

# The `papermas` package

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## Abstract

This `LATEX` package allows to compute the number of sheets of paper needed to print a document as well as the mass of that printed version of the document, useful e. g. when sending it by mail to determine the postage. (The number of pages of a document can be determined with the `pageslts` package.)

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Save per page about 200 ml water, 2 g CO<sub>2</sub> and 2 g wood:  
Therefore please print only if this is really necessary.

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# 1 Introduction

This package is kind of an add-on to the `pageslts` package, but because that already uses some resources and computing the number of sheets of paper or the paper mass probably is not needed so often, this was made into a separate package.

It allows to compute the number of sheets of paper needed to print a document (useful when the paper is running out) as well as the mass of that printed version of the document, useful e. g. when sending it by mail to determine the postage.

**Warning/Disclaimer:** The mass of (printer's) ink has to be added and that of envelope, address sticker, stamps, ... Thus this is only an estimation without guarantee – do not sue me, if you have got to pay excess postage!

The name `papermas` is short for paper mass but written with only one `s`, because some software has problems with names with more than eight letters.

It is `mass` and gives a result in grammes [g], because the weight  $F = m \cdot g$  (really  $\vec{F} = m \cdot \vec{g}$ ) [N] would require the knowledge of the gravitational acceleration  $g$  (depending on place and time, in central Europe approximately  $9.81 \text{ m/s}^2$ ) and give a result in NEWTON, which probably is not very useful.

# 2 Usage

Just load the package placing

```
\usepackage[<options>]{papermas}
```

in the preamble of your L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> source file (preferably after calling the `pageslts` package).

Because the `pageslts` package is used to get the total number of pages, please place a `\pagenumbering{...}` with appropriate argument (e. g. `arabic`, `roman`, `Roman`, `fnsymbol`, `alph`, or `Alph`) right behind `\begin{document}` (see documentation of `pageslts` package).

Now you can say

```
This document consists of $\arabic{pagesLTS.pagenr}$~pages.  
When printing $\papermaspagespersheet$~pages on one sheet of  
paper, $\papermasssheets$~sheets will be needed. For  
ISO~A~\papermasformat\ paper of $\papermasmasss \unit{g}\unit{m}^{-2}$  
specific mass, the printout will have a mass of about  
$\papermasstotal \unit{g}$.
```

to get e. g.

```
This document consists of 101 pages. When printing 4 pages on one  
sheet of paper, 26 sheets will be needed. For ISO A 4 paper of  $80 \text{ g m}^{-2}$   
specific mass, the printout will have a mass of about 130 g.
```

This information is also presented at the screen while compiling your document (look for `papermas`), in the log file (search for `*** Paper mass ***`), and can be found in the aux file – probably one does not want to have the information in the printed document.

One could use the `(x)color` package and

```
{\color{white} This document ... of about $\papermasstotal \unit{g}$.
```

which does not show in the printed document (white background of the page assumed), but can be made visible on the screen by marking that text.

## 2.1 Options

**options**      The **papermas** package takes the following options:

### 2.1.1 **format**

**format**      The option **format** wants to know the ISO A...format of the paper used for printing, i. e. **format=4** means ISO A4 paper format (which is also the default).

### 2.1.2 **masss**

**masss**      The option **masss** wants to know the specific (therefore the third **s**) mass of the paper used for printing in g/m<sup>2</sup>. The default is **masss=80**, i. e. 80 g/m<sup>2</sup>.

### 2.1.3 **pagespersheet**

**pagespersheet**      The option **pagespersheet** wants to know, how many pages are to be printed on one sheet of paper. **pagespersheet=2** could mean duplex printing or printing two pages on one side of paper while keeping the back side blank. This does not influence the real printing process! So, if this number differs from the one chosen for printing, the result will be wrong, of course.

### 2.1.4 **decimalsep**

**decimalsep**      The option **decimalsep** wants to know, what should be used for the decimal separator. In English this is “.”, while in German it is “,”. Enclose this in brackets, e. g. **decimalsep={.}** or **decimalsep={,}**. The default is “.”. This is used for the mass of the printed document, and this value is given at the screen during compilation as well as in the **log** and **aux** files. Therefore something like **decimalsep={,\,}** would cause trouble there.

## 3 Alternatives

For determining the number of pages (not sheets of paper) instead of the **pageslts** package the alternatives listed in the description of that package could be used, but then the according code in this package would need to be changed (and also e. g. the **ifcounter** command used here).

With the **totpages** package optionally the number of sheets of paper needed to print the document can be computed, too.

(See **pageslts** documentation.)

(You programmed or found another alternative, which is available at **CTAN**? OK, send an e-mail to me with the name, location at **CTAN**:, and a short notice, and I will probably include it in the list above.)

About how to get those packages, please see subsection **6.1**.

## 4 Example

```
1 (*example)
2 \documentclass[british,a4paper]{article}[2007/10/19]% v1.4h
3 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
4 \usepackage{hyperref}[2011/04/17]% v6.82g
5 \hypersetup{
6   extension=pdf,%
7   plainpages=false,%
8   pdfpagelabels=true,%
9   hyperindex=false,%
10  pdflang={en},%
11  pdftitle={papermas package example},%
12  pdfauthor={Hans-Martin Muench},%
13  pdfsubject={Example for the papermas package},%
14  pdfkeywords={LaTeX, papermas, Hans-Martin Muench},%
15  pdfview=Fit,%
16  pdfstartview=Fit,%
17  pdfpagelayout=SinglePage,%
18  bookmarksopen=false%
19 }
20 \usepackage[pagecontinue=true,alphMult=ab,AlphMulti=AB,fnsymbolmult=true,%
21             romanMult=true,RomanMulti=true]{pageslts}[2011/08/08]% v1.2a
22 %% These are the default options. %%
23 \usepackage[format=4,masss=80,pagespersheet=2,decimalsep={.}]{papermas}
24 %% These are the default options. %%
25 \listfiles
26 \begin{document}
27 \pagenumbering{arabic}
28
29 \section*{Example for papermas}
30 \markboth{Example for papermas}{Example for papermas}
31
32 This example demonstrates the use of package\newline
33 \textsf{papermas}, v1.0g as of 2011/08/08 (HMM).\newline
34 The used options were \texttt{format=4} (ISO~A4),
35 \texttt{masss=80} ( $\text{\unit{g}\unit{m}^{-2}}$ ), and\newline
36 \texttt{pagespersheet=2} (pages per sheet of paper,
37 i.\,e. either duplex printing or\newline
38 printing two pages on one side of a sheet of paper with blank back side).\newline
39 (These are the default options.)\newline
40 For more details please see the documentation!\newline
41
42 \bigskip
43
44 This document consists of
45 \lastpageref{LastPages}~(\arabic{pagesLTS.pagenr})~pages.
46 When printing  $\text{\papermaspagespersheet}$  pages on one sheet of
47 paper,  $\text{\papermasssheets}$  sheets will be needed. For
48 ISO~A~\papermasformat\ paper of  $\text{\papermasmasss}$   $\text{\unit{g}\unit{m}^{-2}}$ 
49 specific mass, the printout will have a mass of about
50  $\text{\papermasstotal}$   $\text{\unit{g}}$ $.
51
52 \bigskip
53
54 \noindent Save per page about  $\text{\$200\unit{ml}}$ $ water,
55  $\text{\$2\unit{g}}$ $  $\text{CO}_2$ $ and  $\text{\$2\unit{g}}$ $ wood:\newline
56 Therefore please print only if this is really necessary.\newline
```

```

57 I do NOT think, that it is necessary to print THIS file, really\newline
58 (at least not after this page)!
59
60 \newpage Page \thepage
61 \newpage Page \thepage
62 \newpage Page \thepage
63 \newpage Page \thepage
64 \newpage Page \thepage
65 \newpage Page \thepage
66 \newpage Page \thepage
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102 \newpage Page \thepage
103 \newpage Page \thepage
104 \newpage Page \thepage
105 \newpage Page \thepage
106 \newpage Page \thepage
107 \newpage Page \thepage
108 \newpage Page \thepage
109 \newpage Page \thepage
110 \newpage Page \thepage
111 \newpage Last page \thepage.
112
113 \end{document}
114 \</example>

```

## 5 The implementation

We start off by checking that we are loading into L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> and announcing the name and version of this package.

```
115 (*package)
116 \NeedsTeXFormat{LaTeX2e}[2009/09/24]
117 \ProvidesPackage{papermas}[2011/08/08 v1.0g
118         Computes paper mass of a printout (HMM)]
119
```

A short description of the papermas package:

```
120 %% Allows to compute the number of sheets of paper
121 %% needed to print a document as well as the
122 %% mass of that printed version of the document,
123 %% useful e. g. when sending it by mail to determine the postage.
124 %% Warning/Disclaimer: Mass of (printer's) ink has to be added
125 %% and that of envelope, address sticker, stamps,...!
126 %% So, this is only an estimation without guarantee -
127 %% do not sue me, if you have got to pay excess postage!
128
```

For the handling of the options we need the kvoptions package of HEIKO OBERDIEK (see subsection 6.1):

```
129 \RequirePackage{kvoptions}[2010/12/23]% v3.10
```

For the total number of pages we need the pageslts package of myself (see subsection 6.1):

```
130 \RequirePackage{pageslts}[2011/08/08]% v1.2a
131 \RequirePackage{intcalc}[2007/09/27]% v1.1; for intcalcPow
```

A last information for the user:

```
132 %% papermas may work with earlier versions of LaTeX and those
133 %% packages, but this was not tested. Please consider updating
134 %% your LaTeX and packages to the most recent version
135 %% (if they are not already the most recent version).
136
```

See subsection 6.1 about how to get them.

The options are introduced:

```
137 \SetupKeyvalOptions{family = papermas,prefix = papermas@}
138 \DeclareStringOption[4]{format}[4]%          paper format, ISO A...,
139 %%                                           default: (ISO A) 4
140 \DeclareStringOption[80]{masss}[80]%         specific mass of the paper,
141 %%                                           default: 80 (g/(m^2))
142 \DeclareStringOption[2]{pagespersheet}[2]%   number of pages per sheet,
143 %%                                           for duplex printing this is 2.
144 \DeclareStringOption[.]{decimalsep}[.]%      decimal separator,
145 %%                                           e. g. "." or ",": decimalsep={,} - brackets are needed!!!
146 %%                                           decimalsep={,\,} does not work for screen, aux, log output!
147
148 \ProcessKeyvalOptions*
149
```

`\unit` We define a `\unit` command:

```
150 \gdef\unit#1{\mathord{\thinspace\mathrm{#1}}}%
151
```

Even if diverse commands are not defined yet, we do not want a  
 $\text{\LaTeX}$  Error: ... undefined.

```

152 \ifundefined{papermasstotal}{\gdef\papermasstotal{\textbf{??}}}{%
153 \ifundefined{papermasstotal}{\gdef\papermasstotal{\textbf{??}}}{%
154 \ifundefined{papermasformat}{\gdef\papermasformat{\textbf{??}}}{%
155 \ifundefined{papermasmasss}{\gdef\papermasmasss{\textbf{??}}}{%
156 \ifundefined{papermaspagespersheet}{\gdef\papermaspagespersheet{\textbf{??}}}{%
157 \ifundefined{papermasssheets}{\gdef\papermasssheets{\textbf{??}}}{%
158

```

$\backslash$ papermas@totmass This is the internal command, which computes the total paper mass of the printed document.

```

159 \newcommand\papermas@totmass{%
160   \newcounter{papermasA}% paper mass for ISO A...
161   \setcounter{papermasA}{\papermas@format}% e. g. 4

```

We check whether papermasA has a resonable value:

```

162   \ifnum \value{papermasA}<0%
163     \PackageError{papermas}{Option format has no valid value}%
164     {The format option of the papermas package\MessageBreak%
165      only takes whole, non-negative numbers (0, 1, 2, 3,...)\MessageBreak%
166      because this should be the paper format\MessageBreak%
167      ISO A 0, 1, 2, 3,...\MessageBreak%
168      Found instead: \papermas@format \MessageBreak%
169     }
170   \else%

```

papermasA has a resonable value. We introduce a new counter papermasmasss and initialize it with the value given in option masss, i. e.  $\backslash$ papermas@masss.

```

171   \newcounter{papermasmasss}% always 0
172   \setcounter{papermasmasss}{\papermas@masss}% default: 80

```

Counters are integers, but the amount of the mass of a single sheet of paper in most cases is not an integer, therefore we multiply with 100 to get two digits behind the decimal separator.

(Later we need to devide by 100 again, of course.)

```

173   \multiply \value{papermasmasss} 100 % default: 8000

```

We check whether papermasmasss has a resonable value, i. e.  $> 0$ :

```

174   \ifnum \value{papermasmasss}<1%
175     \PackageError{papermas}{Option masss has no valid value}%
176     {The masss option of the papermas package\MessageBreak%
177      only takes positive numbers,\MessageBreak%
178      because this should be the mass per square meter\MessageBreak%
179      of a single sheet of your paper.\MessageBreak%
180      Found instead: \papermas@masss \MessageBreak%
181     }
182   \else

```

masss has a resonable value, and therefore also  $\backslash$ papermas@masss and papermasmasss.

We check whether option pagespersheet has a resonable value, i. e.  $\geq 1$ :

```

183   \newcounter{papermasPPS}% is 0
184   \setcounter{papermasPPS}{\papermas@pagespersheet}% default 2
185   \ifnum \value{papermasPPS} < 1%
186     \PackageError{papermas}{%

```



```

187         The number of pages per sheet must be positive.}{%
188         You cannot print less than one TeX page per sheet of paper.\MessageBreak%
189         The value found was \papermas@pagespersheet .\MessageBreak%
190     }
191 \else

```

pagespersheet has a resonable value, and therefore also  
\papermas@pagespersheet and papermasTmpA.

We introduce a new counter `papermas@sheets` for the number of sheets printed and initialize it with the number of pages as computed by package `pageslts`, i. e. `pagesLTS.pagenr`.

```

192     \newcounter{papermas@sheets}
193     \setcounter{papermas@sheets}{\arabic{pagesLTS.pagenr}}%

```

When more than one page is printed on one sheet of paper, the number of sheets needed for printing is decreased:

```

194     \divide \value{papermas@sheets} by \value{papermasPPS}%

```

`\divide` cuts off all digits behind the decimal separator, but if there are digits  $> 0$ , this means that there is an additional, last sheet, which is only partially covered with print (e. g. only one side of it for duplex printing an odd number of pages). In that case, we have to add one sheet of paper to the number of sheets needed.

```

195     \newcounter{papermas@tmpn}
196     \setcounter{papermas@tmpn}{\arabic{papermas@sheets}}%
197     \multiply \value{papermas@tmpn} \value{papermasPPS}%
198     \ifnum \value{papermas@tmpn}=\value{pagesLTS.pagenr}
199         \relax
200     \else
201         \addtocounter{papermas@sheets}{1}%
202     \fi

```

Now we can multiply the specific mass of 100 sheets with the number of sheets needed for printing:

```

203     \multiply \value{papermasmasss} \value{papermas@sheets}
204 % default:      8000      (no default for this)

```

The result is in  $\text{g m}^{-2}$ .  
A sheet with format ISO A0 has a size of  $1 \text{ m}^2$ ,  
a sheet with format ISO A1 has a size of  $1 \text{ m}^2 \cdot 2^{-1}$ ,  
a sheet with format ISO A2 has a size of  $1 \text{ m}^2 \cdot 2^{-2}$ ,  
..., and  
a sheet with format ISO  $A_n$  has a size of  $1 \text{ m}^2 \cdot 2^{-n}$ .

Therefore we compute  $2^{\text{papermasA}}$  and divide the specific paper mass by that value:

```

205     \divide \value{papermasmasss} by \intcalcPow{2}{\value{papermasA}}
206 % default:      16000      /      2^(\value{papermasA})

```

We need to get the division by 100 and the digits after the decimal separator right:

```

207 % for the example 297 is used
208 \newcounter{papermas@tmpm}
209 \setcounter{papermas@tmpm}{\arabic{papermasmasss}}% m:297 n: o: p: q:
210 \setcounter{papermas@tmpn}{\arabic{papermasmasss}}% m:291 n:291 o: p: q:
211 \divide \value{papermas@tmpn} by 100% m:297 n:2 o: p: q:

```

```

212 \newcounter{papermas@tmpo}
213 \setcounter{papermas@tmpo}{\arabic{papermas@tmpn}}% m:291 n:2 o:2 p: q:
214 \multiply \value{papermas@tmpn} 10% m:297 n:20 o:2 p: q:
215 \divide \value{papermas@tmpn} by 10% m:29 n:20 o:2 p: q:
216 \newcounter{papermas@tmpp}
217 \setcounter{papermas@tmpp}{\arabic{papermas@tmpm}}
218 \addtocounter{papermas@tmpp}{-\arabic{papermas@tmpn}}%m:29 n:20 o:2 p:9 q:
219 % 29 - 20 = 9
220 \multiply \value{papermas@tmpm} 10% m:290 n:20 o:2 p:9 q:
221 \newcounter{papermas@tmpq}
222 \setcounter{papermas@tmpq}{\arabic{papermas@tmpp}}
223 \addtocounter{papermas@tmpq}{-\arabic{papermas@tmpm}}%m:290 n:20 o:2 p:9 q:7
224 % 297 - 290 = 7

```

Now rounding mathematically correct, i.e.  $\geq 0.5$  becomes 1 (and remember a possible amount carried forward!) and  $< 0.5$  becomes 0.

```

225 \ifnum\value{papermas@tmpq}>4
226 \addtocounter{papermas@tmpp}{1}% m:290 n:20 o:2 p:10 q:7
227 \ifnum\value{papermas@tmpp}>9% m:290 n:20 o:2 p:10 q:7
228 \addtocounter{papermas@tmpo}{1}% m:290 n:20 o:3 p:10 q:7
229 \setcounter{papermas@tmpp}{0}% m:290 n:20 o:3 p:0 q:7
230 \fi
231 \fi

```

The result in the example above is  $297/100 = 2.97 \approx 3.0$ . We write this into `\papermastmpr` (where `\papermas@decimalsep` is the decimal separator) and the (other) options' values into temporary definitions, as well as the number of sheets:

```

232 \edef\papermastmpr{\arabic{papermas@tmpo}\papermas@decimalsep\arabic{papermas@tmpp}}%
233 \xdef\papermas@mbs{\arabic{papermas@tmpo}}%
234 \edef\papermastmpformat{\papermas@format}%
235 \edef\papermastmpmasss{\papermas@masss}%
236 \edef\papermastmppagespersheet{\papermas@pagespersheet}%
237 \edef\papermastmpt{\arabic{papermas@sheets}}%

```

We use the `pageslts` package, which already was used to determine the total number of pages, to check for the counter `papermassttl`. If it exists, nothing is done, if it does not exist, it is declared as `\newcounter` (and by default set to zero).

```

238 \pagesLTS@ifcounter{papermassttl}

```

If the `papermassttl` counter value already has the value of `papermasmasss`, everything is fine.

```

239 \ifnum\value{papermassttl}=\value{papermasmasss}
240 \relax

```

Otherwise we need another run of L<sup>A</sup>T<sub>E</sub>X.

```

241 \else
242 \AtVeryVeryEnd{%
243 \PackageWarningNoLine{papermas}{%
244 Number of pages may have changed.\MessageBreak%
245 Rerun to get it right%
246 }%
247 }%
248 \fi

```

In any case, we set the counter `papermassttl` to the current value of `papermasmasss`.

```

249 \setcounter{papermassttl}{\arabic{papermasmasss}}

```

Because we want to write out into the aux-file, we need the expanded value (as string) of `papermasmasss`:

```
250 \edef\papermastmps{\arabic{papermasmasss}}%
```

If we are allowed to write into the aux-file, we do it here. If we are not allowed to do it, the `pageslts` package already gave an according error message.

```
251 \if@files%
```

When it is read from the aux-file and when its content is processed, the counter `papermassttl` might not have been defined yet. Therefore we again use the `\pagesLTS@ifcounter` command of the `pageslts` package.

```
252 \immediate\write\@auxout{\string
253 \pagesLTS@ifcounter{papermassttl}}%
```

We set the counter `papermassttl` to the value `\papermastmps`, i.e. `\arabic{papermasmasss}`. In the next compilation run, it will be checked, whether `\value{papermassttl}=\value{papermasmasss}` (see above). If this is the case, everything is OK, no changes happened, and no rerun is necessary (at least not for `papermas`).

```
254 \immediate\write\@auxout{\string
255 \setcounter{papermassttl}{\papermastmps}}%
```

What we do need, is to get the determined `\papermastmpr` to the user. Therefore

1. we define `\papermasstotal` in the aux-file, where the user can look it up
2. we define `\papermasstotal`, so the user can e.g. write

This document consists of  $\arabic{pagesLTS.pagenr}$  pages.  
When printing  $\papermaspagespersheet$  pages on one sheet of paper,  $\papermasssheets$  sheets will be needed. For ISO~A~ $\papermasformat$  paper of  $\papermasmasss$  unit{g} unit{m}^{-2} specific mass, the printout will have a mass of about  $\papermasstotal$  unit{g}.

```
256 \immediate\write\@auxout{\string
257 \gdef\string\papermasstotal{\papermastmpr}}%
258 \immediate\write\@auxout{\string
259 \gdef\string\papermasformat{\papermastmpformat}}%
260 \immediate\write\@auxout{\string
261 \gdef\string\papermasmasss{\papermastmpmasss}}%
262 \immediate\write\@auxout{\string
263 \gdef\string\papermaspagespersheet{\papermastmppagespersheet}}%
```

3. we give at the screen the information about the `\papermasstotal` (see `\AtVeryVeryEnd` below)
4. which will also appear in the log-file.

We want to give also `\papermastmpt = \arabic{papermas@sheets}` to the user, i. e. the number of sheets needed to print the document. Therefore we follow the same procedure:

```

264         \immediate\write\@auxout{\string
265         \gdef\string\papermasssheets{\papermastmpt}}}%
266     \fi%
267 \fi%
268 \fi%
269 \fi%
270 }
271

```

`\AtBeginDocument` `\AtBeginDocument` it is checked whether some commands, which are/will be defined via the `aux`-file, are undefined yet. If this is the case, `\AtVeryVeryEnd` a rerun warning is given.

```

272 \AtBeginDocument{%
273   \gdef\papermas@undefined{\textbf{??}}
274   \gdef\papermas@rerun{0}
275   \ifx\papermasstotal\papermas@undefined      \gdef\papermas@rerun{1} \fi
276   \ifx\papermasformat\papermas@undefined      \gdef\papermas@rerun{1} \fi
277   \ifx\papermasmassss\papermas@undefined      \gdef\papermas@rerun{1} \fi
278   \ifx\papermaspagespersheet\papermas@undefined \gdef\papermas@rerun{1} \fi
279   \ifx\papermasssheets\papermas@undefined      \gdef\papermas@rerun{1} \fi
280   \ifx\papermas@rerun\pagesLTS@one
281     \AtVeryVeryEnd{
282       \PackageWarningNoLine{papermas}{%
283         Variable(s) still undefined!\MessageBreak%
284         Rerun to get the variable(s) right%
285       }
286     }
287   \fi
288 }
289
290

```

`\AfterLastShipout` What we did not do yet, is to really *call* the command `\papermas@totmass`. We do this `\AfterLastShipout`, because we need the total number of pages, and asking for them at the end of the document might save another compilation run.

```

291 \AfterLastShipout{%
292   \papermas@totmass%
293 }%
294

```

`\AfterLastShipout` is a command from the `atveryend` package of HEIKO OBERDIEK, which is already loaded by the `pageslts` package (about how to get the `atveryend` package, please see the documentation of the `pageslts` package – you may need to get further packages for `pageslts` anyway, if they have not been installed within your  $\text{\LaTeX}$  system).

For pretty printing the message of `papermas` three internal commands are needed. We borrow the `pagesLTS.pnc.0` counter from the `pageslts` package instead of defining another new one.

```

295 \newcommand{\papermas@log}[1]{%
296   \ifnum#1>9%
297     \addtocounter{pagesLTS.pnc.0}{1}%
298     \papermas@log{\intcalcdDiv{#1}{10}}%
299   \fi%
300 }
301
302 \newcommand{\papermas@spaces}[2]{%
303   \edef\papermas@remember{\arabic{pagesLTS.pnc.0}}%
304   \setcounter{pagesLTS.pnc.0}{1}%
305   \papermas@log{#1}%
306   \addtocounter{pagesLTS.pnc.0}{-#2}%
307   \multiply \value{pagesLTS.pnc.0} -1%
308   \papermas@space{\arabic{pagesLTS.pnc.0}}%
309   \message{*^~J}%
310   \setcounter{pagesLTS.pnc.0}{\papermas@remember}%
311 }
312
313 \newcommand{\papermas@space}[1]{%
314   \ifnum \value{pagesLTS.pnc.0}>0%
315     \message{}%
316   \fi%
317   \setcounter{pagesLTS.pnc.0}{#1}%
318   \addtocounter{pagesLTS.pnc.0}{-1}%
319   \ifnum \value{pagesLTS.pnc.0}>0%
320     \papermas@space{\arabic{pagesLTS.pnc.0}}%
321   \fi%
322 }
323

```

`\AtVeryVeryEnd`

```

324 \AtVeryVeryEnd{%
    \AtVeryVeryEnd{...} is even later than \AfterLastShipout:
    “This code is called right before the final \cs{@@end}.”

```

(`atveryend` package of HEIKO OBERDIEK, v1.6 as of 2011/04/15).

If no necessity for a rerun was *detected* (Check for other rerun warnings!), the final `\PackageInfo` is given.

```

325 \ifx\papermas@rerun\pagesLTS@zero%
326   \message{^~J}%
327   \message{papermas: ***** Paper mass *****^~J}%
328   \message{papermas: * This document consists of \arabic{pagesLTS.pagenr} pages.}
329   \papermas@spaces{\arabic{pagesLTS.pagenr}}{16}%
330   \message{papermas: * When printing \papermaspagespersheet\space pages on one sheet of paper.}
331   \papermas@spaces{\papermaspagespersheet}{6}%
332   \message{papermas: * \papermasssheets\space sheets will be needed.}
333   \papermas@spaces{\papermasssheets}{26}%
334   \message{papermas: * For ISO A \papermasformat\space paper of \papermasmasss\space g/m^2 s}
335   \papermas@spaces{\papermasmasss}{7}%
336   \message{papermas: * the printout will have a mass of about \papermasstotal\space g.}
337   \papermas@spaces{\papermas@mbbs}{5}%
338   \message{papermas: *****^~J}

```

```

339   \message{^^J}
340   \fi%
341 }
342

```

`\papermas@powerof` The command `\papermas@powerof` is **obsolete**. `\intcalcPow` is used instead. For compatibility reasons we still provide the command (but with other code), and issue an error message.

```

343 \newcommand\papermas@powerof[2]{%
344   \PackageError{papermas}{Obsolete command \string\papermas@powerof\space used}{%
345     The command \string\papermas@powerof\space has been removed from the papermas package.\Mes
346     Please use e.g. \string\intcalcPow\space from the intcalc package instead.\MessageBreak%
347     You can now just type Return to continue, but this error message will be\MessageBreak%
348     issued again when using \string\papermas@powerof,\space and the command might be\MessageBr
349     removed completely from future versions of the papermas package.\MessageBreak%
350   }%
351   \AtVeryVeryEnd{%
352     \message{^^J%
353       papermas: Please remember to replace the \string\papermas@powerof\space command!^^J^^J%
354     }%
355   }%
356   \pagesLTS@ifcounter{papermas@result}%
357   \setcounter{papermas@result}{\intcalcPow{#1}{#2}}%
358 }
359
360 \end{package}

```

## 6 Installation

### 6.1 Downloads

Everything is available at CTAN: <http://www.ctan.org/tex-archive/>, but may need additional packages themselves.

`papermas.dtx` For unpacking the `papermas.dtx` file and constructing the documentation it is required:

- T<sub>E</sub>XFormat L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>: <http://www.CTAN.org/>
- document class `ltxdoc`, 2007/11/11, v2.0u,  
[CTAN:macros/latex/base/ltxdoc.dtx](http://www.ctan.org/macros/latex/base/ltxdoc.dtx)
- package `holtxdoc`, 2011/02/04, v0.21,  
[CTAN:macros/latex/contrib/oberdiek/holtxdoc.dtx](http://www.ctan.org/macros/latex/contrib/oberdiek/holtxdoc.dtx)
- package `hypdoc`, 2010/03/26, v1.9,  
[CTAN:macros/latex/contrib/oberdiek/hypdoc.dtx](http://www.ctan.org/macros/latex/contrib/oberdiek/hypdoc.dtx)

`papermas.sty` The `papermas.sty` for L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> (i.e. all documents using the `papermas` package) requires:

- T<sub>E</sub>XFormat L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>, <http://www.CTAN.org/>
- package `intcalc`, 2007/09/27, v1.1,  
[CTAN:macros/latex/contrib/oberdiek/intcalc.dtx](http://www.ctan.org/macros/latex/contrib/oberdiek/intcalc.dtx)
- package `kvoptions`, 2010/12/23, v3.10,  
[CTAN:macros/latex/contrib/oberdiek/kvoptions.dtx](http://www.ctan.org/macros/latex/contrib/oberdiek/kvoptions.dtx)
- package `pageslts`, 2011/08/08, v1.2a,  
[CTAN:macros/latex/contrib/pageslts/pageslts.dtx](http://www.ctan.org/macros/latex/contrib/pageslts/pageslts.dtx)

`papermas-example.tex` The `papermas-example.tex` requires the same files as all documents using the `papermas` package, and additionally:

- class `article`, 2007/10/19, v1.4h, from `classes.dtx`:  
[CTAN:macros/latex/base/classes.dtx](http://www.ctan.org/macros/latex/base/classes.dtx)
- package `papermas`, 2011/08/08, v1.0g,  
[CTAN:macros/latex/contrib/papermas/papermas.dtx](http://www.ctan.org/macros/latex/contrib/papermas/papermas.dtx)  
(Well, it is the example file for this package, and because you are reading the documentation for the `papermas` package, it can be assumed that you already have some version of it – is it the current one?)

`totpages` As possible alternative in section 3 there is listed

- package `totpages`, 2005/09/19, v2.00,  
[CTAN:macros/latex/contrib/totpages/totpages.dtx](http://www.ctan.org/macros/latex/contrib/totpages/totpages.dtx)

`Oberdiek` All packages of HEIKO OBERDIEK’S bundle ‘oberdiek’ (especially `holtxdoc`,  
`holtxdoc` `atveryend`, `intcalc`, and `kvoptions`) are also available in a TDS compliant ZIP archive:  
`atveryend` [CTAN:install/macros/latex/contrib/oberdiek.tds.zip](http://www.ctan.org/install/macros/latex/contrib/oberdiek.tds.zip).  
`intcalc` It is probably best to download and use this, because the packages in there are  
`kvoptions` quite probably both recent and compatible among themselves.

**hyperref**      hyperref is not included in that bundle and needs to be downloaded separately,  
<http://mirror.ctan.org/install/macros/latex/contrib/hyperref.tds.zip>.

**Münch**      A hyperlinked list of my (other) packages can be found at <http://www.Uni-Bonn.de/~uzs5pv/LaTeX.html>.

## 6.2 Package, unpacking TDS

**Package.** This package is available on **CTAN**:

**CTAN:macros/latex/contrib/papermas/papermas.dtx**

The source file.

**CTAN:macros/latex/contrib/papermas/papermas.pdf**

The documentation.

**CTAN:macros/latex/contrib/papermas/papermas-example.pdf**

The compiled example file, as it should look like.

**CTAN:macros/latex/contrib/papermas/README**

The README file.

**CTAN:install/macros/latex/contrib/papermas.tds.zip**

Everything in TDS compliant, compiled format.

which additionally contains

papermas.ins	The installation file.
papermas.drv	The driver to generate the documentation.
papermas.sty	The <code>.style</code> file.
papermas-example.tex	The example file.

For required other packages, see the preceding subsection.

**Unpacking.** The `.dtx` file is a self-extracting `docstrip` archive. The files are extracted by running the `.dtx` through plain `TeX`:

```
tex papermas.dtx
```

About generating the documentation see paragraph 6.4 below.

**TDS.** Now the different files must be moved into the different directories in your installation TDS tree (also known as `texmf` tree):

<code>papermas.sty</code>	→ <code>tex/latex/papermas.sty</code>
<code>papermas.pdf</code>	→ <code>doc/latex/papermas.pdf</code>
<code>papermas-example.tex</code>	→ <code>doc/latex/papermas-example.tex</code>
<code>papermas-example.pdf</code>	→ <code>doc/latex/papermas-example.pdf</code>
<code>papermas.dtx</code>	→ <code>source/latex/papermas.dtx</code>

If you have a `docstrip.cfg` that configures and enables `docstrip`'s TDS installing feature, then some files can already be in the right place, see the documentation of `docstrip`.

## 6.3 Refresh file name databases

If your `TeX` distribution (`teTeX`, `mikTeX`, ...) relies on file name databases, you must refresh these. For example, `teTeX` users run `texhash` or `mktexlsr`.



## 6.4 Some details for the interested

**Unpacking with L<sup>A</sup>T<sub>E</sub>X.** The `.dtx` chooses its action depending on the format:

**plain T<sub>E</sub>X:** Run `docstrip` and extract the files.

**L<sup>A</sup>T<sub>E</sub>X:** Generate the documentation.

If you insist on using L<sup>A</sup>T<sub>E</sub>X for `docstrip` (really, `docstrip` does not need L<sup>A</sup>T<sub>E</sub>X), then inform the autodetect routine about your intention:

```
latex \let\install=y\input{papermas.dtx}
```

Do not forget to quote the argument according to the demands of your shell.

**Generating the documentation.** You can use both the `.dtx` or the `.drv` to generate the documentation. The process can be configured by a configuration file `ltxdoc.cfg`. For instance, put this line into that file, if you want to have A4 as paper format:

```
\PassOptionsToClass{a4paper}{article}
```

An example follows how to generate the documentation with pdfL<sup>A</sup>T<sub>E</sub>X:

```
pdflatex papermas.drv
makeindex -s gind.ist papermas.idx
pdflatex papermas.drv
makeindex -s gind.ist papermas.idx
pdflatex papermas.drv
```

## 6.5 Compiling the example

The example file, `papermas-example.tex`, can be compiled via

```
latex papermas-example.tex
```

or (recommended)

```
pdflatex papermas-example.tex
```

but will need probably three compiler runs to get everything right.

## 7 Acknowledgements

I would like to thank HEIKO OBERDIEK (heiko dot oberdiek at googlemail dot com) for providing a lot (!) of useful packages (from which I also got everything I know about creating a file in `.dtx` format, ok, say it: copying), and the `news:comp.text.tex` and `news:de.comp.text.tex` newsgroups for their help in all things T<sub>E</sub>X.

## 8 History

[2010/06/01 v1.0(a)]

- First version of this `papermas` package.

[2010/06/03 v1.0b]

- New `\papermassheets` and `reruncheck` introduced; several small changes.
- Example adapted to other examples of mine.
- Updated references to other packages.
- TDS locations updated.
- Several changes in the documentation and the Readme file.

[2010/06/24 v1.0c]

- `holtxdoc` warning in `drv` updated.
- Corrected the location of the package at CTAN.  
(TDS was still missing due to packaging error.)
- Updated references to other packages: `hyperref` and `pagesLTS`.
- Added a list of my other packages.
- Several changes to the documentation.
- Introduced new **option**: `decimalsep`.

[2010/07/29 v1.0d]

- Corrected given url of `papermas.tds.zip` and other urls.
- There is a new version of the used `hyperref` package: 2010/06/18, v6.81g.
- There is a new version of the used `pagesLTS` package: 2010/07/29, v1.1e.
- Included a `\Checksum`.

[2011/02/01 v1.0e]

- Updated to version 2010/12/16 v6.81z of the `hyperref` package.
- Removed wrong % from the driver file.
- Changed the `\unit` definition (got rid of an old `\rm`).
- Replaced the list of my packages with a link to a web page list of those, which has the advantage of showing the recent versions of all those packages.
- Now using `\@ifundefined`.
- Removed `/muench/` from the path at diverse locations.
- There is a new version of the used `pagesLTS` package: 2011/02/01, v1.1m.
- Some small changes.

[2011/06/02 v1.0f]

- There is a new version of the used `koptions` package: 2010/12/23, v3.10.
- There is a new version of the used `pagesLTS` package: 2011/03/17, v1.1o.
- The `holtxdoc` package was fixed (recent version: 2011/02/04, v0.21), therefore the warning in `drv` could be removed. – Adapted the style of this documentation to new OBERDIEK `dtx` style.
- There is a new version of the used `hyperref` package: 2011/04/17, v6.82g.
- The rerun warnings are given after the `filelist` (if that is called with `\listfiles`) and the final `papermas` information is presented `\AtVeryVeryEnd` (now only ones instead of twice).
- Replaced `\text` by `\textrm`.
- Instead of compiling “ $a$  to the power of  $b$ ” itself, `papermas` now uses the `intcalc` package of HEIKO OBERDIEK.
- Removed five counters.
- A lot of small changes (also in the README).

[2011/08/08 v1.0g]

- The `pagesLTS` package has been renamed to `pageslts`: 2011/08/08, v1.2a.
- Replaced `\global\edef` by `\xdef`.
- Minor details.

When you find a mistake or have a suggestion for an improvement of this package, please send an e-mail to the maintainer, thanks! (Please see BUG REPORTS in the README.)

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