-looking text. If you use LaTeX for your paper, some of these rules have to be either ignored or at least interpreted generously. For example you may interpret "60 characters per line" not as a fixed, but average or maximal value.

As executed, record regulations are usually intended to obtain a useable result even if the author does not know what needs to be considered. Useable means frequently: readable and correctable. In my opinion the type area of a text set with LaTeX and the typearea package meets these criteria well right from the beginning. Thus if you are confronted with regulations which deviate obviously substantially from it, then I recommend to submit a text single dump to the responsible person and inquire whether it is permitted to supply the work despite the deviations in this form. If necessary the type area can be moderately adapted by modification of option DIV. I advise against use of \areaset for this purpose however. At worst you may use geometry package (see [Ume00]), which is not part of

KOMA-Script, or change the type area parameters of LaTeX. You may find
the values determined by typearea in the log file of your document. Thus
moderate adjustments should be possible. However, make absolutely sure
that the proportions of the text area correspond approximately to those
of the page including consideration of the binding correction.

If it should be absolutely necessary to set the text one-and-a-half-lined
then you should not redefine \baselinestretch under any circumstances.
Although this procedure was recommended very frequently, it is obsolete
since the introduction of LaTeX 2_ε in 1994. Use at least the instruction
\linespread. I recommend package setspace (see [Tob00]), which is not
part of KOMA-Script. Also you should use typearea to calculate a new
type area after the conversion of the line spacing. However, you should
switch back to the normal line spacing for the title, preferably also for the
table contents and various listings — as well as the bibliography and the
index. The setspace package offers for this a special environment and its
own instructions.

The typearea package even with option DIVcalc calculates a very gener-
ous text area. Many conservative typographers will state that the resulting
line length is still excessive. The calculated *DIV* value may be found in the
log file to the respective document. Thus you can select a smaller value
easily after the first LaTeX run.

The question is put to me not infrequently, why I actually talk section
after section about type area calculations, when it would be very much
simpler to merely give you a package with which one can adjust the edges
like during a text processing. Often also it is stated that such a package
would be anyway the better solution, since everyone can judge how good
edges are to be selected, and that the edges calculated by KOMA-Script
are anyway not that great. I take the liberty of translating a suitable
quotation from [WF00]. You may find the original German words in the
German scrguide.

> *The making by oneself is quite widespread, the results are of-
> ten doubtful, because layman typographers do not see what is
> incorrect and cannot not know what it important. Thus one
> gets accustomed to wrong and poor typography. [. . .] Now the
> objection could be made that typography is nevertheless a taste
> thing. If it concerned decoration, perhaps one could let that
> argument apply, however, since it concerns primarily informa-
> tion with typography, errors cannot only disturb, but may even
> cause damage.*

The Main Classes scrbook, scrreprt and scrartcl

The main classes of the KOMA-Script bundle are designed as counterparts to the standard LATEX classes. This means that the KOMA-Script bundle contains replacements for the three standard classes book, report and article. There is also a replacement for the standard class letter. The document class for letters is described in a separate chapter, because it is fundamentally different from the three main classes (see chapter 6). The names of the KOMA-Script classes are composed of the prefix "scr" and the abbreviated name of the corresponding standard class. In order to restrict the length of the names to eight letters, the vowels, starting with the last one, are left off as necessary. The table 3.1 shows an overview of the correspondence between the standard classes and the KOMA-Script classes.

   The simplest way to use a KOMA-Script class instead of a standard one is to substitute the class name in the `\documentclass` command according to table 3.1. Normally, the document should be processed without errors by LATEX, just like before the substitution. The look however should be different. Additionally, the KOMA-Script classes provide new possibilities and options that are described in the following sections.

Table 3.1.: Correspondence between standard classes, KOMA-Script classes and Script styles.

standard class	KOMA-Script class
article	scrartcl
report	scrreprt
book	scrbook
letter	scrlttr2

3.1. The Options

This section describes the global options of the three main classes. The majority of the options can also be found in the standard classes. Since experience shows that many options of the standard classes are unknown, their description is included here. This is a departure from the rule that the `scrguide` should only describe those aspects whose implementation differs from the standard one.

Table 3.2 lists those options that are set by default in at least one of the KOMA-Script classes. The table shows for each KOMA-Script main class if the option is set by default and if it is even defined for that class. An undefined option cannot be set, either by default or by the user.

Table 3.2.: Default options of the KOMA-Script classes

Option	scrbook	scrreprt	scrartcl
11pt	default	default	default
a4paper	default	default	default
abstractoff	*undefined*	default	default
bigheadings	default	default	default
chapteratlists=	10pt	10pt	*undefined*
final	default	default	default
footnosepline	default	default	default
headnosepline	default	default	default
listsindent	default	default	default
nochapterprefix	default	default	*undefined*
onelinecaption	default	default	default
notitlepage			default
onecolumn	default	default	default
oneside		default	default
openany		default	default
openright	default		
parindent	default	default	default
tablecaptionbelow	default	default	default
titlepage	default	default	
tocindent	default	default	default
twoside	default		
version=	first	first	first

Allow me an observation before proceeding with the descriptions of the options. It is often the case that at the beginning of a document one is often unsure which options to choose for that specific document. Some options, for instance the choice of paper size, may be fixed from the beginning. But already the question of which *DIV* value to use could be difficult to answer initially. On the other hand, this kind of information should be initially irrelevant for the main tasks of an author: design of the document structure, text writing, preparation of figures, tables and index. As an author you should concentrate initially on the contents. When that is done, you can concentrate on the fine

points of presentation. Besides the choice of options, this means correcting things like hyphenation, page breaks, and the distribution of tables and figures. As an example consider table 3.2, which I moved repeatedly between the beginning and the end of this section. The choice of the actual position will only be made during the final production of the document.

3.1.1. Options for Compatibility

Users who archive their documents as source code generally place great value on obtaining exactly the same output in future LaTeX runs. However, in some cases, improvements and corrections to a class can lead to changes in behaviour, particularly as regards line and page breaks.

```
version
version=value
```

v2.96a Since version 2.96a KOMA-Script offers the choice of whether a source file should output as far as possible identical results in future LaTeX runs, or whether output should be determined according to the latest changes in the class. The option version determines with which version compatibility is to be maintained. The default setting is version 2.9t. The same result can be achieved by setting

```
version=first
```

or

```
version=2.9
```

or

```
version=2.9t.
```

If an unknown version number is given as *value* a warning is output and for safety's sake the option is set to version=first. With

```
version=last
```

the current latest version can be selected. In this case future compatibility is switched off. If the option is used without a value, then once again the value of last is assumed.

The question of compatibility is first of all a question of line and page breaking. New capabilities, which do not affect page breaks, are also available if the option of compatibility to an older version is selected. The option has no effect on changes in the page breaking when using a newer

version, which result purely through the correction of errors. If absolute compatibility including errors is required, then the requisite KOMA-Script version should be archived along with the document source.

It should be noted that the option `version` cannot be changed after the loading of the class.

3.1.2. Options for Page Layout

With the standard classes the page layout is established by the option files `size10.clo`, `size11.clo`, `size12.clo` (or `bk10.clo`, `bk11.clo`, `bk12.clo` for the book class) and by fixed values in the class definitions. The KOMA-Script classes, however, do not use a fixed page layout, but one that depends on the paper format and font size. For this task all three main classes use the typearea package (see chapter 2). The package is automatically loaded by the KOMA-Script main classes. Therefore it is not necessary to load the package using `\usepackage{typearea}`. If a LaTeX run results in an error "`Option clash for package typearea`", then this is most likely owing to the use of an explicit command `\usepackage[package options]{typearea}`.

```
letterpaper
legalpaper
executivepaper
aXpaper
bXpaper
cXpaper
dXpaper
landscape
```

The basic options for the choice of paper format are not processed directly by the classes. Instead, they are automatically processed by the typearea package as global options (see section 2.4, page 31). The options a5paper, a4paper, letterpaper, legalpaper and executivepaper correspond to the likewise-named options of the standard classes and define the same paper format. The page layout calculated for each is different, however.

The reason that the options for the A, B, C or D format are not processed by the typearea is not because they are global options, but because the KOMA-Script classes explicitly pass them to the typearea package. This is caused by the way option processing is implemented in the typearea package and by the operation of the underlying option passing and processing mechanism of LaTeX.

This is also valid for the options, described subsequently, that set the binding correction, the divisor and the number of header lines.

```
BCOR correction
DIV factor
DIVcalc
DIVclassic
Value headlines
```

The options for the divisor and the binding correction are passed directly to the typearea package (see). This differs from the standard classes, where there is no such transfer. This is also valid for the option that sets the number of header lines.

3.1.3. Options for Document Layout

This subsection deals with all the options that affect the document layout in general and not only the page layout. Strictly speaking, of course, all page layout options (see) are also document layout options. The reverse is also partially true.

```
oneside
twoside
```

These two options have the same effect as in the standard classes. The option `oneside` defines a one-sided document layout with a one-sided page layout. This means in particular that normally a ragged page bottom is used.

The option `twoside` defines a two-sided document layout with a two-sided page layout. This means that the LaTeX command `\flushbottom` is used to ensure that page breaks don't leave a variable empty space at the bottom of a page. A ragged page bottom can be obtained with the LaTeX command `\raggedbottom`.

```
onecolumn
twocolumn
```

These options have the same effect as the corresponding standard options. They are used to switch between a one-column and a two-column layout. The standard LaTeX capabilities for multi-column layout are only useful for very simple uses. The standard package multicol is much more versatile (see [Mit00]).

> openany
> openright

scrbook, These options have the same effect as the corresponding standard options.
scrreprt They affect the choice of the page where a chapter can begin, so they
are not available with the scrartcl class, since the next largest unit below
"part" is "section". The chapter level is not available in scrartcl.

A chapter always begins on a new page. When the option openany is
active, any page can be used. The option openright causes the chapter to
begin on a new right page. An empty left page may be inserted automatically in this case. The empty pages are created by the implicit execution
of the LaTeX command \cleardoublepage.

The option openright has no effect with a one-sided layout, because
only the two-sided layout differentiates between left and right pages. For
this reason it should only be used together with the twoside option.

> cleardoublestandard
> cleardoubleplain
> cleardoubleempty

If one wishes the empty pages created by the \cleardoublepage command to have no headers but only a page number, or neither headers nor
page number while using the standard classes, the only possibility is to
redefine the command appropriately. KOMA-Script provides options that
avoid this necessity. The option cleardoublestandard enables the default \cleardoublepage behaviour. If the option cleardoubleplain is
used, then the plain page style is applied to the empty left page. The
option cleardoubleempty causes the empty page style to be used. The
page styles are described in section 3.2.2.

> titlepage
> notitlepage

Both options have the same effect as the corresponding standard ones. The
titlepage option makes LaTeX use separate pages for the titles. These
pages are set inside a titlepage environment and normally have neither
header nor footer. In comparison with standard LaTeX, KOMA-Script
expands the handling of the titles significantly (see section 3.3).

The option notitlepage specifies that an *in-page* title is used. This
means that the title is specially emphasized, but it may be followed by
more material on the same page, for instance by an abstract or a section.

```
parskip
parskip*
parskip+
parskip-
halfparskip
halfparskip*
halfparskip+
halfparskip-
parindent
```

The standard classes normally set paragraphs indented and without any verti-
cal inter-paragraph space. This is the best solution when using a regular page
layout, like the ones produced with the typearea package. If neither indenta-
tion nor vertical space is used, only the length of the last line would give the
reader a reference point. In extreme cases, it is very difficult to detect whether
a line is full or not. Furthermore, it is found that a marker at the paragraph's
end tends to be easily forgotten by the start of the next line. A marker at the
paragraph's beginning is more easily remembered. Inter-paragraph spacing has
the drawback of disappearing in some contexts. For instance, after a displayed
formula it would be impossible to detect if the previous paragraph continues
or if a new one begins. Also, when starting to read at the top of a new page
it might be necessary to look at the previous page in order determine if a
new paragraph has been started or not. All these problems disappear when
using indentation. A combination of indentation and vertical inter-paragraph
spacing is redundant and therefore should be avoided. The indentation is per-
fectly sufficient by itself. The only drawback of indentation is the reduction of
the line length. The use of inter-paragraph spacing is therefore justified when
using short lines, for instance in a newspaper.

Independently of the explanation above, there are often requests
for a document layout with vertical inter-paragraph spacing instead
of indentation. KOMA-Script provides a large number of related op-
tions: `parskip`, `parskip-`, `parskip*`, `parskip+` and `halfparskip`,
`halfparskip-`, `halfparskip*` and `halfparskip+`.

The four `parskip` options each define an inter-paragraph spacing of one
line. The four `halfparskip` options use just a spacing of half a line. In
order to avoid a change of paragraph going unnoticed, for instance after a
page break, three of the options of each set ensure that the last line of a
paragraph is not completely filled. The variants without plus or star sign
ensure a free space of 1 em. The plus variant ensures that at least a third
of the line is free and the star variant ensures that at least a fourth of the
line is free. The minus variants make no special provision for the last line
of a paragraph.

All eight options also change the spacing before, after and inside list environments. This avoids the problem of these environments or the paragraphs inside them having a larger separation than the separation between the paragraphs of normal text. Additionally, these options ensure that the table of contents and the lists of figures and tables are set without any additional spacing.

The default behaviour of KOMA-Script follows the `parindent` option. In this case, there is no spacing between paragraphs, only an indentation of the first line by 1 em.

```
headsepline
headnosepline
footsepline
footnosepline
```

In order to have a line separating the header from the text body use the option `headsepline`. The option `headnosepline` has the reverse effect. These options have no effect with the page styles `empty` and `plain`, because there is no header in this case. Such a line always has the effect of visually bringing header and text body closer together. That doesn't mean that the header must now be moved farther from the text body. Instead, the header should be considered as belonging to the text body for the purpose of page layout calculations. KOMA-Script takes this into account by automatically passing the option `headinclude` to the `typearea` package whenever the `headsepline` option is used.

The presence of a line between text body and footer is controlled by the options `footsepline` and `footnosepline`, that behave like the corresponding header functions. Whenever a line is requested by the `footsepline` option, the `footinclude` option is automatically passed to the `typearea` package. In contrast to `headsepline`, `footsepline` takes effect when used together with the page style `plain`, because the `plain` style produces a page number in the footer.

```
chapterprefix
nochapterprefix
```

scrbook, With the standard classes book and report a chapter title consists of a line
scrreprt with the word "Chapter"[1]followed by the chapter number. The title itself is set left-justified on the following lines. The same effect is obtained in KOMA-Script with the class option `chapterprefix`. The default however

---

[1]When using another language the word "Chapter" is naturally translated to the appropriate language.

is `nochapterprefix`. These options also affect the automatic running titles in the headers (see section 3.2.2).

> ```
> appendixprefix
> noappendixprefix
> ```

scrbook, Sometimes one wishes to have the chapter titles in simplified form accord-
scrreprt ing to `nochapterprefix`. But at the same time, one wishes a title of an appendix to be preceded by a line with "Appendix" followed by the appendix letter. This is achieved by using the `appendixprefix` option. Since this results in an inconsistent document layout, I advise against using this option.

The reverse option `noappendixprefix` exists only for completeness' sake. I don't know of any sensible use for it.

> ```
> onelinecaption
> noonelinecaption
> ```

The standard classes differentiate between one-line and multi-line table or figure captions. One-line captions are centered while multi-line captions are left-justified. This behavior, which is also the default with KOMA-Script, corresponds to the option `onelinecaption`. There is no special handling of one-line captions when the `noonelinecaption` option is given.

The avoidance of a special treatment for the caption has an additional effect that is sometimes highly desirable. Footnotes that appear inside a `\caption` command often have a wrong number assigned to them. This happens because the footnote counter is incremented once as soon as the text is measured to determine if it will be one line or more. When the `noonelinecaption` option is used no such measurement is made. The footnote numbers are therefore correct.

But since KOMA-Script version 2.9 you don't need the option `noonelinecaption` to avoid the above described effect. KOMA-Script classes contain a workaround, so you can have footnotes inside captions. It should be mentioned though that when using footnotes inside floating environments, the contents of the floating environment should be encapsulated inside a minipage. That way it is guaranteed that floating environment and footnote are inseparable.

3.1.4. Options for Font Selection

Font options are those options that affect the font size of the document or the fonts of individual elements. Options that affect the font style are also

theoretically font options. However KOMA-Script currently has no such options.

```
10pt
11pt
12pt
Xpt
```

The options 10pt, 11pt and 12pt have the same effect as the corresponding standard options. In contrast to the standard classes, KOMA-Script can be used to choose other font sizes. However, LaTeX provides the necessary class option files only for 10 pt, 11 pt und 12 pt, and KOMA-Script does not provide any class option files, so the user must provide any other class option files. The package extsizes (see [Kil99]), for example, can be used to provide a size14.clo class file. Very big font sizes may lead to arithmetic overflow inside the page layout calculations of the typearea package.

```
smallheadings
normalheadings
bigheadings
```

The font size used for the titles is relatively big, both with the standard classes and with KOMA-Script. Not everyone likes this choice; moreover it is specially problematic for small paper sizes. Consequently, KOMA-Script provides, besides the large title font size defined by the bigheadings option, the two options normalheadings and smallheadings, that allow for smaller title font sizes. The font sizes for headings resulting from these options for scrbook and scrreprt are shown in table 3.9, page 76. For scrartcl smaller font sizes are generally used.

scrbook,
scrreprt   The spacing before and after chapter titles is also influenced by these options. Chapter titles are also influenced by the options chapterprefix and nochapterprefix, and appendix titles by the options appendixprefix and noappendixprefix, all of which are described in section 3.1.3, page 44.

3.1.5. Options Affecting the Table of Contents

KOMA-Script has several options that affect the entries in the table of contents. The form of the table of contents is fixed but several variations can be obtained with the options provided.

```
liststotoc
idxtotoc
bibtotoc
bibtotocnumbered
liststotocnumbered
```

Normally, lists of tables and figures, index and bibliography are not included in the table of contents. These entries are purposely omitted in classical typography because, among other things, a very particular placement of these items is silently assumed, if they are present at all:

- table of contents after the title pages,

- lists of tables and figures after the table of contents,

- index right at the end,

- bibliography before the index.

Books, in which all these items are present, often include ribbons that can be used to mark the location of these items in the book, so that the reader only has to look for them once.

It is becoming increasingly common to find entries in the table of contents for the lists of tables and figures, for the bibliography, and, sometimes, even for the index. This is surely also related to the recent trend of putting lists of figures and tables at the end of the document. Both lists are similar to the table of contents in structure and intention. I'm therefore sceptical of this evolution. Since it makes no sense to include only one of the lists of tables and figures in the table of contents, there exists only one option `liststotoc` that causes entries for both types of lists to be included. This also includes any lists produced with version 1.2e or later of the float package (see [Lin01]). All these lists are unnumbered, since they contain entries that reference other sections of the document.

The option `idxtotoc` causes an entry for the index to be included in the table of contents. The index is unnumbered since it too only includes references to the contents of the other sectional units.

The bibliography is a different kind of listing. It does not list the contents of the present document but refers instead to external documents. For that reason, it could be argued that it qualifies as a chapter (or section) and, as such, should be numbered. The option `bibtotocnumbered` has this effect, including the generation of the corresponding entry in the table of contents. I personally think that this reasoning would lead us to consider a classical list of sources also to be a separate chapter. On the other hand, the

bibliography is finally not something that was written by the document's author. In view of this, the bibliography merits nothing more than an unnumbered entry in the table of contents, and that can be achieved with the `bibtotoc` option.

v2.8q   As the author of KOMA-Script already views the option `liststotoc` with open skepticism, and frankly detests option `bibtotocnumbered`, it should come as no surprise that he implemented option `liststotocnumbered` only under extreme duress. He fears that as a next step someone will want the table of contents numbered and entered in the table of contents. Therefore, those looking in this documentation for a detailed description of option `liststotoc` will search in vain. A similar option for the index would be just as silly, so its implementation has been determinedly refused so far.

```
tocindent
tocleft
```

v2.8q   The table of contents is normally set up so that different sectional units have different indentations. The section number is set left-justified in a fixed-width field. This setup is selected with the option `tocindent`.

When there are many sections, the corresponding numbering tends to become very wide, so that the reserved field overflows. The FAQ [RNH02] suggests that the table of contents should be redefined in such a case. KOMA-Script offers an alternative format that avoids the problem completely. If the option `tocleft` is selected, then no variable indentation is applied to the titles of the sectional units. Instead, a table-like organisation is used, where all unit numbers and titles, respectively, are set in a left-justified column. The space necessary for the unit numbers is thus determined automatically.

In order to calculate automatically the space taken by the unit numbers when using the option `tocleft` it is necessary to redefine some macros. It is improbable but not impossible that this leads to problems when using other packages. If you think this may be causing problems, you should try the alternative option `tocindent`, since it does not make any redefinitions. When using packages that affect the format of the table of contents, it is possible that the use of options `tocleft` and `tocindent` too may lead to problems. When using such packages then, for safety's sake, one should refrain from using either of these options as global (class) options.

If the `tocleft` option is active, the width of the field for unit numbering is determined when outputting the table of contents. After a change that affects the table of contents, at most three LATEX runs are necessary to obtain

a correctly set table of contents.

3.1.6. Options for Lists of Floats

The best known lists of floats are the list of figures and the list of tables. Additionally, with help from the float package, for instance, it is possible to produce new float environments with corresponding lists.

Whether KOMA-Script options have any effect on lists of floats produced by other packages depends mainly on those packages. This is generally the case with the lists of floats produced by the float package.

Besides the options described here, there are others that affect the lists of floats though not their formatting or contents. Instead they affect what is included in the table of contents. The corresponding descriptions can therefore be found in .

> listsindent
> listsleft

v2.8q Lists of figures and tables are generally set up so that their numbering uses a fixed space. This corresponds to the use of option listsindent.

If the numbers become too large, for instance because many tables are used, it may happen that the available space is exceeded. Therefore KOMA-Script supplies an option called listsleft that is similar to the tocleft option. The width of the numbers is automatically determined and the space for them correspondingly adjusted. Concerning the mode of operation and the side effects, the observations made in for the tocleft option are equally valid in this case. Please note that when using the listsleft option several LaTeX runs are necessary before the lists of floats achieve their final form.

> chapteratlists
> chapteratlists=*value*

scrbook,   Normally, every chapter entry generated with \chapter introduces vertical
scrreprt   spacing into the lists of floats. Since version 2.96a this applies also for the
           command \addchap, if no compatibility option to an earlier version was
v2.96a   chosen (see option version in).

Furthermore, now the option chapteratlists can be used to change the spacing, by passing the desired distance as *value*. The default setting is 10 pt. If the value is set to entry or no value is specified, then instead of a vertical distance the chapter entry itself will be entered into the lists.

This option can be changed with \KOMAoptions{*chapteratlists*} or \KOMAoptions{*chapteratlists=value*} even inside the document. It

takes effect from the next heading onwards. However, changes to the option will only become effective in the lists following two more LaTeX runs.

3.1.7. Options Affecting the Formatting

Formatting options are all those options that affect the form or formatting of the document and cannot be assigned to other sections. They are therefore the *remaining options*.

```
abstracton
abstractoff
```

scrreprt, In the standard classes the `abstract` environment sets the text "Abstract"
scrartcl centered before the summary text. This was normal practice in the past. In the meantime, newspaper reading has trained readers to recognize a displayed text at the beginning of an article or report as the abstract. This is even more true when the text comes before the table of contents. It is also surprising when precisely this title appears small and centered. KOMA-Script provides the possibility of including or excluding the abstract's title with the options `abstracton` and `abstractoff`.

Books typically use another type of summary. In that case there is usually a dedicated summary chapter at the beginning or end of the book. This chapter is often combined with the introduction or a description of wider prospects. Therefore, the class scrbook has no `abstract` environment. A summary chapter is also recommended for reports in a wider sense, like a Master's or Ph.D. thesis.

```
pointednumbers
pointlessnumbers
```

In German, according to DUDEN, the numbering of sectional units should have no dot at the end if only arabic numbers are used (see [DUD96 , R 3]). On the other hand, if roman numerals or letters are appear in the numbering, then a dot should appear at the end of the numbering (see [DUD96 , R 4]). KOMA-Script has an internal mechanisms that tries to implement this somewhat complex rule. The resulting effect is that, normally, after the sectional commands \part and \appendix a switch is made to numbering with an ending dot. The information is saved in the aux file and takes effect on the next LaTeX run.

In some cases the mechanism for placing or leaving off the ending dot may fail, or other languagues may have different rules. Therefore it is

possible to activate the use of the ending dot manually with the option `pointednumbers` or to deactivate it with `pointlessnumbers`.

Please note that the mechanism only takes effect on the next LaTeX run. Therefore, before trying to use these options to forcibly control the numbering format, a further run without changing any options should be made.

Calling these options `dottednumbers` and `dotlessnumbers` or similar would be more correct. It so happened that the meaning of the chosen names was not clear to me a few years ago when the options were implemented. Some people asked me not to fix this "funny little mistake" so I didn't.

`leqno`

Equations are normally numbered on the right. The standard option `leqno` causes the standard option file `leqno.clo` to be loaded. The equations are then numbered on the left.

`fleqn`

Displayed equations are normally centered. The standard option `fleqn` causes the standard option file `fleqn.clo` to be loaded. Displayed equations are then left-justified.

`tablecaptionbelow`
`tablecaptionabove`

As described in section 3.6.6, page 103, the `\caption` command acts with figures like the `\captionbelow` command. The behaviour with tables, however, depends on these two options. In the default setting, `tablecaptionbelow`, the `\caption` macro acts also with tables like the `\captionbelow` command. With the `tablecaptionabove` option, `\caption` acts like the `\captionabove` command.

Note that using any of these options does not change the position of the caption from above the top of the table to below the bottom of the table or vica versa. It only affects whether the text is formatted as a caption for use above or below a table. Whether the text is in fact placed above or below a table is set through the position of the `\caption` command inside the `table` environment.

float   Note that when using the float package, the options `tablecaptionbelow` and `tablecaptionabove` cease to act correctly when `\restylefloat` is applied to tables. More details of the float package and `\restylefloat` can be found in [Lin01]. Additional support in KOMA-Script for the float

package may be found at the explanation of `komaabove` in section 3.6.6, page 107.

---

origlongtable

---

longtable The package longtable (see [Car98]) sets table captions internally by calling the command `\LT@makecaption`. In order to ensure that these table captions match the ones used with normal tables, the KOMA-Script classes normally redefine that command. See section 3.6.6, page 104 for more details. The redefinition is performed with help of the command `\AfterPackage` immediately after the loading of package longtable. If the package caption2 (see [Som04]) has been previously loaded, the redefinition is not made in order not to interfere with the caption2 package.

If the table captions produced by the longtable package should not be redefined by the KOMA-Script classes, activate the `origlongtable` option.

---

openbib

The standard option `openbib` switches to an alternative bibliography format. The effects are twofold: The first line of a bibliography entry, normally containing the author's name, receives a smaller indentation; and the command `\newblock` is redefined to produce a paragraph. Without this option, `\newblock` introduces only a stretchable horizontal space.

---

draft
final

The two standard options `draft` and `final` are normally used to distinguish between the draft and final versions of a document. In particular, the option `draft` activates small black boxes that are set at the end of overly long lines. The boxes help the untrained eye to find paragraphs that have to be treated manually. With the `final` option no such boxes are shown.

The two options are also processed by other packages and affect their operation. For instance, the graphics and the graphicx packages don't actually output the graphics when the option `draft` is specified. Instead they output a framed box of the appropriate size containing only the graphic's filename (see [Car99b]).

3.2. General Document Characteristics

Some document characteristics do not apply to a particular section of the document like the titling, the text body or the bibliography, but do affect

the entire document. Some of these characteristics were already described in section 3.1.

3.2.1. Changing Fonts

KOMA-Script does not use fixed fonts and attributes to emphasize different elements of the text. Instead there are variables that contain the commands used for changing fonts and other text attributes. In previous versions of KOMA-Script the user had to use \renewcommand to redefine those variables. It was also not easy to determine the name of the variable affecting an element given the element's name. Besides, it was also often necessary to determine the original definition before proceeding to redefine it.

These difficulties were actually intended, since the interface was not for users, but only for package authors building their packages on top of KOMA-Script. The years have shown, however, that the interface was in fact mainly used by document authors. So a new, simpler interface was created. However, the author explicitly advises the typographically inexperienced user against changing font sizes and other graphical characteristics according to his taste. Knowledge and feeling are basic conditions for the selection and mixture of different font sizes, attributes and families.

```
\setkomafont{element}{commands}
\addtokomafont{element}{commands}
\usekomafont{element}
```

v2.8p   With the help of the two commands \setkomafont and \addtokomafont it is possible to define the *commands* that change the characteristics of a given *element*. Theoretically all possible statements including literal text could be used as *commands*. You should however absolutely limit yourself to those statements that really switch only one font attribute. This will usually be the commands \normalfont, \rmfamily, \sffamily, \ttfamily, \mdseries, \bfseries, \upshape, \itshape, \slshape, \scshape and the font size commands \Huge, \huge, \LARGE, etc. The description of these commands can be found in [OPHS99], [Tea01] or [Tea00]. Color switching commands like \normalcolor (see [Car99b]) are also acceptable. The behavior when using other commands, specially those that make redefinitions or generate output, is not defined. Strange behavior is possible and does not represent a bug.

The command \setkomafont provides a font switching command with a completely new definition. In contrast to this the \addtokomafont command merely extends an existing definition. It is recommended to not use

both commands in the same document. Usage examples can be found in the paragraphs on the corresponding element. Names and meanings of the individual items are listed in . The default values are shown in the corresponding paragraphs.

The command \usekomafont can change the current font specification to the one currently used with the specified *element*.

Example: Assume that you want to use for the element `captionlabel` the same font specification that is used with `descriptionlabel`. This can be easily done with:

> \setkomafont{captionlabel}{\usekomafont{↩
> descriptionlabel}}

You can find other examples in the paragraphs on each element.

Table 3.3.: Elements, whose type style can be changed with the KOMA-Script command \setkomafont or \addtokomafont

---

`caption`
      Text of a table or figure caption

`captionlabel`
      Label of a table or figure caption; used according to the element `caption`

`chapter`
      Title of the sectional unit \chapter

`chapterentry`
      Table of contents entry of the sectional unit \chapter

`chapterentrypagenumber`
      Page number of the table of contents entry of the sectional unit \chapter, variation on the element `chapterentry`

`descriptionlabel`
      Labels, i. e., the optional argument of \item in the `description` environment

`dictum`
      wise saying (see command \dictum)

Table 3.3.: Elements, whose type style can be changed (*continuation*)

---

dictumauthor

    Author of a wise saying; used according to the element `dictumtext`

dictumtext

    Another name for `dictum`

disposition

    All sectional unit titles, i.e., the arguments of `\part` down to `\subparagraph` and `\minisec`, including the title of the abstract; used before the element of the corresponding unit

footnote

    Footnote text and marker

footnotelabel

    Mark of a footnote; used according to the element `footnote`

footnotereference

    Footnote reference in the text

minisec

    Title of `\minisec`

pagefoot

    The foot of a page, but also the head of a page

pagehead

    The head of a page, but also the foot of a page

pagenumber

    Page number in the header or footer

pagination

    Another name for `pagenumber`

paragraph

    Title of the sectional unit `\paragraph`

part

    Title of the `\part` sectional unit, without the line containing the part number

---

Table 3.3.: Elements, whose type style can be changed (*continuation*)

---

partentry

Table of contents entry of the secitonal unit \part

partentrypagenumber

Page number of the table of contents entry of the sectional unit \part variation on the element partentry

partnumber

Line containing the part number in a title of the sectional unit \part

section

Title of the sectional unit \section

sectionentry

Table of contents entry of sectional unit \section (only available in scrartcl)

sectionentrypagenumber

Page number of the table of contents entry of the sectional unit \section, variation on element sectionentry (only available in scrartcl)

sectioning

Another name for disposition

subject

Categorization of the document, i.e., the argument of \subject on the main title page

subparagraph

Title of the sectional unit \subparagraph

subsection

Title of the sectional unit \subsection

subsubsection

Title of the sectional unit \subsubsection

subtitle

Subtitle of the document, i.e., the argument of \subtitle on the main title page

---

Table 3.3.: Elements, whose type style can be changed (*continuation*)

`title`

> Main title of the document, i. e., the argument of `\title` (for details about the title size see the additional note in the text from)

3.2.2. Page Style

One of the general characteristics of a document is the page style. In LaTeX this means mostly the contents of headers and footers.

```
\pagestyle{empty}
\pagestyle{plain}
\pagestyle{headings}
\pagestyle{myheadings}
\thispagestyle{local page style}
```

Usually one distinguishes four different page styles.

empty is the page style with entirely empty headers and footers. In KOMA-Script this is completely identical to the standard classes.

plain is the page style with empty header and only a page number in the footer. With the standard classes this page number is always centered in the footer. With KOMA-Script the page number appears on double-sided layout on the outer side of the footer. The one-sided page style behaves like the standard setup.

headings is the page style with running headings in the header. These are headings for which titles are automatically inserted into the header. With the classes scrbook and scrreprt the titles of chapters
scrbook,
scrreprt
and sections are repeated in the header for double-sided layout — with KOMA-Script on the outer side, with the standard classes on the inner side. The page number is set on the outer side of the footer with KOMA-Script, with the standard classes it is set on the inner side of the header. In one-sided layouts only the titles of the chapters are used and are, with KOMA-Script, centered in the header. The page numbers are set centered in the footer with KOMA-Script.
scrartcl
scrartcl behaves similarly, but starting a level deeper in the section hierarchy with sections and subsections, because the chapter level does not exist in this case.

> While the standard classes automatically set running headings always in capitals, KOMA-Script applies the style of the title. This has several typographic reasons. Capitals as a decoration are actually far too strong. If one applies them nevertheless, they should be set in a one point smaller type size and with tighter spacing. The standard classes do not take these points in consideration.

myheadings corresponds mostly to the page style `headings`, but the running headings are not automatically produced, but have to be defined by the user. The commands `\markboth` and `\markright` can be used for that purpose.

Besides, the form of the page styles `headings` and `myheadings` is affected by each of the four class options `headsepline`, `headnosepline`, `footsepline` and `footnosepline` (see section 3.1.3, page 44). The page style starting with the current page is changed by the command `\pagestyle`. On the other hand `\thispagestyle` changes only the style of the current page.

The page style can be set at any time with the help of the `\pagestyle` command and takes effect with the next page that is output. Usually one sets the page style only once at the beginning of the document or in the preamble. To change the page style of the current page only, one uses the `\thispagestyle` command. This also happens automatically at some places in the document. For example, the instruction `\thispagestyle{plain}` is issued implicitly on the first page of a chapter.

Please note that the change between automatic and manual running headings is no longer performed by page style changes when using the `scrpage2` package, but instead via special instructions. The page styles `headings` and `myheadings` should not be used together with this package (see chapter 4, page 125).

In order to change the type style used in the header, footer or for the page number, please use the interface described in section 3.2.1. The same element is used for header and footer, which you can designate equivalently with `pagehead` or `pagefoot`. The element for the page number within the header or footer is called `pagenumber`. The default settings can be found in table 3.4.

| v2.8p |

Example: Assume that you want to set header and footer in a smaller type size and in italics. However, the page number should not be set in italics but bold. Apart from the fact that the result will look horrible, you can obtain this as follows:

Table 3.4.: Default values for the elements of a page style

Element	Default value
pagefoot	\normalfont\normalcolor\slshape
pagehead	\normalfont\normalcolor\slshape
pagenumber	\normalfont\normalcolor

```
\setkomafont{pagehead}{%
  \normalfont\normalcolor\itshape\small
}
\setkomafont{pagenumber}{\normalfont\bfseries}
```

If you want only that in addition to the default slanted variant a smaller type size is used, it is sufficient to use the following:

```
\addtokomafont{pagefoot}{\small}
```

As you can see, the last example uses the element `pagefoot`. You can achieve the same result using `pagehead` instead (see table 3.3 on page 54).

It is not possible to use these methods to force capitals to be used automatically for the running headings. For that, please use the scrpage2 package (see chapter 4, page 134).

If you define your own page styles, the commands \usekomafont{pagehead} and \usekomafont{pagenumber} can be useful. If you do not use the KOMA-Script package scrpage2 (see chapter 4) for that, but, for example, the package fancyhdr (see [vO00]), you can use these commands in your definitions. Thereby you can remain compatible with KOMA-Script as much as possible. If you do not use these commands in your own definitions, changes like those shown in the previous examples have no effect. The packages scrpage and scrpage2 take care to keep the maximum possible compatibility with other packages.

```
\titlepagestyle
\partpagestyle
\chapterpagestyle
\indexpagestyle
```

For some pages a different page style is chosen with the help of the command \thispagestyle. Which page style this actually is, is defined by

Table 3.5.: Macros to set up page style of special pages

`\titlepagestyle`
>   Page style for a title page when using *in-page* titles.

`\partpagestyle`
>   Page style for the pages with `\part` titles.

`\chapterpagestyle`
>   Page style for the first page of a chapter.

`\indexpagestyle`
>   Page style for the first page of the index.

---

scrbook, these four macros, of which `\partpagestyle` and `\chapterpagestyle` are
scrreprt found only with classes scrbook and scrreprt, but not in scrartcl. The default
value for all four cases is `plain`. The meaning of these macros can be taken
from table 3.5. The page styles can be redefined with the `\renewcommand`
macro.

Example: Assume that you want the pages with a `\part` heading to have
no number. Then you can use the following command, for
example in the preamble of your document:

```
\renewcommand*{\partpagestyle}{empty}
```

As mentioned previously on page 57, the page style `empty` is
exactly what is required in this example. Naturally you can
also use a user-defined page style.

Assume you have defined your own page style for initial
chapter pages with the package scrpage2 (see chapter 4).
You have given to this page style the fitting name `chapter`.
To actually use this style, you must redefine the macro
`\chapterpagestyle` accordingly:

```
\renewcommand*{\chapterpagestyle}{chapter}
```

Assume that you want that the table of contents of a book to
have no page numbers. However, everything after the table of
contents should work again with the page style `headings`, as
well as with `plain` on every first page of a chapter. You can
use the following commands:

```
\clearpage
\pagestyle{empty}
\renewcommand*{\chapterpagestyle}{empty}
\tableofcontents
\clearpage
\pagestyle{headings}
\renewcommand*{\chapterpagestyle}{plain}
```

Instead of the above you may do a local redefinition using a group. The advantage will be that you don't need to know the current page style before the change to switch back at the end.

```
\clearpage
\begingroup
  \pagestyle{empty}
  \renewcommand*{\chapterpagestyle}{empty}
  \tableofcontents
  \clearpage
\endgroup
```

But notice that you never should put a numbered head into a group. Otherwise you may get funny results with commands like \label.

Whoever thinks that it is possible to put running headings on the first page of a chapter by using the command

```
\renewcommand*{\chapterpagestyle}{headings}
```

will be surprised at the results. For sure, the page style headings is thereby applied to the initial page of a chapter. But nevertheless no running headings appear when using the openright option. The reason for this behaviour can be found in the LaTeX core. There, the command \rightmark, that generates the marks for right-hand pages, is defined with;

```
\let\@rightmark\@secondoftwo
\def\rightmark{\expandafter\@rightmark
  \firstmark\@empty\@empty}
```

The right-hand mark is set with \firstmark. \firstmark contains the left-hand and right-hand marks that were first set for a page. Within \chapter, \markboth is used to set the left mark to the chapter header and the right mark to empty. Hence, the first right mark on a chapter beginning with a

right-hand page is empty. Therefore, the running heading is also empty on those pages.

You could redefine \rightmark in the preamble so that the last mark on the page is used instead of the first:

```
\makeatletter
\renewcommand*{\rightmark}{%
  \expandafter\@rightmark\botmark\@empty\@empty}
\makeatother
```

This would however cause the running heading of the first page of a chapter to use the title of the last section in the page. This is confusing and should be avoided.

It is also confusing (and hence should be avoided) to have as running heading of the first page of a chapter the chapter title instead of the the section title. Therefore, the current behavior should be considered to be correct.

```
\clearpage
\cleardoublepage
\cleardoublestandardpage
\cleardoubleplainpage
\cleardoubleemptypage
```

The LaTeX core contains the \clearpage command, which takes care that all not yet output floats are output, and then starts a new page. There exists the instruction \cleardoublepage which works like \clearpage but which, in the double-sided layouts (see layout option twoside in) starts a new right-hand page. An empty left page in the current page style is output if necessary.

With \cleardoublestandardpage KOMA-Script works as described above. The \cleardoubleplainpage command changes the page style of the empty left page to plain in order to suppress the running heading. Analogously, the page style empty is applied to the empty page with \cleardoubleemptypage, suppressing the page number as well as the runnning heading. The page is thus entirely empty. However, the approach used by \cleardoublepage is dependent on the layout options cleardoublestandard, cleardoubleplain and cleardoubleempty described in and acts according to the active option.

```
\ifthispageodd{true}{false}  \ifthispagewasodd true\else false\fi
```

A peculiarity of LaTeX consists of the fact that it is not possible to determine on which page the current text will fall. It is also difficult to say whether the

current page has an odd or an even page number.   Now some will argue
that there is, nevertheless, the TEX test macro \ifodd which one needs only
to apply to the current page counter.   However, this is an error.   At the
time of the evaluation of such a test LATEX does not know at all whether the
text just processed will be typeset on the current page or only on the next.
The page breaks take place not while reading the paragraph, but only in the
output routine of LATEX. However, at that moment a command of the form
\ifodd\value{page} would already have been completely evaluated.

   To find out reliably whether a text falls on an even or odd page, one must
usually work with a label and a page reference to this label. One must also
take special precautionary measures during the first LATEX run, when the label
is not yet known.

   If one wants to find out with KOMA-Script whether a text falls on an
even or odd page, one can use the \ifthispageodd command. The *true*
argument is executed only if the command falls on an odd page. Otherwise
the *false* argument is executed.

   More precisely stated, the question is not where the text is, but whether a
page reference to a label placed in this location would refer to an odd or an
even page.

Example: Assume that you want to indicate if an odd or even page is
               output. This could be achieved with the command:

```
This is a page with an \ifthispageodd{odd}{even↩
  }
page number.
```

               The output would then be:

                    This is a page with an odd page number.

   Because the \ifthispageodd command uses a mechanism that is very
similar to a label and a reference to it, at least two LATEX runs are required
after every text modification. Only then the decision is correct. In the first
run a heuristic is used to make the first choice.

   There are situations where the \ifthispageodd command never leads to
the correct result. Suppose that the command is used within a box. A box
is set by LATEX always as a whole. No page breaks take place inside. Assume
further that the *true* part is very big, but the *false* part is empty. If we
suppose further that the box with the *false* part still fits on the current, even
page, but that with the *true* part it does not. Further assume that KOMA-
Script heuristically decides for the first run that the *true* part applies. The

Table 3.6.: Available numbering styles of page numbers

numbering style	example	description
arabic	8	Arabic numbers
roman	viii	lower-case Roman numbers
Roman	VIII	upper-case Roman numbers
alph	h	letters
Alph	H	capital letters

decision is wrong and is revised in the next run. The *false* part is thereby processed, instead of the *true* part. The decision must again be revised in the next run and so on.

These cases are rare. Nevertheless it should not be said that I have not pointed out that they are possible.

Sometimes you need to know the state of the last decision. This may be done using the expert command \ifthispagewasodd. This is either same like \iftrue or \iffalse and may be used like those.

```
\pagenumbering{numbering style}
```

This command works the same way in KOMA-Script as in the standard classes. More precisely it is a command from the LaTeX kernel. You can specify with this command the *numbering style* of page numbers. The changes take effect immediately, hence starting with the page that contains the command. The possible settings can be found in table 3.6. Using the command \pagenumbering also resets the page counter. Thus the page number of the next page which TeX outputs will have the number 1 in the style *numbering style*.

3.3. Titles

After having described the options and some general issues, we begin the document where it usually begins: with the titles. The titles comprise everything that belongs in the widest sense to the title of a document. Like already mentioned in , we can distinguish between title pages and *in-page* titles. Article classes like article or scrartcl have by default *in-page* titles, while classes like report, book, screprt and scrbook have title pages as default. The defaults can be changed with the class options titlepage and notitlepage.

`titlepage`

With the standard classes and with KOMA-Script all title pages are defined
in a special environment, the `titlepage` environment. This environment
always starts a new page — in the two-sided layout a new right page. For
this page, the style is changed by `\thispagestyle{empty}`, so that neither
page number nor running heading are output. At the end of the environ-
ment the page is automatically shipped out. Should you not be able to
use the automatic layout of the title page, it is advisable to design a new
one with the help of this environment.

Example: Assume you want a title page on which only the word "Me"
stands at the top on the left, as large as possible and in bold —
no author, no date, nothing else. The following document cre-
ates just that:

```
\documentclass{scrbook}
\begin{document}
\begin{titlepage}
  \textbf{\Huge Me}
\end{titlepage}
\end{document}
```

Simple? Right.

`\maketitle[`*page number*`]`

While the the standard classes produce a title page that may have the
three items title, author and date, with KOMA-Script the `\maketitle`
command can produce up to six pages.

In contrast to the standard classes, the `\maketitle` macro in KOMA-
Script accepts an optional numeric argument. If it is used, this number is
made the page number of the first title page. However, this page number
is not output, but affects only the numbering. You should choose an
odd number, because otherwise the whole counting gets mixed up. In
my opinion there are only two meaningful applications for the optional
argument. On the one hand, one could give to the half-title the logical
page number -1 in order to give the full title page the number 1. On the
other hand, it could be used to start at a higher page number, for instance,
3, 5, or 7 to accommodate other title pages added by the publishing house.
The optional argument is ignored for *in-page* titles. However, the page style
of such a title page can be changed by redefining the `\titlepagestyle`
macro. For that see .

The following commands do not lead necessarily to the production of the titles. The typesetting of the title pages is always done by \maketitle. The commands explained below only define the contents of the title pages. It is however not necessary, and when using the babel package not recommended, to use these in the preamble before \begin{document} (see [Bra01]). Examples can be found at the end of this section.

```
\extratitle{half-title}
```

In earlier times the inner book was often not protected from dirt by a cover. This task was then taken over by the first page of the book which carried mostly a shortened title called the *half-title*. Nowadays the extra page is often applied before the real full title and contains information about the publisher, series number and similar information.

With KOMA-Script it is possible to include a page before the real title page. The *half-title* can be arbitrary text — even several paragraphs. The contents of the *half-title* are output by KOMA-Script without additional formatting. Their organisation is completely left to the user. The back of the half-title remains empty. The half-title has its own title page even when *in-page* titles are used. The output of the half-title defined with \extratitle takes place as part of the titles produced by \maketitle.

Example: Let's go back to the previous example and assume that the spartan "Me" is the half-title. The full title should still follow the half-title. One can proceed as follows:

```
\documentclass{scrbook}
\begin{document}
  \extratitle{\textbf{\Huge Me}}
  \title{It's me}
  \maketitle
\end{document}
```

You can center the half-title and put it a little lower down the page:

```
\documentclass{scrbook}
\begin{document}
  \extratitle{\vspace*{4\baselineskip}
    \begin{center}\textbf{\Huge Me}\end{center}}
  \title{It's me}
  \maketitle
```

Table 3.7.: Font defaults for the elements of the title

Element name	Default
subject	\normalfont\normalcolor\bfseries\Large
title	\usekomafont{disposition}
subtitle	\usekomafont{title}\large

```
\end{document}
```

The command \title is necessary in order to make the examples above work correctly. It is explained next.

```
\titlehead{Titlehead}
\subject{Subject}
\title{Title}
\subtitle{Subtitle}
\author{Author}
\date{Date}
\publishers{Publisher}
\and
\thanks{Footnote}
```

The contents of the full title page are defined by seven elements. The *title head* is defined with the command \titlehead. It is typeset in regular paragraph style and full width at the top of the page. It can be freely designed by the user.

The *Subject* is output immediately above the *Title*. A slightly larger font size than the regular one is used.

v2.8p   The *Title* is output with a very large font size. Besides the change of size, the settings for the element title also take effect. By default these settings are identical to the settings for the element disposition (see table 3.3, page 54). The font size is however not affected (see table 3.3, page 68). The default settings can be changed with the commands of section 3.2.1.

v2.97c   The *Subtitle* is set just below the title, in a font determined by the element subtitle. The default, seen in table 3.7 can be changed with the help of the commands in section 3.2.1.

Below the *Subtitle* appears the *Author*. Several authors can be specified in the argument of \author. They should be separated by \and.

Below the author or authors appears the date. The default value is the present date, as produced by \today. The \date command accepts

Table 3.8.: Font size and horizontal positioning of the elements in the main title page in the order of their vertical position from top to bottom when typeset with \maketitle

Element	Command	Font	Justification
Title head	\titlehead	\normalsize	Regular parag
Subject	\subject	\usekomafont{subject}	centered
Title	\title	\huge\usekomafont{title}	centered
Subtitle	\subtitle	\usekomafont{subtitle}	centered
Authors	\author	\Large	centered
Date	\date	\Large	centered
Publishers	\publishers	\Large	centered

arbitrary information or even an empty argument.

Finally comes the *Publisher*. Of course this command can also be used for any other information of little importance. If necessary, the \parbox command can be used to typeset this information over the full page width like a regular paragraph. Then it is to be considered equivalent to the title head. However, note that this field is put above any existing footnotes.

Footnotes on the title page are produced not with \footnote, but with \thanks. They serve typically for notes associated with the authors. Symbols are used as footnote markers instead of numbers.

With the exception of *titlehead* and possible footnotes, all the items are centered horizontally. The information is summarised in table 3.8.

Example: Assume you are writing a dissertation. The title page should have the university's name and address at the top, flush left, and the semester flush right. As usual a title is to be used, including author and delivery date. The adviser must also be indicated, together with the fact that the document is a dissertation. This can be obtained as follows:

```
\documentclass{scrbook}
\begin{document}
\titlehead{{\Large Unseen University
   \hfill SS~2002\\}
 Higher Analytical Institute\\
 Mythological Rd\\
 34567 Etherworld}
\subject{Dissertation}
```

```
\title{Digital space simulation with the DSP↩
    \,56004}
\subtitle{short but sweet?}
\author{Fuzzy George}
\date{30. February 2002}
\publishers{Adviser Prof. John Eccentric Doe}
\maketitle
\end{document}
```

A frequent misunderstanding concerns the role of the full title page. It is often erroneously assumed that the cover (or dust cover) is meant. Therefore, it is frequently expected that the title page does not follow the normal page layout, but has equally large left and right margins.

However if one takes a book and opens it, one notices very quickly at least one title page under the cover within the so-called inner book. Precisely these title pages are produced by \maketitle. As is the case with the half-title, the full title page belongs to the inner book, and therefore should have the same page layout as the rest of the document. A cover is actually something that should be created in a separate document. The cover often has a very individual format. It can also be designed with the help of a graphics or DTP program. A separate document should also be used because the cover will be printed on a different medium, possibly cardboard, and possibly with another printer.

```
\uppertitleback{titlebackhead}
\lowertitleback{titlebackfoot}
```

With the standard classes, the back of the title page is left empty. However, with KOMA-Script the back of the full title page can be used for other information. Exactly two elements which the user can freely format are recognized: *titlebackhead* and *titlebackfoot*. The head can reach up to the foot and vice versa. If one takes this manual as an example, the exclusion of liability was set with the help of the \uppertitleback command.

```
\dedication{dedication}
```

KOMA-Script provides a page for dedications. The dedication is centered and uses a slightly larger type size. The back is empty like the back page of the half-title. The dedication page is produced by \maketitle and must therefore be defined before this command is issued.

Example: This time assume that you have written a poetry book and you want to dedicate it to your wife. A solution would look like this:

```
\documentclass{scrbook}
\begin{document}
\extratitle{\textbf{\Huge In Love}}
\title{In Love}
\author{Prince Ironheart}
\date{1412}
\lowertitleback{This poem book was set with%
    the help of {\KOMAScript} and {\LaTeX}}
\uppertitleback{Selfmockery Publishers}
\dedication{To my treasure hazel-hen\\
  in eternal love\\
  from your dormouse.}
\maketitle
\end{document}
```

Please use your own favorite pet names.

abstract

scrartcl, Particularly with articles, more rarely with reports, there is a summary
scrreprt directly under the title and before the table of contents. Therefore, this
is often considered a part of the titles. Some LaTeX classes offer a special
environment for this summary, the abstract environment. This is output
directly, at it is not a component of the titles set by \maketitle. Please
note that abstract is an environment, not a command. Whether the
summary has a heading or not is determined by the options abstracton
and abstractoff (see section 3.1.7, page 50)

With books (scrbook) the summary is frequently a component of the
introduction or a separate chapter at the end of the document. Therefore
no abstract environment is provided. When using the class scrreprt it is
surely worth considering whether one should not proceed likewise.

3.4. The Table of Contents

The titles are normally followed by the table of contents. Often the table
of contents is followed by lists of floats, e. g., lists of tables and figures (see
section 3.6.6).

```
\tableofcontents
\contentsname
```

The production of the table of contents is done by the `\tableofcontents` command. To get a correct table of contents, at least two LATEX runs are necessary after every change. The option `liststotoc` causes the lists of figures and tables to be included in the table of contents. `idxtotoc` is the corresponding option for the index. This is rather uncommon in classical typography. One does find the bibliography included in the table of contents slightly more frequently. This can be obtained with the options `bibtotoc` and `bibtotocnumbered`. These options are explained in .

The table of contents is set as an unnumbered chapter and is therefore subject to the side effects of the standard `\chapter*` command, which are described in . However, the running headings for left and right pages are correctly filled with the heading of the table of contents.

The text of the heading is given by the macro `\contentsname`. If you make use of a language package such as babel, please read the documentation of that package before redefining this macro.

There are two variants for the construction of the table of contents. With the standard variant, the titles of the sectional units are indented so that the unit number is flush left to the edge of the text of the next upper sectional unit. However, the space for the numbers is thereby limited and is only sufficient for a little more than 1.5 places per unit level. Should this become a problem, the option `tocleft` can be used to set the behaviour such that all entries in the table of contents are set flush left under one another. As explained in , several LATEX runs are needed.

The entry for the highest sectional unit below `\part`, i. e., `\chapter` with scrbook and scrreprt or `\section` with scrartcl is not indented. The font style is however affected by the settings of the element `disposition` (see). There are no dots between the text of the sectional unit heading and the page number. The typographic reasons for this are that the font is usually different, and the desire for appropriate emphasis. The table of contents of this manual is a good example of these considerations.

```
tocdepth
```

Normally, the units included in the table of contents are all the units from `\part` to `\subsection` (for the classes scrbook and scrreprt) or from `\part` to `\subsubsection` (for the class scrartcl). The inclusion of a sectional unit in the table of contents is controlled by the counter `tocdepth`. This has the

value −1 for \part, 0 for \chapter, and so on. By setting, incrementing or decrementing the counter, one can choose the lowest sectional unit level to be included in the table of contents. The same happens with the standard classes.

The user of the scrpage2 package (see chapter 4) does not need to remember the numerical values of each sectional unit. They are given by the values of the macros \chapterlevel, \sectionlevel and so on down to \subparagraphlevel.

Example: Assume that you are preparing an article that uses the sectional unit \subsubsection. However, you don't want this sectional unit to appear in the table of contents. The preamble of your document might contain the following:

```
\documentclass{scrartcl}
\setcounter{tocdepth}{2}
```

You set the counter tocdepth to 2 because you know that this is the value for \subsection. If you know that scrartcl normally includes all levels down to \subsubsection in the table of contents, you can simply decrement the counter tocdepth by one:

```
\documentclass{scrartcl}
\addtocounter{tocdepth}{-1}
```

How much you should add to or subtract from the tocdepth counter can also be found by looking at the table of contents after the first LaTeX run.

A small hint in order that you do not need to remember which sectional unit has which number: in the table of contents count the number of units required extra or less and then, as in the above example, use \addtocounter to add or subtract that number to or from tocdepth.

KOMA-Script has always attempted to avoid page breaking directly between a sectional unit and the adjacent next lower unit, for example, between a chapter title and its first section title. However, the mechanism

v2.96a worked poorly or not at all until version 2.96. In version 2.96a the mechanism was much improved and should now always work correctly. There can be changes in the page breaking in the table of contents as a result though. Thus, the new mechanism is only active, if the compatibility option is not set to version 2.96 or less (see option version, section 3.1.1,

The mechanism also does not work if the commands to generate the table of contents are redefined, for example, by the use of the package tocloft.

3.5. Lists of Floats

As a rule, the lists of floats, e. g., list of tables and list of figures, can be found directly after the table of contents. In some documents, they can even be found in the appendix. However, the author of this manual prefers their location after the table of contents, therefore the explanation is given here.

```
\listoftables
\listoffigures
\listtablename
\listfigurename
```

These commands generate a list of tables or figures. Changes in the document that modify these lists will require two LaTeX runs in order to take effect. The layout of the lists can be influenced by the options `listsindent` and `listsleft` (see). Moreover, the options `liststotoc` and `liststotocnumbered` have indirect influence (see).

The text of the titles of this tables are stored in the macros \listtablename and \listfigurename. If you use a language package like babel and want to redefine these macros, you should read the documentation of the language package.

3.6. Main Text

This section explains everything provided by KOMA-Script in order to write the main text. The main text is the part that the author should focus on first. Of course this includes tables, figures and comparable information as well.

scrbook **3.6.1. Separation**

Before getting to the main text we will have a short look at three commands which exist both in the standard class book and the KOMA-Script class scrbook. They are used for separation of the *front matter*, the *main matter* and the *back matter* of a book.

```
\frontmatter
\mainmatter
\backmatter
```

The macro `\frontmatter` introduces the front matter in which roman numerals are used for the page numbers. Chapter headings in a front matter are not numbered. The section titles would be numbered, start at chapter 0, and would be consecutively numbered across chapter boundaries. However, this is of no import, as the front matter is used only for the title pages, table of contents, lists of figures and tables, and a foreword. The foreword can thus be set as a normal chapter. A foreword should never be divided into sections but kept as short as possible. Therefore in the foreword there is no need for a deeper structuring than the chapter level.

v2.97e In case the user sees things differently and wishes to use numbered sections in the chapters of the front matter, as of version 2.97e the section numbering no longer contains the chapter number. This change only takes effect when the compatibility option is set to at least version 2.97e (see option `version`, section 3.1.1, page 39). It is explicity noted that this creates a confusion with chapter numbers! The use of `\addsec` and `\section*` (see section 3.6.2, page 78 and page 78) are thus, in the author's opinion, far more preferable.

v2.97e As of version 2.97e the numbering of float environments, such as tables and figures, and equation numbers in the front matter also contain no chapter number part. To take effect this too requires the corresponding compatibility setting (see option `version`, section 3.1.1, page 39).

`\mainmatter` introduces the main matter with the main text. If there is no front matter then this command can be omitted. The default page numbering in the main matter uses Arabic numerals (re)starting in the main matter at 1.

The back matter is introduced with `\backmatter`. Opinions differ in what should be part of the back matter. So in some cases you will find only the bibliography, in some cases only the index, and in other cases both of these as well as the appendices. The chapters in the back matter are similar to the chapters in the front matter, but page numbering is not reset. If you do require separate page numbering you may use the command `\pagenumbering` from section 3.2.2, page 64.

3.6.2. Structuring the Document

There are several commands to structure a document into parts, chapters, sections and so on.

```
\part[Short version]{Heading}
\chapter[Short version]{Heading}
\section[Short version]{Heading}
\subsection[Short version]{Heading}
\subsubsection[Short version]{Heading}
\paragraph[Short version]{Heading}
\subparagraph[Short version]{Heading}
```

The standard sectioning commands in KOMA-Script work in a similar fashion to those of the standard classes. Thus, an alternative entry for the table of contents and running headings can be specified as an optional argument to the sectioning commands.

The title of the level part (\part) is distinguished from other sectioning levels by being numbered independently from the other parts. This means that the chapter level (in scrbook or scrreprt), or the section level (in scrartcl) is numbered consecutively over all parts. Furthermore, for classes scrbook and scrreprt the title of the part level together with the corresponding preamble (see \setpartpreamble, page 85) is set on a separate page.

scrartcl   \chapter only exists in book or report classes, that is, in classes book, scrbook, report and scrreport, but not in the article classes article and scrartcl. In addition to this, the command \chapter in KOMA-Script differs substantially from the version in the standard class. In the standard classes the chapter number is used together with the prefix "Chapter", or the corresponding word in the appropriate language, on a separate line above the actual chapter title test. This overpowering style is replaced in KOMA-Script by a simple chapter number before the chapter heading text, can however be reverted by the option chapterprefix (see section 3.1.3, page 44).

scrbook,   Please note that \part and \chapter in classes scrbook and scrreprt change the page style for one page. The applied page style in KOMA-
scrreprt   Script is defined in the macros \partpagestyle and \chapterpagestyle (see section 3.2.2, page 59).

v2.8p   The font of all headings can be changed with the commands \setkomafont and \addtokomafont described in section 3.2.1. In doing this, generally the element disposition is used, followed by a specific element for every section level (see table 3.3, page 54). The font for the element disposition is predefined as \normalfont\normalcolor\sffamily\bfseries. The default font size for the specific elements depends on the options bigheadings, normalheadings and smallheadings (see section 3.1.4, page 46). The defaults are listed in table 3.9

Table 3.9.: Default font sizes for different levels of document structuring in scrbook and scrreprt

class option	element	default
bigheadings	part	\Huge
	partnumber	\huge
	chapter	\huge
	section	\Large
	subsection	\large
	subsubsection	\normalsize
	paragraph	\normalsize
	subparagraph	\normalsize
normalheadings	part	\huge
	partnumber	\huge
	chapter	\LARGE
	section	\Large
	subsection	\large
	subsubsection	\normalsize
	paragraph	\normalsize
	subparagraph	\normalsize
smallheadings	part	\LARGE
	partnumber	\LARGE
	chapter	\Large
	section	\large
	subsection	\normalsize
	subsubsection	\normalsize
	paragraph	\normalsize
	subparagraph	\normalsize

Example: Suppose you are using the class option bigheadings and notice that the very big headings of document parts are too bold. You could change this as follows:

```
\setkomafont{disposition}{\normalcolor\sffamily←
    }
\part{Appendices}
\addtokomafont{disposition}{\bfseries}
```

Using the command above you only switch off the font attribute

bold for a heading "Appendices". A much more comfortable and elegant solution is to change all \part headings at once. This is done either by:

```
\addtokomafont{part}{\normalfont\sffamily}
\addtokomafont{partnumber}{\normalfont\sffamily↩
    }
```

or simply using:

```
\addtokomafont{part}{\mdseries}
\addtokomafont{partnumber}{\mdseries}
```

The last version is to be preferred because it gives you the correct result even when you make changes to the disposition element, for instance:

```
\setkomafont{disposition}{\normalcolor\bfseries↩
    }
```

With this change it is possible to set all section levels at once to no longer use sans serif fonts.

Please be warned of misusing the possibilities of font switching to mix fonts, font sizes and font attributes excessively. Picking the most suitable font for a given task is a hard task even for professionals and has almost nothing to do with the personal tastes of non-experts. Please refer to the citation at the end of and to the following explanation.

It is possible to use different font types for different section levels in KOMA-Script. Non-experts in typography should for very good typographical reasons refrain absolutely from using these possibilities.

There is a rule in typography which states that one should mix as few fonts as possible. Using sans serif for headings already seems to be a breach of this rule. However, one should know that bold, large serif letters are much to heavy for headings. Strictly speaking, one would then have to at least use a normal instead of a bold or semi bold font. However, in deeper levels of the structuring a normal font may then appear too lightly weighted. On the other hand, sans serif fonts in headings have a very pleasant appearance and in fact find acceptance almost solely for headings. That is why sans serif is the carefully chosen default in KOMA-Script.

More variety should however be avoided. Font mixing is only for professionals. In case you want to use other fonts than the standard TeX fonts—

regardless of whether these are CM , EC or LM fonts — you should consult an expert, or for safety's sake redefine the font for the element `disposition` as seen in the example above. The author of this documentation considers the commonly encountered combinations Times and Helvetica or Palatino with Helvetica as unfavourable.

```
\part*{Heading}
\chapter*{Heading}
\section*{Heading}
\subsection*{Heading}
\subsubsection*{Heading}
\paragraph*{Heading}
\subparagraph*{Heading}
```

All disposition commands have starred versions, which are unnumbered, and produce section headings which do not show up in the table of contents or in in the running heading. The absence of a running heading often has an unwanted side effect. For example, if a chapter which is set using \chapter* spans several pages, then the running heading of the previous chapter suddenly reappears. KOMA-Script offers a solution for this which

scrbook, is described below. \chapter* only exists in book and report classes, that
scrreprt is, book, scrbook, report and scrreport, but not the article classes article and scrartcl.

Please note that \part and \chapter change the page style for one page. The applied style is defined in the macros \partpagestyle and \chapterpagestyle in KOMA-Script (see).

v2.8p   As for the possibilities of font switching, the same explanations apply as were given above for the unstarred variants. The structuring elements are named the same since they do not indicate variants but structuring levels.

```
\addpart[Short version]{Heading}
\addpart*{Heading}
\addchap[Short version]{Heading}
\addchap*{Heading}
\addsec[Short version]{Heading}
\addsec*{Heading}
```

In addition to the commands of the standard classes KOMA-Script offers the new commands \addsec and \addchap. They are similar to the standard commands \chapter and \section except that they are unnumbered. They thus produce both a running heading and an entry in the table of contents. The starred variants \addchap* and \addsec* are similar to the standard commands \chapter* and \section* except for a tiny but

important difference: The running headings are deleted. This eliminates the side effect of obsolete headers mentioned above. Instead, the running scrartcl headings on following pages remain empty. \addchap and \addchap* of course only exist in book and report classes, namely book, scrbook, report and scrreport, but not in the article classes article and scrartcl.

Similarly, the command \addpart produces an unnumbered document part with an entry in the table of contents. Since the running headings are already deleted by \part and \part* the problem of obsolete headers does not exist. The starred version \addpart* is thus identical to \part* and is only defined for consistency reasons.

Please note that \addpart and \addchap and their starred versions change the page style for one page. The particular page style is defined in the macros \partpagestyle and \chapterpagestyle (see).

v2.8p As for the possibilities of font switching, the same explanations apply as given above for the normal structuring commands. The elements are named the same since they describe not variants but structuring levels.

`\minisec{Heading}`

Sometimes a heading is wanted which is highlighted but also closely linked to the following text. Such a heading should not be separated by a large vertical skip.

The command \minisec is designed for this situation. This heading is not associated with any structuring level. Such a *mini section* does not produce an entry in the table of contents nor does it receive any numbering.

Example: You have developed a kit for building a mouse trap and want the documentation separated into a list of necessary items and an assembly description. You could write the following:

```
\minisec{Items needed}

\begin{flushleft}
  1 plank ($100\times 50 \times 12$)\\
  1 spring-plug of a beer-bottle\\
  1 spring of a ball-point pen\\
  1 drawing pin\\
  2 screws\\
  1 hammer\\
  1 knife
\end{flushleft}
```

```
\minisec{Assembly}
At first one searches the mouse-hole and puts ↩
    the drawing pin
directly behind the hole. Thus the mouse cannot↩
     escape during the
following actions.

Then one knocks the spring-plug with the hammer↩
     into the mouse-hole.
If the spring-plug's size is not big enough in ↩
    order to shut the
mouse-hole entirely, then one can utilize the ↩
    plank instead and
fasten it against the front of the mouse-hole ↩
    utilizing the two
screws and the knife. Instead of the knife one ↩
    can use a
screw-driver instead.
```

Which gives:

Items needed
1 plank ($100 \times 50 \times 12$)
1 spring-plug of a beer-bottle
1 spring of a ball-point pen
1 drawing pin
2 screws
1 hammer
1 knife

Assembly
At first one searches the mouse-hole and puts the drawing pin directly behind the hole. Thus the mouse cannot escape during the following actions.

Then one knocks the spring-plug with the hammer into the mouse-hole. If the spring-plug's size is not big enough in order to shut the mouse-hole entirely, then one can utilize the plank instead and fasten it against the front of the mouse-hole utilizing the two screws and the knife. Instead of the knife one can use a screw-driver instead.

The font type of the structuring command \minisec be changed us-

ing the element disposition (see table 3.3, page 54) and minisec. De-

fault setting of element `minisec` is empty, so the default of the element `disposition` is active.

`\raggedsection`

In the standard classes headings are set as justified text. That means that hyphenated words can occur and headings with more than one line are stretched up to the text border. This is a rather uncommon approach in typography. KOMA-Script therefore formats the headings left aligned with hanging indentation using `\raggedsection` with the definition:

> `\newcommand*{\raggedsection}{\raggedright}`

This command can be redefined with `\renewcommand`.

Example: You prefer justified headings, so you write in the preamble of your document:

> `\renewcommand*{\raggedsection}{}`

or more compactly:

> `\let\raggedsection\relax`

You will get a formatting of the headings which is very close to that of the standard classes. It will become even closer when you combine this change with the change of the element `disposition` mentioned above.

`\partformat`
`\chapterformat`
`\othersectionlevelsformat{`*section name*`}`
`\autodot`

As you might know, for every counter in LATEX there is a command `\the`*countername*, which outputs the value of the counter. Depending on the class the counter for a particular level starting from `\section` (book, scrbook, report, scrreprt) or `\subsection` (article, scrartcl) is composed of the counter for the next higher level followed by a dot and the Arabic number of the *countername* of the respective level.

KOMA-Script has added a further logical level to the output of the section number. The counters for the respective heading are not merely output. They are formatted using the commands `\partformat`, scrbook, `\chapterformat` and `\othersectionlevelsformat`. Of course the com-
scrreprt

mand \chapterformat like \thechapter does not exist in the class scrartcl but only in the classes scrbook and scrreprt.

As described in section 3.1.7, page 50, dots in section numbers should be handled for the German-speaking region according to the rules given in [DUD96]. The command \autodot in KOMA-Script ensures that these rules are being followed. In all levels except for \part a dot is followed by a further \enskip. This corresponds to a horizontal skip of 0.5 em.

The command \othersectionlevelsformat takes as a parameter the name of the section level, such as "*section*", "*subsection*" ... Per default therefore, only the levels \part and \chapter have formatting commands of their own, while all other section levels are covered by one general formatting command. This has historical reasons. At the time that Werner Lemberg suggested a suitable extension of KOMA-Script for his CJK package, only this differentiation was needed.

The formatting commands can be redefined using \renewcommand to fit them to your personal needs. The following original definitions are used by the KOMA-Script classes:

```
\newcommand*{\partformat}{\partname~\thepart\autodot}
\newcommand*{\chapterformat}{%
  \chapappifchapterprefix{\ }\thechapter\autodot\enskip}
\newcommand*{\othersectionlevelsformat}[1]{%
  \csname the#1\endcsname\autodot\enskip}
```

Example: Assume that when using \part you do not want the word "Part" written in front of the part number. You could use the following command in the preamble of your document:

```
\renewcommand*{\partformat}{\thepart\autodot}
```

Strictly speaking, you could do without \autodot at this point and insert a fixed dot instead. As \part is numbered with roman numerals, according to [DUD96] a dot has to be applied. However, you thereby give up the possibility to use one of the options pointednumbers and pointlessnumbers and optionally depart from the rules. More details concerning class options can be found in section 3.1.7, page 50.

An additional possibility could be to place the section numbers in the left margin in such a way that the heading text is left aligned with the surrounding text. This can be accomplished with:

```
\renewcommand*{\othersectionlevelsformat}[1]{%
    \llap{\csname the#1\endcsname\autodot\enskip↩
        }}
```

The little known TEX command \llap in the definition above
puts its argument left of the current position without changing
the position thereby. A much better LATEX solution would be:

```
\renewcommand*{\othersectionlevelsformat}[1]{%
    \makebox[0pt][r]{%
        \csname the#1\endcsname\autodot\enskip}}
```

See [Tea01] for more information about the optional argu-
ments of \makebox.

```
\chapappifchapterprefix{additional text}
\chapapp
```

scrbook, These two commands are not only used internally by KOMA-Script but
scrreprt are also provided to the user. Later it will be shown how they can be

v2.8o   used for example to redefine other commands. Using the layout option
chapterprefix (see section 3.1.3, page 44) \chapappifchapterprefix
outputs the word "Chapter" in the main part of the document in the
current language, followed by *additional text*. In the appendix, the
word "Appendix" in the current language is output instead, followed by
additional text. If the option nochapterprefix is set, then nothing is
output.

The command \chapapp always outputs the word "Chapter" or "Ap-
pendix". In this case the options chapterprefix and nochapterprefix
have no effect.

Since chapters only exist in the classes scrbook and scrreprt these com-
mands only exist in these classes.

```
\chaptermark{Running heading}
\sectionmark{Running heading}
\subsectionmark{Running heading}
\chaptermarkformat
\sectionmarkformat
\subsectionmarkformat
```

As mentioned in section 3.2.2 the page style headings works with au-
tomatic running headings. For this, the commands \chaptermark and
\sectionmark, or \sectionmark and \subsectionmark, respectively, are

defined. Every structuring command (\chapter, \section ...) automatically carries out the respective \...mark command. The parameter passed contains the text of the section heading. The respective section number is added automatically in the \...mark command. The formatting is done according to the section level with one of the three commands \chaptermarkformat, \sectionmarkformat or \subsectionmarkformat.

scrbook, Of course there is no command \chaptermark or \chaptermarkformat in
scrreprt scrartcl. Accordingly, \subsectionmark and \subsectionmarkformat exex ist only in scrartcl. This changes when you use the scrpage2 package (see
scrartcl chapter 4).

Similar to \chapterformat and \othersectionlevelsformat, the commands \chaptermarkformat (not in scrartcl), \sectionmarkformat and \subsectionmarkformat (only in scrartcl) define the formatting of the sectioning numbers in the automatic running headings. They can be adapted to your personal needs with \renewcommand. The original definitions for the KOMA-Script classes are:

```
\newcommand*{\chaptermarkformat}{%
  \chapappifchapterprefix{\ }\thechapter\autodot\enskip}
\newcommand*{\sectionmarkformat}{\thesection\autodot\↩
    enskip}
\newcommand*{\subsectionmarkformat}{%
  \thesubsection\autodot\enskip}
```

Example: Suppose you want to prepend the word "Chapter" to the chapter number in the running heading. For example you could insert the following definition in the preamble of your document :

```
\renewcommand*{\chaptermarkformat}{%
 \chapapp~\thechapter\autodot\enskip}
```

As you can see, both the commands \chapappifchapterprefix and \chapapp explained above are used here.

secnumdepth

Per default, in the classes scrbook and scrreprt the section levels from \part down to \subsection and in the class scrartcl the levels from \part down to \subsubsection are numbered. This is controlled by the LaTeX counter secnumdepth. The value -1 represents \part, 0 the level \chapter, and

so on. By defining, incrementing or decrementing this counter you can determine down to which level the headings are numbered. The same applies in the standard classes. Please refer also to the explanation concerning the counter `tocdepth` in .

```
\setpartpreamble[position][width]{preamble}
\setchapterpreamble[position][width]{preamble}
```

scrbook, Parts and chapters in KOMA-Script can be started with a *preamble*. This
scrreprt is particularly useful when you are using a two column layout with the class option `twocolumn`, since the heading together with the *preamble* is always set in a one column layout. The *preamble* can comprise more than one paragraph. The command to output the *preamble* has to be placed before the respective \part, \addpart, \chapter or \addchap command.

Example: You are writing a report about the condition of a company. You organize the report in such a way that every department gets its own partial report. Every one of these parts should be introduced by an abstract on the corresponding title page. You could write the following:

```
\setpartpreamble{%
  \begin{abstract}
    This is a filler text. It serves merely to ↩
        demonstrate the
    capabilities of {\KOMAScript}. If you read ↩
        this text, you will
    get no information.
  \end{abstract}
}
\part{Department for Word Processing}
```

Depending on the settings for the heading font size (see) and the options for the `abstract` environment (see), the result would look similar to:

<div style="border: 1px solid;">

Part III.

Department for Word Processing

Abstract

This is a filler text. It serves merely to demonstrate the capabilities of KOMA-Script. If you read this text, you will get no information.

</div>

Please note that it is *you* who is responsible for the spaces between the heading, preamble and the following text. Please note also that there is no `abstract` environment in the class scrbook (see).

v2.8p   The first optional argument *position* determines the position at which the preamble is placed with the help of one or two letters. For the vertical placement there are two possibilities at present:

o: above the heading

u: below the heading

You can insert one preamble above and another below a heading. For the horizontal placement you have the choice between three alignments:

l: left-aligned

r: right-aligned

c: centered

However, this does not output the text of the *preamble* in such a manner, but inserts a box whose width is determined by the second optional argument *width*. If you leave out this second argument the whole text width is used. In that case the option for horizontal positioning will have no effect. You can combine exactly one letter from the vertical with one letter from the horizontal positioning.

```
\dictum[author]{dictum}
\dictumwidth
\dictumauthorformat{author}
\raggeddictum
\raggeddictumtext
\raggeddictumauthor
```

scrbook, Apart from an introductory paragraph you can use \setpartpreamble or
scrreprt

Table 3.10.: Default settings for the elements of a dictum

Element	Default
dictumtext	\normalfont\normalcolor\sffamily\small
dictumauthor	\itshape

\setchapterpreamble for a kind of *aphorism* (also known as "dictum") at the beginning of a chapter or section. The command \dictum inserts such an aphorism. This macro can be used as obligatory argument of either the command \setchapterpreamble or \setpartpreamble. However, this is not obligatory.

The dictum together with an optional *author* is inserted in a \parbox (see [Tea01]) of width \dictumwidth. Yet \dictumwidth is not a length which can be set with \setlength. It is a macro that can be redefined using \renewcommand. Default setting is 0.3333\textwidth, which is a third of the textwidth. The box itself is positioned with the command \raggeddictum. Default here is \raggedleft, that is, right justified. The command \raggeddictum can be redefined using \renewcommand.

Within the box the *dictum* is set using \raggeddictumtext. Default setting is \raggedright, that is, left justified. Similarly to \raggeddictum this can be redefined with \renewcommand. The output uses the default font setting for the element dictumtext, which can be changed with the commands from section 3.2.1. Default settings are listed in table 3.10.

If there is an *author* name, it is separated from the *dictum* by a line the full width of the \parbox. This is defined by the macro \raggeddictumauthor. Default is \raggedleft. This command can also be redefined using \renewcommand. The format of the output is defined with \dictumauthorformat. This macro expects the \author as argument. As default \dictumauthorformat is defined as:

```
\newcommand*{\dictumauthorformat}[1]{(#1)}
```

Thus the *author* is set enclosed in rounded parenthesis. For the element dictumauthor a different font than for the element dictumtext can be defined. Default settings are listed in table 3.10. Changes can be made using the commands from section 3.2.1. If \dictum is used within the macro \setchapterpreamble or \setpartpreamble you have to take care of the following: the horizontal positioning is always done with \raggeddictum. Therefore, the optional argument for horizontal positioning which is im-

plemented for these two commands has no effect. \textwidth is not
the width of the whole text corpus but the actually used text width. If
\dictumwidth is set to .5\textwidth and \setchapterpreamble has an
optional width of .5\textwidth too, you will get a box with a width one
quarter of the text width. Therefore, if you use \dictum it is recommended
to refrain from setting the optional width for \setchapterpreamble or
\setpartpreamble.

   If you have more than one dictum one under another, you should sep-
arate them by an additional vertical space, easily accomplished using the
command \bigskip.

Example: You are writing a chapter on an aspect of weather forecasting.
               You have come across an aphorism which you would like to
               place at the beginning of the chapter beneath the heading.
               You could write:

```
\setchapterpreamble[u]{%
  \dictum[Anonymous]{Forecasting is the art of ↩
      saying
          what is going to happen and then to ↩
              explain
          why it didn't.}}
\chapter{Weather forecasting}
```

The output would look as follows:

> **17 Weather forecasting**
>
>   Forecasting is the art
>   of saying what is
>   going to happen and
>   then to explain why
>   it didn't.
>   ————————————
>   *(Anonymous)*
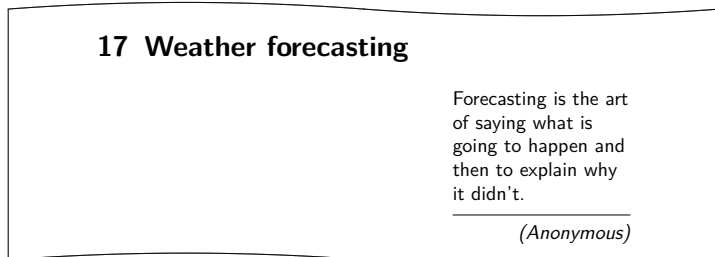
If you would rather the dictum span only a quarter of the text
width rather than one third you can redefine \dictumwidth:

```
\renewcommand*{\dictumwidth}{.25\textwidth}
```

   For a somewhat more sophisticated formatting of left- or right-
aligned paragraphs including hyphenation you can use the pack-
age ragged2e [Sch03].
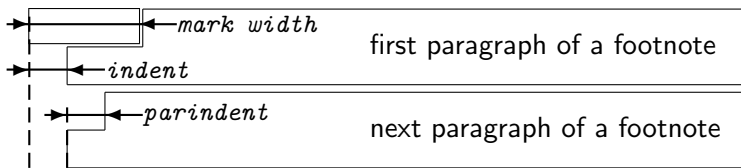
Figure 3.1.: Parameters that control the footnote layout

3.6.3. Footnotes

Footnotes are not limited to the main part of the document. However, since footnotes are mainly used in the main text they are covered in this section.

```
\footnote[number]{text}
\footnotemark[number]
\footnotetext[number]{text}
```

Similarly to the standard classes, footnotes in KOMA-Script are produced with the \footnote command, or alternatively the pairwise usage of the commands \footnotemark and \footnotetext. As in the standard classes it is possible that a page break occurs within a footnote. Normally this happens if the footnote mark is placed so near the bottom of a page as to leave LaTeX no choice but to break the footnote onto the next page.

```
\deffootnote[mark width]{indent}{parindent}{definition}
\deffootnotemark{definition}
\thefootnotemark
\textsuperscript{text}
```

Footnotes are formatted slightly differently in KOMA-Script to in the standard classes. As in the standard classes the footnote mark in the text is depicted using a small superscripted number. The same formatting is used in the footnote itself. The mark in the footnote is type-set right-aligned in a box with width *mark width*. The first line of the footnote follows directly.

All following lines will be indented by the length of *indent*. If the optional parameter *mark width* is not specified, it defaults to *indent*. If the footnote consists of more than one paragraph, then the first line of a paragraph is indented, in addition to *indent*, by the value of *parindent*.

Figure 3.1 illustrates the layout parameters once more. The default configuration of KOMA-Script is:

```
\deffootnote[1em]{1.5em}{1em}
  {\textsuperscript{\thefootnotemark}}
```

`\textsuperscript` controls both the superscript and the smaller font size. `\thefootnotemark` is the current footnote mark without any formatting.

v2.8q   The font element `footnote` determines the font of the footnote including the footnote mark. Using the element `footnotelabel` the font of the footnote mark can be changed separately with the commands mentioned in section 3.2.1 Please refer also to table 3.3, page 54. Default setting is no change in the font.

The footnote mark in the text is defined separately from the mark in front of the actual footnote. This is done with `\deffootnotemark`. Default setting is:

```
\deffootnotemark{%
  \textsuperscript{\thefootnotemark}}
```

v2.8q   In the above the font for the element `footnotereference` is applied (see table 3.3, page 54). Thus the footnote marks in the text and in the footnote itself are identical. The font can be changed with the commands described in section 3.2.1.

Example: A feature often asked for is footnote marks which are neither in superscript nor in a smaller font size. They should not touch the footnote text but be separated by a small space. This can be accomplished as follows:

```
\deffootnote{1em}{1em}{\thefootnotemark\ }
```

The footnote mark and the following space are therefore set right-aligned into a box of width 1 em. The following lines of the footnote text are also indented by 1 em from the left margin.

Another often requested footnote layout is left-aligned footnote marks. These can be obtained with:

```
\deffootnote{1.5em}{1em}{%
    \makebox[1.5em][l]{\thefootnotemark}}
```

If you want however only to change the font for all footnotes, for example to sans serif, you can solve this problem simply by using the commands from section 3.1.4:

```
\setkomafont{footnote}{\sffamily}
```

As demonstrated with the examples above, the simple user interface of KOMA-Script provides a great variety of different footnote formattings.

3.6.4. Lists

Both LaTeX and the standard classes offer different environments for lists. Though slightly changed or extended all these list are of course offered in KOMA-Script as well. In general all lists — even of different kind — can be nested up to four levels. From a typographical view, anything more would make no sense, as more than three levels can no longer be easily perceived. The recommended procedure in such a case is to split the large list into several smaller ones.

```
itemize
\item
\labelitemi
\labelitemii
\labelitemiii
\labelitemiv
```

The simplest form of a list is an `itemize` list. The users of a certain disliked word processing package often refer to this form of a list as *bulletpoints*. Presumably, these users are unable to envisage that, depending on the level, a different symbol from a large dot could be used to introduce each point. Depending on the level, KOMA-Script uses the following marks: "•", "–", "∗" and "·". The definition of these symbols is specified in the macros \labelitemi, \labelitemii, \labelitemiii and \labelitemiv, all of which can be redefined using \renewcommand. Every item is introduced with \item.

Example: You have a simple list which is nested in several levels. You write for example:

```
\minisec{Vehicles}
\begin{itemize}
  \item aeroplanes
  \begin{itemize}
    \item biplane
    \item jets
    \item transport planes
```

```
      \begin{itemize}
        \item single-engined
        \begin{itemize}
          \item jet-driven
          \item propeller-driven
        \end{itemize}
        \item multi-engined
      \end{itemize}
      \item helicopters
    \end{itemize}
%% wahrsheinlich Platzfiller in Deutscher Ausgabe↩
    ?
% \item motorcycles
% \begin{itemize}
% \item historically accurate
% \item futuristic, not real
% \end{itemize}
    \item automobiles
    \begin{itemize}
      \item racing cars
      \item private cars
      \item lorries
    \end{itemize}
    \item bicycles
  \end{itemize}
```

As output you get:

Vehicles
- aeroplanes
  - biplanes
  - jets
  - transport planes
    * single-engined
      · jet-driven
      · propeller-driven
    * multi-engined
  - helicopters
- automobiles
  - racing cars
  - private cars
  - lorries
- bicycles

```
enumerate
\item
\theenumi
\theenumii
\theenumiii
\theenumiv
\labelenumi
\labelenumii
\labelenumiii
\labelenumiv
```

Another form of a list often used is a numbered list which is already implemented by the LaTeX kernel. Depending on the level, the numbering uses the following characters: Arabic numbers, small letters, small roman numerals and capital letters. The kind of numbering is defined with the macros \theenumi down to \theenumiv. The output format is determined by the macros \labelenumi to \labelenumiv. While the small letter of the second level is followed by a round parenthesis, the values of all other levels are followed by a dot. Every item is introduced with \item.

Example: Replacing every occurrence of an itemize environment with an enumerate environment in the example above we get the following result:

Vehicles
1. aeroplanes
    a) biplanes
    b) jets
    c) transport planes
        i. single-engined
            A. jet-driven
            B. propeller-driven
        ii. multi-engined
    d) helicopters
2. automobiles
    a) racing cars
    b) private cars
    c) lorries
3. bicycles

Using \label within a list you can set labels which are referenced with \ref. In the example above, a label was set after the jet-driven, single-engined transport planes with \label{xmp:jets}. The \ref value is then 1(c)iA.

```
description
\item[item]
```

A further list form is the description list. Its main use is the description of several items. The item itself is an optional parameter in \item. The
v2.8p fontwhich is responsible for emphasizing the item can be changed with the commands for the element descriptionlabel (see table 3.3, page 54) described in section 3.2.1. Default setting is \sffamily\bfseries.

Example: Instead of items in sans serif and bold you want them printed in the standard font in bold. Using

```
\setkomafont{descriptionlabel}{\normalfont\↩
    bfseries}
```

you redefine the font accordingly.

An example for a description list is the output of the page styles listed in section 3.2.2. The heavily abbreviated source code is:

```
\begin{description}
```

```
        \item[empty] is the page style without any ↩
           header or footer.
        \item[plain] is the page style without ↩
           headings.
        \item[headings] is the page style with ↩
           running headings.
        \item[myheadings] is the page style for ↩
           manual headings.
    \end{description}
```

This abbreviated version gives:

> **empty** is the page style without any header or footer.
>
> **plain** is the page style without headings.
>
> **headings** is the page style with running headings.
>
> **myheadings** is the page style for manual headings.

---

labeling[*delimiter*]{*widest pattern*}
\item[*keyword*]

An additional form of a description list is only available in the KOMA-Script classes: the labeling environment. Unlike the description environment, you can provide a pattern whose length determines the indentation of all items. Furthermore, you can put an optional *delimiter* between the item and its description.

Example: Slightly changing the example from the description environment, we could write:

```
        \begin{labeling}[~---]{%
           \usekomafont{descriptionlabel}myheadings}
         \item[\usekomafont{descriptionlabel}empty]
           Page style without header and footer
         \item[\usekomafont{descriptionlabel}plain]
           Page style for chapter beginnings without ↩
              headings
         \item[\usekomafont{descriptionlabel}headings]
           Page style for running headings
         \item[\usekomafont{descriptionlabel}↩
           myheadings]
           Page style for manual headings
        \end{labeling}
```

As result we get:

empty	– Page style without header and footer
plain	– Page style for chapter beginnings without headings
headings	– Page style for running headings
myheadings	– Page style for manual headings

As can be seen in this example, a font changing command has to be repeated both in the pattern and in the optional parameter of every \item command in this environment.

Originally this environment was implemented for things like "Precondition, Assertion, Proof", or "Given, Required, Solution" that are often used in lecture hand-outs. By now this environment has found many different applications. For example, the environment for examples in this guide was defined with the labeling environment.

verse

Usually the verse environment is not perceived as a list environment because you do not work with \item commands. Instead, fixed line breaks are used within the flushleft environment. Yet internally in both the standard classes as well as KOMA-Script it is indeed a list environment.

In general the verse environment is used for poems. Lines are indented both left and right. Individual lines of verse are ended by a fixed line break \\. Verses are set as paragraphs, separated by an empty line. Often also \medskip or \bigskip is used instead. To avoid a page break at the end of a line of verse you as usual insert * instead of \\.

Example: As an example, the first lines of "Little Red Riding Hood and the Wolf" by Roald Dahl:

```
\begin{verse}
  As soon as Wolf began to feel\\*
  that he would like a decent meal,\\*
  He went and knocked on Grandma's door.\\*
  When Grandma opened it, she saw\\*
  The sharp white teeth, the horrid grin,\\*
  And Wolfie said, 'May I come in?'
\end{verse}
```

The result is as follows:

> As soon as Wolf began to feel
> That he would like a decent meal,
> He went and knocked on Grandma's door.
> When Grandma opened it, she saw
> The sharp white teeth, the horrid grin,
> And Wolfie said, 'May I come in?'

However, if you have very long lines of verse, for instance:

```
\begin{verse}
  Both the philosopher and the house-owner
  have always something to repair.\\
  \bigskip
  Don't trust a man, my son, who tells you
  that he has never lied.
\end{verse}
```

where a line break occurs within a line of verse:

> Both the philosopher and the house-owner
>   have always something to repair.
>
> Don't trust a man, my son, who tells you that
>   he has never lied.

there * can not prevent a page break occurring within a verse at such a line break. To prevent such a page break, a \nopagebreak would have to be inserted somewhere in the first line:

```
\begin{verse}
  Both the philosopher and the house-owner\↩
      nopagebreak
  have always something to repair.\\
  \bigskip
  Don't trust a man, my son, who tells you\↩
      nopagebreak
  that he has never lied.
\end{verse}
```

In the above example, \bigskip was used to separate the lines of verse.

```
quote
quotation
```

These two environments are also list environments and can be found both in the standard and the KOMA-Script classes. Both environments use justified text which is indented both on the left and right side. Usually they are used to separate long citations from the main text. The difference between these two lies in the manner in which paragraphs are typeset. While quote paragraphs are highlighted by vertical space, in quotation paragraphs the first line is indented. This is also true for the first line of a quotation environment. To prevent indentation you have to insert a \noindent command before the text.

Example: You want to highlight a short anecdote. You write the following quotation environment for this:

```
A small example for a short anecdote:
\begin{quotation}
  The old year was turning brown; the West Wind←
      was
  calling;

  Tom caught the beechen leaf in the forest ←
      falling.
  ''I've caught the happy day blown me by the ←
      breezes!
  Why wait till morrow-year? I'll take it when ←
      me pleases.
  This I'll mend my boat and journey as it ←
      chances
  west down the withy-stream, following my ←
      fancies!''

  Little Bird sat on twig. ''Whillo, Tom! I ←
      heed you.
  I've a guess, I've a guess where your fancies←
       lead you.
  Shall I go, shall I go, bring him word to ←
      meet you?''
\end{quotation}
```

The result is:

A small example for a short anecdote:

> The old year was turning brown; the West
> Wind was calling;
> Tom caught the beechen leaf in the forest
> falling. "I've caught the happy day blown me
> by the breezes! Why wait till morrow-year?
> I'll take it when me pleases. This I'll mend
> my boat and journey as it chances west down
> the withy-stream, following my fancies!"
> Little Bird sat on twig. "Whillo, Tom! I
> heed you. I've a guess, I've a guess where
> your fancies lead you. Shall I go, shall I go,
> bring him word to meet you?"

Using a quote environment instead you get:

A small example for a short anecdote:

> The old year was turning brown; the West
> Wind was calling;
>
> Tom caught the beechen leaf in the forest
> falling. "I've caught the happy day blown me
> by the breezes! Why wait till morrow-year?
> I'll take it when me pleases. This I'll mend
> my boat and journey as it chances west down
> the withy-stream, following my fancies!"
>
> Little Bird sat on twig. "Whillo, Tom! I
> heed you. I've a guess, I've a guess where
> your fancies lead you. Shall I go, shall I go,
> bring him word to meet you?"

```
addmargin[left indentation]{indentation}
addmargin*[inner indentation]{indentation}
```

Similar to quote and quotation, the addmargin environment changes the margin. In contrast to the first two environments, with addmargin the user can set the width of the indentation. Besides this, this environment does not change the indentation of the first line nor the vertical spacing between paragraphs.

If only the obligatory argument *indentation* is given, both the left and right margin are expanded by this value. If the optional argument *left indentation* is given as well, then at the left margin the value *left indentation* is used instead of *indentation*.

The starred addmargin* only differs from the normal version in a two-sided layout. Furthermore, the difference only occurs if the optional argument *inner indentation* is used. In this case this value *inner*

indentation is added to the normal inner indentation. For right-hand pages this is the left margin, for left-hand pages the right margin. Then the value of *indentation* determines the width of the opposite margin.

Both versions of this environment take also negative values for all parameters. This has the effect of expanding the environment into the margin.

Example: Suppose you write a documentation which includes short source code examples. To highlight these you want them separated from the text by a horizontal line and shifted slightly into the outer margin. First you define the environment:

```
\newenvironment{SourceCodeFrame}{%
  \begin{addmargin*}[1em]{-1em}%
    \begin{minipage}{\linewidth}%
      \rule{\linewidth}{2pt}%
}{%
    \rule[.25\baselineskip]{\linewidth}{2pt}%
    \end{minipage}%
  \end{addmargin*}%
}
```

If you now put your source code in such an environment it will show up as:

```
You define yourself the following environment:

\newenvironment{\SourceCodeFrame}{%
  \begin{addmargin*}[1em]{-1em}%
    \begin{minipage}{\linewidth}%
      \rule{\linewidth}{2pt}%
}{%
    \rule[.25\baselineskip]{\linewidth}{2pt←
        }%
    \end{minipage}%
  \end{addmargin*}%
}

This may be feasible or not. In any case it shows the
usage of this environment.
```

The optional argument of the addmargin* environment makes sure that the inner margin is extended by 1 em. In turn the outer margin is decreased by 1 em. The result is a shift by 1 em to the outside. Instead of 1em you can of course use a length, for example, 2\parindent.

There is one problem with the `addmargin*` which you should be aware of. If a page break occurs within an `addmargin*` environment, the indentation on the following page will be on the wrong side. This means that suddenly the *inner indentation* is applied on the outside of the page. Therefore it is recommended to prevent page breaks within this environment. This can be achieved by using an additional `\parbox` or, as in the example above, a `minipage`. This makes use of the fact that neither the argument of a `\parbox` nor the content of a `minipage` breaks at the end of a page. Unfortunately this is not without another disadvantage: in some cases pages can no longer be filled correctly, which has the effect of generating several warnings.

Incidentally, whether a page is going to be on the left or right side of the book can not be determined for certain in the first LaTeX run. For details please refer to the explanation of the commands `\ifthispageodd` and `\ifthispagewasodd` in .

One concluding remark on list environments: on the internet and during support it is often asked why such an environment is followed by a indented paragraph. In fact, this is not the case but is the result of the user demanding a new paragraph. In LaTeX empty lines are interpreted as a new paragraph. This is also the case before and after list environments. Thus, if you want a list environment to be set within a paragraph you have to omit empty lines before and after. To nevertheless separate the environment from the rest of your text in the LaTeX source file, you can insert a comment line before and after, that is, lines which begin with a percent character and contain nothing more.

3.6.5. Margin Notes

```
\marginpar[margin note left]{margin note}
\marginline{margin note}
```

Usually margin notes in LaTeX are inserted with the command `\marginpar`. They are placed in the outer margin. In documents with one-sided layout the right border is used. Though `\marginpar` can take an optional different margin note argument in case the output is in the left margin, margin notes are always set in justified layout. However, experience has shown that many users prefer left- or right-aligned margin notes instead. To facilitate this, KOMA-Script offers the command `\marginline`.

Example: In the introduction, the class name scrartcl can be found in the

margin. This can be produced[2] with:

```
\marginline{\texttt{scrartcl}}
```

Instead of \marginline you could have used \marginpar. In fact the first command is implemented internally as:

```
\marginpar[\raggedleft\texttt{scrartcl}]
  {\raggedright\texttt{scrartcl}}
```

Thus \marginline is really only an abbreviated writing of the code above.

Unfortunately \marginpar does not always work correctly in two-sided layout. Whether a margin note will end up in the left or right margin is already decided while evaluating the command \marginpar. If the output routine now shifts the margin note onto the next page the formatting is no longer correct. This behaviour is deeply rooted within LaTeX and was therefore declared a feature by the LaTeX3 team. \marginline suffers from this "feature" too. The package mparhack (see [SU03]) offers a standard solution for this problem which naturally benefits also \marginpar and \marginline.

Note that you may not use \marginpar or \marginline within float environments such as tables or figures. Also, these commands will not function in displayed math formulas.

3.6.6. Tables and Figures

With the floating environments LaTeX offers a very capable and comfortable mechanism for automatic placement of figures and tables. But often these floating environments are slightly misunderstood by beginners. They often ask for a fixed position of a table or figure within the text. However, since these floating environments are being referenced in the text this is not necessary in most cases. It is also not sensible because such an object can only be set on the page if there is enough space left for it. If this is not the case the object would have to be shifted onto the next page, thereby possibly leaving a huge blank space on the page before.

Often one finds in a document for every floating object the same optional argument for positioning the object. This also makes no sense. In such cases one should rather change the standard parameter globally. For more details refer to [RNH02].

---

[2]In fact, instead of \texttt, a semantic highlighting was used. To avoid confusion this was replaced in the example.

One last important note before starting this section: most mechanisms described here which extend the capabilities of the standard classes no longer work correctly when used together with packages which modify the typesetting of captions of figures and tables. This should be self evident, but it is often not understood.

```
\caption[entry]{title}
\captionbelow[entry]{title}
\captionabove[entry]{title}
```

In the standard classes caption text *title* of tables and figures is inserted with the `\caption` command below the table or figure. In general this is correct for figures. Opinions differ as to whether captions of tables are to be placed above or, consistent with captions of figures, below the table. That is the reason why KOMA-Script, unlike the standard classes, offers `\captionbelow` for captions below and `\captionabove` for captions above tables or figures. Using `\caption` for figures always produces captions below the figure, whereas with tables the behaviour of `\caption` can be modified using the options `tablecaptionabove` and `tablecaptionbelow` (see section 3.1.7, page 51). For compatibility reasons the default behaviour of `\caption` used with tables is similar to `\captionbelow`.

Example: Instead of using captions below a table you want to place your captions above it, because you have tables which span more then one page. In the standard classes you could only write:

```
\begin{table}
  \caption{This is an example table}
  \begin{tabular}{llll}
    This & is & an & example.\\\hline
    This & is & an & example.\\
    This & is & an & example.
  \end{tabular}
\end{table}
```

Then you would get the unsatisfying result:

Table 30.2: This is an example table.			
This	is	an	example.
This	is	an	example.
This	is	an	example.

Using KOMA-Script you write instead:

```
\begin{table}
  \captionabove{This is just an example table}
  \begin{tabular}{llll}
    This & is & an & example.\\\hline
    This & is & an & example.\\
    This & is & an & example.
  \end{tabular}
\end{table}
```

Then you get:

Table 30.2: This is just an example table			
This	is	an	example.
This	is	an	example.
This	is	an	example.

Since you want all your tables typeset with captions above, you could of course use the option `tablecaptionabove` instead (see section 3.1.7, page 51). Then you can use `\caption` as you would in the standard classes. You will get the same result as with `\captionabove`.

Some would argue that you could achieve the same result using the `\topcaption` command from the topcapt package (see [Fai99]). However, that is not the case. The command `\topcaption` is ignored by packages which directly redefine the `\caption` macro. The hyperref package (see [Rah01]) is one such example. In KOMA-Script, `\captionabove` and `\captionbelow` are so implemented that changes have an effect on both of these commands as well.

If the longtable package is used, KOMA-Script ensures that captions above tables which are placed within a `longtable` environment have the same appearance as those in a normal `table` environment. This also means that you can apply the same settings as in a `table` environment. Please note that in the longtable package the maximum width of a table caption can be limited and the default is set to 4 in (see [Car98]). Used together with KOMA-Script this mechanism in longtable works only if the class option `origlongtable` is set (see section 3.1.7, page 52). If the caption2 or caption package (see [Som04]) is loaded, table captions are handled by this package.

Please note that `\captionabove` and `\captionbelow`, if placed within a `float` environment which was defined using the float package, have the exact same behaviour described in [Lin01] for the `\caption` command. In

this case, the float style determines whether the caption will be set below or above the figure or table.

```
captionbeside[entry]{title}[placement][width][offset]
captionbeside[entry]{title}[placement][width][offset]*
```

v2.8q   Apart from captions above and below the figure, one often finds captions, in particular with small figures, which are placed beside the figure. In general in this case both the baseline of the figure and of the caption are aligned at the bottom. With some fiddling and the use of two \parbox commands this could also be achieved in the standard classes. However, KOMA-Script offers a special environment for this which can be used within the floating environment. The first optional parameter *entry* and the obligatory parameter *title* mean the same as the corresponding parameters of \caption, \captionabove or \captionbelow. The caption text *title* is placed beside the content of the environment in this case.

Whether the caption text *title* is placed on the left or the right can be determined by the parameter *placement*. Exactly one of the following letters is allowed:

l   –   left

r   –   right

i   –   inner margin in two-sided layout

o   –   outer margin in two-sided layout

Default setting is to the right of the content of the environment. If either o or i are used you may need to run LaTeX twice to obtain the correct placement.

Per default the content of the environment and the caption text *title* fill the entire available text width. However, using the optional parameter *width*, it is possible to adjust the width used. This width could even be larger than the current text width.

When supplying a *width* the used width is usually centered with respect to the text width. Using the optional parameter *offset*, you can shift the environment relative to the left margin. A positive value corresponds to a shift to the right, whereas a negative value corresponds to a shift to the left. An *offset* of 0 pt gives you a left-aligned output.

Adding a star to the optional parameter *offset* makes the the value mean a shift relative to the right margin on left hand pages in two-sided layout. A positive value corresponds to a shift towards the outer margin,

KOMA-Script

Figure 3.2.: A figure description which is neither above
nor below, but beside the figure

whereas a negative value corresponds to a shift towards the inner margin.
An *offset* of 0 pt means alignment with the inner margin. As mentioned
before, in some cases it takes two LaTeX runs for this to work correctly.

Example: An example for the usage of the `captionbeside` environment
can be found in figure 3.2. This figure was typeset with:

```
\begin{figure}
  \begin{captionbeside}[Example for a figure ↩
      description]%
    {A figure description which is neither above↩
        nor
     below, but beside the figure}[i][\linewidth↩
        ][2em]*
    \fbox{%
      \parbox[b][5\baselineskip][c]{.25\↩
          textwidth}{%
        \hspace*{\fill}\KOMAScript\hspace*{\fill↩
            }\par}}
  \end{captionbeside}
  \label{fig:maincls.captionbeside}
\end{figure}
```

The total width is thus the currently available width
`\linewidth`. However, this width is shifted `2em` to the out-
side. The caption text or description is placed on the inner
side beside the figure. The figure itself is shifted 2 em into the
outer margin.

v2.8p   The font style for the description and the label — "Figure" or "Table",
followed by the number and the delimiter — can be changed with the com-
mands described in section 3.2.1. The respective elements for this are
`caption` and `captionlabel` (see table 3.3, page 54). First the font style
for the element `caption` is applied to the element `captionlabel` too. After

Table 3.11.: Font defaults for the elements of figure or table captions

element	default
caption	\normalfont
captionlabel	\normalfont

this the font style of captionlabel is applied on the respective element. The default settings are listed in table 3.11.

Example: You want the table and figure descriptions typeset in a smaller font size. Thus you could write the following in the preamble of your document:

> \addtokomafont{caption}{\small}

Furthermore, you would like the labels to be printed in sans serif and bold. You add:

> \setkomafont{captionlabel}{\sffamily\bfseries}

As you can see, simple extensions of the default definitions are possible.

komaabove
komabelow

float   If you use the float package the appearance of the float environments is solely defined by the *float* style. This includes whether captions above or below are used. In the float package there is no predefined style which gives you the same output and offers the same setting options (see below) as KOMA-Script. Therefore KOMA-Script defines the two additional styles komaabove and komabelow. When using the float package these styles can be activated just like the styles plain, boxed or ruled defined in float. For details refer to [Lin01]. The style komaabove inserts \caption, \captionabove and \captionbelow above, whereas komabelow inserts them below the float content.

\captionformat

In KOMA-Script there are different ways to change the formatting of the caption text. The definition of different font styles was already explained above. This or the caption delimiter between the label and the label text

itself is specified in the macro \captionformat. In contrast to all other
\...format commands, in this case it does not contain the counter but
only the items which follow it. The original definition is:

```
\newcommand*{\captionformat}{:\ }
```

This too can be changed with \renewcommand.

Example: For some inexplicable reasons you want a dash with spaces
before and after instead of a colon followed by a space as label
delimiter. You define:

```
\renewcommand*{\captionformat}{~--~}
```

This definition should be put in the preamble of your docu-
ment.

```
\figureformat
\tableformat
```

It was already mentioned that \captionformat does not contain format-
ting for the label itself. This situation should under no circumstances be
changed using redefinitions of the commands for the output of counters,
\thefigure or \thetable. Such a redefinition would have unwanted side
effects on the output of \ref or the table of contents, list of figures and list
of tables. To deal with the situation, KOMA-Script offers two \...format
commands instead. These are predefined as follows:

```
\newcommand*{\figureformat}{\figurename~\thefigure\←↩
    autodot}
\newcommand*{\tableformat}{\tablename~\thetable\autodot}
```

They also can be adapted to your personal preferences with
\renewcommand.

Example: From time to time captions without any label and of course
without delimiter are desired. In KOMA-Script it takes only
the following definitions to achieve this:

```
\renewcommand*{\figureformat}{}
\renewcommand*{\tableformat}{}
\renewcommand*{\captionformat}{}
```

It should be noted, however, that although no numbering is
output, the internal counters are nevertheless incremented.

This becomes important especially if this redefinition is applied only to selected `figure` or `table` environments.

```
\setcapindent{indent}
\setcapindent*{xindent}
\setcaphanging
```

As mentioned previously, in the standard classes the captions are set in a non-hanging style, that is, in multi-line captions the second and subsequent lines start directly beneath the label. The standard classes provide no direct mechanism to change this behaviour. In KOMA-Script, on the contrary, beginning at the second line all lines are indented by the width of the label so that the caption text is aligned.

This behaviour, which corresponds to the usage of `\setcaphanging`, can easily be changed by using the command `\setcapindent` or `\setcapindent*`. Here the parameter *indent* determines the indentation of the second and subsequent lines.

If you want a line break after the label and before the caption text, then you can define the indentation *xindent* of the caption text with the starred version of the command instead: `\setcapindent*`.

Using a negative value of *indent* instead, a line break is also inserted before the caption text and only the first line of the caption text but not subsequent lines are indented by the absolute value of *indent*.

Whether one-line captions are set as captions with more than one line or are treated separately is specified with the class options `onelinecaption` and `nooonelinecaption`. For details please refer to the explanations of these options in .

Example: For the examples please refer to figures 3.3 to 3.6. As you can see the usage of a fully hanging indentation is not advantageous when combined with narrow column width. To illustrate, the source code for the second figure is given here with a modified caption text:

```
\begin{figure}
  \setcapindent{1em}
  \fbox{\parbox{.95\linewidth}{\centering{\←
      KOMAScript}}}
  \caption{Example with slightly indented ←
      caption
            starting at the second line}
\end{figure}
```

KOMA-Script	KOMA-Script

Figure 3.3.: Equivalent to the standard setting, similar to the usage of \setcaphanging

Figure 3.4.: With slightly hanging indentation starting at the second line using \setcapindent{1em}

KOMA-Script	KOMA-Script

Figure 3.5.:
With hanging indentation starting at the second line and line break before the description using \setcapindent*{1em}

Figure 3.6.:
With indentation in the second line only and line break before the description using \setcapindent{-1em}

As can be seen the formatting can also be changed locally within the figure environment. The change then affects only the current figure. Following figures once again use the default settings or global settings set, for example, in the preamble of the document. This also of course applies to tables.

```
\setcapwidth[justification]{width}
\setcapmargin[margin left]{margin}
\setcapmargin*[margin inside]{margin}
```

v2.8q | Using these three commands you can specify the width and justification of the caption text. In general the whole text width or column width is available for the caption.

With the command \setcapwidth you can decrease this *width*. The obligatory argument determines the maximum *width* of the caption. As an optional argument you can supply exactly one letter which specifies the horizontal justification. The possible justifications are given in the following list.

l   –   left-aligned

c   –   centered

r   –   right-aligned

i   –   alignment at the inner margin in double-sided output

o   –   alignment at the outer margin in double-sided output

The justification inside and outside corresponds to left-aligned and right-aligned, respectively, in single-sided output. Within longtable tables the justification inside or outside does not work correctly. In particular, the captions on subsequent pages of such tables are aligned according to the format of the caption on the first page of the table. This is a conceptual problem in the implementation of longtable.

With the command \setcapmargin you can specify a *margin* which is to be left free next to the description in addition to the normal text margin. If you want margins with different widths at the left and right side you can specify these using the optional argument *margin left*. The starred version \setcapmargin* defines instead of a *margin left* a *margin inside* in a double-sided layout. In case of longtable tables you have to deal with the same problem with justification inside or outside as mentioned with the macro \setcapwidth. Furthermore, the usage of \setcapmargin or \setcapmargin* switches on the option noonelinecaption (see) for the captions which are typeset with this margin setting.

longtable places the caption in a box, which is issued again on subsequent pages as needed. When outputting a box, the macros needed for its creation are not reevaluated. That is the reason why it is not possible for KOMA-Script to swap margin settings for even pages in double-sided layout . This is what would be necessary in order to produce a justification which is shifted towards the outside or inside.

You can also submit negative values for *margin* and *margin left* or *margin inside*. This has the effect of the caption expanding into the margin.

Example: A rather odd problem is that of a figure caption which is required to be both centered and of the same width as the figure itself. If the width of the figure is known in advance, the solution with KOMA-Script is quite easy. Supposing the figure has a width of 8 cm, it only takes:

```
\setcapwidth[c]{8cm}
```

directly in front of \caption or \captionbelow. If the width is unknown then you first have to define a length in the preamble of your document:

```
\newlength{\FigureWidth}
```

Having done this you can calculate the width directly with the
LaTeX command \settowidth (see [Tea01]) in many cases.
A possible solution would look as follows:

```
\begin{figure}
  \centering%
  \settowidth{\FigureWidth}{%
    \fbox{\quad\KOMAScript\quad}%
    }%
  \fbox{\quad\KOMAScript\quad}%
  \setcapwidth[c]{\FigureWidth}
  \caption{Example of a centered caption below ↩
      the figure}
\end{figure}
```

However, it is awkward to write the content twice and to call
\setcapwidth for every figure. Yet nothing is easier than defin-
ing a new command in the preamble of your document which
hides the three steps of:

1. defining the width of the argument

2. specifying the width of the caption

3. outputting the argument

in:

```
\newcommand{\Figure}[1]{%
  \settowidth{\FigureWidth}{#1}%
  \setcapwidth[c]{\FigureWidth}%
  #1}
```

Using this command the example abbreviates to:

```
\begin{figure}
  \centering%
  \Figure{\fbox{\quad\KOMAScript\quad}}%
  \caption{Example of a centered caption below ↩
      the figure}
\end{figure}
```

However, commands have the disadvantage that errors in the
macros of the argument in case of arguments with more than
one line are not reported with the very accurate line numbers

by LATEX. Thus in some cases the use of an environment has advantages. Then, however, the question arises of how the width of the content of the environment can be determined. The solution involves the `lrbox` environment, described in [Tea01]:

```
\newsavebox{\FigureBox}
\newenvironment{FigureDefinesCaptionWidth}{%
  \begin{lrbox}{\FigureBox}%
}{%
  \end{lrbox}%
  \global\setbox\FigureBox=\box\FigureBox%
  \aftergroup\SetFigureBox%
}
\newcommand{\SetFigureBox}{%
  \Figure{\usebox{\FigureBox}}}
```

This definition uses the macro `\Figure` defined above. In the main text you write:

```
\begin{figure}
  \centering%
  \begin{FigureDefinesCaptionWidth}
    \fbox{\hspace{1em}\KOMAScript\hspace{1em}}
  \end{FigureDefinesCaptionWidth}
  \caption{Example of a centered caption below ↩
      the figure}
\end{figure}
```

Admittedly, the environment in this example is not necessary. However, its definition using `\global` is quite tricky. Most users would probably not be able to define such an environment without help. Thus, as this definition can be very useful, it was introduced in the above example.

Even if the `captionbeside` environment did not exist you could nevertheless place the figure caption beside the figure in a quite simple way. For this `\SetFigureBox` from the example above would have to be redefined first:

```
\renewcommand{\SetFigureBox}{%
  \settowidth{\captionwidth}{\usebox{\FigureBox↩
      }}%
```

```
\parbox[b]{\captionwidth}{\usebox{\FigureBox↩
    }}%
\hfill%
\addtolength{\captionwidth}{1em}%
\addtolength{\captionwidth}{-\hsize}%
\setlength{\captionwidth}{-\captionwidth}%
\setcapwidth[c]{\captionwidth}%
}
```

Finally you only have to put the \caption command in a \parbox too:

```
\begin{figure}
  \centering%
  \begin{FigureSetsCaptionWidth}
    \fbox{\rule{0pt}{5\baselineskip}%
      \hspace{1em}\KOMAScript\hspace{1em}}
  \end{FigureSetsCaptionWidth}
  \parbox[b]{\FigureWidth}{%
    \caption{Example of a centered caption
             below the figure}
  }
\end{figure}
```

The \rule command in this example only serves as an invisible support to produce an example figure with a greater vertical height.

3.6.7. Logical Markup of Text

LaTeX offers different possibilities for logical markup of text. Strictly speaking, a heading is a kind of markup too. However, in this section we are only concerned with direct markup, i. e., markup which does not have an additional semantic meaning and which can be used for different purposes. More details on the normally defined possibilities can be found in [OPHS99], [Tea01] and [Tea00].

```
\textsubscript{text}
```

In section 3.6.3, page 89, the command \textsuperscript was already introduced as an integral part of the LaTeX kernel. Unfortunately, LaTeX

itself does not offer a command to produce text in subscript instead of superscript. KOMA-Script defines \textsubscript for this purpose.

Example: You are writing a text on human metabolism. From time to time you have to give some simple chemical formulas in which the numbers are in subscript. For enabling logical markup you first define in the document preamble or in a separate package:

```
\newcommand*{\molec}[2]{#1\textsubscript{#2}}
```

Using this you then write:

```
The cell produces its energy partly from ←↩
    reaction of \molec C6\molec
H{12}\molec O6 and \molec O2 to produce \molec ←↩
    H2\Molec O{} and
\molec C{}\molec O2. However, arsenic (\molec{←↩
    As}{}) has a quite
detrimental effect on the metabolism.
```

The output looks as follows:

> The cell produces its energy from reaction of $C_6H_{12}O_6$
> and O_2 to produce H_2O and CO_2. However, arsenic (As)
> has a quite detrimental effect on the metabolism.

Some time later you decide that the chemical formulas should be typeset in sans serif. Now you can see the advantages of using logical markup. You only have the redefine the \molec command:

```
\newcommand*{\molec}[2]{\textsf{#1\←↩
    textsubscript{#2}}}
```

Now the output in the whole document changes to:

> The cell produces its energy partly from reaction of
> $C_6H_{12}O_6$ and O_2 to produce H_2O and CO_2. How-
> ever, arsenic (As) has a quite detrimental effect on the
> metabolism.

In the example above, the notation "\molec C6" is used. This makes use of the fact that arguments consisting of only one character do not have to be enclosed in parentheses. That is why "\molec C6" is similar

to "\molec{C}{6}". You might already know this from indices or powers in mathematical environments, such as "x^2" instead of "x^{2}" for "x^2".

3.7. Appendix

The last part of a document usually contains the appendix, the bibliography and, if necessary, the index.

```
\appendix
```

The appendix in the standard as well as the KOMA-Script classes is introduced with \appendix. This command switches, among other things, the chapter numbering to upper case letters, also ensuring that the rules according to [DUD96] are followed (for German-speaking regions). These rules are explained in more detail in the description of the class options pointednumbers and pointlessnumbers in section 3.1.7, page 50.

Please note that \appendix is a command, *not* an environment! This command does not expect any argument. Sectioning in the appendix uses \chapter and \section just as does the main text.

```
\appendixmore
```

There is a peculiarity within the \appendix command in the KOMA-Script classes. If the command \appendixmore is defined, this command is executed also by the \appendix command. Internally the KOMA-Script classes scrbook and scrreprt take advantage of this behaviour to implement the options appendixprefix and noappendixprefix (see section 3.1.3, page 45). You should take note of this in case you decide to define or redefine the \appendixmore. In case one of these options is set, you will receive an error message when using \newcommand{\appendixmore}{...}. This behaviour is intended to prevent you from disabling options without noticing it.

Example: You do not want the chapters in the main part of the classes scrbook or scrreprt to be introduced by a prefix line (see layout options chapterprefix and nochapterprefix in section 3.1.3, page 44). For consistency you also do not want such a line in the appendix either. Instead, you would like to see the word "Chapter" in the language of your choice written in front of the chapter letter and, simultaneously, in the page headings. Instead of using the either layout option appendixprefix or

noappendixprefix, you would define in the document preamble:

```
\newcommand*{\appendixmore}{%
  \renewcommand*{\chapterformat}{%
    \appendixname~\thechapter\autodot\enskip}
  \renewcommand*{\chaptermarkformat}{%
    \appendixname~\thechapter\autodot\enskip}
}
```

In case you subsequently change your mind and decide to use the option appendixprefix at a later stage, you will get an error message because of the already defined \appendixmore command. This behaviour prevents the definition made above from invisibly changing the settings intended with the option.

It is also possible to get a similar behaviour of the appendix for the class scrartcl. You would write in the preamble of your document:

```
\newcommand*{\appendixmore}{%
  \renewcommand*{\othersectionlevelsformat↩
      }[1]{%
    \ifthenelse{\equal{##1}{section}}{\↩
        appendixname~}{}%
    \csname the##1\endcsname\autodot\enskip}
  \renewcommand*{\sectionmarkformat}{%
    \appendixname~\thesection\autodot\enskip}
}
```

In addition, the package ifthen (see [Car99a]) is required.

Redefined commands are explained in more detail in

\setbibpreamble{*preamble*}

The command \setbibpreamble can be used to set a preamble for the bibliography. This can be achieved by placing the preamble before the command for issuing the bibliography. However, it does not have to be directly in front of it. For example, it could be placed at the beginning of the document. Similar to the class options bibtotoc and bibtotocnumbered, this command can only be successful if you have not loaded a package which prevents this by redefining the thebibliography environment.

Even though the natbib package makes unauthorized use of internal macros of KOMA-Script it could be achieved that \setbibpreamble works with the current version of natbib (see [Dal99]).

Example: You want to point out that the sorting of the references in the bibliography is not according to their occurrence in the text, but in alphabetical order. You use the following command:

```
\setbibpreamble{References are in alphabetical ←
    order.
  References with more than one author are ←
      sorted
  according to the first author.\par\bigskip}
```

The \bigskip command makes sure that the preamble and the first reference are separated by a large vertical space.

\setindexpreamble{*preamble*}

Similarly to the bibliography you can use a preamble to the index. This is often the case if you have more than one index or if you use different kinds of referencing by highlighting the page numbers in different ways.

Example: You have a document in which terms are both defined and used. The page numbers of definitions are in bold. Of course you want to make your reader aware of this fact. Thus you insert a preamble for the index:

```
\setindexpreamble{In \textbf{bold} printed page←
    numbers are
  references to the definition of terms. Other ←
      page numbers indicate
  the use of a term.\par\bigskip}
```

Please note that the page style of the first page of the index is changed. The applied page style is defined in the macro \indexpagestyle (see).

The production, sorting and output of the index is done by the standard LaTeX packages and additional programs. Similar to the standard classes KOMA-Script only provides the basic macros and environments.

3.8. Obsolete Commands

In this section you will find commands which should not be used any longer. They are part of older KOMA-Script versions and their use was documented. For compatibility reasons they can still be used in the current KOMA-Script release. There are however new mechanisms and user interfaces which you should use instead. The reason for listing the obsolete macros in this documentation is only to aid users in understanding old documents. Furthermore, package authors are free to use these macros in the future.

```
\sectfont
```

This macro sets the font which is used for all section headings and the abstract, the main title and the highest level below \part in the table of contents. Instead, use the commands for the element `disposition`, described in section 3.2.1.

```
\capfont
\caplabelfont
```

The macro \capfont sets the font which is used for captions in tables and figures. The macro \caplabelfont sets the font which is used for the label and numbering of tables and pictures. Instead, use the commands for the elements `caption` and `captionlabel`, described in section 3.2.1.

```
\descfont
```

This macro sets the font for the optional item arguments of a `description` environment. Instead, use the commands for the element `descriptionlabel`, described in section 3.2.1.

Adapting Page Headers and Footers with scrpage2

As already mentioned in the two previous chapters, KOMA-Script includes a package to customise the document page header and footer. As of 2001, this package is no longer scrpage but the much improved and enhanced successor scrpage2. Therefore, this documentation describes only scrpage2. The package scrpage is obsolete.

In place of scrpage2 you can of course make use of fancyhdr (see [vO00]). However, scrpage2 integrated markedly better with the KOMA-Script bundle. For this reason, and because at the time the forerunner to fancyhdr was missing many features, scrpage2 was developed. Naturally, scrpage2 is not limited to use only with the KOMA-Script classes, but can just as easily be used with other document classes.

Included as part of the basic functionality of scrpage2 are various pre-defined and configurable page styles.

4.1. Basic Functionality

To understand the following description, an overview of LaTeX's fairly involved header and footer mechanism is needed. The LaTeX kernel defines the page styles empty, which produces a completely empty header and footer, and plain, which produces usually only a page number in the footer and an empty header. Apart from these, many document classes provide the style headings, which allows more complex style settings and running headings. The headings style often has a related variant, myheadings, which is similar except for switching off the running headings and reverting them to manual control by the user. A more detailed description is given in section 3.2.2 where it is also noted that some LaTeX commands automatically switch to the page style plain for the current page, independent of what page style was chosen by the author, and consequently a document needs an appropriate plain page style.

Therefore scrpage2 defines its own plain and headings page styles, named scrplain and scrheadings. The manual activation of scrplain is not necessary, since the activation of scrheadings takes care of it automatically. Only if one wants to use one's own page style in combination with scrplain must the page style scrplain be activated first, i. e., with \pagestyle{*scrplain*}\pagestyle{*personalPagestyle*}.

The original headings page style of the document class is available as

useheadings. This re-definition is required since scrpage2 uses a differ-
ent way to deal with automatic and manual headings. This way is more
flexible and allows configurations which would usually prove difficult to
implement for inexperienced users. The required commands to work with
the scrpage2 implementation are introduced at the end of section 4.1.1 and
the beginning of section 4.1.2.

4.1.1. Predefined Page Styles

```
scrheadings
scrplain
```

Package scrpage2 delivers its own page style, named scrheadings, which
can be activated with the \pagestyle{scrheadings}. When this page
style is in use, an appropriate scrplain page style is used for the plain
page style. In this case *appropriate* means that this new plain page style
is also configureable by the commands introduced in section 4.1.3, which,
for example, configure the header and footer width. Neither the activation
of scrheadings nor the attendant change to the plain page style influ-
ences the mode of manual or automatic headings (see section 4.1.2). The
scrplain page style can also be activated directly with \pagestyle.

```
\lehead[scrplain-left-even]{scrheadings-left-even}
\cehead[scrplain-center-even]{scrheadings-center-even}
\rehead[scrplain-right-even]{scrheadings-right-even}
\lefoot[scrplain-left-even]{scrheadings-left-even}
\cefoot[scrplain-center-even]{scrheadings-center-even}
\refoot[scrplain-right-even]{scrheadings-right-even}
\lohead[scrplain-left-odd]{scrheadings-left-odd}
\cohead[scrplain-center-odd]{scrheadings-center-odd}
\rohead[scrplain-right-odd]{scrheadings-right-odd}
\lofoot[scrplain-left-odd]{scrheadings-left-odd}
\cofoot[scrplain-center-odd]{scrheadings-center-odd}
\rofoot[scrplain-right-odd]{scrheadings-right-odd}
\ihead[scrplain-inside]{scrheadings-inside}
\chead[scrplain-centered]{scrheadings-centered}
\ohead[scrplain-outside]{scrheadings-outside}
\ifoot[scrplain-inside]{scrheadings-inside}
\cfoot[scrplain-centered]{scrheadings-centered}
\ofoot[scrplain-outside]{scrheadings-outside}
```

The page styles include three boxes in both the header and the footer. The
commands modifying the content of these boxes can be seen in figure 4.1.
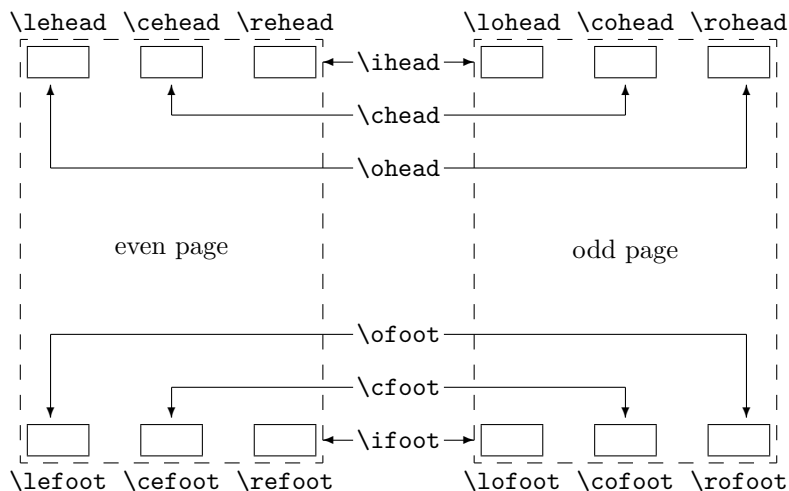
Figure 4.1.: Commands for modification of page styles `scrheadings` and `scrplain` and their relationship to header and footer elements

Commands in the middle column modify the box contents on both odd and even pages.

Example: If one wants the page number be placed in the middle of the footer, then following can be used:

```
\cfoot{\pagemark}
```

The next example shows how to place both running heading and page number in the header; the running heading inside and the page number outside:

```
\ohead{\pagemark}
\ihead{\headmark}
\cfoot{}
```

The command `\cfoot{}` is only required in order to empty the item in the middle of the footer, which normally contains the page number.

The commands which are associated with only one item can be used for more advanced settings.

Example: Assuming one has the order to write an annual report for one's company, one could use commands like this:

```
\ohead{\pagemark}
\rehead{Annual Report 2001}
\lohead{\headmark}
\cefoot{TheCompanyName Inc.}
\cofoot{Department: Development}
```

In order to keep the data in the footer synchronized with the content of the document, the footer has to be updated using \cofoot when a new department is discussed in the report.

As mentioned above, there is a new plain page style which corresponds to scrheadings. Since it should also be possible to customize this style, the commands support an optional argument with which the contents of the appropriate fields of this plain page style can be modified.

Example: The position of the page number for the page style scrheadings can be declared as follows:

```
\cfoot[\pagemark]{}
\ohead[]{\pagemark}
```

When the command \chapter, after it has started a new page, now switches to the plain page style, then the page number is centered in the footer.

```
\clearscrheadings
\clearscrplain
\clearscrheadfoot
```

If one wants to redefine both the page style scrheadings and the corresponding plain page style, frequently one must empty some already occupied page elements. Since one rarely fills all items with new content, in most cases several instructions with empty parameters are necessary. With the help of these three instructions the quick and thorough deletion is possible. While \clearscrheadings only deletes all fields of the page style scrheadings, and \clearscrplain deletes all fields of the corresponding plain page style, \clearscrheadfoot sets all fields of both page styles to empty.

Example: If one wants to reset the page style to the default KOMA-Script settings, independent of the actual configuration, only these three commands are sufficient:

```
\clearscrheadfoot
\ohead{\headmark}
\ofoot[\pagemark]{\pagemark}
```

Without the commands \clearscrheadfoot, \clearscrheadings and \clearscrplain, 6 commands with 9 empty arguments would be required:

```
\ihead[]{}
\chead[]{}
\ohead[]{\headmark}
\ifoot[]{}
\cfoot[]{}
\ofoot[\pagemark]{\pagemark}
```

Of course, for a specific configuration, some of them could be dropped.

In the previous examples two commands were used which have not been introduced yet. The description of these commands follows.

\leftmark
\rightmark

These two instructions make it possible to access the running headings, which are normally meant for the left or for the right page. These two instruction are not made available by scrpage2, but directly by the LaTeX kernel. When in this section running headings of the left page or the right page are mentioned, this refers to the contents of \leftmark or \rightmark, respectively.

\headmark

This command gives access to the content of running headings. In contrast to \leftmark and \rightmark, one need not regard the proper assignment to left or right page.

\pagemark

This command returns the formatted page number. The formatting can be controlled by \pnumfont, introduced in section 4.1.3, page 126, which \pagemark heeds automatically. Alternatively, \setkomafont can be used if a KOMA-Script class is used (see section 3.2.1).

useheadings

The package scrpage2 is meant primarily for use of the supplied styles or for defining one's own styles. However, it may be necessary to shift back also to a style provided by the document class. It might appear that this should be done with \page style{headings}, but this has the disadvantage that commands \automark and \manualmark, to be discussed shortly, do not function as expected. For this reason one should shift back to the original styles using \page style{useheadings}, which chooses the correct page styles automatically for both manual and automatic running headings.

4.1.2. Manual and Running Headings

Usually there is a *my*-version of the headings page style. If such a page style is active, then the running headings are no longer updated no longer automatically and become manual headings. With scrpage2 a different path is taken. Whether the headings are running or manual is determined by the instructions \automark and \manualmark, respectively. The default can be set already while loading of the package, with the options automark and manualmark (see).

\manualmark

As the name suggests, \manualmark switches off the updating of the running headings and makes them manual. It is left to the user to update and provide contents for the headings. For that purpose the instructions \markboth and \markright are available.

\automark[*right page*]{*left page*}

The macro \automark activates the automatic updating, that is, running headings. For the two parameters the designations of the document sectioning level whose title is to appear in appropriate place are to be used. Valid values for the parameters are: part, chapter, section, subsection, subsubsection, paragraph, and subparagraph. For most of the classes use of part will not produce the expected result. So far only KOMA-Script classes from version 2.9s up are known to support this value.

v2.2

The optional argument *right page* is understandably meant only for two-sided documents. In the one-sided case one should normally not use it. With the help of the option autooneside one can also set that the optional argument in one-sided mode is ignored automatically (see).

Example: Assuming that the document uses a *book* class, whose topmost section level is *chapter*, then after a preceding \manualmark

> \automark[section]{chapter}

restores the original behaviour. If one prefers lower section levels in running headings, the following can be used:

> \automark[subsection]{section}

How useful the last declaration is, everybody has to decide for themselves.

For the upper section level, the data of the headings is set by the command \markboth, while that for the lower section level by \markright or \markleft. These commands are called indirectly by the sectioning commands. The macro \markleft is provided by the package scrpage2 and is defined similarly to \markright in the LaTeX kernel. Although \markleft is not defined as an internal command, the direct use is not recommended.

4.1.3. Formatting of Header and Footer

The previous section concerned itself mainly with the contents of the header and footer. This is of course not sufficient to satisfy formative ambitions. Therefore we devote this section exclusively to this topic.

> \headfont
> \pnumfont

The command \headfont contains the commands which determine the font of header and footer lines. The style of the page number is defined by the command \pnumfont.

Example: If, for example, one wants the header and footer to be typeset in bold sans serif, and the page number in a slanted serif style, then one can use the following definitions:

> \renewcommand{\headfont}{\normalfont\sffamily\←
>   bfseries}
> \renewcommand{\pnumfont}{\normalfont\rmfamily\←
>   slshape}

From version 2.8p of the KOMA-Script classes a new unified user interface scheme is implemented for font attributes. If scrpage2 is used together

with one of these classes, then it is recommended to set up font attributes in the manner described in section 3.2.1.

Example: Instead of `\renewcommand` the command `\setkomafont` should be used to configure the font attributes. The previous definitions can then be written as:

```
\setkomafont{pagehead}\normalfont\sffamily\↩
    bfseries}
\setkomafont{pagenumber}{\normalfont\rmfamily\↩
    slshape}
```

```
\setheadwidth[shift]{width}
\setfootwidth[shift]{width}
```

Normally the widths of header and footer lines correspond to the width of the text body. The commands `\setheadwidth` and `\setfootwidth` enable the user to adapt in a simple manner the widths to his needs. The mandatory argument *width* takes the value of the desired width of the page header or footer, while *shift* is a length parameter by which amount the appropriate item is shifted toward the outside page edge.

For the most common situations the mandatory argument *width* accepts the following symbolic values:

paper   – the width of the paper

page   – the width of the page

text   – the width of the text body

textwithmarginpar – the width of the text body including margin

head   – the current header width

foot   – the current footer width

The difference between `paper` and `page` is that `page` means the width of the paper less the binding correction if the package typearea is used (see chapter 2). Without typearea both values are identical.

Example: Assume that one wants a layout like that of *The LaTeX Companion*, where the header projects into the margin. This can be obtained with:

```
\setheadwidth[0pt]{textwithmarginpar}
```

which appears like this on an odd page:

> KOMA-Script 3
> _____
> This fill text is currently seized by 130 million
> receptors in your retina. Thereby the nerve   Retina
> cells are put in a state of stimulation, which
> spreads into the rear part of your brain origi-
> nating from

If the footer line should have the same width and alignment, then two ways to set this up are possible. The first way simply repeats the settings for the case of the footer line:

```
\setfootwidth[0pt]{textwithmarginpar}
```

In the second way the symbolic value head is used, since the header already has the desired settings.

```
\setfootwidth[0pt]{head}
```

If no *shift* is indicated, i. e., without the optional argument, then the header or footer appears arranged symmetrically on the page. In other words, a value for the *shift* is determined automatically to correspond to the current page shape.

Example: Continuing with the previous example, we remove the optional argument:

```
\setheadwidth{textwithmarginpar}
```

which appears like this on an odd page:

> KOMA-Script 3
> _____
> This fill text is currently seized by 130 million
> receptors in your retina. Thereby the nerve   Retina
> cells are put in a state of stimulation, which
> spreads into the rear part of your brain origi-
> nating from

As can be seen, the header is now shifted inward, while the header width has not changed. The shift is calculated in a way that the configuration of the typearea become visible also here.

```
\setheadtopline[length]{thickness}[commands]
\setheadsepline[length]{thickness}[commands]
\setfootsepline[length]{thickness}[commands]
\setfootbotline[length]{thickness}[commands]
```

Corresponding to the size configuration parameters of header and footer there are commands to modify the lines above and below the header and footer.

\setheadtopline – configures the line above the header

\setheadsepline – configures the line below the header

\setfootsepline – configures the line above the footer

\setfootbotline – configures the line below the footer

The mandatory argument *thickness* determines how strongly the line is drawn. The optional argument *length* accepts the same symbolic values as *width* for \setheadwidth, as well as also a normal length expression. As long as the optional argument *length* is not assigned a value, the appropriate line length adapts automatically the width of the header or the footer.

Use auto in the length argument to restore this automation for the length of a line.

v2.2   The optional argument *commands* may be used to specify additional commands to be executed before the respective line is drawn. For example, such commands could be used for changing the color of the line. When using a KOMA-Script class you could also use \setkomafont to specify commands for one of the elements headtopline, headsepline, footsepline, footbottomline, or footbotline. These can then be extended via \addtokomafont. See section 3.2.1 for details on the \setkomafont and \addkomafont commands.

```
\setheadtopline[auto]{current}
\setheadtopline[auto]{}
\setheadtopline[auto]{}[]
```

The arguments shown here for the command \setheadtopline are of course valid for the other three configuration commands too.

If the mandatory parameter has the value current or has been left empty, then the line thickness is not changed. This may be used to modify the length of the line without changing its thickness.

If the optional argument *commands* is omitted, then all command settings that might have been specified before will remain active, while an empty *commands* argument will revoke any previously valid commands.

Example: If the header, for example, is to be contrasted by a strong line of 2 pt above and a normal line of 0.4 pt between header and body, one can achieve this with:

```
\setheadtopline{2pt}
\setheadsepline{.4pt}
```

KOMA-Script   3

This fill text is currently seized by 130 million receptors in your retina. Thereby the nerve cells are put in a state of stimulation, which spreads into the rear part of your brain origi-nating from

Retina

To specify that this line is to be drawn also, e. g., in red color, you would change the commands like this:

```
\setheadtopline{2pt}[\color{red}]
\setheadsepline{.4pt}[\color{red}]
```

In this example, as well as in the following one, line color is activated by applying the syntax of the color package, so this package must of course be loaded. Since scrpage2 comes without built-in color handling, any package providing color support may be used.

KOMA-Script classes also support the following way of color specification:

```
\setheadtopline{2pt}
\setheadsepline{.4pt}
\setkomafont{headtopline}[\color{red}]
\setkomafont{headsepline}[\color{red}]
```

The automatic adjustment to the header and footer width is illustrated in the following example:

```
\setfootbotline{2pt}
\setfootsepline[text]{.4pt}
\setfootwidth[0pt]{textwithmarginpar}
```

This fill text is currently seized by 130 million receptors in your retina. Thereby the nerve cells are put in a state of stimulation, which spreads.

Retina

KOMA-Script   3

Now not everyone will like the alignment of the line above the footer; instead, one would expect the line to be left-aligned. This can only be achieved with a global package option, which will be described together with other package options in the next section 4.1.4.

4.1.4. Package Options

```
headinclude
headexclude
footinclude
footexclude
```

These options determine whether the page header or the page footer are considered as part of the page body for the calculation of the type area. The adjustments necessary by the use of these parameters are made by the package typearea (see section 2.4), if this package is loaded after scrpage2. Important here is that when using a KOMA-Script class, these options must be given for the document class and not for the package scrpage2, in order to be effective.

```
headtoplineand plainheadtopline
headseplineand plainheadsepline
footseplineand plainfootsepline
footbotlineand plainfootbotline
```

Basic adjustment of the lines under and over header and footer can be made with these options. These adjustments are then considered the default for

all page styles defined with scrpage2. If one of these options is used, then a line thickness 0.4 pt is set.

Since there is a corresponding `plain` page style to the page style scrheadings, the corresponding line in the plain style can also be configured with the `plain...` options. These `plain` options do however work only if the corresponding options without `plain` are activated. Thus, `plainheadtopline` shows no effect without the `headtopline` option set.

With these options, it is to be noted that the appropriate page part, header or footer, is considered as a part of the text area for the calculation of the type area in case a line has been activated. This means that, if the separation line between header and text is activated with `headsepline`, then the package typearea calculates the type area in such a way that the page header is part of the text block automatically.

The conditions for the options of the preceding paragraph apply also to this automation. That means that the package typearea must be loaded after scrpage2, or that on use of a KOMA-Script class, the options `headinclude` and `footinclude` must be set explicitly with \documentclass in order to transfer header or footer line in the text area.

```
ilines
clines
olines
```

With the definition of the line lengths the case can arise where the lengths are set correctly, but the justification is not as desired because the line will be centered in the header or footer area. With the package options presented here, this specification can be modified for all page styles defined with scrpage2. The option `ilines` sets the justification in such a way that the lines align to the inside edge. The option `clines` behaves like the default justification, and `olines` aligns at the outside edge.

Example: The next example illustrates the influence of the option `ilines`. Please compare to the example for \setfootsepline on .

```
\usepackage[ilines]{scrpage2}
\setfootbotline{2pt}
\setfootsepline[text]{.4pt}
\setfootwidth[0pt]{textwithmarginpar}
```

The mere use of the option `ilines` leads to the different result shown below:

> This fill text is currently seized by 130 million
> receptors in your retina. Thereby the nerve ^Retina
> cells are put in a state of stimulation, which
> ~~spreads~~ KOMA-Script   3

In contrast to the default configuration, the separation line between text and footer is now left-aligned, not centered.

---

automark
manualmark

These options set at the beginning of the document whether to use running headings or manual ones. The option automark switches the automatic updating on, manualmark deactivates it. Without the use of one of the two options, the setting which was valid when the package was loaded is preserved, .

Example: You load the package scrpage2 directly after the document class scrreprt without any package options:

```
\documentclass{scrreprt}
\usepackage{scrpage2}
```

Since the default page style of scrreprt is plain, this page style is also now still active. Futhermore, plain means manual headings. If one now activates the page style scrheadings with

```
\pagestyle{scrheadings}
```

then the manual headings are nevertheless still active.

If you instead use the document class scrbook, then after

```
\documentclass{scrbook}
\usepackage{scrpage2}
```

the page style headings is active and the running headings are updated automatically. Switching to the page style scrheadings keeps this setting active. The marking commands of scrbook continue to be used.

However, the use of

\usepackage[automark]{scrpage2}

activates running headings independently of the used document class. The option does not of course affect the used page style `plain` of the class scrreprt. The headings are not visible until the page style is changed to scrheadings, useheadings or another user-defined page style with headings.

<div style="border:1px solid">autooneside</div>

This option ensures that the optional parameter of \automark will be ignored automatically in one-sided mode. See also the explanation of the command \automark in .

<div style="border:1px solid">komastyle
standardstyle</div>

These options determine the look of the predefined page style scrheadings. The option komastyle configures a look like that of the KOMA-Script classes. This is the default for KOMA-Script classes and can in this way also be set for other classes.

The option standardstyle configures a page style as it is expected by the standard classes. Furthermore, the option markuppercase will be activated automatically, but only if option markusedcase is not given.

<div style="border:1px solid">markuppercase
markusedcase</div>

In order to achieve the functionality of \automark, the package scrpage2 modifies internal commands which are used by the document structuring commands to set the running headings. Since some classes, in contrast to the KOMA-Script classes, write the headings in uppercase letters, scrpage2 has to know how the used document class sets the headings.

Option markuppercase shows scrpage2 that the document class uses uppercase letters. If the document class does not set the headings in uppercase letters, then the option markusedcase should be given. These options are not suitable to force a representation; thus, unexpected effects may occur if the given option does not match the actual behaviour of the document class.

<div style="border:1px solid">nouppercase</div>

In the previous paragraph dealing with markuppercase and markusedcase, it has been already stated that some document classes

set the running headings in uppercase letters using the commands `\MakeUppercase` or `\uppercase`. Setting the option nouppercase allows disabling both these commands in the headers and footers. However, this is valid only for page styles defined by scrpage2, including scrheadings and its corresponding `plain` page style.

The applied method is very brutal and can cause that desired changes of normal letters to uppercase letters do not occur. Since these cases do not occur frequently, the option nouppercase usually affords a useful solution.

Example: Your document uses the standard class book, but you do not want the uppercase headings but mixed case headings. Then the preamble of your document could start with:

```
\documentclass{book}
\usepackage[nouppercase]{scrpage2}
\pagestyle{scrheadings}
```

The selection of the page style scrheadings is necessary, since otherwise the page style headings is active, which does not respect the settings made by option nouppercase.

In some cases not only classes but also packages set the running headings in uppercase letters. Also in these cases the option nouppercase should be able to switch back to the normal mixed case headings.

4.2. Defining Own Page Styles

4.2.1. The Interface for Beginners

Now one would not like to remain bound to only the provided page styles, but may wish to define one's own page styles. Sometimes there will be a special need, since a specific *Corporate Identity* may require the declaration of its own page styles. The easiest way to deal with this is:

```
\deftripstyle{name}[LO][LI]{HI}{HC}{HO}{FI}{FC}{FO}
```

The individual parameters have the following meanings:

name – the name of the page style, in order to activate it using the command `\pagestyle{name}`

LO   – the thickness of the outside lines, i. e., the line above the header and the line below the footer (optional)

LI   –   the thickness of the separation lines, i. e., the line below the header and the line above the foot (optional)

HI   –   contents of the inside box in the page header for two-sided layout or left for one-sided layout

HC   –   contents of the centered box in the page header

HO   –   contents of the outside box in the page header for two-sided layout or right for one-sided layout

FI   –   contents of the inside box in the page footer for two-sided layout or left for one-sided layout

FC   –   contents of the centered box in the page footer

FO   –   contents of the outside box in the page footer for two-sided layout or right for one-sided layout

The command `\deftripstyle` definitely represents the simplest possibility of defining page styles. Unfortunately, there are also restrictions connected with this, since in a page range using a page style defined via deftripstyle, no modification of the lines above and below header and footer can take place.

Example: Assume a two-sided layout, where the running headings are placed on the inside. Furthermore, the document title, here "Report", shall be placed outside in the header, the page number shall be centered in the footer.

```
\deftripstyle{TheReport}%
            {\headmark}{}{Report}%
            {}{\pagemark}{}
```

If moreover the lines above the header and below the footer shall be drawn with a thickness of 2 pt, and the text body be separated from header and footer with 0.4 pt lines, then the definition has to be extended:

```
\deftripstyle{TheReport}[2pt][.4pt]%
            {\headmark}{}{Report}%
            {}{\pagemark}{}
```

Report   2. The Eye

2.1 Retina
This fill text is currently seized by 130 million receptors in your retina. Thereby the nerve cells are put in a state of stimulation, which spreads into the rear part of your brain originating from the optic nerve. From there the stimulation is transmitted in a split second also in other parts of your cerebrum. Your frontal lobe becomes stimulated. Intention impulses spread from there, which your central nervous

14

2.1 Retina   Report

system transforms in actual deeds. Head and eyes already react. They follow the text, taking the information present there and transmit them via the optic nerve.

15

4.2.2. The Interface for Experts

Simple page styles, as they can be defined with \deftripstyle, are fairly rare according to experience. Either a professor requires that the thesis looks like his or her own — and who seriously wants to argue against such a wish? — or a company would like that half the financial accounting emerges in the page footer. No problem, the solution is:

```
\defpagestyle{name}{header definition}{footer definition}
\newpagestyle{name}{header definition}{footer definition}
\renewpagestyle{name}{header definition}{footer definition}
\providepagestyle{name}{header definition}{footer definition}
```

These four commands give full access to the capabilities of scrpage2 to define page styles. Their structure is indentical, they differ only in the manner of working.

\defpagestyle   – defines a new page style. If a page style with this name already exists it will be overwritten.

\newpagestyle   – defines a new page style. If a page style with this name already exists a error message will be given.

\renewpagestyle   – redefines a page style. If a page style with this name does not exist a error message will be given.

\providepagestyle – defines a new page style only if there is no page style with that name already present.

Using \defpagestyle as an example, the syntax of the four commands is explained below.

name   – the name of the page style for `\pagestyle{name}`

header definition – the declaration of the header, consisting of five el-
                          ement; elements in round parenthesis are optional:
                          `(ALL,ALT){EP}{OP}{OS}(BLL,BLT)`

footer definition – the declaration of the footer, consisting of five ele-
                          ment; elements in round parenthesis are optional:
                          `(ALL,ALT){EP}{OP}{OS}(BLL,BLT)`

As can be seen, header and footer declaration have identical structure.
The individual parameters have the following meanings:

ALL – above line length: (header = outside, footer = separation line)

ALT – above line thickness

EP – definition for *even* pages

OP – definition for *odd* pages

OS – definition for *one-sided* layout

BLL – below line length: (header = separation line, footer = outside)

BLT – below line thickness

If the optional line-parameters are omitted, then the line behaviour re-
mains configurable by the commands introduced in section 4.1.3, page 129.
  The three elements *EP*, *OP* and *OS* are boxes with the width of page
header or footer, as appropriate. The corresponding definitions are set
left-justified in the boxes. To set something left- and right-justified into
the boxes, the space between two text elements can be stretched using
`\hfill`, in order to write the first text element on the left edge *and*:

```
{\headmark\hfill\pagemark}
```

If one would like a third text-element centered in the box, then an ex-
tended definition must be used. The commands `\rlap` and `\llap` simply
write the given arguments, but for LaTeX they take up no horizontal space.
Only in this way is the middle text really centered.

```
{\rlap{\headmark}\hfill centered text\hfill\llap{\↩
    pagemark}}
```

This and the use of the expert interface in connection with other commands provided by scpage2 follows now in the final example.

Example: This examples uses the document class scrbook, which means that the default page layout is two-sided. The package scrpage2 is loaded with options automark and headsepline. The first switches on the automatic update of running headings, the second determines that a separation line between header and text body is drawn in the scrheadings page style.

```
\documentclass{scrbook}
\usepackage[automark,headsepline]{scrpage2}
```

The expert interface is used to define two page styles. The page style withoutLines does not define any line parameters. The second page style withLines defines a line thicknes of 1 pt for the line above the header and 0 pt for the separation line between header and text.

```
\defpagestyle{withoutLines}{%
  {Example\hfill\headmark}{\headmark\hfill ←
      without lines}
  {\rlap{Example}\hfill\headmark\hfill%
   \llap{without lines}}
}{%
  {\pagemark\hfill}{\hfill\pagemark}
  {\hfill\pagemark\hfill}
}

\defpagestyle{withLines}{%
  (\textwidth,1pt)
  {with lines\hfill\headmark}{\headmark\hfill ←
      with lines}
  {\rlap{\KOMAScript}\hfill \headmark\hfill%
   \llap{with lines}}
  (0pt,0pt)
}{%
  (\textwidth,.4pt)
  {\pagemark\hfill}{\hfill\pagemark}
  {\hfill\pagemark\hfill}
  (\textwidth,1pt)
```

```
}
```

Right at the beginning of the document the page style scrheadings is activated. The command \chapter starts a new chapter and automatically sets the page rstyle for this page to plain. Even though not a prime example, the command \chead shows how running headings can be created even on a plain page. However, in principle running headings on chapter start-pages are to be avoided, since otherwise the special character of the plain page style is lost. It is more important to indicate that a new chapter starts here than that a section of this page has a special title.

Instead of \leftmark one would expect the use of \rightmark in the parameter of \chead, since the chapter starts on an even page. But, because of internal LaTeX definitions, this does not work. It only returns an empty string.

```
\begin{document}
\pagestyle{scrheadings}
\chapter{Thermodynamics}

\chead[\leftmark]{}

\section{Main Laws}
Every system has an extensive state quantity ↵
    called
Energy. In a closed system the energy is ↵
    constant.
```

1. Thermodynamics

1.Thermodynamics
1.1 Main Laws
Every System has an extensive state quantity

After starting a new page the page style scrheadings is active and thus the separation line below the header is visible.

```
There is a state quatity of a system, called ↩
    entropy, whose temporal
change consists of entropy flow and entropy ↩
    generation.
```

> *1. Thermodynamics*
> ──────────────────────
>
> There is a condition unit of a system, called
> entropy, whose temporal change consists of en-
> tropy flow and entropy generation.

After switching to the next page, the automatic update of the running headings is disabled using `\manualmark`, and the page style withoutLines becomes active. Since no line parameters are given in the definition of this page style, the default configuration is used, which draws a separation line between header and text body because scrpage2 was called with headsepline.

> *Energy Conversion*   *without lines*
> ───
> **1.2 Exergy and Anergy**
> During the transition of a system to an equi-
> librium state with its environment, the maxi-
> mum work gainable is called exergy.

```
\manualmark
\pagestyle{withoutLines}
\section{Exergy and Anergy}\markright{Energy ↩
    Conversion}
During the transition of a system to an ↩
    equilibrium state
with its environment, the maximum work gainable↩
     is called
exergy.
```

At the next page of the document, the page style withLines is activated. The line settings of its definition are taken in account and the lines are drawn accordingly.

```
\pagestyle{mitLinien}
\renewcommand{\headfont}{\itshape\bfseries}
The portion of an energy not convertible in ←↩
    exergy
is named anergy \Var{B}.
\[ B = U + T (S_1 - S_u) - p (V_1 - V_u)\]
\end{document}
```

---
with lines   *1. Thermodynamics*

The portion of an energy not convertible in exergy is named anergy B.

$$B = U + T(S_1 - S_u) - p(V_1 - V_u)$$

4.2.3. Managing Page Styles

Before long the work with different page styles will establish a common set of employed page styles, depending on taste and tasks. In order to make the management of page styles easier and avoid time-consuming copy operations each time a new project is started, scrpage2 reads the file scrpage.cfg after initialisation. This file can contain a set of user-defined page styles which many projects can share.

Weekday and Time Using scrdate and scrtime

There are two packages included in KOMA-Script to improve and extend the handling of date and time over and above what is provided by the standard commands \today and \date. Like all the other packages from the KOMA-Script bundle these two packages may be used not only with KOMA-Script classes but also with the standard and many other classes.

5.1. The Name of the Current Day of the Week Using scrdate

The first problem is the question of the current day of the week. The answer may be given using the package scrdate.

`\todaysname`

You should know that with \today one obtains the current date in a language-dependent spelling. scrdate offers you the command \todaysname with which one can obtain the name of the current day of the week in a language-dependent spelling.

Example: In your document you want to show the name of the weekday on which the dvi file was generated using LaTeX. To do this, you write:

> I have done the {\LaTeX} run of this document↩
>   on a \todaysname.

This will result in, e. g.:

> I have done the LaTeX run of this document on a Friday.

Note that the package is not able to decline words. The known terms are the nominative singular that may be used, e. g., in the date of a letter. Given this limitation, the example above can work correctly only for some languages.

Tip: The names of the weekdays are saved in capitalized form, i. e., the first letter is a capital letter, all the others are lowercase letters. But for some languages you may need the names completely in lowercase. You may achieve this using the standard LaTeX command \MakeLowercase. You simply have to write \MakeLowercase{\todaysname}.

`\nameday{`*`name`*`}`

Analogous to how the output of `\today` can be modified using `\date`, so the output of `\todaysname` can be changed to *name* by using `\nameday`.

Example: You change the current date to a fixed value using `\date`. You are not interested in the actual name of the day, but want only to show that it is a workday. So you set:

> `\nameday{workday}`

After this the previous example will result in:

> I have done the LaTeX run of this document on a workday.

Currently the package scrdate knows the languages english (english, american, USenglish, UKenglish and british), german (german, ngerman and austrian), french, italian, spanish, croatian, and finnish. If you want to configure it for other languages, see `scrdate.dtx`.

In the current implementation it does not matter whether you load scrdate before or after german, ngerman, babel or similar packages. The current language will be set up at `\begin{document}`.

To explain a little bit more exactly: while you are using a language selection which works in a compatible way to babel or german, the correct language will be used by scrdate. If you are using another language selection you will get (US) english names. In `scrdate.dtx` you will find the description of the scrdate commands for defining the names.

5.2. Getting the Time with Package scrtime

The second problem is the question of the current time. The solution may be found using package scrtime.

`\thistime[`*`delimiter`*`]`
`\thistime*[`*`delimiter`*`]`

`\thistime` results in the current time. The delimiter between the values of hour, minutes and seconds can be given in the optional argument. The default symbol of the delimiter is ":".

`\thistime*` works in almost the same way as `\thistime`. The only difference is that unlike with `\thistime`, with `\thistime*` the value of the minute field is not preceded by a zero when its value is less than 10. Thus, with `\thistime` the minute field has always two places.

Example: The line

> `Your train departs at \thistime.`

results, for example, in:

> Your train departs at 11:57.

or:

> Your train departs at 23:09.

In contrast to the previous example a line like:

> `This day is already \thistime*[\ hours and\ ]` ↩︎
> `    minutes old.`

results in:

> This day is already 11 hours and 57 minutes old.

or:

> This day is already 12 hours and 25 minutes old.

`\settime{time}`

\settime sets the output of \thistime and \thistime* to the value *time*.
Now the optional parameter of \thistime or \thistime* is ignored, since
the result of \thistime or \thistime* was completely determined using
\settime.

`12h`
`24h`

Using the options `12h` and `24h` one can select whether the result of
\thistime and \thistime* is in 12- or in 24-hour format. The default is
`24h`. The option has no effect on the results of \thistime and \thistime*
if \settime is used.

The New Letter Class scrlttr2

Since the June 2002 release KOMA-Script provides a completely rewritten
letter class. Although part of the code is identical to that of the main classes
described in chapter 3, letters are quite different from articles, reports, books,
and suchlike. That alone justifies a separate chapter about the letter class.
But there is another reason for a chapter on scrlttr2. This class has been
redeveloped from scratch and provides a new user interface different from every
other class the author knows of. This new user interface may be uncommon,
but the author is convinced both experienced and new KOMA-Script users
will benefit from its advantages.

v2.8q

6.1. Looking Back on the Old Letter Class

With the June 2002 release the old letter class scrlettr became obsolete.
It is recommended not to use that class for new applications. There is no
more active development of the old letter class, and support is very restricted.
However, if you really need the documentation of the old letter class, you can
still find it in the file `scrlettr.dtx`, but only in German. You should run it
through LaTeX several times, like this:

```
latex scrlettr.dtx
latex scrlettr.dtx
latex scrlettr.dtx
```

Then you obtain the file `scrlettr.dvi` containing the old German manual.

To facilitate the transition to the new class, there is a compatibility option.
In general, the complete older functionality still remains in the new class.
Without that compatibility option, the user interface and the defaults will be
different. More details on this option are provided in section 6.2.9, table 6.11
and section 6.9.

6.2. Options

The letter class scrlttr2 uses the package keyval to handle options. This is
part of the graphics package (see [Car99b]). Since graphics is part of the
required section of LaTeX, it should be found in every LaTeX distribution.
Should your TeX distribution contain LaTeX, but not the packages graphics

and keyval, please complain to your TeX distributor. If you want to use scrlttr2, you will have to install the graphics package yourself in that case.

The special feature of the keyval package is that options can have values. Thus, you not only need a lot less options, but perhaps also fewer optional arguments. You will see that when discussing the letter environment in . The class will automatically load the keyval package. If you need to supply options to the keyval package, you should use the \PassOptionsToPackage command before \documentclass.

6.2.1. Defining Options Later

This section anticipates a feature of the new letter class. The meaning of this feature will not become clear until the structure of a document with more than one letter inside and another feature of scrlttr2 is understood. However, to keep the number of forward references low, it is reasonable to describe the feature this early.

| \KOMAoptions{*option list*} |

A special feature of the scrlttr2 class is the possibility to change many options even after loading the class. The \KOMAoptions command serves this purpose, taking options and their values as arguments. You can list multiple options, separated by commas, just like in the optional argument of \documentclass. If an option is only available when loading the class, i.e., as an optional argument to \documentclass, this will be explicitly mentioned in the option's description.

If you set an option to an illegal value within the *option list*, LaTeX will stop and show an error message. By entering "h" you will get an explanation that will also list possible values for that particular option.

6.2.2. Options for Compatibility

People who archive their letters in source code format generally place the highest priority on obtaining exactly the same results in future LaTeX runs. In some cases however, improvements and corrections to the class can lead to changes in behaviour, particularly as regards page breaking.

| version=*value* |

v2.9t With scrlttr2 there is the choice, whether a source file should give, as far as is technically possible, the same in any future LaTeX runs, or whether the document should be set according to the latest version of the class. To

which version compatibility should be retained is determined by the option `version`. The default is version 2.9t. The same effect can be obtained with

```
version=first
```

or

```
version=2.9
```

or

```
version=2.9t
```

If an unknown version is entered for *value*, a warning is output and for safety's sake `version=first` is assumed. With

```
version=last
```

the current newest version can be selected. In this case future compatibility is waived. If the option is used without any value, then `last` is assumed as well.

The question of compatibility concerns first and foremost page breaking. New features which have no effect on page breaking will be available even when compatibility to an earlier version is chosen by this option. The option also has no effect on changes in page breaking which result from the removal of old errors in the new version class. If page breaking compatibility is required absolutely, to the point of incorporating previous class errors, then the document should rather be archived together with the relevant version of KOMA-Script.

It should be noted that the option `version` can no longer be changed after loading of the class.

6.2.3. Page Layout Options

In contrast to the old scrlettr class, but in agreement with the other KOMA-Script classes, the scrlttr2 class refers to the typearea package for the construction of the page layout (see chapter 2). The package will be loaded by the class automatically, and the class then controls the package. The necessary options will be explained in this section.

| paper=*format* |

This option defines the paper format. Theoretically, all paper formats known by the typearea are supported. However, you must leave out the suffix `paper` when entering a value. So, for letter format, you would use

the value `letter`. The formats of the ISO A, B, C, and D series must be entered in lowercase letters, e. g., `a4` for ISO A4. See also section 2.5.

Although every paper size supported by typearea can be used, several formats may result in unexpected results on the first page of a letter. That is not a conceptual problem with the class, but a reflection that there currently exist only parameter sets for ISO A4. Unfortunately, there are no general rules to calculate the placement of the address field and so on for arbitrary paper sizes. However, it is possible to define additional parameter sets for different paper sizes. See section 6.2.9 for more information.

```
BCOR=length
DIV=value
headlines=count
```

The options for the divisor, the binding correction, and the number of headlines will be translated directly into the corresponding options of the typearea package and passed to it. If the options are set using `\KOMAoptions` and not as class options, the `\typearea` command from the typearea package will be used instead. See section 2.4, page 24.

```
enlargefirstpage
```

As described later in this chapter, the first page of a letter always uses a different page layout. The scrlttr2 class provides a mechanism to calculate height and vertical alignment of header and footer of the first page independently of the following pages. If, as a result, the footer of the first page would reach into the text area, this text area is automatically made smaller using the `\enlargethispage` macro. On the other hand, if the text area should become larger, supposing that the footer on the first page allows that, you can also use this option. At best, a little more text will then fit on the first page. See also the description of the pseudo-length `firstfootvpos` in section 6.4.3, page 188. This option can take the standard values for simple switches, as listed in table 6.1, page 150. Default is `false`.

6.2.4. Other Layout Options

In this subsection, you will find all options, except the specific page layout options, that have an influence on the layout in general. Strictly speaking, all page layout options (see 6.2.3) are also layout options, and vice versa for some of them.

Table 6.1.: Standard values for simple switches in scrlttr2

Value	Description
true	activates the option
on	activates the option
false	deactivates the option
off	deactivates the option

mpinclude
mpexclude

These two options of the typearea package should not be used with the
scrlttr2 class, because the first page in particular does not take this option
into account. To anticipate any complaints, a warning will be issued when
this option is used. If you feel adventurous you could try how these options,
especially mpinclude, interact with other class options.

twoside

From the author's point of view, double-sided letters do not make much
sense. Therefore, the option twoside only partially switches to double-
sided layout. You thus get the possibility to have different margins on
left and right pages, but this possibility is not used. So this option really
means *activate the possibilities of a double-sided document, but stay with
the one-sided layout as far and as long as possible.* This option can take
the standard values for simple switches, as listed in table 6.1, page 150.
Default is false.

By the way, double-sided letters are not supported, because they seem
entirely unreasonable.

cleardoublepage=*style*

If you want pages inserted by the \cleardoublepage command to just
contain a page number in the header and footer, or to be empty, this
can be accomplished with this option. There are three different styles
supported that are listed at table 6.2. Default is standard.

headsepline
footsepline

These two options insert a separator line below the header or above the
footer, respectively, on consecutive pages. In the terminology of this man-
ual, all pages of a letter except the first one are consecutive pages. This

Table 6.2.: Possible values of option `cleardoublepage` for selection of page style of empty left pages with scrlttr2

---

empty
> switches to page style `empty` for inserted pages

plain
> switches to page style `plain` for inserted pages

standard
> keeps the current page style for inserted pages

---

option can take the standard values for simple switches, as listed in table 6.1, page 150. Default is `false`. If one of the options is used without a value, like in the declaration above, this evaluates as `true`, so the separator line will be activated. When used as a `\documentclass` option, the option `headinclude` or `footinclude`, respectively, will be passed on to the typearea package (see section 2.4, page 27).

`pagenumber=position`

This option defines if and where a page number will be placed on consecutive pages. All pages without a letterhead are consecutive pages. This option affects the page styles `headings` and `plain`. It also affects the default page styles of the scrpage2 package, if set before loading the package (see chapter 4). It can take values only influencing horizontal, only vertical, or both positions. Possible value are shown in table 6.3. Default is `botcenter`.

`parskip=value`

Especially in letters you often encounter paragraphs marked not with indentation of the first line, but with a vertical skip between them. This is a matter of tradition. Apparently, it was easier for a secretary to operate the carriage return lever twice than to set an indentation using a tab stop or the space bar. Correct justification is almost impossible using a typewriter, so letters are traditionally typeset unjustified.

However, typographers like Jan Tschichold take the view that letters, written using means available to modern typesetting, should take advantage of their possibilities just like other documents do. Under these circumstances, letters should also be typeset using paragraph indentation and justification.

Table 6.3.: Possible values of option `pagenumber` for the position of the page number in page styles `headings` and `plain` with scrlttr2

`bot`, `foot`
>   page number in footer, horizontal position not changed

`botcenter`, `botcentered`, `botmittle`, `footcenter`, `footcentered`, `footmiddle`
>   page number in footer, centered

`botleft`, `footleft`
>   page number in footer, left justified

`botright`, `footright`
>   page number in footer, right justified

`center`, `centered`, `middle`
>   page number centered horizontally, vertical position not changed

`false`, `no`, `off`
>   no page number

`head`, `top`
>   page number in header, horizontal position not changed

`headcenter`, `headcentered`, `headmiddle`, `topcenter`, `topcentered`, `topmiddle`
>   page number in header, centered

`headleft`, `topleft`
>   page number in header, left justified

`headright`, `topright`
>   page number in header, right justified

`left`
>   page number left, vertical position not changed

`right`
>   page number right, vertical position not changed

As a reaction to many serious requests, scrlttr2 offers the possibility to mark paragraphs not only by indentation of the first line, but alternatively by a vertical skip. You can choose between a full or half a line of vertical space. When using paragraph spacing, it is often useful to keep the last line of a paragraph shorter so that paragraph recognition will be eased. All these features are controlled by different values for the `parskip` option, shown in table 6.4. Default is `false`.

6.2.5. Font Options

Fonts options are any options which influence the size of the base font or of fonts for particular parts of the letter. In theory, options affecting the font type would also count as font options. At present there is only one option for font size in scrlttr2.

| fontsize=*size* |

Whereas in the main classes you choose the font size for the document using the `10pt`, `12pt`, etc., options, in the scrlttr2 class the desired *size* is set using the `fontsize` option. The functionality is however the same. This option can only be used with `\documentclass`, not with `\KOMAoptions`. Default is `12pt`.

6.2.6. Options for Letterhead and Address

The scrlttr2 class offers numerous extensions for the design of the letterhead. There are also options for address formatting, extending the possibilities of the standard letter class, although these features could already be found in the now obsolete scrlettr class.

| firsthead |

v2.97e This option determines whether the letterhead will be typeset at all. The option undestands the standard values for simple keys, given in table 6.1, page 150. Default is for the letterhead to be set.

| fromalign |

This option defines the placement of the return address in the letterhead of the first page. Apart from the various options for positioning the return v2.97e address in the letterhead, there is also the option of adding the return address to the sender's extension. At the same time, this option serves as a switch to activate or deactivate the extended letterhead options. If these

Table 6.4.: Possible values of option `parskip` to select the paragraph mark with scrlttr2

`false`, `off`

> paragraph indentation instead of vertical space; the last line of a paragraph may be arbitrarily filled

`full`, `on`, `true`

> one line vertical space between paragraphs; there must be at least 1 em free space in the last line of a paragraph

`full*`

> one line vertical space between paragraphs; there must be at least a quarter of a line free space at the end of a paragraph

`full+`

> one line vertical space between paragraphs; there must be at least a third of a line free space at the end of a paragraph

`full-`

> one line vertical space between paragraphs; the last line of a paragraph may be arbitrarily filled

`half`

> half a line vertical space between paragraphs; there must be at least 1 em free space in the last line of a paragraph

`half*`

> half a line vertical space between paragraphs; there must be at least a quarter of a line free space at the end of a paragraph

`half+`

> half a line vertical space between paragraphs; there must be at least a third of a line free space at the end of a paragraph

`half-`

> one line vertical space between paragraphs

Table 6.5.: Possible values of option `fromalign` for setting the position of the from address in the letterhead with scrlttr2

`center`, `centered`, `middle`
> return address centered; an optional logo will be above the extended return address; letterhead extensions will be activated

`false`, `no`, `off`
> standard design will be used for the return address; the letterhead extensions are deactivated

`left`
> left-justified return address; an optional logo will be right justified; letterhead extensions will be activated

`locationleft`, `leftlocation`
> return address is set left-justified in the sender's extension; a logo, if applicable, will be placed above it; the letterhead is automatically deactivated but can be reactivated using option `firsthead`.

`locationright`, `rightlocation`, `location`
> return address is set right-justified in the sender's extension; a logo, if applicable, will be placed above it; the letterhead is automatically deactivated but can be reactivated using option `firsthead`.

`right`
> right-justified return address; an optional logo will be left justified; letterhead extensions will be activated

---

extensions are deactivated, some other options will have no effect. This will be noted in the explanations of the respective options. Possible values for `fromalign` are shown in table 6.5. Default is `left`.

---
fromrule

This option is part of the letterhead extensions (see option `fromalign` above). It allows you to place a horizontal line within the return address. The possible values are shown in table 6.6. Default is `false`. You can not activate more than one line at a time. Regarding the length of the line, see section 6.4.8, page 187.

Table 6.6.: Possible values of option `fromrule` for the position of the rule in the from address with scrlttr2

`afteraddress`, `below`, `on`, `true`, `yes`
  rule below the return address

`aftername`
  rule directly below the sender's name

`false`, `no`, `off`
  no rule

| fromphone |

This option is part of the letterhead extensions (see option `fromalign` above). It defines whether the phone number will be part of the return address. This option can take the standard values for simple switches, as listed in table 6.1, page 150. Default is `false`.

| fromfax |

This option is part of the letterhead extensions (see option `fromalign` above). It defines whether the facsimile number will be part of the return address. This option can take the standard values for simple switches, as listed in table 6.1, page 150. Default is `false`.

| fromemail |

This option is part of the letterhead extensions (see option `fromalign` above). It defines whether the email address will be part of the return address. This option can take the standard values for simple switches, as listed in table 6.1, page 150. Default is `false`.

| fromurl |

This option is part of the letterhead extensions (see option `fromalign` above). It defines whether the URL will be part of the return address. This option can take the standard values for simple switches, as listed in table 6.1, page 150. Default is `false`.

| fromlogo |

This option is part of the letterhead extensions (see option `fromalign` above). It defines whether the logo will be part of the return address.

This option can take the standard values for simple switches, as listed in table 6.1, page 150. Regarding the placement of the logo, see also the explanation of the option `fromalign` above. Default is `false`.

`addrfield`

This option defines whether an address field will be set. Default is to use the address field. This option can take the standard values for simple switches, as listed in table 6.1, page 150. Default is `true`.

`backaddress`

This option defines whether a return address for window envelopes will be set. Default is to use the return address. If the address field is suppressed (see option `addrfield`), there will be no return address either. This option can take the standard values for simple switches, as listed in table 6.1, page 150. Default is `true`.

`subject`

This option serves two purposes: first, you can choose if your subject should have a title, given by the *subject* variable (see table 6.18, page 198); second, you can choose if the subject should be set before or after the opening. Furthermore, the formatting of the subject can be modified. Possible values for this option are shown in table 6.7. It is expressly noted that when using the setting `underlined`, the subject must fit on one line! Defaults are `beforeopening` and `untitled`.

v2.97c

`locfield`

`scrlttr2` places a field with additional sender attributes next to the address field. This can be used, for example, for bank account or similar additional information. Depending on the `fromalign` option, it will also be used for the sender logo. The width of this field may be defined within an `lco` file (see section 6.2.9). If the width is set to 0 in that file, then the `locfield` option can toggle between two presets for the field width. See the explanation on the `locwidth` pseudo length in section 6.4.5, page 194. Possible values for this option are shown in table 6.8. Default is `narrow`.

`foldmarks`

This option activates or deactivates foldmarks for vertical two-, three- or four-panel folding, and a single horizontal folding, of the letter, whereby the folding need not result in equal-sized parts. The position of the four

Table 6.7.: Possible values of option `subject` for the position of the subject with scrlttr2

---

afteropening
   set subject after opening

beforeopening
   set subject before opening

centered
   set subject centered

left
   set subject left-justified

right
   set subject right-justified

titled
   add title to subject

underlined
   set subject underlined (see note in text)

untitled
   do not add title to subject

Table 6.8.: Possible values of option `locfield` for setting the width of the field with additional sender attributes with scrlttr2

---

narrow
   narrow sender supplement field

wide
   wide sender supplement field

---

horizontal and the single vertical marks are configurable via pseudo-lengths (see section 6.4.1 from page 184 onwards).

The user has a choice: Either one may use the standard values for simple switches, as described in table 6.1, page 150, to activate or deactivate at once all configured foldmarks on the left and upper edges of the paper; or one may specify by one or more letters, as listed in table 6.9, the use of the individual foldmarks independently. Also in the latter case the foldmarks will only be shown if they have not been switched off generally with one of `false`, `off` or `no`. The exact positioning of the foldmarks is specified in the user settings, that is, the `lco` files (see section 6.2.9) chosen for a letter. Default values are `true` and `TBMPL`.

v2.97e

The exact placement of the fold marks for three-panel letter folding depends on user settings, that is, the `lco` files (see section 6.2.9). The folding need not result in equal-sized parts. This option can take the standard values for simple switches, as listed in table 6.1, page 150. Default is `true`, which implies setting the fold marks.

Example: Assume that you would like to deactivate all foldmarks exept the punching mark. This you can accomplish with, for example:

```
\KOMAoption{foldmarks=blmt}
```

as long as the defaults have not been changed previously. If some changes might have been made before, then for added safety you may use:

```
\KOMAoption{foldmarks=true,foldmarks=blmtP}
```

numericaldate

This option toggles between the standard, language-dependent date presentation, and a short, numerical one. KOMA-Script does not provide the standard presentation. It should be defined by packages such as german, babel, or isodate. The short, numerical presentation, on the other hand, is produced by scrlttr2 itself. This option can take the standard values for simple switches, as listed in table 6.1, page 150. Default is `false`, which results in standard date presentation. In the now obsolete scrlettr class, the opposite effect was achieved using the `orgdate` option.

refline

With the scrlttr2 class, the header, footer, address, and sender attributes

Table 6.9.: Combined values for the configuration of foldmarks with the option `foldmarks`

B	activate upper horizontal foldmark on left paper edge
b	deactivate upper horizontal foldmark on left paper edge
H	activate all horizontal foldmarks on left paper edge
h	deactivate all horizontal foldmarks on left paper edge
L	activate left vertical foldmark on upper paper edge
l	deactivate left vertical foldmark on upper paper edge
M	activate middle horizontal foldmark on left paper edge
m	deactivate middle horizontal foldmark on left paper edge
P	activate punch or center mark on left paper edge
p	deactivate punch or center mark on left paper edge
T	activate lower horizontal foldmark on left paper edge
t	deactivate lower horizontal foldmark on left paper edge
V	activate all vertical foldmarks on upper paper edge
v	deactivate all vertical foldmarks on upper paper edge

Table 6.10.: Possible value of option `refline` for setting the width of the reference fields line with scrlttr2

---

narrow
> reference fields line restricted to type area

wide
> reference fields line corresponds to address and sender attributes

---

may extend beyond the normal type area to the left and to the right. This option defines whether that should also apply to the reference fields line. Normally, the reference fields line contains at least the date, but it can hold additional data. Possible values for this option are shown in table 6.10. Default is `narrow`.

6.2.7. Options for the Letterfoot

The letterfoot is the footer of the first page of the letter. There exist some special rules for its placement, which are given in the description of the option `enlargefirstpage` (see section 6.2.3, page 149) and the pseudo-length `firstfootvpos` (siehe section 6.4.3, page 188).

firstfoot

v2.97e This option determines whether the letterfoot is set or not. If the letter-foot is not set then the pseudo-length `firstfootvpos` is also ignored, and instead scrlttr2 assumes that the value is equal to \paperheight. This has an effect when the option `enlargefirstpage` (see section 6.4.3, page 188) is used concurrently.

The option understands the standard values for simple switches, as given in table 6.1, page 150. Default is the setting of the letterfoot.

6.2.8. Formatting Options

Formatting options are those which influence form or formatting of the output and do not belong to another section. You might also call them the *miscellaneous options*.

draft

This option toggles between the final and the draft version of a document. In particular, enabling the `draft` option activates little black boxes

that will be drawn at the end of overfull lines. These boxes allow the unpracticed eye to more easily identify paragraphs that need manual intervention. When the `draft` option is disabled, there will be no such boxes. This option can take the standard values for simple switches, as listed in table 6.1, page 150. Default is `false`, as usual. However, I strongly recommend enabling the `draft` option when designing a letter, as for every other document.

6.2.9. The Letter Class Option Files

Normally, you would not redefine parameters like the distance between the address field and the top edge of the paper every time you write a letter. Instead, you would reuse a whole set of parameters for certain occasions. It will be much the same for the letterhead and footer used on the first page. Therefore, it is reasonable to save these settings in a separate file. For this purpose, the scrlttr2 class offers the `lco` files. The `lco` suffix is an abbreviation for l*etter* c*lass* o*ption*.

In an `lco` file you can use all commands available to the document at the time the `lco` file is loaded. Additionally, it can contain internal commands available to package writers. For scrlttr2, these are in particular the commands `\@newplength`, `\@setplength`, and `\@addtoplength` (see section 6.3.4).

There are already some `lco` files included in the KOMA-Script distribution. The `DIN.lco`, `DINmtext.lco`, `SNleft.lco`, and `SN.lco` files serve to adjust KOMA-Script to different layout standards. They are well suited as templates for your own parameter sets. The `KOMAold.lco` file, on the other hand, serves to improve compatibility with the old letter class scrlettr. Since it contains internal commands not open to package writers, you should not use this as a template for your own `lco` files. You can find a list of predefined `lco` files in table 6.11, page 165.

If you have defined a parameter set for a letter standard not yet supported by KOMA-Script, you are explicitly invited to send this parameter set to the KOMA-Script support address. Please do not forget to include the permission for distribution under the KOMA-Script license (see the `lppl.txt` file). If you know the necessary metrics for an unsupported letter standard, but are not able to write a corresponding `lco` file yourself, you can also contact the KOMA-Script author, Markus Kohm, directly.

`\LoadLetterOption{name}`

Usually, the `lco` files will be loaded by the `\documentclass` command.

You enter the name of the `lco` file without suffix as an option. The `lco` file will be loaded right after the class file.

However, it is also possible to load an `lco` file later, or even from within another `lco` file. This can be done with the `\LoadLetterOption` command, which takes the *name* of the `lco` file without suffix as a parameter.

Example: You write a document containing several letters. Most of them should comply with the German DIN standard. So you start with:

```
\documentclass{scrlttr2}
```

However, one letter should use the DINmtext variant, with the address field placed more toward the top, which results in more text fitting on the first page. The folding will be modified so that the address field still matches the address window in a DIN C6/5 envelope. You can achieve this as follows:

```
\begin{letter}{Markus Kohm\\
   Freiherr-von-Drais-Stra\ss e 66\\68535 ←
      Edingen-Neckarhausen}
 \LoadLetterOption{DINmtext}
 \opening{Hello,}
```

Since construction of the page does not start before the `\opening` command, it is sufficient to load the `lco` file before this. In particular, the laoding need not be done before `\begin{letter}`. Therefore the changes made by loading the `lco` file are local to the corresponding letter.

v2.97 If an `lco` file is loaded via `\documentclass`, then it may no longer have the same name as an option.

Example: You do not want to enter your sender address every time, so you create an `lco` file with the necessary data, like this:

```
\ProvidesFile{mkohm.lco}[2002/02/25 letter ←
   class option]
\setkomavar{fromname}{Markus Kohm}
\setkomavar{fromaddress}{Freiherr-von-Drais-←
   Stra\ss e 66\\
                       68535 Edingen-←
                           Neckarhausen}
```

The command \setkomavar used above, and the principle of variables will be explained in detail in . In the example given here, knowledge of the exact function of the command is not critical. It is only important to note what can be done with lco files, less so exactly how this might be accomplished. Please note that the German sharp s, "ß", was entered using the TeX macro \ss, because directly after \documentclass no packages for input encoding, for example \usepackage[latin1]{inputenc} for Unix or \usepackage[ansinew]{inputenc} for Windows, and no language packages, like \usepackage{ngerman} for the new German orthography, are loaded.

However, if you would always use the same input encoding, you could also include it into your lco file. This would look as follows:

```
\ProvidesFile{mkohm.lco}[2002/02/25 letter ↩
    class option]
\RequirePackage[latin1]{inputenc}
\setkomavar{fromname}{Markus Kohm}
\setkomavar{fromaddress}{Freiherr-von-Drais-↩
    Stra\ss e 66\\
                        68535 Edingen-↩
                            Neckarhausen}
```

There is one distinct disadvantage with this usage: you can no longer load this lco file later in your document. If you want to have letters with different senders in one document, you should therefore refrain from loading packages in your lco file.

Let us further assume that I always typeset letters using the preset parameters KOMAold. Then I could add the following line to my mkohm.lco file:

```
\LoadLetterOption{KOMAold}
```

Anyway, now you can preset my sender address using

```
\documentclass[mkohm]{scrlttr2}
```

In you can find a list of all predefined lco files. If you use a printer that has large unprintable areas on the left or right

side, you might have problems with the SN option. Since the Swiss standard
SN 101 130 defines the address field to be placed 8 mm from the right paper
edge, the headline and the sender attributes too will be set with the same
small distance from the paper edge. This also applies to the reference fields
line when using the `refline=wide` option (see). If
you have this kind of problem, create your own `lco` file that loads SN first
and then changes `toaddrhpos` (see) to a smaller
value. Additionally, also reduce `toaddrwidth` accordingly.

Table 6.11.: The predefined `lco` files

DIN

> parameter set for letters on A4-size paper, complying with German standard DIN 676; suitable for window envelopes in the sizes C4, C5, C6, and C6/5 (C6 long).

DINmtext

> parameter set for letters on A4-size paper, complying with DIN 676, but using an alternate layout with more text on the first page; only suitable for window envelopes in the sizes C6 and C6/5 (C6 long).

KOMAold

> parameter set for letters on A4-size paper using a layout close to the now obsolete scrlettr letter class; suitable for window envelopes in the sizes C4, C5, C6, and C6/5 (C6 long); some additional commands to improve compatibility with obsolete scrlettr commands are defined; scrlttr2 may behave slightly different when used with this `lco` file than with the other `lco` files.

NipponEL

> parameter set for Japanese letters in A4 format; suitable for Japanese window envelopes of types Chou or You 3 or 4, in which the windows is approximately 90 mm wide, 45 mm high, and positioned 22 mm from the left and 12 mm from the top edge (see appendix A).

...

Table 6.11.: The predefined `lco` files (*continuation*)

NipponEH

> parameter set for Japanese letters in A4 format; suitable for Japanese window envelopes of types Chou or You 3 or 4, in which the windows is approximately 90 mm wide, 55 mm high, and positioned 22 mm from the left and 12 mm from the top edge (see appendix A).

NipponLL

> parameter set for Japanese letters in A4 format; suitable for Japanese window envelopes of types Chou or You 3 or 4, in which the windows is approximately 90 mm wide, 45 mm high, and positioned 25 mm from the left and 12 mm from the top edge (see appendix A).

NipponLH

> parameter set for Japanese letters in A4 format; suitable for Japanese window envelopes of types Chou or You 3 or 4, in which the windows is approximately 90 mm wide, 55 mm high, and positioned 25 mm from the left and 12 mm from the top edge (see appendix A).

NipponRL

> parameter set for Japanese letters in A4 format; suitable for Japanese window envelopes of types Chou or You 3 or 4, in which the windows is approximately 90 mm wide, 45 mm high, and positioned 25 mm from the left and 24 mm from the top edge (see appendix A).

KakuLL

> parameter set for Japanese letters in A4 format; suitable for Japanese window envelopes of type Kaku A4, in which the windows is approximately 90 mm wide, 45 mm high, and positioned 25 mm from the left and 24 mm from the top edge (see appendix A).

SN

> parameter set for Swiss letters with address field on the right side, according to SN 010 130; suitable for Swiss window envelopes in the sizes C4, C5, C6, and C6/5 (C6 long).

Table 6.11.: The predefined `lco` files (*continuation*)

`SNleft`

> parameter set for Swiss letters with address field on the left side; suitable for Swiss window envelopes with window on the left side in the sizes C4, C5, C6, and C6/5 (C6 long).

```
\LetterOptionNeedsPapersize{option name}{paper size}
```

As mentioned in section 6.2.3, at present there exist only parameter sets and `lco` files for A4-sized paper. In order that you will at least be warned when using another *paper size*, you will find a `\LetterOptionNeedsPapersize` command in every `lco` file distributed with KOMA-Script. The first argument is the name of the `lco` file without the ".`lco`" suffix. The second argument is the paper size for which the `lco` file is designed.

If several `lco` files are loaded in succession, a `\LetterOptionNeedsPapersize` command can be contained in each of them, but the `\opening` command will only check the last given *paper size*. As shown in the following example, an experienced user can thus easily write `lco` files with parameter sets for other paper sizes. If you do not plan to set up such `lco` files yourself, you may just forget about this option and skip the example.

Example: Suppose you use A5-sized paper in normal, i. e., upright or portrait, orientation for your letters. We further assume that you want to put them into standard C6 window envelopes. In that case, the position of the address field would be the same as for a DIN standard letter on A4-sized paper. The main difference is that A5 paper needs only one fold. So you want to disable the upper and lower fold marks. The easiest way to achieve this is to place the marks outside of the paper area.

```
\ProvidesFile{paper=a5.lco}[2002/05/02 letter ↩
    class option]
\LetterOptionNeedsPapersize{paper=a5}{a5}
\@setplength{tfoldmarkvpos}{\paperheight}
\@setplength{bfoldmarkvpos}{\paperheight}
```

Besides this, the placement of the foot, that is, the pseudo-length `firstfootvpos`, must be adjusted. It is left to the reader to find an appropriate value. When using such an `lco` file, you must only

> take care that other lco file options, like SN, are declared before
> the paper size, i. e., before loading "paper=a5.lco". Does this
> seem too complicated? Only before you have used it the first time.
> Anyway, how often do you write letters not using your standard
> formats for A4-size or letter-size paper?

By the way, the DIN lco file will always be loaded as the first lco file. This ensures that all pseudo-lengths will have more or less reasonable default values.

Please note that it is not possible to use \PassOptionsToPackage to pass options to packages from within an lco file that have already been loaded by the class. Normally, this only applies to the typearea, scrlfile, and keyval packages.

6.3. General Document Properties

Some document properties are not assigned to any particular part of the document such as to the letterhead or the letter body. Several of these properties have already been mentioned or explained in section 6.2.

6.3.1. Font Selection

Commands for defining, extending and querying the font of a specific element can be found in section 3.2.1. These commands work exactly the same in scrlttr2. The elements which can be influenced in this way are listed in table 6.12.

Table 6.12.: Alphabetical list of elements whose font can be changed in scrlttr2 using the commands \setkomafont and \addtokomafont

---

addressee
      name und address in address field

backaddress
      return address for a window envelope

descriptionlabel
      label, i. e., the optional argument of \item, in a description
      environment

foldmark
      foldmark on the letter page; intended for color settings

---

<div align="right">. . .</div>

Table 6.12.: Elements whose font can be changed (*continuation*)

`fromaddress`
    sender's address in the letterhead

`fromname`
    sender's address in the letterhead if different from `fromaddress`

`fromrule`
    line in return address field in letterhead; intended for color settings

`pagefoot`
    in most cases the footer, sometimes the header of a page

`pagehead`
    in most cases the header, sometimes the footer of page

`pagenumber`
    page number in the footer or header, inserted with `\pagemark`

`specialmail`
    mode of dispatch in address field

`subject`
    subject in the opening of the letter

`title`
    title in the opening of the letter

`toaddress`
    variation of the element `addressee` for setting the adressee address
    (less the name) in the adress field

`toname`
    variation of the element `addressee` for the name (only) of the
    addressee in the address field

6.3.2. Page Style

One of the general properties of a document is the page style. Please refer
also to section 3.2.2 and chapter 4.

```
\pagestyle{empty}
\pagestyle{plain}
\pagestyle{headings}
\pagestyle{myheadings}
\thispagestyle{local page style}
```

In letters written with scrlttr2 there are four different page styles.

empty is the page style, in which the header and footer of subsequent pages (all pages apart from the first) are completely empty. This page style is also used for the first page, because header and footer of this page are set by otehr means using the macro \opening (see section 6.4.2, section 6.4.3, as well as section 6.5.1, page 200).

plain is the page style with only page numbers in the header or footer on subsequent pages. The placement of these page numbers is determined by the option pagenumber (see section 6.2.4, page 151).

headings is the page style for running (automatic) headings on subsequent pages. The inserted marks are the sender's name from the variable fromname and the subject from the variable subject (see section 6.4.2, page 186 and section 6.4.7, page 198). At which position these marks and the page numbers are placed, depends on the option pagenumber (see section 6.2.4, page 151). The author can also change these marks manually after the \opening command. To this end, the commands \markboth and \markright are available as usual, and with the use of package scrpage2 also \markleft (see section 4.1.2, page 125) is available.

myheadings is the page style for manual page headings on subsequent pages. This is very similar to headings, but here the marks must be set by the author using the commands \markboth and \markright. With the use of package scrpage2 also \markleft can be utilized.

In the terminology of this manual, subsequent pages are all pages of a letter except for the first one.

Page styles are also influenced by the option headsepline and footsepline (see section 6.2.4, page 150). The page style beginning with the current page is switched using \pagestyle. In contrast, \thispagestyle changes only the page style of the current page. The letter class itself uses \thispagestyle{empty} within \opening for the first page of the letter.

For changing the font style of headers or footers you should use the user interface described in section 3.2.1. For header and footer the same element is used, which you can name either `pagehead` or `pagefoot`. The element for the page number within the header or footer is named `pagenumber`. Default settings are listed in table 3.4, page 59. Please have also a look at the example in section 3.2.2, page 58.

```
\clearpage
\cleardoublepage
\cleardoublestandardpage
\cleardoubleplainpage
\cleardoubleemptypage
```

Please refer to section 3.2.2, page 62. The function of `\cleardoublepage` in scrlttr2 depends on the option `cleardoublepage` which is described in more detail in section 6.2.4, page 150.

6.3.3. Variables

Apart from options, commands, environments, counters and lengths, additional elements have already been introduced in KOMA-Script. A typical property of an element is the font style and the option to change it (see section 3.2.1). At this point we now introduce variables. Variables have a name by which they are called, and they have a content. The content of a variable can be set independently from time and location of the actual usage in the same way as the contents of a command can be separated from its usage. The main difference between a command and a variable is that a command usually triggers an action, whereas a variable only consists of plain text which is then output by a command. Furthermore, a variable can additionally have a description which can be set and output.

This section specifically only gives an introduction to the concept of variables. The following examples have no special meaning. More detailed examples can be found in the explanation of predefined variables of the letter class in the following sections. An overview of all variables is given in table 6.13.

Table 6.13.: Alphabetical list of all supported variables in scrlttr2

backaddress
return address for window envelopes (section 6.4.4, page 192)

...

Table 6.13.: Alphabetical list of all supported variables in scrlttr2 (*continued*)

backaddressseparator
: separator within the return address (section 6.4.4, page 192)

ccseparator
: separator between title of additional addressees, and additional addressees (section 6.6.2, page 203)

customer
: customer number (section 6.4.6, page 197)

date
: date (section 6.4.6, page 197)

emailseparator
: separator between e-mail name and e-mail address (section 6.4.2, page 188)

enclseparator
: separator between title of enclosure, and enclosures (section 6.6.2, page 204)

faxseparator
: separator between title of fax, and fax number (section 6.4.2, page 188)

fromaddress
: sender's address without sender name (section 6.4.2, page 186)

frombank
: sender's bank account (section 6.4.8, page 199)

fromemail
: sender's e-mail (section 6.4.2, page 186)

fromfax
: sender's fax number (section 6.4.2, page 186)

fromlogo
: commands for inserting the sender's logo (section 6.4.2, page 186)

fromname
: complete name of sender (section 6.4.2, page 186)

. . .

Table 6.13.: Alphabetical list of all supported variables in scrlttr2 (*continued*)

`fromphone`

      sender's telephone number (section 6.4.2, page 186)

`fromurl`

      a url of the sender (section 6.4.2, page 186)

`invoice`

      invoice number (section 6.4.6, page 197)

`location`

      more details of the sender (section 6.4.5, page 195)

`myref`

      sender's reference (section 6.4.6, page 197)

`place`

      place (section 6.4.6, page 197)

`placeseparator`

      separator between place and date (section 6.4.6, page 197)

`phoneseparator`

      separator between title of telephone, and telephone number (section 6.4.2, page 188)

`signature`

      signature beneath the ending of the letter (section 6.6.1, page 202)

`specialmail`

      mode of dispatch (section 6.4.4, page 193)

`subject`

      subject (section 6.4.7, page 198)

`subjectseparator`

      separator between title of subject, and subject (section 6.4.7, page 198)

`title`

      letter title (section 6.4.7, page 198)

. . .

Table 6.13.: Alphabetical list of all supported variables in scrlttr2 (*continued*)

---

toname
> complete name of addressee (section 6.4.4, page 193)

toaddress
> address of addressee without addressee name (section 6.4.4, page 193)

yourmail
> date of addressee's mail (section 6.4.6, page 197)

yourref
> addressee's reference (section 6.4.6, page 197)

```
\newkomavar[description]{name}
\newkomavar*[description]{name}
\removereffields
\defaultreffields
\addtoreffields{name}
```

With `\newkomavar` a new variable is defined. This variable is addressed via *name*. As an option you can define a *description* for the variable *name*. Using the command `\addtoreffields` you can add the variable *name* to the reference fields line (see section 6.4.6). The *description* and the content of the variable are added at the end of the reference fields line. The starred version `\newkomavar*` is similar to the unstarred version, with a subsequent call of the command `\addtoreffields`. Thus, the starred version automatically adds the variable to the reference fields line.

Example: Suppose you need an additional field for direct dialling. You can define this field either with

```
\newkomavar[Direct dialling]{myphone}
\addtoreffields{myphone}
```

or more concisely with

```
\newkomavar*[direct dialling]{myphone}
```

When you define a variable for the reference fields line you should always give it a description.

With the command `\removereffields` all variables in the ference line can be removed. This also includes the predefined variables of the class.

The reference fields line is then empty except for the date which is always appended to the end. This can be useful, for example, if you wish to change the order of the variables in the reference fields line.

The command \defaultreffields acts to reset the reference fields line to its predefined format. In doing so, all custom-defined variables are removed from the reference fields line.

```
\setkomavar{name}[description]{content}
\setkomavar*{name}{description}
```

With the command \setkomavar you determine the *content* of the variable *name*. Using an optional argument you can at the same time change the *description* of the variable. In contrast, \setkomavar* can only set the *description* of the variable *name*.

Example: Suppose you have defined a direct dialling as mentioned above and you now want to set the content. You write:

    \setkomavar{myphone}{-\,11}

In addition, you want to replace the term "direct dialling" with "Connection". Thus you add the description:

    \setkomavar*{myphone}{Connection}

or you can combine both in one command:

    \setkomavar{myphone}[Connection]{-\,11}

By the way: You may delete the content of a variable using an empty *content* argument. You can also delete the description using an empty *description* argument.

Example: Suppose you have defined a direct dialling as mentioned above and you now no longer want a description to be set. You write:

    \setkomavar*{myphone}{}

You can combine this with the definition of the content:

    \setkomavar{myphone}[]{-\,11}

So you may setup the content and delete the description using only one command.

```
\usekomavar[command]{name}
\usekomavar*[command]{name}
```

v2.9i   In some cases it is necessary for the user to access the content or the
description of a variable, and not to leave this only up to the class. This is
specially important when you have defined a variable which is not added
to the reference fields line. Using the command \usekomavar you have
access to the content of the variable *name*, whereas the starred version
\usekomavar* allows you to access the description.

The commands \usekomavar and \usekomavar* are, similarly to all com-
mands where a starred version exists or which can take an optional ar-
gument, not fully expandable. Nevertheless, if used within \markboth,
\markright or similar commands, you need not insert a \protect be-
fore using them. Of course this is also true for \markleft if us-
ing package scrpage2. However, these kinds of commands can not
be used within commands like \MakeUppercase which directly influ-
ence their argument. \MakeUppercase{\usekomavar{name}} would re-
sult in \usekomavar{NAME}. To avoid this problem you may use com-
mands like \MakeUppercase as an optional argument to \usekomavar or
\usekomavar*. Then you will get the uppercase content of a variable using
\usekomavar[\MakeUppercase]{name}.

```
\ifkomavarempty{name}{true}{false}
\ifkomavarempty*{name}{true}{false}
```

v2.9i   With these commands you may check whether or not the expanded content
or description of a variable is empty. The *true* argument will be executed
if the content or description is empty. Otherwise the *false* argument will
be executed. The starred variant handles the description of a variable, the
unstarred variant handles the contents.

It is important to know that the content or description of the variable will
be expanded as far as this is possible with \edef. If this results in spaces or
unexpandable macros like \relax, the result will be not empty even where
the use of the variable would not result in any visible output.

Both variants of the command also must not be used as the argument of
\MakeUppercase or other commands which have similar effects to their argu-
ments (see the description of \usekomavar above for more information about
using commands like \usekomavar or \ifkomavarempty at the argument
of \MakeUppercase). However, they are robust enough to be used as the
argument of, e. g., \markboth or \footnote.

6.3.4. The Pseudo-Lengths

TEX works with a fixed number of registers. There are registers for tokens, for boxes, for counters, for skips and for dimensions. Overall there are 256 registers for each of these categories. For LATEX lengths, which are addressed with \newlength, skip registers are used. Once all these registers are in use, you can not define any more additional lengths. The letter class scrlttr2 would normally use up more than 20 of such registers for the first page alone. LATEX itself already uses 40 of these registers. The typearea package needs some of them too; thus, approximately a quarter of the precious registers would already be in use. That is the reason why lengths specific to letters in scrlttr2 are defined with macros instead of lengths. The drawback of this approach is that computations with macros is somewhat more complicated than with real lengths.

It can be pointed out that the now recommended LATEX installation with ε-TEX no longer suffers from the above-mentioned limitation. However, that improvement came too late for scrlttr2.

A list of all pseudo-lengths in scrlttr2 is shown in table 6.14 starting at page 177. The meaning of the various pseudo-lengths is shown graphically in figure 6.1. The dimensions used in the figure correspond to the default settings of scrlttr2. More detailed description of the individual pseudo-lengths is found in the individual sections of this chapter.

Table 6.14.: Pseudo-lengths provided by class scrlttr2

---

backaddrheight
> height of the return address at the upper edge of the address field (section 6.4.4, page 192)

bfoldmarkvpos
> vertical distance of lower foldmark from top paper edge (section 6.4.8, page 184)

firstfootvpos
> vertical distance of letterfoot from top paper edge (section 6.4.3, page 188)

firstfootwidth
> width of letterfoot; letterfoot is centered horizontally on letter paper (section 6.4.3, page 189)

Table 6.14.: Pseudo-lengths provided by class scrlttr2 (*continued*)

---

firstheadvpos
> vertical distance of letterhead from top paper edge (section 6.4.2, page 186)

firstheadwidth
> width of letter head; letterhead is centered horizontally on letter paper (section 6.4.2, page 186)

foldmarkhpos
> horizontal distance of all foldmarks from left paper edge (section 6.4.8, page 185)

fromrulethickness
> Thickness of an optional horizontal line in the letterhead (section 6.4.2, page 187)

fromrulewidth
> length of an optional horizontal rule in letterhead (section 6.4.2, page 187)

locwidth
> width of supplemental data field; for zero value width is calculated automatically with respect to option `locfield` that is described in section 6.2.6 (section 6.4.5, page 194)

refaftervskip
> vertical skip below reference fields line (section 6.4.6, page 197)

refhpos
> horizontal distance of reference fields line from left paper edge; for zero value reference fields line is centered horizontally on letter paper (section 6.4.6, page 196)

refvpos
> vertical distance of reference fields line from top paper edge (section 6.4.6, page 196)

refwidth
> width of reference fields line (section 6.4.6, page 196)

. . .

Table 6.14.: Pseudo-lengths provided by class scrlttr2 (*continued*)

`sigbeforevskip`

      vertical skip between closing and signature (section 6.6.1, page 202)

`sigindent`

      indentation of signature with respect to text body (section 6.6.1, page 202)

`specialmailindent`

      left indentation of mode of dispatch within address field (section 6.4.4, page 193)

`specialmailrightindent`

      right indentation of mode of dispatch within address field (section 6.4.4, page 193)

`tfoldmarkvpos`

      vertical distance of upper foldmark from top paper edge (section 6.4.8, page 184)

`toaddrheight`

      height of address field (section 6.4.4, page 191)

`toaddrhpos`

      horizontal distance of address field from left paper edge, for positive values; or negative horizontal distance of address field from right paper edge, for negative values (section 6.4.4, page 191)

`toaddrindent`

      left and right indentation of address within address field (section 6.4.4, page 192)

`toaddrvpos`

      vertical distance of address field from top paper edge (section 6.4.4, page 191)

`toaddrwidth`

      width of address field (section 6.4.4, page 191)

`\@newplength{name}`

This command defines an new pseudo-length. This new pseudo-length is uniquely identified by its *name*. If with this command a redefinition of an
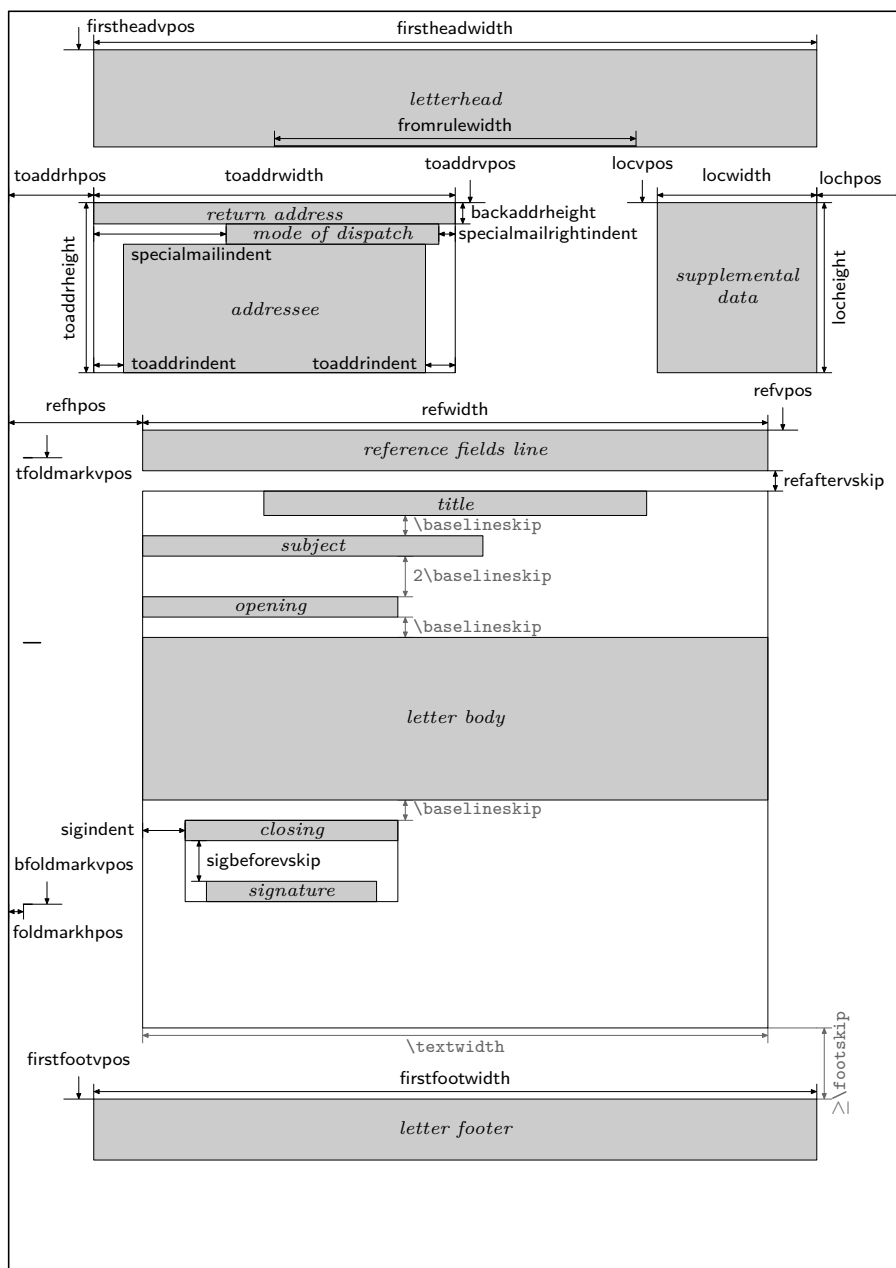
Figure 6.1.: Schematic of the pseudo-lengths for a letter

already existing pseudo-length is attempted, the commands exits with an error message.

Since the user in general does not define own pseudo-lengths, this command is not intended as a user command. Thus, it can not be used within a document, but it can, for example, be used within an `lco` file.

```
\@setplength[factor]{pseudo-length}{value}
\@addtoplength[factor]{pseudo-length}{value}
```

Using the command `\@setplength` you can assign the multiple of a *value* to a *pseudo-length*. The *factor* is given as an optional argument (see also `\setlengthtoplength`). The command `\@addtoplength` adds the *value* to a *pseudo-length*. To assign, or to add the multiple of, one *pseudo-length* to another pseudo-length, the command `\useplength` is used within *value*. To subtract the value of one pseudo-length from another *pseudo-length* a minus sign, or `-1`, is used as the *factor*.

Since the user in general does not define own pseudo-lengths, this command is not intended as a user command. Thus, it can not be used within a document, but can, for example, be used within an `lco` file.

```
\useplength{name}
```

Using this command you can access the value of the pseudo-length with the given *name*. This is one of the few user commands in connection with pseudo-lengths. Of course this command can also be used with an `lco` file.

```
\setlengthtoplength[factor]{length}{pseudo-length}
\addtolengthplength[factor]{length}{pseudo-length}
```

While you can simply prepend a factor to a length, this is not possible with pseudo-lengths. Suppose you have a length `\test` with the value 2 pt; then 3`\test` gives you the value 6 pt. Using pseudo-lengths instead, 3`\useplength{test}` would give you 32 pt. This is especially annoying if you want a real *length* to take the value of a *pseudo-length*.

Using the command `\setlengthtoplength` you can assign the multiple of a *pseudo-length* to a real *length*. Here, instead of prepending the *factor* to the *pseudo-length*, it is given as an optional argument. You should also use this command when you want to assign the negative value of a *pseudo-length* to a *length*. In this case you can either use a minus sign or `-1` as the *factor*. The command `\addtolengthplength` works very similarly; it adds the multiple of a *pseudo-length* to the *length*.

6.3.5. The General Structure of a Letter Document

The general structure of a letter document differs somewhat from the structure of a normal document. Whereas a book document in general contains only one book, a letter document can contain several letters. As illustrated in figure 6.2, a letter document consists of a preamble, the individual letters, and the closing.

The preamble comprises all settings that in general concern all letters. Most of them can also be overwritten in the settings of the individual letters. The only setting which can not be changed within a single letter is the font size (see option `fontsize` in section 6.2.5, page 153). It is recommended that only general settings such as the loading of packages and the setting of options be placed before `\begin{document}`. All settings that comprise the setting of variables or other text features should be done after `\begin{document}`. This is particularly recommended when the babel package (see [Bra01]) is used, or language-dependent variables of scrlttr2 are to be changed.

The closing usually consists only of `\end{document}`. Of course you can also insert additional comments at this point.

As shown in figure 6.3, every single letter itself consists of an introduction, the letter body, and the closing. In the introduction, all settings pertaining only to the current letter are defined. It is important that this introduction always ends with `\opening`. Similarly, the closing always starts with `\closing`. The two arguments *opening* and *closing* can be left empty, but both commands must be used and must have an argument.

It should be noted that several settings can be changed between the individual letters. Such changes then have an effect on all subsequent letters. For reasons of maintainability of your letter documents, it is however not recommended to use further general settings with limited scope between the letters.

As already mentioned, all general settings used in the preamble of a letter document, with the exception of font size, can also be in the preamble of the individual letters. Therefore, you will not find more detailed explanations for the possible settings in this section. Please refer to section 6.4.

6.4. The Letter Declaration

The letter declaration gives all settings for the letter itself, as well as for the first page of the body. The first page consists of more than just the preliminaries of the letter; in fact, it consists of several different parts.

```
\documentclass[...]{scrlttr2}
...
                    settings for all letters
...
\begin{document}
...
                    settings for all letters
...
```
```
\begin{letter}{addressee}
...
          content of the individual letter
...
\end{letter}
```
                                   ⋮
```
\end{document}
```
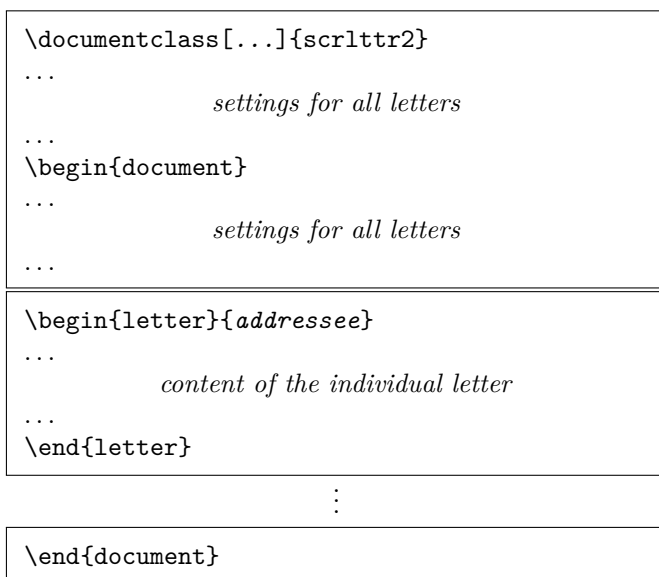
Figure 6.2.: General structure of a letter document with several individual letters (the structure of a single letter is shown in figure 6.3)

```
\begin{letter}[options]{addressee}
...
               settings for this letter
...
\opening{opening}
```
```
...
                      letter text
...
```
```
\closing{closing}
\ps
...
                       postscript
...
\encl{enclosures}
\cc{additional addressees}
\end{letter}
```
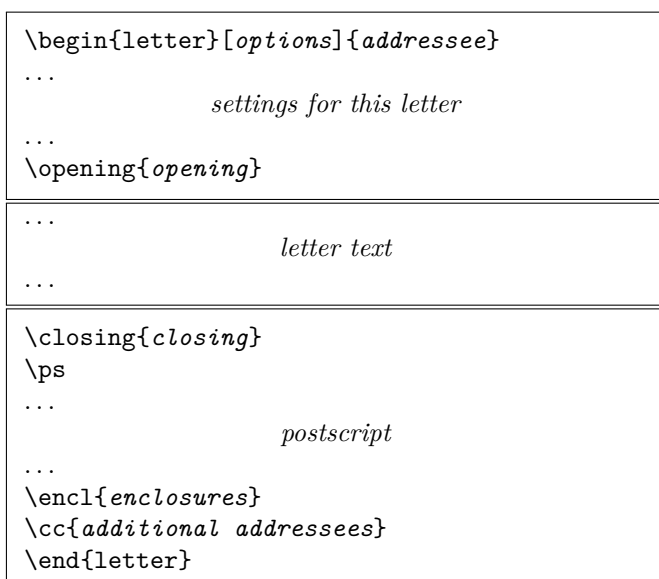
Figure 6.3.: General structure of a single letter within a letter document (see also figure 6.2)

6.4.1. Foldmarks

Foldmarks are short horizontal lines at the left edge, and short vertical lines at the upper edge of the paper. KOMA-Script at present supports three configurable horizontal and one configurable vertical foldmarks. In addition, there is support for a punchmark or center mark which cannot be shifted in the vertical direction.

```
tfoldmarkvpos
mfoldmarkvpos
bfoldmarkvpos
```

The letter class scrlttr2 knows a total of three vertically-placed configurable foldmarks. The position of the upper foldmark, taken from the upper edge of the paper, is governed by the pseudo-length `tfoldmarkvpos`, that of

v2.97e | the middle foldmark by pseudo-length `mfoldmarkvpos`, and that of the lower foldmark by pseudo-length `bfoldmarkvpos`. With the addition of the punch or centermark, there is still a fourth horizontal mark. This one is however always placed at the vertical center of the paper.

The upper and lower foldmarks do not serve to divide the paper into exactly equal thirds. Instead, with their help, the paper should be folded such that the address field appears correctly in the space available in the chosen window envelope format, which is determined by choice of `lco` file. Several such files are available offering predefined formats. An anomaly is present with `DINmtext`: for this format, an envelope format of C6/5 (also known as "C6 long") is assumed. Letters written with this option are not suited to envelopes of formats C5 or C4.

The middle foldmark is not normally required for Western letters. In Japan, however, a larger number of envelope formats exists, requiring one more foldmark (see the Japanese `lco` files). At this point attention is drawn to the fact that reference to "upper", "middle", and "lower" foldmarks is simply a convenience. In fact, it is not defined that `tfoldmarkvpos` must be smaller than `mfoldmarkvpos`, which in turn must be smaller than `bfoldmarkvpos`. If on the other hand one of the pseudo-lengths is set to null, then the corresponding foldmark will not be set even if the option `foldmarks` (see) is explicity activated.

```
tfoldmarklength
mfoldmarklength
bfoldmarklength
pfoldmarklength
```

v2.97e | These four pseudo-lengths determine the lengths of the four horizontal

foldmarks. One exceptional behaviour exists. If the length is given as null, then the three vertically-configurable pseudo-lengths `tfoldmarklength`, `mfoldmarklength` and `bfoldmarklength` are set to 2 mm in length. The length of the punchmark, `pfoldmarklength`, is instead set to 4 mm.

`foldmarkhpos`

This pseudo-length gives the distance of all horizontal foldmarks from the left edge of the paper. Normally, this is 3.5 mm. This value can be changed in the user's own `lco` file, in case the user's printer has a wider unprintable left margin. Whether the foldmarks are typeset at all depends on the option `foldmarks` (see section 6.2.6, page 157).

`lfoldmarkhpos`

v2.97e Apart from the horizontal foldmarks there is also a vertical foldmark, whose position from the left margin is set via the pseudo-length `lfoldmarkhpos`. This foldmark is used, for example, in Japanese Chou- or You-format envelopes, when one wishes to use A4 size sheets with them. This can also be useful for envelopes in C6 format.

`lfoldmarklength`

v2.97e The length of the vertical foldmark is set via the pseudo-length `lfoldmarklength`. Here too there is an exceptional behaviour. When the length is set to null, a length of 4 mm is actually used.

`foldmarkvpos`

v2.97e This pseudo-length gives the distance of all vertical foldmarks from teh upper edge of the paper. Normally this is 3.5 mm, but the value can be changed in the user's personal `lco` file in case the user's printer has a wider unprintable top margin. Whether the foldmarks are typeset at all depends on the option `foldmarks` (see section 6.2.6, page 157). At present there is only one vertical foldmark, which is designated the left vertical foldmark.

`foldmarkthickness`

v2.97c This pseudo-length determines the thickness of all foldmarks. Default value is 0.2 pt, in other words a very thin hairline. In particular, if the color of the foldmarks is changed, this can be too thin!

`foldmark`

v2.97c Via this element the color of the foldmarks can be changed. To do so, the commands to change the font of the element are usd, as described in section 6.3.1, page 168. The default setting is no change.

6.4.2. The Letterhead

The term letterhead here refers to all of the data pertaining to the sender and which is set above the addressee's address. It is usually expected that this information is set via the page style settings. In fact, this was the case in the earlier incarnation of the letter class, scrlettr. But with scrlttr2, the letterhead is made independent of the page style setting, and is set by the command \opening. The position of the letterhead is absolute and independent of the type area. In fact, the first page of a letter, the page that holds the letterhead, is set using the page style empty.

firstheadvpos

The pseudo-length firstheadvpos gives the distance between the top edge of the paper and start of the letterhead. This value is set differently in the various predefined lco files. A typical value is 8 mm.

firstheadwidth

The pseudo-length firstheadwidth gives the width of the letterhead. This value is set differently in the various predefined lco files. While this value usually depends on the paper width and the distance between the left edge of the paper and the adressee address field, it was the type area width in KOMAold.

fromname fromaddress fromphone fromfax fromemail fromurl fromlogo

These variables give all information concerning the sender necessary to create the letterhead. Which variables will actually be used to finally build the letterhead can be chosen by use of the letterhead extensions (see option fromalign in section 6.2.6, page 153) and the options given there. The variables fromname, fromaddress and fromlogo will be set in the letterhead without their labels; the variables fromphone, fromfax, fromemail and fromurl will be set with their labels. The labels are shown in table 6.15, page 187.

An important hint concerns the sender's address: within the sender's address, parts such as street, P.O. Box, state, country, etc., are separated with a double backslash. Depending on how the sender's address is used,

Table 6.15.: The sender's predefined labels for the letterhead

---

fromemail
       \usekomavar*{emailseparator}\usekomavar{emailseparator}

fromfax
       \usekomavar*{faxseparator} \usekomavar{faxseparator}

fromname
       \headfromname

fromphone
       \usekomavar*{phoneseparator}\usekomavar{phoneseparator}

fromurl
       \usekomavar*{urlseparator}\usekomavar{urlseparator}

---

this double backslash will be interpreted differently and therefore is not strictly always a line break. Paragraphs, vertical spacing and the like are usually not allowed within the sender's address declaration. One has to have very good knowledge of scrlttr2 to use things like those mentioned above, intelligently. Another point to note is the one should most certainly set the variables for return address (see section 6.4.4, page 192) and signature (see section 6.6.1, page 202) oneself.

It is possible, by the way, to load an external picture to use as a logo. For this purpose one can put as content of fromlogo an \includegraphics command. Naturally, the corresponding package, that is, either graphics or graphicx (see [Car99b]), has to be loaded in the preamble of the letter document (see section 6.3.5).

```
fromrulethickness
fromrulewidth
```

Depending on the class option fromrule (see section 6.2.6, page 155), a horizontal rule can be drawn the predefined letterheads under or within the sender address. If the pseudo-length fromrulewidth has a value of 0 pt, which is the default in the predefined lco files, the rule length is calculated automatically taking into account, e. g., letterhead width or an optional logo. Users can adjust rule length manually in their own lco files by setting this pseudo-length to positive values using \setplength (see section 6.3.4, page 181). The default thickness of the line, fromrulethickness, is 0.4 pt.

v2.97c

Table 6.16.: predefined labels and contents of hyphens for sender's data in the letterhead

name	label	content
emailseparator	\emailname	:~
faxseparator	\faxname	:~
phoneseparator	\phonename	:~
urlseparator	\wwwname	:~

```
phoneseparator
faxseparator
emailseparator
urlseparator
```

With these variables, hyphens are defined. If applicable, they are used in the sender's data in the letterhead (see table 6.15). As a feature, they are labeled and the labels also used in the sender's details of the letterhead. To look up the predefined labels and their contents, see table 6.16.

```
\firsthead{construction}
```

For most cases, scrlttr2 with its options and variables offers enough possibilities to create a letterhead. In very rare situations one may wish to have more freedom in terms of layout. In those situations one will have to do without predefined letterheads, which could have been chosen via options. Instead, one needs to create one's own letterhead from scratch. To do so, one has to define the preferred *construction* with the command \firsthead. Within \firsthead, and with the help of the \parbox command (see [Tea01]), one can set several boxes side by side, or one underneath the other. An advanced user will thus be able to create a letterhead on his own. Of course the *construct* may use variables with the help of \usekomavar.

6.4.3. The Letterfoot

As the first page holds a letterhead of its own, it also holds a footer of its own. And, as with the letterhead, it will not be set by the page style settings, but directly with the use of \opening.

```
firstfootvpos
```

This pseudo-length gives the distance between the letterfoot and the upper edge of the paper. This value is set differently in the various predefined

lco files. It also takes care of preventing text from jutting into the footer area. If needed, it can help to shorten the text height on the first page using \enlargethispage. Likewise, and if it is needed, the text height can conversely be extended with the help of the option enlargefirstpage. This way, the distance between text area and the first letterfoot can be reduced to the value \footskip. See also

2.9t   With the compatibility option set up to version 2.9t (see version in) the footer is set independently of the type area in all predefined lco files (see section 6.2.9) except for KOMAold. The option enlargefirstpage also loses its effect. From version 2.9u onwards the footer is set in a position at the bottom edge of the paper. In this situation, the height of the type area also becomes dependent on enlargefirstpage.

v2.97e   If the letterfoot be switched off using option firstfoot (siehe), then the setting of firstfootvpos is ignored, and instead \paperheight is applied. Thus, there remains a mimimum bottom margin of length \footskip.

`firstfootwidth`

This pseudo-length gives the width of the letter's first page footer. The value is set equal to that of the pseudo-length firstheadwidth in the predefined lco files.

`\firstfoot{`*construction*`}`

The first page's footer is preset to empty. However, with the \firstfoot command, it is possible to create a *construction* the same way as when defining the letterhead with \firsthead.

Example: In the first page's footer, you may want to set the content of the variable frombank (the bank account). The double backslash should be exchanged with a comma at the same time:

```
\firstfoot{%
  \parbox[b]{\linewidth}{%
    \centering\def\\{, }\usekomavar{frombank}%
  }%
}
```

For the hyphen you might define a variable of your own if you like. This is left as an exercise for the reader.

Nowadays it has become very common to create a proper footer in order to obtain some balance with respect to the letterhead. This can be done as follows:

```
\firstfoot{%
  \parbox[t]{\textwidth}{\footnotesize
    \begin{tabular}[t]{l@{}}%
      \multicolumn{1}{@{}l@{}}{Partners:}\\
      Jim Smith\\
      Russ Mayer
    \end{tabular}%
    \hfill
    \begin{tabular}[t]{l@{}}%
      \multicolumn{1}{@{}l@{}}{Manager:}\\
      Jane Fonda\\[1ex]
      \multicolumn{1}{@{}l@{}}{Court Of ←
          Jurisdiction:}\\
      Great Plains
    \end{tabular}%
    \ifkomavarempty{frombank}{}{%
      \hfill
      \begin{tabular}[t]{l@{}}%
        \multicolumn{1}{@{}l@{}}{\usekomavar*{←
            frombank}:}\\
        \usekomavar{frombank}
      \end{tabular}%
    }%
  }%
}
```

This example, by the way, came from Torsten Krüger. With

```
\setkomavar{frombank}{Account No. ←
    12\,345\,678\\
  at Citibank\\
  bank code no: 876\,543\,21}
```

the bank account can be set accordingly. If the footer will have such a large height then it might happen that you have to shift its position. You can do this with the pseudo-length firstfootvpos, which is described above in this section.

In the previous example a multi-line footer was set. With a compatibility setting to version 2.9u (see `version` in section 6.2.2, page 147) the space will in general not suffice. In that case, you may need to reduce `firstfootvpos` (see page 188) appropriately.

6.4.4. The Address

The term address here refers to the addressee's name and address which are output in an address field. Additional information can be output within this address field, such as dispatch type or a return address; the latter is especially useful when using window envelopes. The address directly follows the letterhead.

> `toaddrvpos`
> `toaddrhpos`

These pseudo-lengths define vertical and horizontal position of the address field relative to the top-left corner of the paper. Values are set differently in the various predefined `lco` files, according to standard envelope window measures. A special feature of `toaddrhpos` is that with negative values the offset is that of the right edge of the address field relative to the right edge of the paper. This can be found, for instance, in the case of `SN`. The smallest value of `toaddrvpos` is found with `DINmtext`. Care must be taken to avoid overlap of letterhead and address field. Whether the address field is output or not can be controlled by class option `addrfield` (see section 6.2.6, page 157).

> `toaddrheight`

The pseudo-length `toaddrheight` defines the height of the address field, including the dispatch type. If no dispatch type is specified, then the address is vertically centered in the field. If a dispatch type is specified, then the address is set below the dispatch type, and vertically centered in the remaining field height.

> `toaddrwidth`

The pseudo-length `toaddrwidth` defines the width of the address field. Values are set differently in the various predefined `lco` files, according to standard envelope window measures. Typical values are between 70 mm and 100 mm.

Example: Assume that your printer has a very wide left or right margin of 15 mm. In this case, when using the option `SN`, the letterhead, sender's extensions and the address can not be completely printed. Thus, you create a new `lco` file with the following content:

```
\ProvidesFile{SNmmarg.lco}
[2002/06/04 v0.1 my own lco]
\LoadLetterOption{SN}
\@addtoplength{toaddrwidth}{%
  -\useplength{toaddrhpos}}
\@setplength{toaddrhpos}{-15mm}
\@addtoplength{toaddrwidth}{%
  \useplength{toaddrhpos}}
\endinput
```

Then, until you can obtain a printer with smaller page margins, you simply use the option `SNmmarg` instead of `SN`.

<div style="border:1px solid">toaddrindent</div>

Additional indentation of the address within address field can be controlled by the pseudo-length `toaddrindent`. Its value applies to both left and right margin. Default value is 0 pt.

<div style="border:1px solid">
backaddress
backaddressseparator
backaddrheight
</div>

When using window envelopes, the sender's return address is often included within the window, placed at the top above the addressee and dispatch type information, separated by a horizontal rule and set in a smaller font size. The contents of the return address, stored in the variable `backaddress`, are usually built automatically from the variables `fromname` and `fromaddress`. Within the return address, double backslashes are replaced by the content of the variable `backaddressseparator`, whose default value is a comma followed by a non-breaking space.

The height reserved for the return address within the address field is defined by the pseudo-length `backaddrheight`. In the predefined `lco` files, this is typically set to 5 mm. Whether the return address is output or not is controlled by document class options `addrfield` (see section 6.2.6, page 157) and `backaddress` (see section 6.2.6, page 157).

```
specialmail
specialmailindent
specialmailrightindent
```

An optional dispatch type can be output within the address field between the return address and the addressee address, by setting the variable `specialmail`. Left and right alignment are determined by pseudo-lengths `specialmailindent` and `specialmailrightindent`, respectively. In the predefined `lco` files provided by KOMA-Script, `specialmailindent` is set to rubber length `\fill`, while `specialmailrightindent` is set to 1 em. Thus the dispatch type is set 1 em from the address field's right margin.

```
toname
toaddress
```

These two variables contain the addressee's name and address as output in the address field. Usually you will not access these variables directly, but their values are taken from the argument to the `letter` environment. Please see the important hint on address formatting given in .

```
letter[options]{addressee}
```

The `letter` environment is only one of the key environments of the letter class. A special scrlttr2 feature are optional arguments to the `letter` environment. These *options* are executed internally via the `\KOMAoptions` command.

The *addressee* is a mandatory argument passed to the `letter` environment. Parts of the addressee contents are separated by double backslashes. The first part of *addressee* is stored in variable `toname`, while the rest is stored in variable `toaddress` for further use. These parts are output on individual lines in the address field. Nevertheless, the double backslash should not be interpreted as a certain line break. Vertical material such as paragraphs or vertical space is not permitted within *addressee*, and could lead to unexpected results and error messages, as is the case also for the standard letter class.

The `letter` environment does not actually start the letter output. This is done by the `\opening` command.

```
\AtBeginLetter{commands}
```

LaTeX enables the user to declare *commands* whose execution is delayed until a determined point. Such points are called *hooks*. Known macros for using hooks are `\AtBeginDocument` and `\AtEndOfClass`. The letter

class scrlttr2 provides an additional hook that can be used via the macro \AtBeginLetter. Originally, hooks were provided for package and class authors, so they are documented in [Tea99] only, and not in [Tea01]. However, with letters there are useful applications of \AtBeginLetter as the following example may illustrate:

Example: It is given that one has to set multiple letters with question-naires within one document. Questions are numbered automat-ically within single letters using a counter. Since, in contrast to page numbering, that counter is not known by scrlttr2, it would not be reset at the start of each new letter. Given that each questionnaire contains ten questions, question 1 would get number 11 in the second letter. A solution is to reset this counter at the beginning of each new letter:

```
\newcounter{Question}
\newcommand{\Question}[1]{%
  \refstepcounter{Question}\par
  \@hangfrom{\makebox[2em][r]{\theQuestion↩
      :~}}{#1}}
\AtBeginLetter{\setcounter{Question}{0}}
```

This way question 1 remains question 1, even in the 1001st letter. Of course definitions like those mentioned above need to be stated either between macros \makeatletter and \makeatother (see [RNH02]) in letter declarations (see sec-tion 6.3.5 and figure 6.2, page 183), in a unique package, or in an lco file (see section 6.2.9).

6.4.5. The Sender's Extensions

Often, especially with business letters, the space for the letterhead or page footer seems to be too tight to include all you want. To give more details about the sender, often the space right beside the addressee's field is used. In this manual this field is called the *sender's extension*

```
locheight
lochpos
locvpos
locwidth
```

v2.97d The pseudo-lengths locwidth and locheight set the width and height of the sender's extension field. The pseudo-lengths lochpos and locvpos

determine the distances from the right and upper paper edges. These value is typically set to 0 pt in the predefined `lco` files. This does not mean that the sender's extension has no width; instead, it means that the actual width is set with `\opening` when the paper width, address window width, and the distance between the left and upper edges of the paper and the address window are known. The option `locfield` (see section 6.2.6, page 157) is also taken into account. As is the case for `toaddrhpos`, negative values of `lochpos` take on a special meaning. In that case, instead of referring to a distance from the right edge of the paper, `lochpos` now means a distance from the left edge of the paper. The meaning is thus the opposite to that of `toaddrhpos` (see section 6.4.4, page 191).

```
location
```

The contents of the sender's extension field is determined by the variable `location`. To set this variable's content, it is permitted to use formatting commands like `\raggedright`. One has to consider that depending on the use of the options `fromalign` and `fromlogo`, a part of the space for the sender's extension may already be reserved for a logo or return address (see section 6.2.6, page 153 and page 156).

Example: Assume that you would like to put the names of your partners, manager, or court of jurisdiction in the sender's extension field. You can do this as follows:

```
\KOMAoptions{locfield=wide}
\setkomavar{location}{\raggedright
  \textbf{Partners:}\\
  \quad Hugo Mayer\\
  \quad Bernd Miller\\[1ex]
  \textbf{Manager:}\\
  \quad Liselotte Mayer\\[1ex]
  \textbf{Court of jurisdiction:}\\
  \quad Washington, DC
}
```

The option `locfield=wide` is set to make the details fit horizontally. Sender details like those mentioned in the above example can be written, together with the common sender address details, into your own `lco` file.

6.4.6. The Reference Fields Line

Especially with business letters, a line can be found that gives initials, dial code, customer number, invoice number, or a reference to a previous letter. In this manual this line is called the *reference fields line*. The reference fields line can consist of more than just one line and is set only if one of those variables mentioned above is given. Only those fields will be set that are given. To set a seemingly empty field, one needs to give as value at least a white space or `\null`. If you want to have your letter without a reference fields line, then instead of it the label and contents of the variable `date` will be set.

```
refvpos
```

This pseudo-length gives the distance between the upper edge of the paper and the reference fields line. Its value is set differently in the various predefined `lco` files. Typical values are between 80.5 mm and 98.5 mm.

```
refwidth
refhpos
```

This pseudo-length gives the width that is available for the reference fields line. The value is set typically to 0 pt in the predefined `lco` files. This value has a special meaning: in no way does it determine that there is no available width for the business line; instead, this value means that the width will be calculated with the `\opening`. Thus the calculated width depends on the determination of the options `refline` (see). At the same time, `refhpos` will be set according to this option. With `refline=wide`, the reference fields line is centered, while with `refline=narrow` it is aligned on the left.

If `refwidth` non-null, i. e., the width of the reference fields line is therefore not determined by the option `refline`, then `refhpos` gives the distance of the reference fields line from the left edge of the paper. If this distance is null, then the reference fields line is set so that the ratio between its distances from the left and right edges of the paper equal the ratio of distance of the type area from the left and right edges of the paper. Thus, for a type area horizontally centered on the paper, the reference fields line too will be centered.

As a rule, these special cases are likely to be of little interest to the normal user. The simplest rule is as follows: either `refhpos` is left at null and so the width and alignment of the reference fields line are left to the option `refline`, or `refwidth` as well as `refhpos` are set by the user.

Table 6.17.: predefined labels of typical variables of the reference fields line. The content of the macros depend on language.

name	label	in english
yourref	\yourrefname	Your reference
yourmail	\yourmailname	Your letter from
myref	\myrefname	Our reference
customer	\customername	Customer No.:
invoice	\invoicename	Invoice No.:
date	\datename	date

```
refaftervskip
```

This pseudo-length gives the vertical space that has to be inserted beneath the reference fields line. The value is set in the predefined `lco` files. It directly affects the text height of the first page. A typical value lies between one and two lines.

```
yourref
yourmail
myref
customer
invoice
date
```

These variables are typical reference fields. Their meanings are given in table 6.13 on page 171. Each variable has also a predefined label, shown in table 6.17. The field width that belongs to each variable, adjusts itself automatically to its label and content.

```
place
placeseparator
```

As said before in the introduction of this subsection, the reference fields line can be omitted. This happens if all variables of the business line are empty with the exception of the variable for the date. In this case, the content of `place` and `placeseparator` will be set, followed by the content of `date`. The predefined content of the `placeseparator` is a comma followed by a non-breaking space. If the variable `place` has no value then the hyphen remains unset also. The predefined content of `date` is `\today` and depends on the setting of the option `numericaldate` (see section 6.2.6, page 159).

Chapter 6.

Table 6.18.: Predefined labels of subject-related variables.

name	label
subject	\usekomavar*{subjectseparator}%
	\usekomavar{subjectseparator}
subjectseparator	\subjectname

6.4.7. The Title and the Subject Line

Business letters very often carry a subject line. The subject line indicates briefly the respect of the letter. Usually the subject should be short and precise and not run across several lines. Apart fom the subject, such a letter may also carry a title. Titles find usage most often with irregular letters such as a warning, an invoice or a reminder.

title

With scrlttr2 a letter can carry an additional title. The title is centered and set with font size \LARGE directly after and beneath the reference fields line. The predefined font setup for this element (\normalcolor\sffamily\bfseries) can be changed with help of the interface described in section 3.2.1. Font size declarations are allowed.

Example: Assume that you are to write a reminder. Thus you put as title:

> \setkomavar{title}{Reminder}

This way the addressee will recognize a reminder as such.

subject
subjectseparator

In case a subject should be set, the contents of the variable subject need to be defined. Depending on what the option subject is set to, a label can be placed in front of the subject contents; also, the vertical position of the subject contents can be changed (see section 6.2.6, page 157). The predefined labels are shown in table 6.18. The predefined value of subjectseparator is a colon followed by a non-breaking space.

The subject line is set in a separate font. To change this use the user interface described in section 3.2.1. For the element subject the predetermined font in scrlttr2 is \normalfont\normalcolor\bfseries.

Example: Assume you are a board member and want to write a letter
to another member of that board about a few internals of the
organization. You want to clarify with your subject line what
this letter is all about, but without labeling it thus. You can
do this as follows:

```
\setkomavar{subject}[Subject ]{%
  organization's internals}
```

or easier:

```
\setkomavar{subject}[]{%
  about organization's internals}
```

Furthermore, if you want to set the subject line not only in
bold but also in sans serif:

```
\addtokomafont{subject}{\sffamily}
```

As you can see, it is really easy to solve such problems.

6.4.8. Further Settings

In this paragraph variables and settings are listed which could not be
assigned to any other part of the letter declaration but somehow belong
to this section.

---
frombank

This variable at the moment takes on a special meaning: it is not used
internally at this point, and the user can make use of it to set, for example,
his bank account within the sender's extension field or the footer.

\nexthead{*construction*}
\nextfoot{*construction*}

The possibilities that are offered with variables and options in scrlttr2
should be good enough in most cases to create letterheads and footers for
those pages that follow the first letter page. Even more so since you can
additionally change with \markboth and \markright the sender's state-
ments that scrlttr2 uses to create the letterhead. The term "subsequent
pages" in this manual refers to all pages following the first letter page. The
commands \markboth and \markright can in particular be used together
with pagestyle myheadings. If the package scrpage2 is used then this,

of course, is valid also for pagestyle `scrheadings`. There the command
`\markleft` is furthermore available.

At times one wants to have more freedom with creating the letterhead
or footer of subsequent pages. Then one has to give up the possibilities
of predefined letterheads or footers that could have been chosen via the
option `pagenumber` (see). Instead one is free to
create the letterhead and footer of subsequent pages just the way one wants
to have them set. For that, one creates the desired letterhead or footer
construction using the command `\nexthead` or `\nextfoot`, respectively.
Within `\nexthead` and `\nextfoot` you can, for example, have several boxes
side by side or one beneath the other by use of the `\parbox` command
(see [Tea01]). A more advanced user should have no problems creating
letterheads of footers of his own. Within *construction* you can of course
also make use of the variables by using `\usekomavar`.

6.5. The Text

In contrast to an article, a report or a book, a letter normally has no
chapter or section structure. Even float environments with tables and
figure are unusual. Therefore, a letter has no table of contents, lists of
figures and tables, index, bibliography, glossary or similar things. The
letter text mainly consists of an opening and the main text. Thereupon
follow the signature, a postscript and various listings.

6.5.1. The Opening

In the early days of computer-generated letters, programs did not have many
capabilities, therefore the letters seldom had an opening. Today the capabili-
ties have been enhanced. Thus personal openings are very common, even in
mass-production advertising letters.

`\opening{`*opening*`}`

This is one of the most important commands in scrlttr2. For the user it
may seem that only the opening is typeset, but the command also typesets
the folding marks, letterhead, address field, reference fields line, subject,
the page footer and others. In short, without `\opening` there is no letter.

6.5.2. Footnotes

In letters footnotes should be used more sparingly than in normal docu-
ments. However, scrlttr2 is equipped with all mechanisms mentioned in

section 3.6.3 for the main document classes. Therefore they will not be discussed here again.

6.5.3. Lists

Lists have the same validity in letters as in normal documents. Thus scrlttr2 provides the same possibilities as mentioned in section 3.6.4 for the main document classes. Therefore they will not be discussed here again.

6.5.4. Margin Notes

Margin notes are quite uncommon in letters. Therefore the option `mpinclude` is not actively supported by scrlttr2. However, scrlttr2 is equipped with all mechanisms mentioned in section 3.6.5 for the main document classes. Therefore they will not be discussed here again.

6.5.5. Text Emphasis

The distinction of text has the same importance in letters as in other documents. Thus the same rules apply, meaning: emphasize text sparingly. Even letters should be readable and a letter where each word is typeset in another font is quite unreadable.

The class scrlttr2 is equipped with all mechanisms mentioned in section 3.6.7 for the main document classes. Therefore it will not be discussed here again.

6.6. The Closing Part

A letter always ends with a closing phrase. Even computer-generated letters without signature have such a phrase. Sometimes this is a sentence such as, "This letter has been generated automatically and is valid without a signature.". Sometimes a sentence like this will even be used as a signature. Thereupon can follow a postscript and various listings.

6.6.1. Closing

The closing consists of three parts: besides the closing phrase there are a hand-written inscription and the signature, which acts as an explanation for the inscription.

---

signature

The variable `signature` holds an explanation for the inscription. The content is predefined as `\usekomavar{fromname}`. The explanation may consist of multiple lines. The lines should then be separated by a double backslash. Paragraphs in the explanation are however not permitted.

`\closing{`*closing phrase*`}`

The command `\closing` not only typesets the closing phrase, but also the content of the variable `signature`. The closing phrase may consists of multiple lines, but paragraphs are not permitted.

---

sigindent
sigbeforevskip
\raggedsignature

Closing phrase and signature will be typeset in a box. The width of the box is determined by the length of the longest line of the closing phrase or signature.

The box will be typeset with indentation of the length set in pseudo-length `sigindent`. In the predefined `lco` files this length is set to 0 mm.

The command `\raggedsignature` defines the alignment inside the box. In the predefined `lco` files the command is either defined as `\centering` (all besides KOMAold) or `\raggedright` (KOMAold). In order to obtain flush-right or flush-left alignment inside the box, the command can be redefined in the same way as `\raggedsection` (see section 3.6.2, page 81).

Between closing phrase and signature a vertical space is inserted, the height of which is defined in the pseudo-length `sigbeforevskip`. In the predefined `lco` files this is set to 2 lines. In this space you can then write your inscription.

Example: You are writing as the directorate of a society a letter to all members. Moreover, you want on the one hand to elucidate that you are writing in the name of the board of directors, and on the other hand you want indicate your position on the board of directors.

```
\setkomavar{signature}{John McEnvy\\
 {\small (Vice-President ``The Other Society'')↩
    }}
\closing{Regards\\
  (for the board of directors)}
```

You can of coure set the variable `signature` in your private `lco` files. Otherwise it is advisable to define the variable in the letter preamble (see section 6.4).

6.6.2. Postscript, Carbon Copy and Enclosures

After the closing can follow some other statements. Besides the postscript, there are the distribution list of carbon copies, and the reference to enclosures.

`\ps`

In the time when letters were written by hand it was quite common to use a postscript because this was the only way to add information which one had forgotten to mention in the main part of the letter. Of course, in letters written with LaTeX you can insert additional lines easily. Nevertheless, it is still popular to use the postscript. It gives one a good possibility to underline again the most important or sometimes the less important things of the particular letter.

This instruction merely switches to the postscript. Hence, a new paragraph begins, and a vertical distance — usually below the signature — is inserted. The command `\ps` is followed by normal text. If you want the postscript to be introduced with the acronym "PS:" , which by the way is written without a full stop, you have to type this yourself. The acronym is typeset neither automatically nor optionally by the class scrlttr2.

`\cc{`*`distribution list`*`}`
`ccseparator`

With the command `\cc` it is possible to typeset a *distribution list*. The command takes the *distribution list* as its argument. If the content of the variable `ccseparator` is not empty, then the name and the content of this variable is inserted before *distribution list*. In this case the *distribution list* will be indented appropriately. It is a good idea to set the *distribution list* `\raggedright` and to separate the individual entries with a double backslash.

Example: You want to indicate that your letter is sent to all members of a society and to the board of directors:

```
\cc{%
  the board of directors\\
  all society members}
```

> This instruction should be written below the \closing instruc-
> tion from the previous example, or below a possible postscript.

A vertical space is inserted automatically before the distribution list.

```
\encl{enclosures}
enclseparator
```

`Enclosures` have the same structure as the distribution list. The only
difference is that here the enclosures starts with the name and content of
the variable `enclseparator`.

6.7. Language Support

The document class scrlttr2 supports many languages. These include
German (`german` for old German orthography, `ngerman` for the new or-
thography, and `austrian` for Austrian), English (`english` without spec-
ification as to whether American or British should be used, `american`
and `USenglish` for American, and `british` and `UKenglish` for British),
French, Italian, Spanish, Dutch, Croatian and Finnish.

6.7.1. Language Selection

If the package babel (see [Bra01]) is used, one can switch between lan-
guages with the command \selectlanguage{*language*}. Other packages
like german (see [Rai98a]) and ngerman (see [Rai98b]) also define this
command. As a rule though, the language selection takes place already as
a direct consequence of loading such a package. Further information can
be obtained in the documentation of the relevant packages.

There is one thing more to mention about language packages. The package
french (see [Gau03]) redefines not only the terms of section 6.7.2, but also
other, for instance it even redefines the command \opening, since it assumes
that the definition of the standard letter is used. With scrlttr2 this is not the
case, therefore the package french destroys the definition in scrlttr2 and does
not work correctly with KOMA-Script. The author views this is a fault in the
french package.

If one utilizes the babel package in order to switch to language french
while the package french is simultaneously installed, then the same problems
will likely occur, since babel employs definitions from the french package. If
the package french is not installed then there are no problems. Aimilarly, there
is no problem if for babel instead of french other languages like acadian,
canadien, francais or frenchb are chosen.

From babel version 3.7j this problem only occurs when it is indicated explicitly by means of an option that babel should use the french package.

If it cannot be ascertained that a new version of babel is being used, it is recommended to use

```
\usepackage[...,frenchb,...]{babel}
```

in order to select french.

Other languages can possibly cause similar problems. Currently there are no known problems with the babel package for the german language and the various english language selections.

```
\captionsenglish
\captionsUSenglish
\captionsamerican
\captionsbritish
\captionsUKenglish
\captionsgerman
\captionsngerman
\captionsaustrian
\captionsfrench
\captionsitalian
\captionsspanish
\captionsdutch
\captionscroatian
\captionsfinnish
```

If one switches the language then using these commands the language-dependent terms from section 6.7.2 are redefined. If the used language selection scheme does not support this then the commands above can be used directly.

Table 6.19.: Language-dependent forms of the date

Command	Date example
\dateenglish	1/12/1993
\dateUSenglish	12/1/1993
\dateamerican	12/1/1993
\datebritish	1/12/1993
\dateUKenglish	1/12/1993
\dategerman	1. 12. 1993
\datengerman	1. 12. 1993
\dateaustrian	1. 12. 1993
\datefrench	1. 12. 1993
\dateitalian	1. 12. 1993
\datespanish	1. 12. 1993
\datedutch	1. 12. 1993
\datecroatian	1. 12. 1993.
\datefinnish	1.12.1993.

```
\dateenglish
\dateUSenglish
\dateamerican
\datebritish
\dateUKenglish
\dategerman
\datengerman
\dateaustrian
\datefrench
\dateitalian
\datespanish
\datedutch
\datecroatian
\datefinnish
```

The numerical representation of the date (see option numericaldate in section 6.2.6) will be written depending on the selected language. Some examples can be found in table 6.19.

6.7.2. Language-Dependent Terms

As is usual in LaTeX, the language-dependent terms are defined by commands which are then redefined when one switches the language.

```
\yourrefname
\yourmailname
\myrefname
\customername
\invoicename
\subjectname
\ccname
\enclname
\headtoname
\headfromname
\datename
\pagename
\phonename
\faxname
\emailname
\wwwname
\bankname
```

The commands above contain the language-dependent terms. These definitions can be modified in order to support a new language or for private customization. How this can be done is described in section 6.7.3. The definitions become active only at \begin{document}. Therefore they are not available in the LaTeX preamble and cannot be redefined there. In table 6.20 the default settings for english and ngerman can be found.

6.7.3. Defining and Changing Language-dependent Terms

Normally one has to change or define the language-dependent terms of section 6.7.1 in such a way that in addition to the available terms the new or redefined terms are defined. This is made more difficult by the fact that some packages like german or ngerman redefine those settings when the packages are loaded. This definitions unfortunately occurs in such a manner as to destroy all previous private settings. That is also the reason why scrlttr2 delays its own changes, with \AtBeginDocument until \begin{document}, that is, after package loading is completed. The user can also use \AtBeginDocument, or redefine the language-dependent terms after \begin{document}, that is, not put them in the preamble at all. The class scrlttr2 even provides some additional commands for defining language-dependent terms.

Table 6.20.: Default settings for languages english and ngerman

Command	english	ngerman
\bankname	Bank account	Bankverbindung
\ccname[1]	cc	Kopien an
\customername	Customer no.	Kundennummer
\datename	Date	Datum
\emailname	Email	E-Mail
\enclname[1]	encl	Anlagen
\faxname	Fax	Fax
\headfromname	From	Von
\headtoname[1]	To	An
\invoicename	Invoice no.	Rechnungsnummer
\myrefname	Our ref.	Unser Zeichen
\pagename[1]	Page	Seite
\phonename	Phone	Telefon
\subjectname	Subject	Betrifft
\wwwname	Url	URL
\yourmailname	Your letter of	Ihr Schreiben vom
\yourrefname	Your ref.	Ihr Zeichen

[1]Normally these terms are defined by language packages like babel. In this case they are not redefined by scrlttr2 and may differ from the table above.

```
\providecaptionname{language}{term}{definition}
\newcaptionname{language}{term}{definition}
\renewcaptionname{language}{term}{definition}
```

Using one of the commands above, the user can assign a *definition* for a particular *language* to a *term*. The *term* is always a macro. The commands differ dependent on whether a given *language* or a *term* within a given *language* are already defined or not at the time the command is called.

If *language* is not defined, then \providecaptionname does nothing other than writes a message in the log file. This happens only once for each language. If *language* is defined but *term* is not yet defined for it, then it will be defined using *definition*. The *term* will not be redefined if the *language* already has such a definition; instead, an appropriate message is written to the log file.

The command \newcaptionname has a slightly different behaviour. If

the *language* is not yet defined, then a new language command (see section 6.7.1) will be created and a message written to the log file. If *term* is not yet defined in *language*, then it will be defined using *definition*. If *term* already exists in *language*, then this results in an error message.

The command \renewcaptionname again behaves differently. It requires an existing definition of *term* in *language*. If neither *language* nor *term* exist or *term* is unknown in a defined language then a error message will be given. Otherwise, the *term* for *language* will be redefined according to *definition*.

The class scrlttr2 itself employs \providecaptionname in order to define the commands in section 6.7.2.

Example: If you prefer "Your message of" instead of "Your letter of", you have to redefine the definition of \yourmailname.

```
\renewcaptionname{english}{\yourmailname}{%
  Your message of}
```

Since only existing terms in available languages can be redefined, you have to put the command after \begin{document} or delay the command by using \AtBeginDocument. Furthermore, you will get an error message if there is no package used that switches language selection to *english*.

6.8. Address Files and Circular Letters

When people write circular letters one of the more odious tasks is the typing of many different addresses. The class scrlttr2, as did its predecessor scrlettr as well, provides basic support for this task. Currently there are plans for much enhanced support.

\adrentry{*Lastname*}{*Firstname*}{*Address*}{*Phone*}{*F1*}{*F2*}{*Comment*}{*Key*}

The class scrlttr2 supports the use of address files which contain address entries, very useful for circular letters. The file extension of the address file has to be .adr. Each entry is an \adrentry command with eight parameters, for example:

```
\adrentry{McEnvy}
         {Flann}
         {Main Street 1\\ Glasgow}
```

```
{123 4567}
{male}
{}
{niggard}
{FLANN}
```

The 5th and 6th elements, F1 and F2, can be used freely: for example, for the gender, the academic grade, the birthday, or the date on which the person joined a society. The last parameter *Key* should only consist of uppercase letters in order to not interfere with existing TeX or LaTeX commands.

Example: Mr. McEnvy is one of your most important business partners, but every day you receive correspondence from him. Before long you do not want to bother typing his boring address again and again. Here scrlttr2 can help. Assume that all your business partners have an entry in your `partners.adr` address file. If you now have to reply to Mr. McEnvy again, then you can save typing as follows:

```
\input{partners.adr}
\begin{letter}{\FLANN}
  Your correspondence of today \dots
\end{letter}
```

Your TeX system must be configured to have access to your address file. Without access, the \input command results in an error. You can either put your address file in the same directory where you are running LaTeX, or configure your system to find the file in a special directory.

\addrentry{*Lastname*}{*Firstname*}{*Address*}{*Phone*}{*F1*}{*F2*}{*F3*}{*F4*}{*Key*}

Over the years people have objected that the \adrentry has only two free parameters. To cater to this demand, there now exists a new command called \addrentry — note the additional "d" — which supports four freely-definable parameters. Since TeX supports maximally nine parameters per command, the comment parameter has fallen away. Other than this difference, the use is the same as that of \adrentry.

Both \adrentry and \addrentry commands can be freely mixed in the adr files. However, it should be noted that there are some packages which are not suited to the use of \addrentry. For example, the adrconv by

Axel Kielhorn can be used to create address lists from adr files, but it has currently no support for command \addrentry. In this case, the only choice is to extend the package yourself.

Besides the simple access to addresses, the address files can be easily used in order to write circular letters. Thus, there is no requirement to access a complicated database system via TeX.

Example: Suppose you are member of a society and want write an invitation for the next general meeting to all members.

```
\documentclass{scrlttr2}
\begin{document}
\renewcommand*{\adrentry}[8]{
  \begin{letter}{#2 #1\\#3}
    \opening{Dear members,} Our next general ↩
        meeting will be on
    Monday, August 12, 2002. The following ↩
        topics are \dots
    \closing{Regards,}
  \end{letter}
}
\input{members.adr}
\end{document}
```

If the address file contains \addrentry commands too, than an additional definition for \addrentry is required before loading the address file:

```
\renewcommand*{\addrentry}[9]{%
  \adrentry{#1}{#2}{#3}{#4}{#5}{#6}{#7}{#9}%
}
```

In this simple example the extra freely-definable parameter is not used, and therefore \addrentry is defined with the help of \adrentry.

With some additional programming one can let the content of the letters depend on the address data. For this the free parameters of the \adrentry and and \addrentry commands can be used.

Example: Suppose the 5th parameter of the \adrentry command contains the gender of a member (m/f), and the 6th parameter

contains what amount of subscription has not yet been paid by the member. If you would like to write a more personal reminder to each such member, then the next example can help you:

```
\renewcommand*{\adrentry}[8]{
  \ifdim #6pt>0pt\relax
  % #6 is an amount greater than 0.
  % Thus, this selects all members with due ←
      subscription.
    \begin{letter}{#2 #1\\#3}
      \if #5m \opening{Dear Mr.\,#2,} \fi
      \if #5f \opening{Dear Mrs.\,#2,} \fi

      Unfortunately we have to remind you that ←
          you have
      still not paid the member subscription for←
           this
      year.

      Please remit EUR #6 to the account of the ←
          society.
     \closing{Regards,}
    \end{letter}
  \fi
}
```

As you can see, the letter text can be made more personal by depending on attributes of the letter's addressee. The number of attributes is only restricted by number of two free parameters of the \adrentry command, or four free parameters of the \addrentry command.

```
\adrchar{initial letter}
\addrchar{initial letter}
```

As already mentioned above, it is possible to create address and telephone lists using adr files. For that, the additional package adrconv by Axel Kielhorn (see [Kie99]) is needed. This package contains interactive LaTeX documents which help to create those lists.

The address files have to be sorted already in order to obtain sorted lists. It is recommended to separate the sorted entries at each different

initial letter of *Lastname*. As a separator, the commands \adrchar and \addrchar can be used.. These commands will be ignored if the address files are utilized in scrlettr2.

Example: Suppose you have the following short address file:

```
\adrchar{A}
\adrentry{Angel}{Gabriel}
        {Cloud 3\\12345 Heaven's Realm}
        {000\,01\,02\,03}{}{}{archangel}{←
            GABRIEL}
\adrentry{Angel}{Michael}
        {Cloud 3a\\12345 Heaven's Realm}
        {000\,01\,02\,04}{}{}{archangel}{←
            MICHAEL}
\adrchar{K}
\adrentry{Kohm}{Markus}
        {Freiherr-von-Drais-Stra\ss e 66\\68535←
            Edingen-Neckarhausen}
        {+49~62\,03~1\,??\,??}{}{}{no angel at ←
            all}
        {KOMA}
```

This address file can be treated with adrdir.tex of the adrconv package [Kie99]. The result should look like this:

The letter in the page header is created by the \adrchar command. The definition can be found in adrdir.tex.

More about the adrconv package can be found in its documentation. There
you should also find information about whether the current version of adr-
conv supports the \addrentry and \addrchar commands. Former versions
only know the commands \adrentry and \adrchar.

6.9. From scrlettr to scrlttr2

The first step in the conversion of an old letter written with the scr-
lettr class is to load the appropriate lco file using option KOMAold at
\documentclass. Thereupon most commands of the old class should work.
However, you will encounter some differences in the output, since the page
layout of the old class is not realized exactly. The reason is that the cal-
culation of the type area in scrlettr has some minor bugs. For example,
the position of the folding marks used to depend on the height of the page
header, which again depended on the font size. That was unambiguously
a design error.

There is no compatibility regarding the defined lengths in scrlettr. Thus,
if a user has changed the page layout of scrlettr, then the relevant state-
ments should be deleted or commented out. In some cases, the modifica-
tion of a length can cause an error, since this length is no longer defined
in scrlttr2. The user should delete or comment out such modifications as
well.

After the switch from scrlettr to scrlttr2, the old letter example can
be successfully compiled already alone through the setting of the option
KOMAold:

```
\documentclass[10pt,KOMAold]{scrlttr2}
\name{{\KOMAScript} team}
\address{Class Alley 1\\12345 {\LaTeX} City}
\signature{Your {\KOMAScript} team}
\begin{document}
  \begin{letter}{{\KOMAScript} users\\
                Everywhere\\world-wide}
    \opening{Dear {\KOMAScript} users,}
    the {\KOMAScript} team is proud to announce \dots
    \closing{Happy {\TeX}ing}
  \end{letter}
\end{document}
```

The next step is that while wanting the old commands to be still be
available, the layout of the old letter should no longer be used. If, for

example, one wants to sue the layout of the letter class option DIN, then this option can be given in \documentclass, but is has to be specified *after* the option KOMAold:

```
\documentclass[10pt,KOMAold,DIN]{scrlttr2}
\name{{\KOMAScript} team}
\address{Class Alley 1\\12345 {\LaTeX} City}
\signature{Your {\KOMAScript} team}
\begin{document}
  \begin{letter}{{\KOMAScript} users\\
                 Everywhere\\world-wide}
    \opening{Dear {\KOMAScript} users,}
    the {\KOMAScript} team is proud to announce \dots
    \closing{Happy {\TeX}ing}
  \end{letter}
\end{document}
```

By using more options this way, you can further influence the layout. However, the author recommends a more inherent change right away.

The last step is to replace all old commands with their new equivalents, and to omit the option KOMAold. For this task, it may help to read the contents of KOMAold.lco. In that file the old commands are defined using the new commands and variables.

```
\documentclass{scrlttr2}
\setkomavar{fromname}{{\KOMAScript} team}
\setkomavar{fromaddress}{Class Alley 1\\
                         12345 {\LaTeX} City}
\setkomavar{signature}{Your {\KOMAScript} team}
\let\raggedsignature=\raggedright
\begin{document}
  \begin{letter}{{\KOMAScript} users\\
                 Everywhere\\
                 world-wide}
    \opening{Dear {\KOMAScript} users,}
    the {\KOMAScript} team is proud to announce \dots
    \closing{Happy {\TeX}ing}
  \end{letter}
\end{document}
```

This example shows also the possibility to change the alignment of the signature by redefining the command \raggedsignature. This is always

recommended when the width of the explanation of the signature as defined by the command `\setkomavar{signature}{...}` is greater than the width of the argument of `\closing`.

Access to Address Files with scraddr

7.1. Overview

The package scraddr is a small extension to the KOMA-Script letter class. Its aim is to make access to the data of address files more flexible and easier. Basically, the package implements a new loading mechanism for address files which contain address entries in the form of \adrentry and newer \addrentry commands, as described in the previous chapter.

`\InputAddressFile{file name}`

The command \InputAddressFile is the main command of the scraddr, and reads the content of the address file given as its parameter. If the file does not exist the command returns an error message.

For every entry in the address file the command generates a set of macros for accessing the data. For large address files this will take a lot of TeX memory.

```
\adrentry{Lastname}{Firstname}{Address}{Phone}{F1}{F2}{Comment}{Key}
\addrentry{Lastname}{Firstname}{Address}{Phone}{F1}{F2}{F3}{F4}{Key}
\adrchar{initial}
\addrchar{initial}
```

The structure of the address entries in the address file was discussed in detail in onwards. The division of the address file with the help of \adrchar or \addrchar, also discussed therein, has no meaning for scraddr and is simply ignored.

The commands for accessing the data are given by the name of the data field they are intended for.

```
\Name{Key}
\FirstName{Key}
\LastName{Key}
\Address{Key}
\Telephone{Key}
\FreeI{Key}
\FreeII{Key}
\Comment{Key}
\FreeIII{Key}
\FreeIV{Key}
```

These commands give access to data of your address file. The last parameter, i. e., parameter 8 for the \adrentry entry and parameter 9 for the \addrentry entry, is the identifier of an entry, thus the *Key* has to be unique and non-blank. The *Key* should only be composed of letters.

If the file contains more than one entry with the same *Key* value, the last occurrence will be used.

7.2. Usage

First of all, we need an address file with valid address entries. In this example the file has the name `lotr.adr` and contains the following entries.

```
\addrentry{Baggins}{Frodo}%
        {The Hill\\ Bag End/Hobbiton in the Shire}{}%
        {Bilbo Baggins}{pipe-weed}%
        {the Ring-bearer}{Bilbo's heir}{FRODO}
\adrentry{Gamgee}{Samwise}%
        {Bagshot Row 3\\Hobbiton in the Shire}{}%
        {Rosie Cotton}{taters}%
        {the Ring-bearer's faithful servant}{SAM}
\adrentry{Bombadil}{Tom}%
        {The Old Forest}{}%
        {Goldberry}{trill queer songs}%
        {The Master of Wood, Water and Hill}{TOM}
```

The 4$^{\text{th}}$ parameter, the telephone number, has been left blank. If you know the story behind these addresses you will agree that a telephone number makes no sense here, and besides, it should simply be possible to leave them out. The command \InputAddressFile is used to load the address file shown above:

```
\InputAddressFile{lotr}
```

With the help of the commands introduced in this chapter we can now write a letter to old TOM BOMBADIL. In this letter we ask him if he can remember two fellow-travelers from Elder Days.

```
\begin{letter}{\Name{TOM}\\\Address{TOM}}
  \opening{Dear \FirstName{TOM} \LastName{TOM},}

  or \FreeIII{TOM}, how your delightful \FreeI{TOM} ↩
     calls you. Can
```

```
      you remember Mr.\,\LastName{FRODO}, strictly speaking
      \Name{FRODO}, since there was Mr.\,\FreeI{FRODO} too. ←
          He was
      \Comment{FRODO} in the Third Age and \FreeIV{FRODO} \←
          Name{SAM},
      \Comment{SAM}, has attended him.

       Their passions were very worldly. \FirstName{FRODO} ←
           enjoyed
       smoking \FreeII{FRODO}, his attendant appreciated a ←
           good meal with
       \FreeII{SAM}.

       Do you remember? Certainly Mithrandir has told you ←
           much
       about their deeds and adventures .
     \closing{''O spring-time and summer-time
                and spring again after!\\
               O wind on the waterfall,
                and the leaves' laughter!''}
   \end{letter}
```

In the address of letters often both firstname and lastname are required.
Thus, the command \Name{Key} is an abridgement for \FirstName{Key}
\LastName{Key}.

The 5th and 6th parameters of the \adrentry or \adrentry commands
are for free use. They are accessible with the commands \FreeI and
\FreeII. In this example, the 5th parameter contains the name of a person
who is the most important in the life of the entry's person, the 6th contains
the person's passion. The 7th parameter is a comment or in general also a
free parameter. The commands \Comment or \FreeIII give access to this
data. Use of \FreeIV is only valid for \addrentry entries; for \adrentry
entries it results in an error. More on this is covered in the next section.

7.3. Package Warning Options

As mentioned above, the command \FreeIV leads to an error if it is used
for \adrentry entries. How scraddr reacts in such a situation is decide by
package options.

```
adrFreeIVempty
adrFreeIVshow
adrFreeIVwarn
adrFreeIVstop
```

These four options allow the user to choose between *ignore* and *rupture* during the LaTeX run if \FreeIV has been used with an \adrentry entry.

adrFreeIVempty – the command \FreeIV will be ignored

adrFreeIVshow – "(entry FreeIV undefined at *Key*)" will be written as warning in the text

adrFreeIVwarn – writes a warning in the logfile

adrFreeIVstop – the LaTeX run will be interrupted with an error message

To choose the desired reaction, one of these options can be given in the optional argument of the \usepackage command. The default setting is adrFreeIVshow.

Creating Address Files from a Address Database

In former versions of KOMA-Script the package addrconv was a permanent part of the KOMA-Script system. The chief involvement with KOMA-Script was that with the help of addrconv it was possible from an address database in BibTEX format to create address files compatible with the KOMA-Script letter class or with the package scraddr.

```
@address{HMUS,
   name = {Carl McExample},
   title = {Dr.},
   city = {Anywhere},
   zip = 01234,
   country = {Great Britain},
   street = {A long Road},
   phone = {01234 / 5 67 89},
   note = {always forget his birthday},
   key = {HMUS},
}
```

From entries such as that given above, address files can be generated. For this addrconv employs BibTEX and various BibTEX styles. Additionally, there are some LATEX files which can help to create various telephone and address lists for printing.

However, the package addrconv was actually an independent package, since besides what is required for KOMA-Script it includes several more interesting features. Therefore, the package addrconv has for some time already been removed from the KOMA-Script system. The package adrconv, with a single *d*, entirely replaces addrconv. If it is not included in your TEX distribution then it can be downloaded from [Kie99] and you can install it separately.

Control Package Dependencies with scrlfile

The introduction of LaTeX 2_ε in 1994 brought many changes in the handling of LaTeX extensions. Today the package author has many macros available to determine if another package or class is employed and whether specific options are used. The author can load other packages or can specify options in the the case that the package is loaded later. This has led to the expectation that the order in which package are loaded would not be important. Sadly this hope has not been fulfilled.

9.1. About Package Dependencies

More and more frequently, different packages either newly define or redefine the same macro again. In such a case the order in which a package is loaded becomes very important. For the user it sometimes becomes very difficult to understand the behaviour, and in some cases the user wants only to react to the loading of a package. This too is not really a simple matter.

Let us take the simple example of loading the package longtable with a KOMA-Script document class. The longtable package defines table captions very well suited to the standard classes, but the captions are totally unsuitable for documents using KOMA-Script and also do not react to the options of the provided configuration commands. In order to solve this problem, the longtable package commands which are responsible for the table captions need to be redefined. However, by the time the longtable package is loaded, the KOMA-Script class has already been processed.

Until the present, the only way for KOMA-Script to solve this problem was to delay the redefinition until the beginning of the document with help of the macro \AtBeginDocument. If the user wants to change the definitions too, it is recommended to do this in the preamble of the document. However, this is impossible since later at \begin{document} KOMA-Script will again overwrite the user definition with its own. Therefore, the user too has to delay his definition with \AtBeginDocument.

Actually, KOMA-Script should not need to delay the redefinition until \begin{document}. It would be enough to delay exactly until the package longtable has been loaded. Unfortunately, the LaTeX kernel does not define appropriate commands. The package scrlfile provides redress here.

Likewise, it might be conceivable that before a package is loaded one would like to save the definition of a macro in a help-macro, in order to restore its

meaning after the package has been loaded. The package scrlfile allows this, too.

The employment of scrlfile is not limited to package dependencies only. Even dependencies on any other file can be considered. For example, the user can be warned if the not uncritical file `french.ldf` has been loaded.

Although the package is particularly of interest for package authors, there are of course applications for normal LATEX users, too. Therefore, this chapter gives and explains examples for both groups of users.

9.2. Actions Prior to and After Loading

scrlfile can execute actions both before and after the loading of files. In the commands used to do this, distinctions are made made between general files, classes, and packages.

```
\BeforeFile{file}{instructions}
\AfterFile{file}{instructions}
```

The macro `\BeforeFile` ensures that *instructions* are only executed before the next time *file* is loaded. `\AfterFile` works in a similar fashion, and the *instructions* will be executed only after the *file* has been loaded. If *file* is never loaded then the *instructions* will never be executed.

In order to implement those features scrlfile redefines the well known LATEX command `\InputIfFileExists`. If this macro does not have the expected definition then scrlfile issues a warning. This is for the case that in future LATEX versions the macro can have a different definition, or that another package has already redefined it.

The command `\InputIfFileExists` is used by LATEX every time a file is to be loaded. This is independent of whether the actual load command is `\include`, `\LoadClass`, `\documentclass`, `\usepackage`, `\RequirePackage`, or similar. Exceptionally, the command

    \input foo

loads the file `foo` without utilizing `\InputIfFileExists`. Therefore, one should always use

    \input{foo}

instead. Notice the parentheses surrounding the file name!

```
\BeforeClass{class}{instructions}
\BeforePackage{package}{instructions}
```

These two commands work in the same way as \BeforeFile. The only difference is that the document class *class* and the LaTeX package *package* are specified with their names and not with their file names. That means that the file extensions .cls and .sty can be omitted.

```
\AfterClass{class}{instructions}
\AfterClass*{class}{instructions}
\AfterPackage{package}{instructions}
\AfterPackage*{package}{instructions}
```

The commands \AfterClass and \AfterPackage work in the same way as \AfterFile. The only difference is that the document class *class* and the LaTeX package *package* are specified with their names and not with their file names. That means that the file extensions .cls and .sty can be omitted. The starred versions execute the *instructions* not only at next time that the class or package is loaded, but also immediately if the class or package has been loaded already.

Example: In the following, an example for class and package authors shall be given. It shows how KOMA-Script itself employs the new commands. The class scrbook contains:

```
\AfterPackage{hyperref}{%
  \@ifpackagelater{hyperref}{2001/02/19}{}{%
    \ClassWarningNoLine{scrbook}{%
      You are using an old version of hyperref ←↩
          package!%
      \MessageBreak%
      This version has a buggy hack at many ←↩
          drivers%
      \MessageBreak%
      causing \string\addchap\space to behave ←↩
          strange.%
      \MessageBreak%
      Please update hyperref to at least version
      6.71b}}}
```

Old versions of the hyperref package redefine a macro of the scrbook class in such a way that does not work with newer KOMA-Script versions. New versions of hyperref desist from

making these changes if a new KOMA-Script version is detected. For the case that hyperref is loaded at a later stage, therefore, the code in scrbook verifies that a acceptable hyperref version is used. If not, the command issues a warning.

At other places in three KOMA-Script classes the following can be found:

```
\AfterPackage{caption2}{%
  \renewcommand*{\setcapindent}{%
```

After the package caption2 has been loaded, and only if it has been loaded, KOMA-Script redefines its own command \setcapindent. The exact code of the redefinition is not important. It should only be noted that caption2 takes control of the \caption macro and that therefore the normal definition of the \setcapindent macro would become ineffective. The redefinition improves the collaboration with caption2.

There are however also useful examples for normal LaTeX user. Suppose a document that should be available as a PS file, using LaTeX and dvips, as well as a PDF file, using pdfLaTeX. In addition, the document should contain hyperlinks. In the list of tables there are entries longer than one line. This is not a problem for the pdfLaTeX method, since here hyperlinks can be broken across multiple lines. However, if a hyperref driver for dvips or hyperTeX is used then this is not possible. In this case one desires that for the hyperref setup linktocpage is used. The decision which hyperref driver to use happens automatically via hyperref.cfg. The file has, for example, the following content:

```
\ProvidesFile{hyperref.cfg}
\@ifundefined{pdfoutput}{\ExecuteOptions{dvips↩
    }}
                    {\ExecuteOptions{pdftex}}
\endinput
```

All the rest can now be left to \AfterFile.

```
\documentclass{article}
\usepackage{scrlfile}
\AfterFile{hdvips.def}{\hypersetup{linktocpage↩
```

```
        }}
      \AfterFile{hypertex.def}{\hypersetup{↩
          linktocpage}}
      \usepackage{hyperref}
      \begin{document}
      \listoffigures
      \clearpage
      \begin{figure}
        \caption{This is an example for a fairly long↩
             figure caption, but
          which does not employ the optional caption ↩
              argument that would
          allow one to write a short caption in the ↩
              list of figures.}
      \end{figure}
      \end{document}
```

If now the hyperref drivers hypertex or dvips are used, then
the useful hyperref option linktocpage will be set. In the
pdfLATEX case, the option will not be set, since in that case an-
other hyperref driver, hpdftex.def, will be used. That means
neither hdvips.def nor hypertex.def will be loaded.

Furthermore, the loading of package scrlfile and the \AfterFile statement
can be written in a private hyperref.cfg. If you do so, then instead of
\usepackage the macro \RequirePackage ought be used (see [Tea99]).
The new lines have to be inserted directly after the \ProvidesFile line, thus
immediately prior to the execution of the options dvips or pdftex.

Japanese Letter Support for scrlttr2[1]

Since version 2.97e scrlttr2 provides support not only for European ISO envelope sizes and window envelopes, but also for Japanese envelopes, in the form of lco files which set the layout of the paper. This chapter documents the support, and provides a few examples of using the provided lco files for printing letters intended for Japanese envelopes.

A.1. Japanese standard paper and envelope sizes

The Japan Industrial Standard (JIS) defines paper sizes and envelope sizes for national use, which both overlap with the ISO and US sizes and include some metricated traditional Japanese sizes. Envelope window size and position have not been defined internationally as yet; hence, there exists a plethora of envelopes with differing window sizes and positions. The below subsections give some background on Japanese paper sizes and envelopes.

A.1.1. Japanese paper sizes

The JIS defines two main series of paper sizes:

1. the JIS A-series, which is identical to the ISO A-series, but with slightly different tolerances; and

2. the JIS B-series, which is not identical to the ISO/DIN B-series. Instead, the JIS B-series paper has an area 1.5 times that of the corresponding A-series paper, so that the length ratio is approximately 1.22 times the length of the corresponding A-series paper. The aspect ratio of the paper is the same as for A-series paper.

Both JIS A-series and B-series paper is widely available in Japan and most photocopiers and printers are loaded with at least A4 and B4 paper. The ISO/JIS A-series, and the different ISO and JIS B-series sizes are listed in table A.1.

There are also a number of traditional paper sizes, which are now used mostly only by printers. The most common of these old series are the Shiroku-ban and the Kiku paper sizes. The difference of these types compared to the JIS B-series are shown in table A.2. Finally, there are some

---

[1]This chapter has been written originally by Gernot Hassenpflug.

Table A.1.: ISO and JIS standard paper sizes

ISO/JIS A	W×H in mm	ISO B	W×H in mm	JIS B	W×H in mm
A0	841×1189	B0	1000×1414	B0	1030×1456
A1	594×841	B1	707×1000	B1	728×1030
A2	420×594	B2	500×707	B2	515×728
A3	297×420	B3	353×500	B3	364×515
A4	210×297	B4	250×353	B4	257×364
A5	148×210	B5	176×250	B5	182×257
A6	105×148[1]	B6	125×176	B6	128×182
A7	74×105	B7	88×125	B7	91×128
A8	52×74	B8	62×88	B8	64×91
A9	37×52	B9	44×62	B9	45×64
A10	26×37	B10	31×44	B10	32×45
A11	18×26			B11	22×32
A12	13×18			B12	16×22

[1]Although Japan's official postcard size appears to be A6, it is actually 100×148 mm, 5 millimeters narrower than A6.

common stationary sizes, listed in table A.3. You may come across these when buying stationary.

The ISO C-series is not a paper size as such, but is a standard developed for envelopes, intended for the corresponding A-series paper, and is discussed in the next subsection.

Table A.2.: Japanese B-series variants

Format Size	JIS B-series W×H in mm	Shiroku-ban W×H in mm	Kiku W×H in mm
4	257×364	264×379	227×306
5	182×257	189×262	151×227
6	128×182	189×262	
7	91×128	127×188	

Table A.3.: Main Japanese contemporary stationary

Name	W×H in mm	Usage and Comments
Kokusai-ban	216×280	"international size"
		i. e., US letter size
Semi B5 or	177×250	"standard size"
Hyoujun-gata		(formerly called "Hyoujun-gata"),
		semi B5 is almost identical to ISO B5
Oo-gata	177×230	"large size"
Chuu-gata	162×210	"medium size"
Ko-gata	148×210	"small size"
Ippitsu sen	82×185	"note paper"

A.1.2. Japanese envelope sizes

ISO (International Organization for Standardization) envelope sizes are the official international metric envelope sizes; however, Japan uses also JIS and metricated traditional envelope sizes. Sizes identified as nonstandard do not conform to Universal Postal Union requirements for correspondence envelopes.

ISO envelope sizes

The ISO C-series envelope sizes, and possibly B-series envelope sizes, are available in Japan. C-series envelopes can hold the corresponding A-series paper, while B-series envelopes can hold either the corresponding A-series paper or the corresponding C-series envelope. The ISO envelope sizes commonly for Japan are listed in table A.4, with the corresponding paper they are intended for, and the folding required.

JIS and traditional envelope sizes

The JIS classifies envelopes into three categories based on the general shape of the envelope, and where the flap is located:

You: these envelopes are of the 'commercial' type, rectangular, and correspond largely to Western envelope sizes, and also have the flap on the long dimension ('Open Side') in 'commercial' or 'square' style. 'You-kei' means Western-style.

Table A.4.: Japanese ISO envelope sizes

Name	W×H in mm	Usage and Comments
C0	917×1297	for flat A0 sheet; nonstandard
C1	648×917	for flat A1 sheet; nonstandard
C2	458×648	for flat A2 sheet, A1 sheet folded in half; nonstandard
C3	324×458	for flat A3 sheet, A2 sheet folded in half; nonstandard
B4	250×353	C4 envelope
C4	229×324	for flat A4 sheet, A3 sheet folded in half; very common; nonstandard
B5	176×250	C5 envelope
C5	162×229	for flat A5 sheet, A4 sheet folded in half; very common; nonstandard
B6	125×176	C6 envelope; A4 folded in quarters; very common
C6	114×162	for A5 sheet folded in half, A4 sheet folded in quarters; very common
C6/C5	114×229	A4 sheet folded in thirds; very common
C7/6	81×162	for A5 sheet folded in thirds; uncommon; nonstandard
C7	81×114	for A5 sheet folded in quarters; uncommon; nonstandard
C8	57×81	
C9	40×57	
C10	28×40	
DL[1]	110×220	for A4 sheet folded in thirds, A5 sheet folded in half lengthwise; very common

[1]Although DL is not part of the ISO C-series, it is a very widely used standard size. DL, probably at one time the abbreviation of DIN Lang (Deutsche Industrie Norm, long), is now identified as "Dimension Lengthwise" by ISO 269.

Chou: these are also 'commercial' type envelopes, with the same shape as the corresponding 'You' type, but with the flap on the short dimension ('Open End') in 'wallet' style. 'Chou-kei' means long-style.

Kaku: these envelopes are more square in appearance and are made for special use, and correspond to 'announcement' envelopes. The flap is on the long side, in the 'square' style. They generally do not fall under the ordinary envelope postage rates. 'Kaku-kei' means square-style.

The main JIS and traditional envelope sizes and the corresponding paper and its required folding are listed in table A.5.

Table A.5.: Japanese JIS and other envelope sizes

JIS	Name	W× in mm	Usage and Comments
	Chou 1	142×332	for A4 folded in half lengthwise; nonstandard
Yes	Chou 2	119×277	for B5 folded in half lengthwise; nonstandard
Yes	Chou 3	120×235	for A4 folded in thirds; very common
	Chou 31	105×235	for A4 folded in thirds
	Chou 30	92×235	for A4 folded in fourths[3]
	Chou 40	90×225	for A4 folded in fourths[3]
Yes	Chou 4	90×205	for JIS B5 folded in fourths[3]; very common
	Kaku A3	320×440	for A3 flat, A2 folded in half ; nonstandard
	Kaku 0	287×382	for B4 flat, B3 folded in half; nonstandard
	Kaku 1	270×382	for B4 flat, B3 folded in half; nonstandard
Yes	Kaku 2	240×332	for A4 flat, A3 folded in half; nonstandard
	Kaku Kokusai A4	229×324	for A4 flat, A3 folded in half; same size as ISO C4; nonstandard
Yes	Kaku 3	216×277	for B5 flat, B4 folded in half; nonstandard

Table A.5.: Japanese JIS and other envelope sizes (*continued*)

JIS	Name	W× in mm	Usage and Comments
Yes	Kaku 4	197×267	for B5 flat, B4 folded in half; nonstandard
Yes	Kaku 5	190×240	for A5 flat, A4 folded in half ; nonstandard
Yes	Kaku 6	162×229	for A5 flat, A4 folded in half; same size as ISO C5; nonstandard
Yes	Kaku 7	142×205	for B6 flat, B5 folded in half; nonstandard
Yes	Kaku 8	119×197	pay envelope (for salaries, wages) ; common for direct mail
Yes	You 0[1] or Furusu 10	235×120	for A4 folded in thirds; same size as Chou 3 but with 'Open Side' style flap
	You 0[1]	197×136	for kyabine[1] (cabinet) size photos ($165\,\text{mm} \times 120\,\text{mm}$); nonstandard
	You 1[2]	176×120	for B5 folded in quarters
	You 1[2]	173×118	for B5 folded in quarters
Yes	You 2	162×114	for A5 folded in half, A4 folded in quarters; same size as ISO C6
Yes	You 3	148×98	for B6 folded in half
Yes	You 4	235×105	for A4 folded in thirds
Yes	You 5	217×95	for A4 folded in fourths[3]
Yes	You 6	190×98	for B5 folded in thirds
Yes	You 7	165×92	for A4 folded in quarters, B4 folded in quarters

[1] Because two different sizes are called You 0, the JIS You 0 is normally called Furusu 10; Furusu ('fools') derives from 'foolscap'; Kyabine is a metricated traditional Japanese size.

[2] Two slightly different sizes are sold as You 1; the smaller size ($173\,\text{mm} \times 118\,\text{mm}$) is the paper-industry standard size.

[3] Twice in the same direction.

Window variants

There are a large number of window subtypes existing within the framework explained in the previous subsection. The most common window sizes and locations are listed in table A.6.

A.2. Provided `lco` files

In scrlttr2 support is provided for Japanese envelope and window sizes through a number of `lco` files which customize the foldmarks required for different envelope sizes and subvariants with different window positions and sizes.

The provided `lco` files together with the envelope types for which they provide support are listed at table A.7. See table A.4 for the full list of Japanese envelopes and the paper they take, and table A.6 for the common window sizes and locations. The rightmost column indicates which `lco` file provides the support.

The tolerances for location is about 2 mm, so it is possible to accommodate all the envelope and window variants of table A.6 with just a small number of `lco` files. The difference between Chou/You 3 and Chou/You 4 is determined by paper size.

A.3. Examples of Japanese letter usage

Assume you want to write a letter on A4 size paper and will post it in a Japanese envelope. If the envelope has no window, then it is enough to determine whether the envelope dimensions match a European one — the standard DIN.lco style may suffice for many such cases.

If you wish to use a windowed envelope, please note that owing to the large variety, not all existing subvariants are currently supported. If you should note that you particular windowed envelope has its window dimensions and positions significantly (more than approximately 2 mm) different from any of the supported subvariants, please contact the author of KOMA-Script to obtain support as soon as possible, and in the meanwhile create a customized `lco` file for your own use, using one of the existing ones as a template and reading the KOMA-Script documentation attentively.

If your window envelope subvariant is supported, this is how you would go about using it: simply select the required `lco` file and activate the horizontal and vertical foldmarks as required. Another, independent, mark

Table A.6.: Supported Japanese envelope types and the window sizes and locations.

Envelope type	Window name[1]	- size[2]	- location[3]	`lco` file[4]
Chou 3	A	90×45	l 23, t 13	NipponEL
Chou 3	F	90×55	l 23, t 13	NipponEH
Chou 3	Hisago	90×45	l 23, t 12	NipponEL
Chou 3	Mutoh 1	90×45	l 20, t 11	NipponEL
Chou 3	Mutoh 101	90×55	l 20, t 11	NipponEH
Chou 3	Mutoh 2	80×45	l 20, t 11	NipponEL
Chou 3	Mutoh 3	90×45	l 25, t 11	NipponLL
Chou 3	Mutoh 301	90×55	l 25, t 11	NipponLH
Chou 3	Mutoh 6	100×45	l 20, t 11	NipponEL
Chou 3	v.2[5]	90×45	l 24, t 12	NipponLL
Chou 40	A	90×45	l 23, t 13	NipponEL
Chou 4	A	90×45	l 23, t 13	NipponEL
Chou 4	B	80×45	l 98, t 28	NipponRL
Chou 4	C	80×45	l 21, t 13	NipponEL
Chou 4	K	80×45	l 22, t 13	NipponEL
Chou 4	Mutoh 1	80×45	l 40, b 11	—
Chou 4	Mutoh 2	80×45	l 20, t 11	NipponEL
Chou 4	Mutoh 3	90×45	l 20, t 11	NipponEL
Chou 4	Mutoh 6	100×45	l 20, t 11	NipponEL
Chou 4	v.2[5]	80×45	l 20, t 12	NipponEL
Chou 4	v.3[5]	90×45	l 20, t 12	NipponEL
Kaku A4	v.1[6]	95×45	l 20, t 24	KakuLL
You 0	Cruise 6	90×45	l 20, t 12	NipponEL
You 0	Cruise 601	90×55	l 20, t 12	NipponEH
You 0	Cruise 7	90×45	l 20, b 12	NipponEL
You 0	Cruise 8	90×45	l 24, t 12	NipponLL
You 0	v.2[5]	90×45	l 24, t 12	NipponEL
You 0	v.3[5]	90×45	l 23, t 13	NipponEL
You 4	A	90×45	l 23, t 13	NipponEL

[1]Names (acting as subtype information) are taken from the manufacturer catalog.
[2]Given as width by height in millimeters.
[3]Given as offset from left (l) or right (r), followed by offset from bottom (b) or top (t).
[4]The `lco` file, which provides support (see table A.7).
[5]In the absence of any other information, a numerical variation number for the subtype name is provided.
[6]Dimensions apply when envelope is held in portrait mode.

Table A.7.: `lco` files provided by scrlttr2 for Japanese window envelopes

`lco` file	Supported	Window size[1]	Window location[1]
NipponEL	Chou/You 3 and 4	90×45	l 22, t 12
NipponEH	Chou/You 3 and 4	90×55	l 22, t 12
NipponLL	Chou/You 3 and 4	90×45	l 25, t 12
NipponLH	Chou/You 3 and 4	90×55	l 25, t 12
NipponRL	Chou/You 3 and 4	90×45	l 98, t 28
KakuLL	Kaku A4	90×45	l 25, t 24

[1]Window size is given in width by height, location as offset from left (l) or right (r),
followed by offset from bottom (b) or top (t). All Values in millimeters.

is the punching mark which divides a sheet in two horizontally for easy
punching and filing.

A.3.1. Example 1:

Your favourite envelope happens to be a You 3 with window subvariant
Mutoh 3, left over from when the company had its previous name, and
you do not wish them to go to waste. Thus, you write your letter with the
following starting code placed before the letter environment:

```
\LoadLetterOption{NipponLL}\setkomavar{myref}{NipponLL}
\begin{letter}{Martina Muster\\Address}
...
\end{letter}
```

A.3.2. Example 2:

You originally designed your letter for a You 3 envelope, but suddenly you
get handed a used electrical company envelope with cute manga characters
on it which you simply cannot pass up. Surprisingly, you find it conforms
fairly closely to the Chou 4 size and C window subvariant, such that you
realize you can alter the following in your document preamble:

```
\LoadLetterOption{NipponEL}\setkomavar{myref}{NipponEL}
\begin{letter}{Martina Muster\\Address}
...
\end{letter}
```

Now, scrlttr2 automatically reformats the letter for you to fit the required envelope.

Change Log

At this list of changes you will find all significant changes of the user interface of the KOMA-Script bundle at the last few versions. The list was sorted about the names of the classes and packages and their version. The numbers behind the versions are the pages, where the changes are described. At the margins of these pages you will find corresponding version marks.

Bibliography

In the following you can find many references. All of them are referenced from the main text. In many cases the reference points to documents or directories which can be accessed via Internet. In these cases the reference includes a URL instead of a publisher. If the reference points to a LaTeX package then the URL is written in the form "CTAN://*destination*". The prefix "CTAN://" means the TeX archive on a CTAN server or mirror. For example, you can substitute the prefix with ftp://ftp.ctan.org/tex-archive/. For LaTeX packages it is also important to mention that we have tried to give a version number appropriate to the text that cites the reference. But for some packages is is very difficult to find a consistent version number and release date. Additionally the given version is not always the current version. If you want install new packages take care that the package is the most up-to-date version and check first whether the package is already available on your system or not.

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Index

There are two kinds of page numbers at this index. The bold printed numbers show the pages of declaration or explanation of the topic. The normal printed numbers show the pages of using a topic.

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Index of Files, Classes, and Packages

Index of Class and Package Options