The mines-thesis class *

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Abstract

This package provides a class for graduate students at Colorado School of Mines to prepare their theses and dissertations.

Contents

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*This document corresponds to mines-thesis v1.0, dated 2020/01/10.

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1 User's Guide

1.1 Installation

1.2 Invocation and Options

\documentclass The mines-thesis class is invoked in the standard fashion.

> \documentclass[⟨*options*⟩]{mines-thesis}

There are several options corresponding to the type of the document and its general appearance. They are described below. Generally speaking, the options have `key=value` forms, for example,

> \documentclass[10pt]{mines-thesis}

The default options are letterpaper,12pt. **TODO review? oneside? onecolumn,draft,openany**

1.3 Preprogrammed Formats

\title
\author
\year
\degree
\advisor
\coadvisor
\department
\departmenthead

abstract The environment `abstract` must *precede* the `\makefrontmatter` command. Again, this is different from the standard LATEX. Putting `abstract` after `\makefrontmatter` will trigger an error.

> \begin{abstract}
> *Here goes the abstract...*
> \end{abstract}

\makefrontmatter The front matter of a thesis includes:

1. Title page (Required)

2. Copyright page

3. Submittal page (Required)

4. Abstract (Required)

5. Table of Contents (Required)

6. Lists (Required if included in thesis)

   (a) List of Figures

    (b) List of Tables

    (c) List of Equations (optional)

    (d) List of Plates

    (e) List of Symbols

7. Acknowledgments

8. Dedication

Invoking

```
\makefrontmatter
```

will generate all components listed above. It can be commentted out until you need the front matter generated.

`\chapter`
`\section`
`\subsection`
`\subsubsection`
`\paragraph`
`landscape`

Try the `lscape` package: `lscape.sty` Produce landscape pages in a (mainly) portrait document. This modifies the margins and rotates the page contents but not the page number. Useful, for example, with large multipage tables, and is compatible with the packages longtable and supertabular. If you are using pdfLaTeX, you should use `pdflscape` instead. The pdflscape package adds PDF support to the landscape environment of package lscape, by setting the PDF/Rotate page attribute. Pages with this attribute will be displayed in landscape orientation by conforming PDF viewers:

```
begin{landscape}
Here goes the figure or table...
\end{landscape}
```

`\OnehalfSpacing`
`\DoubleSpacing`
`SingleSpace`

`\OnehalfSpacing \OnehalfSpacing* \DoubleSpacing \DoubleSpacing*` Text will be double spaced or 1.5 spaced. Sometimes it is also required to make page notes and floats (including captions) in 'double' spacing. The starred version of the two macros above takes care of this.

2 Frequently Asked Questions

Blank pages. If you use `landscape` and got extra blank pages, it if mostly because your figure is too large. You need to resize the height or width of the figure. For example, instead of `\includegraphics[width=\linewidth]{FigureName}`, you should use `\includegraphics[width=.6\linewidth]{FigureName}`

When using line breaks in thesis title, chapter title, or section titles, use `\protect\\` instead of `\\`. This is because these titles use both `center` environment and `\MakeTextUppercase`. `\MakeLowercase` are robust but they have moving arguments (see `\protect`).

3 Implementation

3.1 Initial Code

These packages are useful when writing this `.dtx` file. The `\ifthenelse` macro controls many conditional logic command, So we load `ifthen` package. The `\collect@body` macro in `amsmath` is defined using `\def`. We load `environ` to access the `\long` version of this command.

```
1 \RequirePackage{ifthen}
2 \RequirePackage{environ}
```

3.1.1 Declaration of Options

The `review` boolean is defined here for use with the class options.

```
3 \newboolean{review}
4 \DeclareOption{draft}{\setboolean{review}{true}}
5 \DeclareOption{final}{\setboolean{review}{false}
6 \PassOptionsToClass{final,12pt,onecolumn,openany}{memoir}}
7 \DeclareOption*{
8 \PassOptionsToClass{\CurrentOption}{memoir}
9 }
10 \ExecuteOptions{final}
```

3.1.2 Execution of Options

```
11 \ProcessOptions\relax
```

3.1.3 Package Loading

```
12 \LoadClass[oneside,letterpaper]{memoir}
```

3.2 Main Code

3.2.1 Global Setting

In this section, we define margins, spacings, indentations, hyphenations, and so on. The page is set by `\setpagecc` to be centered with respect to the stock.

```
13 \setpagecc{11in}{8.5in}{*}
```

The margins is set to be `1in` for all left, right, upper, and lower margins.

```
14 \setlrmarginsandblock{1in}{*}{*}
15 \setulmarginsandblock{1in}{*}{*}
```

If there is a header, its height would be `\onelineskip`. If there is a footer, it would be `2\onelineskip` below the body text. The header would be `2\onelineskip` above the body text.

```
16 \setheadfoot{\onelineskip}{2\onelineskip}
17 \setheaderspaces{*}{2\onelineskip}{*}
```

By default, we use double spacing for the thesis/dissertaion.

```
18 \DoubleSpacing
```

The paragraph indentation is `2em`. `1em` is roughly the width of a capital "M" in the current font. We will also indent the first paragraph after a section heading.

```
19 \setlength{\parindent}{2em}
20 \let\@afterindentfalse\@afterindenttrue
21 \@afterindenttrue
```

We check and implement the layout settings.

```
22 \checkandfixthelayout
```

Moreover, we remove all interior spaces for list enviroments,

```
23 \tightlists % use \firmlists if vertical gaps is wanted
```

and prevent LaTeX from hyphenating the entire document.

```
24 \tolerance=1
25 \emergencystretch=\maxdimen
26 \hyphenpenalty=10000
27 \hbadness=10000
```

We alse rename the headings for the toc, lof, lot, and the references. ALL UPPER CASE LETTERS are used.

```
28 \renewcommand{\abstractname}{ABSTRACT}
29 \renewcommand{\chaptername}{CHAPTER}
30 \renewcommand{\appendixname}{APPENDIX}
31 \renewcommand{\contentsname}{TABLE OF CONTENTS}
32 \renewcommand{\listfigurename}{LIST OF FIGURES}
33 \renewcommand{\listtablename}{LIST OF TABLES}
34 \newcommand{\acknowledgmentname}{ACKNOWLEDGMENTS}
35 \renewcommand{\bibname}{REFERENCES}
```

3.2.2 Front Matter

`\makefrontmatter`   The `\makefrontmatter` will generate all front matter pages: `\maketitlepage` for Title Page, `\makecopyrightpage` for Copyright Page, `\makesubmittalpage` for Submittal Page, `\makeabstractpage` for Abstract, `\makecft` for Tables of Contents (toc) and Lists (List of Figures (lof) & List of Tables (lot)), `\makeacknowledgepage` for Acknowledgments, and `\makededicationpage` for Dedication.

First We define the macros for the informations and set their default values.

\title
\author   36 `\renewcommand{\year}[1]{\gdef\@year{#1}}`
\year   37 `\newcommand{\degree}[2]{\gdef\@degreelv{#1}\gdef\@degreename{#2}}`
\degree   38 `\newcommand{\advisor}[1]{\gdef\@advisor{#1}}`
\advisor   39 `\newcommand{\coadvisor}[1]{\gdef\@coadvisor{#1}}`
\coadvisor   40 `\newcommand{\department}[1]{\gdef\@department{#1}}`
\department   41 `\newcommand{\departmenthead}[1]{\gdef\@departmenthead{#1}}`
\departmenthead   42 `\gdef\@author{Student Name}`

```
43 \gdef\@title{This is the first line of a  medium length title,
44 \protect\\ this is the second line}
45 \gdef\@year{2020}
46 \gdef\@degreelv{Doctor of Philosophy}
47 \gdef\@degreename{Computer Science}
48 \gdef\@advisor{Dr. Main Advisor}
49 \gdef\@department{Department of XXXXX}
50 \gdef\@departmenthead{Dr. Department Head}
```

Then we design the title page.

\maketitlepage   The thesis title must be in all upper case letters, be centered on the page both horizontally and vertically, be in an inverted pyramid shape and the font size needs to be the same size as all other font in the main text (i.e. do not make the font size larger).

```
51 \newboolean{auto} % for auto pyramid
52 \setboolean{auto}{false}

53 \DeclareRobustCommand{\invpyr}[1]{
54 \vbox{
55 \vspace{10pt}
56 \hsize=\textwidth
57 \parindent=\z@
58 \emergencystretch=1in
59 \parshape 6
60 0.01\textwidth .98\textwidth
61 0.1\textwidth .8\textwidth
62 0.15\textwidth .7\textwidth
63 0.2\textwidth .6\textwidth
64 0.25\textwidth .5\textwidth
65 0.3\textwidth .4\textwidth
66 \leftskip=\z@ plus 1fil
67 \rightskip=\z@ plus -1fil
68 \parfillskip=\z@ plus 2fil
69 #1\par
70 }
71 }
72 \newcommand{\autotitle}{\setboolean{auto}{true}}
73 \newcommand{\maketitlepage}{
74 \clearpage
75 \begin{vplace}
76 \centering
```

```
77 \ifthenelse{\boolean{auto}}
78 {\invpyr{\MakeTextUppercase{\@title}}}
79 {\@title}
80 \end{vplace}
81 \begin{center}
82 by\\
83 \@author
84 \end{center}
85 \clearpage
86 } % end of \maketitlepage
```

Next, the copyright page.

\makecopyrightpage   Copyright Page. This is an optional page that follows the title page. No displayed page number, centered upper and lower case text.

```
87 \newcommand{\makecopyrightpage}{
88 \clearpage
89 \begin{vplace}[0.8]
90 \centering
91 Copyright~by~\@author~\@year\\
92 All~Rights~Reserved
93 \end{vplace}
94 \clearpage
95 } % end of \makecopyrightpage
```

Next, the submittal page.

\makesubmittalpage   This is a required page that displays the Roman numeral ii page number. Beginning with this page, front matter Roman numeral page numbers are centered 1/2 inch from the bottom edge of page. All signatures are required before the final thesis format review.

```
96 \newcommand{\makesubmittalpage}{
97 \clearpage
98 A thesis submitted to the Faculty and the Board of
99 Trustees of the Colorado School of Mines in partial
100 fulfillment of the requirements for the degree of
101 {\@degreelv} ({\@degreename}).
102 \vspace{2em}
103 \begin{flushleft}
104 Golden, Colorado\\[.5em]
105 Date \underline{\hspace{2in}}
106 \end{flushleft}
107 \vspace{.5em}
108 \begin{flushright}
109 Signed: \underline{\hspace{2in}}\\
110 {\@author}\\[2em]
111 Signed: \underline{\hspace{2in}}\\
112 \begin{SingleSpace}
113 {\@advisor}\\
114 Thesis Advisor\\[2em]
```

```
115 \end{SingleSpace}
116 \@ifundefined{@coadvisor}{
117 \vspace{2.5em}
118 }{
119 Signed: \underline{\hspace{2in}}\\
120 \begin{SingleSpace}
121 {\@coadvisor}\\
122 Thesis Advisor
123 \end{SingleSpace}
124 }
125 \end{flushright}
126 \begin{flushleft}
127 Golden, Colorado\\[.5em]
128 Date \underline{\hspace{2in}}
129 \end{flushleft}
130 \vspace{.5em}
131 \begin{flushright}
132 Signed: \underline{\hspace{2in}}\\
133 \begin{SingleSpace}
134 {\@departmenthead}\\
135 Professor and Head\\
136 {\@department}
137 \end{SingleSpace}
138 \end{flushright}
139 \clearpage
140 } % end of \makesubmittalpage
```

Next, the abstract page.

\makeabstractpage   ABSTRACT (title) is centered horizontally, 1 keyboard return below 1 inch top margin and in ALL UPPER CASE LETTERS. Each paragraph should be indented.

abstract   We redefine the `abstract` environment to save the text.

\@saveabstract

```
141 \newcommand{\@saveabstract}[1]{\long\gdef\@abstract{#1}}
```

```
142 \renewenvironment{abstract}{\Collect@Body\@saveabstract}{}
```

Abstract will show in the table of contents.

```
143 \newcommand{\makeabstractpage}{
144 \clearpage
145 \chapter*{\abstractname}
146 \@abstract
147 \addcontentsline{toc}{chapter}{\abstractname}
148 \clearpage
149 } % end of \makeabstractpage
```

Next, the table of contents and lists.

\makecft   \makecft generates Table of Contents, List of Figures, and List of Tables.

`\tableofcontents` TABLE OF CONTENTS (Title) is centered horizontally, 1 keyboard return below 1 inch top margin and in ALL UPPER CASE LETTERS. Do not list the Table of Contents in the Table of Contents page, so `\tableofcontents*` is used.

```
150 \renewcommand{\cftchapterdotsep}{\cftdotsep}
151 \renewcommand{\cftchapterfont}{\normalfont\MakeTextUppercase}
152 \renewcommand{\cftchapterpagefont}{\normalfont}
153 \renewcommand{\cftchapterleader}{\cftdotfill{\cftchapterdotsep}}
154 \renewcommand{\cftchaptername}{\chaptername\space}
155 \renewcommand{\cftappendixname}{\appendixname\space}
156 \renewcommand{\cftdotsep}{1}
157 % ^^A no extra space before the entry, or in the lof/lot
158 \setlength{\cftbeforechapterskip}{\z@ plus \z@}
159 \renewcommand{\insertchapterspace}{}
160 % ^^A \renewcommand{\insertchapterspace}{
161 % ^^A  \addtocontents{lof}{\protect\addvspace{5pt}} % previous default 10pt
162 % ^^A   \addtocontents{lot}{\protect\addvspace{5pt}}
163 % ^^A }
```

`\l@chapapp` Redefine the generic chapter/appendix toc entry typesetting.

```
164 \renewcommand{\l@chapapp}[3]{%
165 \ifnum \c@tocdepth >\m@ne
166 \begin{SingleSpace}
167 \cftchapterbreak
168 \vskip \cftbeforechapterskip
169 {
170 \leftskip \cftchapterindent\relax
171 %%%      \memRTLleftskip \cftchapterindent\relax
172 \rightskip \@tocrmarg
173 %%%      \memRTLrightskip \@tocrmarg
174 \parfillskip -\rightskip
175 %%%      \parfillskip -\memRTLrightskip
176 \parindent \cftchapterindent\relax
177 \@afterindenttrue
178 \interlinepenalty\@M
179 \leavevmode
180 \let\@cftbsnum \cftchapterpresnum
181 \let\@cftasnum \cftchapteraftersnum
182 \let\@cftasnumb \cftchapteraftersnumb
183 \def\@chapapp@head{#3}%
184 \settowidth{\@tempdima}{\cftchapterfont\@chapapp@head}%
185 \addtolength{\@tempdima}{\cftchapternumwidth}%
186 \advance\leftskip \@tempdima \null\nobreak\hskip -\leftskip
187 %%%      \advance\memRTLleftskip \@tempdima \null\nobreak\hskip -\memRTLleftskip
188 {\cftchapterfont {#1}}\nobreak
189 \cftchapterfillnum{#2}}
190 \end{SingleSpace}
191 \fi}
```

`\@dottedtocline@sec` Redefine `\@dottedtocline` from the original `ltsect.dtx` `\@dottedtocline{⟨level⟩}{⟨indent⟩}{⟨numwidth⟩`

```
192 \newcommand{\@dottedtocline@sec}[5]{%
193 \ifnum #1>\c@tocdepth \else
194 \begin{SingleSpace}
195 \vskip \z@ \@plus.2\p@
196 {\leftskip #2\relax \rightskip \@tocrmarg \parfillskip -\rightskip
197 \parindent #2\relax\@afterindenttrue
198 \interlinepenalty\@M
199 \leavevmode
200 \@tempdima #3\relax
201 \advance\leftskip \@tempdima \null\nobreak\hskip -\leftskip
202 {#4}\nobreak
203 \leaders\hbox{$\m@th
204 \mkern \@dotsep mu\hbox{.}\mkern \@dotsep
205 mu$}\hfill
206 \nobreak
207 \hb@xt@\@pnumwidth{\hfil\normalfont \normalcolor #5}%
208 \par}
209 \end{SingleSpace}%
210 \fi}

211 \renewcommand{\cftfigurename}{\figurename\space}
212 \renewcommand{\cfttablename}{\tablename\space}
```

\l@figure   \l@figure{⟨*title*⟩}{⟨*page*⟩} typesets the lof entry for a \figure caption heading.
             Multiple line figure captions are single spaced.

```
213 \let\oldl@figure=\l@figure
214 \renewcommand{\l@figure}{\SingleSpacing\oldl@figure}
```

\l@table   \l@table{⟨*title*⟩}{⟨*page*⟩} typesets the lof entry for a \table caption heading.
            Multiple line table captions are single spaced.

```
215 \let\oldl@table=\l@table
216 \renewcommand{\l@table}{\SingleSpacing\oldl@table}

217 \AtBeginDocument{
218 \@ifpackageloaded{hyperref}{
219 \settocpreprocessor{chapter}{%
220 \let\tempf@rtoc\f@rtoc%
221 \def\f@rtoc{%When hyperref is used,
222 \texorpdfstring{\MakeTextUppercase{\tempf@rtoc}}{\tempf@rtoc}}%
223 }
224 \renewcommand{\cftchapterfont}{\normalfont}
225 }{}
226 }
227 \newcommand{\makecft}{
228 \tableofcontents*
229 \clearpage
230 \listoffigures
231 \clearpage
232 \listoftables
233 \clearpage
```

```
234 } % end of \makecft
```

\l@section   \l@section{⟨*title*⟩}{⟨*page*⟩} typesets the toc entry for a \section heading.

```
235 \renewcommand{\@dotsep}{1}
236 \renewcommand{\l@section}{
237 \@dottedtocline@sec{1}{1.5em}{2.3em}
238 }
```

\makeacknowledgepage   ACKNOWLEDGMENTS (Title) is centered horizontally, 1 keyboard return below 1 inch top margin and in ALL UPPER CASE LETTERS.

acknowledgment   We difine the acknowledgment environment. First, we need to save the text.

\@saveacknowledgments

```
239 \newcommand{\@saveacknowledgments}[1]{
240 \long\gdef\@acknowledgments{#1}}

241 \newenvironment{acknowledgment}{\Collect@Body\@saveacknowledgments}{}
```

Acknowledgment page is not required.

```
242 \newcommand{\makeacknowledgepage}{
243 \@ifundefined{@acknowledgments}{}{
244 \clearpage
245 \chapter*{\acknowledgmentname}
246 \@acknowledgments
247 \addcontentsline{toc}{chapter}{\acknowledgmentname}
248 \clearpage}
249 } % end of \makeacknowledgepage
```

\makededicationpage   Dedication Page: A dedication page is optional and not frequently included in a thesis. However, occasionally the thesis writer wants to dedicate the document to a professional colleague, friend, or relative. A dedication typically expresses gratitude for someone's support. If a dedication page is included, it is placed at the end of the front matter section, following the acknowledgments. Typically, a dedication page has no title, it simply states, e.g., "For my father." Roman numeral page numbering continues on the dedication page.

dedication   We difine the dedication environment. First, we need to save the text.

\@savededication

```
250 \newcommand{\@savededication}[1]{
251 \long\gdef\@dedication{#1}}

252 \newenvironment{dedication}{\Collect@Body\@savededication}{}

253 \newcommand{\makededicationpage}{
254 \@ifundefined{@dedication}{}{
255 \clearpage
256 \@dedication
257 \clearpage}
258 } % end of \makededicationpage
```

Call single command `\makefrontmatter` to generate all front matters.

```
259 \newcommand{\makefrontmatter}{
260 \pagenumbering{roman}
261 \pagestyle{empty}
262 \maketitlepage
263 \makecopyrightpage
264 \pagestyle{plain}
265 \setcounter{page}{2}
266 \makesubmittalpage
267 \makeabstractpage
268 \makecft
269 \makeacknowledgepage
270 \makededicationpage
271 \pagenumbering{arabic}
272 \setcounter{page}{1}
273 } % end of \makefrontmatter
```

3.2.3 Main Body

`\chapter`

```
274 \makechapterstyle{mineschapter}{%
275 \setlength{\midchapskip}{.2\baselineskip}
276 \setlength{\afterchapskip}{.2\baselineskip}
277 \renewcommand{\chapnumfont}{\normalfont}
278 \renewcommand{\chaptitlefont}{\normalfont}
279 \renewcommand{\chapterheadstart}{}
280 \renewcommand{\printchapternum}{}
281 \renewcommand{\printchapternonum}{}
282 \renewcommand{\printchaptername}{%
283 \centerline{\chapnumfont\MakeTextUppercase{\@chapapp\ \thechapter}}}
284 \renewcommand{\printchaptertitle}[1]{%
285 \centering \vbox{\chaptitlefont\invpyr{\MakeTextUppercase{##1}}}
286 }
287 }
288 \chapterstyle{mineschapter}
```

`\reproduceinfo` Information about the reproduced chapter. Including the author, year, organization, publisher.

```
289 \newcommand{\reproduceinfo}[1]{
290 \begin{center}
291 #1\par
292 \end{center}
293 }
```

`\reproduceabstract` One single line of Abstract flused left.

```
294 \newcommand{\reproduceabstract}{
295 {\noindent Abstract\par}
296 }
```

\footnote Set the format for `\footnote`. One horizontal line to separate the text and the footnotes.

```
297 \AtBeginDocument{
298 \setlength{\footmarkwidth}{\z@}
299 \setlength{\footmarksep}{-\footmarkwidth}
300 \setlength{\footparindent}{\footmarkwidth}
301 \renewcommand{\footnoterule}{%
302 \kern .5\baselineskip%
303 \hrule width \columnwidth \kern .5\baselineskip}
304 }
```

\symbolfootnote A new type of footnote command which use symbols instead of arabic numbers as markers

```
305 \newcommand{\symbolfootnote}[2]{
306 \renewcommand{\thefootnote}{\fnsymbol{footnote}}
307 \footnote[#1]{#2}
308 \renewcommand{\thefootnote}{\arabic{footnote}}
309 }
```

\section Redefine `\section`, `\subsection` and `\subsubsection`.

```
310 \renewcommand{\section}{\@startsection{section}
311 {1} % level
312 {\z@} % indent from left margin
313 {.1ex} % skip above heading
314 {.1ex} % heading between title and text
315 {\normalfont\normalsize\bfseries}}
316 \renewcommand{\subsection}{\@startsection{subsection}
317 {1} % level
318 {\z@} % indent from left margin
319 {.1ex} % skip above heading
320 {.1ex} % heading between title and text
321 {\normalfont\normalsize\bfseries}}
322 \renewcommand{\subsubsection}{\@startsection{subsubsection}
323 {1} % level
324 {\z@} % indent from left margin
325 {.1ex} % skip above heading
326 {.1ex} % heading between title and text
327 {\normalfont\normalsize\bfseries}}
```

longtable

```
328 \AtBeginDocument{
329 \@ifpackageloaded{longtable}{
330 \setlength{\LTcapwidth}{\linewidth}
331
332 }{}
333 }
```

3.2.4 Back Matter

Change the indent of References if `natbib` package is loaded.

```
334 \AtBeginDocument{
335 \@ifpackageloaded{natbib}{
336 \setlength{\bibhang}{\parindent}
337 \renewcommand{\bibpreamble}{\vspace{\parskip}}
338 }{}
339 }
```

`\bibliography`

```
340 \let\oldbibliography=\bibliography
341 \renewcommand{\bibliography}[1]{
342 \begin{SingleSpace}
343 \oldbibliography{#1}
344 \end{SingleSpace}
345 }
```

3.2.5 Others

`landscape`   We define the `landscape` to handle the page numbering in landscape mode.

```
346 \AtBeginDocument{
347 \@ifpackageloaded{pdflscape}{
348 \newcommand{\Lpagenumber}{\ifdim\textwidth=\linewidth\else\bgroup
349 \dimendef\margin=0 %use \margin instead of \dimen0
350 \ifodd\value{page}\margin=\oddsidemargin
351 \else\margin=\evensidemargin
352 \fi
353 \raisebox{\dimexpr -\topmargin-\headheight-\headsep-0.5\linewidth}[0pt][0pt]{%
354 \rlap{\hspace{\dimexpr \margin+\textheight+\footskip}%
355 \llap{\rotatebox{90}{\thepage}}}}%
356 \egroup\fi
357 }
358 \@ifpackageloaded{everypage}{
359 \AddEverypageHook{\Lpagenumber}%
360 \let\oldlandscape=\landscape
361 \let\endoldlandscape=\endlandscape
362 \renewenvironment{landscape}{
363 \oldlandscape\pagestyle{empty}\begin{vplace}}{
364 \end{vplace}\endoldlandscape
365 \pagestyle{plain}}
366 }{}
367 }{}
368 }
```