

The papermas package*

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Abstract

This 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.) –
Further this package allows to compute “*base* to the power of *exponent*” inside `LATEX`.

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Save per page about 200 ml water, 2 g CO₂ 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 my `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,...). So, this is only an estimation without guarantee – do not sue me, if you have got to pay excess postage!

Further this package allows to compute “*base* to the power of *exponent*” inside \LaTeX .

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 need the knowledge about the gravitational acceleration g (depending on place and time, in central Europe approximately 9.81 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 \LaTeX 2_ϵ 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 $\papermasssss \unit{g}\unit{m}^{-2}$
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 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 `Package papermas Info`), 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 `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 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 Option `masss` wants to know the specific (therefore the third s) mass of the paper used for printing in g/m^2 . The default is `masss=80`, i.e. 80 g/m^2 .

2.1.3 pagespersheet

pagespersheet 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 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` 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}
3 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
4 \usepackage[hyperref]{2010/06/18}% v6.81g
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[alphalph]{2010/04/18}% v2.3
21 \usepackage[pagecontinue=true,alphMult=ab,AlphMulti=AB,fnsymbolmult=true,romanMult=true,RomanMult=true]{papermas}
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}, v1.0d as of 2010/07/29 (HMM).\newline
34 The used options were \texttt{format=4} (ISO~A4),
35 \texttt{masss=80} ( $\text{unit}\{g\}\text{unit}\{m\}^{-2}$ ), 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~\textsf{papermasformat} paper of  $\text{papermasmasss}$   $\text{unit}\{g\}\text{unit}\{m\}^{-2}$ 
49 specific mass, the printout will have a mass of about
50  $\text{papermasstotal}$   $\text{unit}\{g\}$ $.
51
52 \bigskip
53
54 Save per page about  $200\text{unit}\{ml\}$ ~water,  $2\text{unit}\{g\}$ ~CO2~$
55 and  $2\text{unit}\{g\}$ ~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
61 \newpage Page \thepage
62 \newpage Page \thepage
63 \newpage Page \thepage
64 \newpage Page \thepage
65 \newpage Page \thepage
66 \newpage Page \thepage
67 \newpage Page \thepage
68 \newpage Page \thepage
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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 Page \thepage
112 \newpage Last page \thepage.
113 \end{document}
114 </example>

```

5 The implementation

We start off by checking that we are loading into L^AT_EX 2_ε and announcing the name and version of this package.

```
115 (*package)
116 \NeedsTeXFormat{LaTeX2e}[1994/06/01]
117 \ProvidesPackage{papermas}[2010/07/29 v1.0d
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 %% Further this package allows to compute
129 %% "base to the power of exponent" inside TeX.
130
```

For the handling of the options we need the kvoptions package of Heiko Oberdiek (see subsection 6.1):

```
131 \RequirePackage{kvoptions}[2010/02/22]% v3.7
```

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

```
132 \RequirePackage{pagesLTS}[2010/07/29]% v1.1e
```

A last information for the user(s):

```
133 %% papermas may work with earlier versions of those packages,
134 %% but this was not tested. Please consider updating your packages
135 %% to the most recent version (if they are not already the most
136 %% recent version).
137
```

See subsection 6.1 about how to get them.

The options are introduced:

```
138 \SetupKeyvalOptions{family = papermas,prefix = papermas@}
139 \DeclareStringOption[4]{format}[4]%      paper foormat, ISO A...,
140                                     %      default: (ISO A) 4
141 \DeclareStringOption[80]{masss}[80]%     specific mass of the paper,
142                                     %      default: 80 (g/(m^2))
143 \DeclareStringOption[2]{pagespersheet}[2]% number of pages per sheet,
144                                     %      for duplex printing this is 2.
145 \DeclareStringOption[.]{decimalsep}[.]%  decimal separator,
146                                     % e. g. "." or ",": decimalsep={,} - brackets are needed!!!
147                                     % decimalsep={,\,} does not work for screen, aux, log output!
148
149 \ProcessKeyvalOptions*
150
```

unit We want to use the `\unit` command from *Scientific WorkPlace*, therefore we need to copy the definition:

```
151 %% Code from tcilatex.tex, Macros for Scientific Word and Scientific WorkPlace 5.5 <06 Oct 20
152 %% Copyright (C) 2005 Mackichan Software, Inc.
153 %% That macro file is NOT proprietary and may be freely copied and distributed.
154 %% \def was changed to \gdef
155 \gdef\unit#1{\mathord{\thinspace\rm #1}}%
156 %% End of code from tcilatex.tex
157
```

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

```

158 \ifx\papermasstotal\undefined \gdef\papermasstotal{\textbf{??}}%
159 \fi
160 \ifx\papermasstotal\undefined \gdef\papermasstotal{\textbf{??}}%
161 \fi
162 \ifx\papermasformat\undefined \gdef\papermasformat{\textbf{??}}%
163 \fi
164 \ifx\papermasssss\undefined \gdef\papermasssss{\textbf{??}}%
165 \fi
166 \ifx\papermaspagespersheet\undefined \gdef\papermaspagespersheet{\textbf{??}}%
167 \fi
168 \ifx\papermasssheets\undefined \gdef\papermasssheets{\textbf{??}}%
169 \fi
170

```

Introducing some new counters:

```

171 \newcounter{papermas@rerun}
172 \newcounter{papermas@base}
173 \newcounter{papermas@exp}
174 \newcounter{papermas@result}
175 \newcounter{papermas@ini}
176 \setcounter{papermas@ini}{1}
177

```

\backslash papermas@powerof We need a command to compute “base to the power of exponent” ($base^{exponent}$).
(Is this really not already implementet in \LaTeX ?!)

```

178 \newcommand\papermas@powerof[2]{%
179   \setcounter{papermas@base}{#1}
180   \setcounter{papermas@exp}{#2}
181   \ifnum \value{papermas@ini}=1
182     \setcounter{papermas@result}{\value{papermas@base}}
183     \setcounter{papermas@ini}{0}
184   \ifnum \value{papermas@exp}=0%
185     \setcounter{papermas@result}{1}
186   \else
187     \addtocounter{papermas@exp}{-1}
188   \fi
189 \fi
190 \ifnum \value{papermas@exp}=0%
191   \setcounter{papermas@ini}{1}
192 \else
193   \multiply \value{papermas@result} \value{papermas@base}
194   \addtocounter{papermas@exp}{-1}
195   \papermas@powerof{#1}{\value{papermas@exp}}
196 \fi%
197 }
198

```

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

```

199 \newcommand\papermas@totmass{%
200   \newcounter{papermasA}% paper mass for ISO A...
201   \setcounter{papermasA}{\papermas@format}% e. g. 4

```

We check whether papermasA has a resonable value:

```

202   \ifnum \value{papermasA}<0%
203     \PackageError{papermas}{Option format has no valid value}%
204     {The format option of the papermas package\MessageBreak%
205       only takes whole, non-negative numbers (0, 1, 2, 3,...)\MessageBreak%
206       because this should be the paper format\MessageBreak%
207       ISO A 0, 1, 2, 3,...\MessageBreak%
208       Found instead: \papermas@format \MessageBreak%
209     }
210   \else%

```


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

```
211 \newcounter{papermasmasss}% always 0
212 \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 divide by 100 again, of course.)

```
213 \multiply \value{papermasmasss} 100 % default: 8000
```

We check whether `papermasmasss` has a reasonable value, i.e. > 0 :

```
214 \ifnum \value{papermasmasss}<1%
215 \PackageError{pagesLTS}{Option masss has no valid value}%
216 {The masss option of the papermas package\MessageBreak%
217 only takes positive numbers,\MessageBreak%
218 because this should be the mass per square meter\MessageBreak%
219 of a single sheet of your paper.\MessageBreak%
220 Found instead: \papermas@masss \MessageBreak%
221 }
222 \else
```

`masss` has a reasonable value, and therefore also `\papermas@masss` and `papermasmasss`.

We check whether option `pagesperssheet` has a reasonable value, i.e. ≥ 1 :

```
223 \newcounter{papermasPPS}% is 0
224 \setcounter{papermasPPS}{\papermas@pagesperssheet}% default 2
225 \ifnum \value{papermasPPS} < 1%
226 \PackageError{papermas}{%
227 The number of pages per sheet must be positive.}%
228 You cannot print less than one TeX page per sheet of paper.\MessageBreak%
229 The value found was \papermas@pagesperssheet .\MessageBreak%
230 }
231 \else
```

`pagesperssheet` has a reasonable value, and therefore also `\papermas@pagesperssheet` 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`.

```
232 \newcounter{papermas@sheets}
233 \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:

```
234 \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.

```
235 \newcounter{papermas@tmpn}
236 \setcounter{papermas@tmpn}{\arabic{papermas@sheets}}%
237 \multiply \value{papermas@tmpn} \value{papermasPPS}%
238 \ifnum \value{papermas@tmpn}=\value{pagesLTS.pagenr}
239 \relax
240 \else
241 \addtocounter{papermas@sheets}{1}%
242 \fi
```

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

```
243 \multiply \value{papermasmasss} \value{papermas@sheets}
244 % default: 8000 (no default for this)
```

The result is in g m^{-2} .

A sheet with format ISO A0 has a size of 1 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 An has a size of $1 \text{ m}^2 \cdot 2^{-n}$.
Therefore we compute $2^{\text{\value{papermasA}}}$:

```
245 \papermas@powerof{2}{\value{papermasA}}
```

The result is saved in `papermas@result`.

We divide the specific paper mass by `papermas@result`:

```
246 \divide \value{papermasmasss} by \value{papermas@result}
247 % default: 16000 / 2^{\value{papermasA}}
```

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

```
248 % for the example 297 is used
249 \newcounter{papermas@tmpm}
250 \setcounter{papermas@tmpm}{\arabic{papermasmasss}}% m:297 n: o: p: q:
251 \setcounter{papermas@tmpn}{\arabic{papermasmasss}}% m:291 n:291 o: p: q:
252 \divide \value{papermas@tmpn} by 100% m:297 n:2 o: p: q:
253 \newcounter{papermas@tmpo}
254 \setcounter{papermas@tmpo}{\arabic{papermas@tmpn}}% m:291 n:2 o:2 p: q:
255 \multiply \value{papermas@tmpn} 10% m:297 n:20 o:2 p: q:
256 \divide \value{papermas@tmpm} by 10% m:29 n:20 o:2 p: q:
257 \newcounter{papermas@tmpp}
258 \setcounter{papermas@tmpp}{\arabic{papermas@tmpm}}
259 \addtocounter{papermas@tmpp}{-\arabic{papermas@tmpn}}%m:29 n:20 o:2 p:9 q:
260 % 29 - 20 = 9
261 \multiply \value{papermas@tmpp} 10% m:290 n:20 o:2 p:9 q:
262 \newcounter{papermas@tmpq}
263 \setcounter{papermas@tmpq}{\arabic{papermasmasss}}
264 \addtocounter{papermas@tmpq}{-\arabic{papermas@tmpm}}%m:290 n:20 o:2 p:9 q:7
265 % 297 - 290 = 7
```

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

```
266 \ifnum\value{papermas@tmpq}>4
267 \addtocounter{papermas@tmpp}{1}% m:290 n:20 o:2 p:10 q:7
268 \ifnum\value{papermas@tmpp}>9% m:290 n:20 o:2 p:10 q:7
269 \addtocounter{papermas@tmpp}{1}% m:290 n:20 o:3 p:10 q:7
270 \setcounter{papermas@tmpp}{0}% m:290 n:20 o:3 p:0 q:7
271 \fi
272 \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:

```
273 \edef\papermastmpr{\arabic{papermas@tmpo}\papermas@decimalsep\arabic{papermas@tmpp}}%
274 \edef\papermastmpformat{\papermas@format}%
275 \edef\papermastmpmasss{\papermas@masss}%
276 \edef\papermastmppagespersheet{\papermas@pagespersheet}%
277 \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).

```
278 \pagesLTS@ifcounter{papermassttl}
```

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

```
279 \ifnum\value{papermassttl}=\value{papermasmasss}
280 \relax
```

Otherwise we need another run of L^AT_EX.

```

281         \else
282         \PackageWarningNoLine{papermas}{%
283             Number of pages may have changed.\MessageBreak%
284             Rerun to get it right.\MessageBreak%
285         }%
286     \fi

```

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

```

287     \setcounter{papermassttl}{\arabic{papermasssss}}

```

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

```

288     \edef\papermastmps{\arabic{papermasssss}}%

```

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.

```

289     \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.

```

290         \immediate\write\@auxout{\string
291         \pagesLTS@ifcounter{papermassttl}}%

```

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

```

292         \immediate\write\@auxout{\string
293         \setcounter{papermassttl}{\papermastmps}}%

```

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

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

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

```

294         \immediate\write\@auxout{\string
295         \gdef\string\papermassttotal{\papermastmpr}}%
296         \immediate\write\@auxout{\string
297         \gdef\string\papermasformat{\papermastmpformat}}%
298         \immediate\write\@auxout{\string
299         \gdef\string\papermasssss{\papermastmpmasss}}%
300         \immediate\write\@auxout{\string
301         \gdef\string\papermaspagespersheet{\papermastmppagespersheet}}%

```

3. we give at the screen the information about the `\papermassttotal` (see `\AtVeryEnd` 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:

```

302         \immediate\write\@auxout{\string
303         \gdef\string\papermasssheets{\papermastmpt}}%
304     \fi%
305 \fi%
306 \fi%
307 \fi%
308 }
309

```

`\AtBeginDocument` `\AtBeginDocument` it is checked whether some commands, which are/will be defined via the aux-file, are undefined yet:

```

310 \AtBeginDocument{%
311   \def\papermas@undefined{\textbf{??}}
312   \setcounter{papermas@rerun}{0}
313   \ifx\papermasstotal\papermas@undefined \addtocounter{papermas@rerun}{000001} \fi
314   \ifx\papermasstotal\papermas@undefined \addtocounter{papermas@rerun}{000010} \fi
315   \ifx\papermasformat\papermas@undefined \addtocounter{papermas@rerun}{000100} \fi
316   \ifx\papermasmasss\papermas@undefined \addtocounter{papermas@rerun}{001000} \fi
317   \ifx\papermaspagespersheet\papermas@undefined \addtocounter{papermas@rerun}{010000} \fi
318   \ifx\papermasssheets\papermas@undefined \addtocounter{papermas@rerun}{100000} \fi
319 }
320

```

If any one of those commands is undefined, `papermas@rerun` is > 1 , and we know that we need another compiler run.

`\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.

```

321 \AfterLastShipout{%
322   \papermas@totmass%
323 }%
324

```

`\AfterLastShipout` is a command from the `atveryend` package of Heiko Oberdiek, which is already loaded by my `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 \LaTeX system).

`\AtVeryEndDocument`

```

325 \AtVeryEndDocument{%
    \AtVeryEndDocument{...} is even later:

```

“The code is called after the `.aux` file is closed and read in again. It is the place for final checks, rerun hints, final messages.”

(`atveryend` package of Heiko Oberdiek, v1.5 as of 2010/03/24)

Error code Here it is used to give a rerun warning, when it is needed:

```

326 \ifnum\value{papermas@rerun}>0
327   \PackageWarningNoLine{papermas}{!\MessageBreak%
328     Variable(s) still undefined.\MessageBreak%
329     (Error code \arabic{papermas@rerun}.)\MessageBreak%
330     Rerun to get the variable(s) right.\MessageBreak%
331   }%

```

The “Error code” can be deciphered as follows:

\papermasstotal	000001
\papermasstotal	000010
\papermasformat	000100
\papermasmasss	001000
\papermaspagespersheet	010000
\papermasssheets	100000

e. g. error code 1001 is 001001 is \papermasmasss and \papermasstotal.

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

```

332 \else
333   \message{papermas: *****}
334   \message{papermas: * This document consists of \arabic{pagesLTS.pagenr} pages. *}
335   \message{papermas: * When printing \papermaspagespersheet\space pages on one sheet of paper, *}
336   \message{papermas: * \papermasssheets\space sheets will be needed. *}
337   \message{papermas: * For ISO A \papermasformat\space paper of \papermasmasss\space g/m^2
338   \message{papermas: * the printout will have a mass of about \papermasstotal\space g. *}
339   \message{papermas: *****}
340   \PackageInfo{papermas}{*****\MessageBreak%
341     * This document consists of \arabic{pagesLTS.pagenr} pages. *\MessageBreak%
342     * When printing \papermaspagespersheet\space pages on one sheet of paper, *\MessageBreak%
343     * \papermasssheets\space sheets will be needed. *\MessageBreak%
344     * For ISO A \papermasformat\space paper of \papermasmasss\space g/m^2 specific mass, *\
345     * the printout will have a mass of about \papermasstotal\space g. *\MessageBreak%
346     *****\MessageBreak%
347   }%
348 \fi%
349 }
350
351 \end{package}

```

6 Installation

6.1 Downloads

Everything should be available on **CTAN**: <ftp://ftp.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:

- \TeX Format \LaTeX 2 ϵ , 1994/06/01, v2 ϵ : **CTAN**:
- document class `ltxdoc`, 2007/11/11, v2.0u,
[CTAN:macros/latex/base/ltxdoc.dtx](#)
- package `hltxdoc`, 2010/04/24, v0.19,
[CTAN:macros/latex/contrib/oberdiek/hltxdoc.dtx](#)
- package `hypdoc`, 2010/03/26, v1.9,
[CTAN:macros/latex/contrib/oberdiek/hypdoc.dtx](#)

`papermas.sty` The `papermas.sty` for \LaTeX 2 ϵ (i. e. all documents using the `papermas` package) requires:

- \TeX Format \LaTeX 2 ϵ , 1994/06/01, v2 ϵ , **CTAN**:
- package `kvoptions`, 2010/02/22, v3.7,
[CTAN:macros/latex/contrib/oberdiek/kvoptions.dtx](#)
- package `pagesLTS`, 2010/07/29, v1.1e,
[CTAN:macros/latex/contrib/pagesLTS/pagesLTS.dtx](#)

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

- package `papermas`, 2010/07/29, v1.0d,
[CTAN: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 alternatives in section 3 there are listed

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

`Oberdiek` All packages of Heiko Oberdiek’s bundle ‘oberdiek’ (especially `hltxdoc`,
`hltxdoc` `atveryend`, `kvoptions`) are also available in a TDS compliant ZIP archive:
`atveryend` [CTAN:install/macros/latex/contrib/oberdiek.tds.zip](#).
`kvoptions` **Warning:** `hltxdoc`, 2010/04/24 v0.19, requires the packages

- `hypdoc`, 2010/03/26, v1.9
- `hyperref`, 2010/03/30, v6.80u (latest: 2010/06/18, v6.81g)
- `pdftexcmds`, 2010/04/01, v0.9
- `ltxcmds`, 2010/03/09, v1.4 (latest: 2010/04/26, v1.7)
- `hologo`, 2010/04/24, v1.2
- `array` (latest: 2008/09/09, v2.4c)

(or more recent versions) and does neither work with nor check for earlier versions!
(It is probably best to download

[CTAN:install/macros/latex/contrib/oberdiek.tds.zip](#) and use this, because the packages in there should be both recent and compatible.)

hrefhide 2010/07/29, v1.0d, [CTAN:macros/latex/contrib/hrefhide/hrefhide.dtx](#) and [CTAN:install/macros/latex/contrib/hrefhide.tds.zip](#)
That package allows to “hide” some (hyperlinked) text when printing the document while keeping the layout.

lastpage 2010/07/29, v1.2a, [CTAN:macros/latex/contrib/lastpage/lastpage.dtx](#) and [CTAN:install/macros/latex/contrib/lastpage.tds.zip](#)
That package allows to refer to the (maybe not so) last page. *The package was originally invented by Jeffrey P. Goldberg.* The `pagesLTS` package is much more mighty, but needs more resources (e. g. new counters).
Submitted to CTAN.

pagesLTS 2010/07/29, v1.1e, [CTAN:macros/latex/contrib/pagesLTS/pagesLTS.dtx](#) and [CTAN:install/macros/latex/contrib/pagesLTS.tds.zip](#)
That package allows to refer to the (very) last page, gives the total number of pages, references to special pages, facilitates the use of nearly any pagenumbering you like (e. g. negative `Roman` numbers or more than `Z` pages with `Alph` page numbering), and works even with `fnsymbol` page numbers.

papermas 2010/07/29, v1.0d, [CTAN:macros/latex/contrib/papermas/papermas.dtx](#) and [CTAN:install/macros/latex/contrib/papermas.tds.zip](#)
The package described in this very documentation:
This 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. Further that package allows to compute “base to the power of exponent” inside \LaTeX .

undolabl 2010/07/29, v1.0f, [CTAN:macros/latex/contrib/undolabl/undolabl.dtx](#) and [CTAN:install/macros/latex/contrib/undolabl.tds.zip](#)
That package allows to override existing labels, especially automatically generated ones.
The main code of that package was invented by
Ulrich Diez (eu_angelion@web.de) *and first published in the* [news:comp.text.tex](#) *newsgroup at*
Sun, 20 Apr 2008 16:39:26 +0200, *with subject:*
Re: How to undefine/overwrite a label? (see e. g. <http://groups.google.de/group/comp.text.tex/msg/5ba8d4722e5cd326?dmode=source> as well as <http://groups.google.de/group/comp.text.tex/msg/af6cfe93917097da?dmode=source>).

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.ins](#)
The installation file.

[CTAN:macros/latex/contrib/papermas/papermas.drv](#)
The driver to generate the documentation.

[CTAN:macros/latex/contrib/papermas/ltxdoc.cfg](#)
The \LaTeX documentation configuration file, also for generating the documentation.

[CTAN:macros/latex/contrib/papermas/papermas.pdf](#)
The documentation.

[CTAN:macros/latex/contrib/papermas/papermas.sty](#)
The `.sty` file.

CTAN:macros/latex/contrib/papermas/papermas-example.tex

The example file.

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

The compiled example file, as it should look like.

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

Everything in TDS compliant, compiled format (submitted, should become available soon).

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/muench/papermas.sty</code>
<code>papermas.pdf</code>	→ <code>doc/latex/muench/papermas.pdf</code>
<code>papermas-example.tex</code>	→ <code>doc/latex/muench/papermas-example.tex</code>
<code>papermas-example.pdf</code>	→ <code>doc/latex/muench/papermas-example.pdf</code>
<code>papermas.dtx</code>	→ <code>source/latex/muench/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 (te`TEX`, mik`TEX`,...) relies on file name databases, you must refresh these. For example, te`TEX` users run `texhash` or `mktextlsr`.

6.4 Some details for the interested

Unpacking with L^AT_EX. The `.dtx` chooses its action depending on the format:

plain T_EX: Run `docstrip` and extract the files.

L^AT_EX: Generate the documentation.

If you insist on using L^AT_EX for `docstrip` (really, `docstrip` does not need L^AT_EX), 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 the configuration file `ltxdoc.cfg`. For instance, put the following line into this file, if you want to have A4 as paper format:

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

An example follows how to generate the documentation with pdfL^AT_EX:

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


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 (H.-Martin Münch) 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_EX.

8 History

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

- First version of this 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 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`.

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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