Annotated source for nmtthes2000.sty

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Abstract

Annotated source for the 2000 NMIMT LaTeX thesis template.

This publication is available in Web form\footnote{http://www.nmt.edu/tcc/help/pubs/nmtthesis/old/annotated/} and also as a PDF document\footnote{http://www.nmt.edu/tcc/help/pubs/nmtthesis/old/annotated/anno.pdf}. Please forward any comments to tcc-doc@nmt.edu.

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1. What, exactly, is this?

This is not a document for public dissemination. It is the author’s attempt to annotate the NMIMT 2000 LaTeX thesis template, in preparation for rewriting it from the ground up; see the new version user manual.

Because this file’s ancestors go back so far, the code is an ugly mixture of modern LaTeX, older LaTeX, and Plain TeX. The new version will hew to modern LaTeX standards as much as possible.

The version shown here has been reformatted to use indentation to elucidate the structure. In particular, the original script often contained \def commands inside other \def commands, and the indentation made it difficult to tell how many commands were being defined, and when.

Two online files are the sum total of the package as the author found it in the fall of 2009. These files can be found in this online directory, and are dated October 15, 2002:


- nmtthes2000.sty: The LaTeX style file.
- disstemplate.tex: A LaTeX file intended to be the basis for creation of a new thesis. This describes all the user-level commands particular to this style, and is the only existing documentation for the style file.

The author is grateful to Dr. Sue Goudy, who used a slight variant of this style for her 2004 dissertation in Computer Science, for her cooperation and provision of a finished PDF of her thesis and some of the files she used. The current document will discuss the few slight changes she made to the 2002 versions.

Certain search strings are used to pick out areas for future work.

- ORPHAN: This code appears to be leftover from ancient history, and I know of no use for it.
- UNK: The function of this code is obscure, but it might be important.
- BUG: I suspect that this doesn’t work correctly in some cases.
- UGLY: There are better ways to do this, or this was done using Plain TeX when there are modern LaTeX improvements.

3 http://www.nmt.edu/tcc/help/pubs/nmtthesis/latex/
1.1. Books cited


1.2. Useful files online

In many cases, large chunks of the stock class files have been pasted in and then tweaked. I have little confidence that the authors understood the stock files completely. However, here is the directory where the stock files live:

```
/usr/share/texmf/tex/latex/base
```

Notable files in this directory include:

- `report.sty`
  Base file for the `report` document class. A thin wrapper around `report.cls`.

- `report.cls`
  The guts of the `report` class. If you see a command that you don't recognize, and none of the books discuss it, it's probably defined in here.

Also, if there is any command that you have never seen before, grepping around this directory may help.

2. Opening comments

Not much important here, but note that the tracks go back 23 years. This predates current LaTeX practice by quite a bit.

```latex
% --------------------------------------------------------------------------------------------------
% % MACROS FOR NEW MEXICO TECH THESIS FORMAT - Adapted by Gerald A. Arnold from MACROS FOR UNIV OF TEXAS THESIS FORMAT - WRITTEN BY KHE-SING THE.
% % *****************************************************************************
% (C) Copyright 1986 by Khe-Sing The.
% % Permission is granted to use and distribute verbatim and modified copies of this file provided the copyright notice and this permission notice are preserved on all copies. Any modification must be so indicated.
% % Modified by Prasad Sakhamuri, UT Computation Center. April 87
% % included thispagemode, markboth definitions in \chapter, \schapter definitions.
% % added pagemodechange to be effective after chapter 1
% % in chapter definition.
% % changed textheight, footskip, headsep and topmargin values.
```
3. Page dimensions

In Goudy's dissertation, actual measurements of an ordinary text page produced these dimensions. Her page numbers were at top center. The specification requires 1.5″=9pc=108pt on the left side, 1″=6pc=72pt at top, bottom, and right.

- Left margin: 1.5″ or 9pc
- Right margin: 99pt = 8pc+3pt
- Top margin: 79pt = 6pc+7pt
- Bottom margin: 127pt = 10pc+7pt
4. User-level commands

These commands are mentioned in disstemplate.tex, so users may employ them.

4.1. \address

User-level; referenced by Section 5.10, “The \vita environment” (p. 24).

\begin{verbatim}
def\address#1% 
  {% 
    \def\addrss{#1}% 
  }% End \address
\end{verbatim}

4.2. \appendix

This command signals the end of regular chapters and the start of appendices. The \par forces a paragraph break.

\begin{verbatim}
def\appendix% 
  {% 
    \par 
  }
\end{verbatim}

The \chapter and section counters are reset so that appendices will be numbered A, B, ....

\begin{verbatim}
\setcounter{chapter}{0} 
\setcounter{section}{0} 
\end{verbatim}

The \@chapapp command is the type of chapter. Its value is tested against \appfl@g in Section 4.4, “\chapter” (p. 6).

\begin{verbatim}
def\@chapapp{APPENDIX}
\end{verbatim}

The \thechapter command is redefined so that it formats the chapter counter using uppercase letters instead of Arabic numerals. This command is used in commands such as Section 4.15, “\section, \subsection, etc.” (p. 11).

\begin{verbatim}
def\thechapter{\Alph{chapter}} 
\end{verbatim}

4.3. \author

A user-level function that saves the author’s name for later use.

\begin{verbatim}
def\author#1{% 
  \def\auth@r{#1}\def\AUTH@R{#1} 
\def\AUTHOR#1{% 
  \def\AUTH@R{#1} 
}% End \author
\end{verbatim}

- The \auth@r function is used in Section 5.7, “The \preface environment” (p. 22) and Section 5.6, “The \dedication environment” (p. 21).
- The \AUTH@R function is used in Section 5.9, “The \titlepage environment” (p. 23).

UGLY: The Tech format always displays the author’s name in mixed case. My conjecture is that at some other school there were places where the author’s name was to be uppercased. There, the author would
have to define both `\author` and `\AUTHOR` variants. The ugly part is that LaTeX now provides a `\MakeUppercase` function that uppercases text.

### 4.4. `\chapter`

Here’s the user-level command. The first line sets the text height on the page.

```latex
\def\chapter{
  \% \textwidth 556pt
}
```

The `\clearpage` forces any floats to be output, then starts a new page.

```latex
\clearpage
```

Set the leading to the usual strange value of 22.3–23 points.

```latex
\baselineskip=22.5pt plus0.5pt minus0.2pt
```

An article I found on the Web\(^4\) says that this line prevents figures from going at the top of the page. I think `\z@` is zero, and `\@topnum` is a switch that we are resetting here.

```latex
\global\@topnum\z@
```

The `\@afterindent` switch apparently controls whether the first paragraph after a chapter is indented or not. See the `indentfirst` package\(^5\).

```latex
\@afterindenttrue
```

The `\secdef` command is a general-purpose command for setting up sectioning commands such as chapters, appendixes, and such. It is discussed in Mittelbach on p. 32. Basically, it invokes command `\@chapter` for the full (`\chapter`) command; for the short (`\chapter*`) command, it invokes `\@schapter`. See Section 6.1, “`\chapter`” (p. 25) and Section 6.6, “`\@schapter`” (p. 29).

```latex
\secdef\@chapter\@schapter
% End `\chapter`
```

The next line defines `\@chapapp` as the text “CHAPTER”. This command gets redefined as “APPENDIX” by Section 4.2, “`\appendix`” (p. 5).

```latex
\def\@chapapp{CHAPTER}
```

The `\appflag` command defines the value of the `\@chapapp` command during the appendix.

```latex
\def\appflag{APPENDIX}
```

### 4.5. `\chapterapp`

For appendices to chapters that have been published separately.

**ORPHAN:** The `disstemplate.tex` does not document the `\chapterapp` command.

---


The \chapterapp command is the user-level command.

First we force a paragraph break, and reset the section counter so the appendices will be numbered A, B, C, ...

\par
\setcounter{section}{0}

Next, redefine the \thesection command, which is invoked by \section, so that the section number is the concatenation of the chapter number, a period, and the appendix letter.

\def\thesection{
  \thechapter.\Alph{section}\%
} % End \thesection

Next, print the section heading with normal-sized, bold text. See Section 7, “Calling \@startsection” (p. 30).

\@startsection{section}{1}{\z@}{3.9ex plus -1ex minus -.2ex}{.3ex plus .2ex}{\normalsize\bf}\%
% End \chapterapp

ORPHAN: There is no other reference to \endchapterapp in the stylesheet. There is one similar name: \endchapterappmark is defined in Section 6.5, “\ps@thesheadings: Define the thesheadings page style” (p. 28).

\def\endchapterapp{
 \par
 \setcounter{section}{0}
 \def\thesection{
   \thechapter.\arabic{section}\%
 } % End \thesection
} % End \endchapterapp

\section{4.6. \committeesize}

User-level command to specify the number of signature lines on the signature page, counting the chair(s). Redefines the \sign@turelines function originally defined in Section 4.16, “\signaturepage” (p. 11).
\def\committeesize#1%
{%
 \newcount\c@mmiteesize
}

Here is a classic example of LaTeX as a programming language, or, more correctly, Plain TeX. The line above defines an integer variable, also known as a counter. The lines below define command \sign@turelines that uses this counter to generate as many signature lines as there are committee members, counting the chair(s) line.

\def\sign@turelines%
{%

The \first@sign@line generates the first signature line. That command is defined in Section 4.16, "signaturepage" (p. 11), and the counter is set to 1 to account for that line.

\first@sign@line
\c@mmiteesize=1

The \loop...\repeat construct is Plain TeX. The \ifnum construct compares \c@mmiteesize to the argument; if it is strictly less, it adds one to the counter, emits another \sign@line signature line, and goes around again.

\loop
 \ifnum\c@mmiteesize<#1
 \advance\c@mmiteesize by1
 \sign@line
 \repeat}
}% End \sign@turelines

It is not necessary to resort to Plain TeX to do iteration. Kopka, p. 192, describes the \whiledo command, available from the optional ifthen package. Also, someone back there couldn't spell “committee”.

4.7. \degree

This is a user-level command and is referenced by Section 5.9, “The titlepage environment” (p. 23).

\def\degree#1{\def\d@gree{#1}}

4.8. \graduationdate

Has values like “July, 2014”. The first function sets the default value based on the date of compilation. The second occurs later and is user-level. Referenced by: Section 5.6, “The dedication environment” (p. 21); Section 5.9, “The titlepage environment” (p. 23); and Section 5.7, “The preface environment” (p. 22).

\def\gr@duationdate%
{%
 \ifcase\month\or
 May\or May\or May\or May\or May\or August\or August\or August\or December\or December\or December\or December\fi,
 \number\year%
}% End \gr@duationdate
\def\graduationdate#1%
The \month function returns the current month in the range 1 through 12. Therefore months 1–5 imply a May graduation; 6–8, August; and 9–12, December.

4.9. \heading

ORPHAN: There is no reference to this command elsewhere in the stylesheet, or in disstemplate.tex.

4.10. \listofacros

Displays the List of Acronyms. Similar to Section 4.11, “\listoffigures” (p. 9), but instead of using the \@starttoc command like the LOF and LOT and TOC, it simply inputs file acros.tex and places it on a separate page.

In theory, an acronym must be pronounceable, such as RADAR. In practice, these are often abbreviations.

4.11. \listoffigures

Displays the List Of Figures. Similar to Section 4.18, “\tableofcontents” (p. 13). The \@starttoc command is from the stock stylesheets; in this case it takes its input from the .lof file.
4.12. \listoftables

Similar to Section 4.11, “\listoffigures” (p. 9), but the \starttoc command takes its input from the .lot file.

\def\listoftables{% 
\@restonecolfalse 
\if@twocolumn 
\@restonecoltrue\onecolumn 
\fi 
\chapter*% 
{% 
LIST OF TABLES
\@mkboth{LIST OF TABLES}{LIST OF TABLES}% 
}% 
\@starttoc{lot} 
\if@restonecol 
\twocolumn 
\fi 
}% End \listoftables

4.13. \newheadline

Protects a newline command. The template file insists that line breaks inside \title, \section, and similar commands must use this command instead of \\\.

I frankly don’t understand why you can’t just use \\ inside a heading; I tried it and the spacing looked the same.

\def\newheadline{\protect\}

4.14. \previousdegrees

ORPHAN: Not mentioned in the template. The second function is not referenced anywhere.
\def\previousdegrees{B.S.} % 
\def\previousdegrees#1\% %
\def\previousdegrees{#1}\% % End \previousdegrees

4.15. \section, \subsection, etc.

These commands define the levels inside chapters; see Section 7, “Calling \@startsection” (p. 30).

\def\section\% %
\@startsection{section}{1}{\z@}% {3.9ex plus -1ex minus -.2ex}{.3ex plus .2ex}{\normal\bf}% % End \section

Here are the \subsection and \subsubsection commands. Comparison to the stock stylesheets is left to the interested reader.

\def\subsection\% %
\@startsection{subsection}{2}{\z@}% {3.9ex plus -1ex minus -.2ex}{.3ex plus .2ex}{\indent\normal\bf}% % End \subsection

The above definition has a major problem: if the subsection title does not fit on a line, continuation lines are actually \textit{unindented} relative to the first line. The intent was to indent subsection headings the same amount as a regular paragraph indent. However, this was achieved with an \indent command in the style (sixth) argument to \@startsection, while specifying zero (\z@) indentation to the third argument. Therefore the continuation lines are indented relative to zero indentation, instead of being indented relative to the 48-point regular paragraph indent.

\def\subsubsection\% %
\@startsection{subsubsection}{3}{\z@}% {3.9ex plus -1ex minus -.2ex}{.3ex plus .2ex}{\normal\bf}% % End \subsubsection

4.16. \signaturepage

Creates the signature page. The \sign@line command creates one horizontal rule, running the full width of the page, where a committee member can sign.

\def\sign@line\% %
\leftline\% Start \leftline
\hbox to \hsize{\hrulefill}% % End \leftline
\bigskip\endgraf

The \leftline, \hbox, and \bigskip commands are Plain TeX.

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The \endgraf command is a copy of the \par command in case someone redefines \par; see Knuth, p. 351. It forces a paragraph break after the line.

Next is a variant function for the first line, where the committee chair or chairs sign. For \supervisor, see Section 4.17, \"\supervisor\" (p. 13).

\def\first@sign@line{
  \leftline{\hbox to \hsize{\hrulefill}}
  \leftline{\supervisor, Advisor}
  \bigskip
}\% End \first@sign@line

Sue Goudy had co-chairman, so her version of the style file substitutes “Advisors” in the above definition.

Next comes a command that assembles the first signature line with one unadorned signature line. This will be redefined in Section 4.6, \"\committeesize\" (p. 7).

\def\signaturelines{\first@sign@line\sign@line}

Here is the user-level command.

\def\signaturepage{
  \clearpage
  \thispagestyle{empty}
  \% End \signaturepage

The \clearpage command goes to a new page and flushes out any floats, although there shouldn't really be floats before the signature page.

The \thispagestyle{empty} command is necessary to prevent any header or footer from appearing; the specification stipulates that the signature page cannot carry a page number.

\thispagestyle{empty}

BUG: The specification says this page is not numbered, meaning not only that no page number appears, but the page number is not incremented. However, the preface can appear in the front matter (small Roman numeral page numbers) and is the only item that follows the approval page. Perhaps this command should also subtract one from the page counter.

Then we skip 40 points down the page with a non-discardable glue, and change the baseline to slightly less than double-spaced. See just below for the \appr@val function, which adds the boilerplate text at the top of the page.

\vspace*{40pt}
\baselineskip=22.5pt plus .5pt minus .2 pt
\appr@val

Skip down another 25 points, then print the signature lines for the committee.

\vspace{25pt}
\sign@turelines

The Plain TeX \vfill is a stretchable glue that absorbs all the remaining space on the page, so that the remaining copy is at the bottom.

\vfill
Next comes the author’s signature line. Really, there are cleaner ways to set the author’s name on the
left and the word “Date” on the right of the same line, in preference to spitting out two lines with a
negative vertical glue between them. BUG: Furthermore, because the leading was set above to a range
of 22.3–23 points, the negative skip will actually set the word “Date” on a baseline slightly higher than
the baseline of the author’s name.

\sign@line
\leftline{AUTH@R}
\vspace{-25 pt}
\rightline{Date}

The \newpage command forces a new page, stretching the current page to its full height.

\newpage
}% End \signaturepage

Finally, here is the \appr@val command for the top of the signature page. The \par forces a new
paragraph, and \noindent prevents normal paragraph indentation. The \fill command seems un-
necessary, since the last line of a paragraph is allowed to be short.

\def\appr@val%{
% \par\noindent
This \th@sistype{} is accepted on behalf of the faculty
of the Institute by the following committee:%
\hfill
}% End \appr@val

4.17. \supervisor

The user-level command to set up the committee chair(s). Used in Section 4.16, “\signature-
page” (p. 11).

\def\supervisor#1%{
% \def\sup@rvisor{#1}%
}% End \supervisor

4.18. \tableofcontents

Displays the table of contents. See Section 6.2, “\chaptertype” (p. 26) for the function that displays
the page heading; the \@mkboth command sets both page marks to “CONTENTS”, in case the header
is using marks.

\def\tableofcontents%{
% \chaptertype*%
% \TABLE OF CONTENTS
% \@mkboth{CONTENTS}{CONTENTS}%
}%
The leading is set to a smaller value for the table of contents. The `\starttoc` command is from the stock stylesheet.

\baselineskip=18pt plus .5pt minus .5pt
\@starttoc{toc}%
}% End \tableofcontents

4.19. `\thesistype`

Type of publication, lowercased for `\th@sistype` and uppercased for `\TH@SISTYPE`. Values: one of thesis (default), dissertation, or report. Referenced by the `acknowledgments` environment.

\% % THESIS TYPE AND DEFAULT VALUES
\% \def\th@sistype{thesis}
\% \def\TH@SISTYPE{Thesis}

The next lines come somewhat later in the file, and are user-level commands.

\% \def\mastersreport{}
\% \def\th@sistype{report}
\% \def\TH@SISTYPE{Independent Study}
}% End \mastersreport
\% \def\dissertation{}
\% \def\th@sistype{dissertation}
\% \def\TH@SISTYPE{Dissertation}
}% End \dissertation

4.20. `\title`

Here’s the user-level command. It is used in Section 5.9, “The titlepage environment” (p. 23).

\% \def\title#1{}
\% \def\ti@tle{#1}
}% End \title

4.21. `\typist`

Sets the default typist string. The second function, occurring further down, is user-level. Used by: Section 5.2, “The acknowledgments environment” (p. 15).

\% \def\typ@ist{the author}
\% \def\typist#1{}
\% \def\typ@ist{#1}
}% End \typist
5. User environments

These are commands that define new environments.

5.1. The abstract environment

The abstract is required, but it does not display page numbers or count in page numbering.

\renewenvironment{abstract}{\abhead}{\abtail}

The \abhead command sets up the environment. First it clears floats, then sets the empty page style to prevent the display of headers and footers.

\def\abhead{
  \clearpage
  \pagestyle{empty}
}

For the \@makeschapterhead command, see Section 6.1, "\@chapter" (p. 25). The \@afterheading command is from the stock stylesheets.

\@makeschapterhead{ABSTRACT}
\@afterheading

Next, one is subtracted from the page number. BUG: This assumes that the abstract is a single page.

\addtocounter{page}{-1}

The leading is set to 25.7–26.5 points.

\baselineskip 26pt plus .5pt minus .2 pt

The \abtail is invoked at the end of the environment. First it forces a paragraph break. The \vfill pushes the last page’s text to the top of the page. Then the page counter is decremented a second time. BUG: Now it seems that the abstract is assumed to be two pages long. The \thispagestyle{empty} command is redundant, since the \abhead command already set \pagestyle{empty}. Then it reinstates the plain page style (with only a page number).

\def\abtail{
  \par
  \vfill
  \addtocounter{page}{-1}
  \thispagestyle{empty}
  \pagestyle{plain}
}

5.2. The acknowledgments environment

Sets one or more pages of acknowledgments.

\renewenvironment{acknowledgments}{\ackhead}{\acktail}
The \ackhead command sets up the environment. First it clears floats and goes to a new page.

\def\ackhead{
  \clearpage
}

The \@makeschapterhead command is described in Section 6.6, "\@schapter" (p. 29). The \@afterheading command is from the stock style file.

\@makeschapterhead{ACKNOWLEDGMENT} \@afterheading

Quoting from the specification: “If an acknowledgement page is used, it follows the abstract and is numbered (ii).”

\setcounter{page}{2}

The style file actually contains two consecutive definitions of \acktail. Here is the first one, which will be overwritten by the second:

\def\acktail{\par\vfill}

Here is the one that will actually take effect. First it forces a paragraph break. Then it displays the production credits, including the inventors of LaTeX and TeX, the developers of this package (as if there were only one), then the typists.

\def\acktail{
  \par
  This \thesistype{} was typeset with LaTeX%
}

The \protect command is necessary so that the footnote is not attached until the \acktail command is actually invoked.

\protect\footnote{
  Usage of this package is permitted only if the source is mentioned.
  \LaTeX{} document preparation system was developed by Leslie Lamport as a special version of Donald Knuth's \TeX{} program for computer typesetting. \TeX{} is a trademark of the American Mathematical Society. The \LaTeX{} macro package for the New Mexico Institute of Mining and Technology \thesistype{} format was adapted from Gerald Arnold's modification of the \LaTeX{} macro package for The University of Texas at Austin by Khe-Sing The.%
}

For the \typ@ist command, see Section 4.21, “\typist” (p. 14). Below the paragraph we space down 28 points.

\par
  \vspace{28pt}
}
5.3. The bibliography environments

There are four bibliography environments:

- **Bibliography** is a normal bibliography at the end of the thesis. Entries are not numbered.
- **Bibliographyno** is like **Bibliography** except that entries are numbered.
- **Bibliographych** is used when a chapter was published elsewhere, and includes the bibliography entries for just that chapter. Entries are not numbered.
- **Bibliographychno** is like **Bibliographych** except that entries are numbered.

The code for each environment is fairly short, and invokes internal environments defined just below. We’ll go through the the **Bibliography** environment in some detail, then discuss only the differences in the other three.

```
\newenvironment{Bibliography}\
{\pagestyle{plain}\begin{thebibliography}{99}}\n{\end{thebibliography}}
```

The currently preferred way to define a new environment is with the \newenvironment command. However, this file uses the ancient, evil way: for an environment named `E`, function `\E` is called at the beginning of environment, and function `\endE` at the end.

Here are the functions for the **Bibliography** command. The use of the \@mkboth command is discussed in Section 4.18, “\tableofcontents” (p. 13).

```
\def\thebibliography#1\
{\chapter*\@mkboth{REFERENCES}{REFERENCES}\begin{thebibliography}{99}\%\}
\end{thebibliography}\%}
```

Set the text height to 556 points.

```
\textheight 556pt
```

The \list and \endlist commands are an alternate way to wrap things in a list environment. The \list command takes two arguments (see Mittelbach, p. 144):

- The first argument is the default label to be attached when an individual \item command does not have the optional argument.
- The second argument is a list of declarations that may modify the shape of the list items.

In the invocation of \list below, the first argument is empty. The various shape parameters are beautifully illustrated on p. 145 of Mittelbach.

```
\list\%\%
\% Shape declarations
\addtolength\labelsep{-0.15in}\%
\addtolength\itemindent{-0.3in}\%
```
UNK. Why are we using counter `enumi` when the entries aren't numbered?

```latex
\usecounter{enumi}
```%

The \texttt{\textbackslash newblock} command is invoked between parts of the bibliography, e.g., between the author and title.

```latex
\def\textbackslash newblock{\hspace{.11em plus .33em minus -.07em}}
```

The \texttt{sloppy} command instructs LaTeX to allow greater inter-word spacing, since some bibliography entries can be particularly hard to break into lines.

```latex
\sloppy
```

The next command changes the definition of the period character to “french spacing,” meaning that spaces at the end of sentences do not get extra space. See Knuth, p. 76.

```latex
\sfcode`\textperiodcentered =1000\relax
```

See Section 6.7, “\texttt{\textbackslash singlespacing}” (p. 29).

```latex
\singlespacing
\% End \texttt{\textbackslash thebibliography}
```

Here is the command called at the end of the \texttt{Bibliography} environment. It reverts to double-spacing; see Section 6.3, “\texttt{\textbackslash doublespacing}” (p. 27). The \texttt{\textbackslash endlist} command ends the \texttt{list} environment.

```latex
\endthebibliography%
{\%\linebreak[1]\% \texttt{\textbackslash doublespacing \textbackslash endlist}\% End \texttt{\textbackslash endthebibliography}}
```

Here are the variants, and their corresponding commands. First, the main bibliography with entries numbered.

```latex
\newenvironment{Bibliographyno}
{\%\linebreak[1]\% \pagestyle{plain}\begin{thebibliographyno}{99}\%\linebreak[1]\% \end{thebibliographyno}\%\linebreak[1]\%}
\def\thebibliographyno#1
{\%\linebreak[1]\% \chapter*\%\linebreak[1]\% REFERENCES \@mkboth{REFERENCES}{REFERENCES}\%\linebreak[1]\% \textheight 556pt\%\linebreak[1]\%}
```
In this list environment, counter \texttt{enumi} is incremented for each \texttt{item}. The first argument to the \texttt{list} command, the default label text, is that counter expressed in Arabic numerals. The rest of this is just like the unnumbered variant, above.

\begin{verbatim}
\list
{\%\[\arabic{enumi}]\%
}{\%\settowidth\labelwidth{[#1]}\leftmargin\labelwidth\advance\leftmargin\labelsep\usecounter{enumi}\%
}{\def\newblock{\hskip .11em plus .33em minus -.07em}\sloppy\singlespacing}
\sfcode`\.=1000\relax\sloppy\singlespacing\endlist
\end{verbatim}

Per-chapter bibliography, entries not numbered.

\begin{verbatim}
\newenvironment{Bibliographych}{\pagestyle{plain}\begin{thechbibliography}{99}}{\end{thechbibliography}}\def\thechbibliography#1{\section*{References}\@mkboth{References}{References}\textheight 556pt\list{\%\addtolength\labelsep{-0.15in}\addtolength\itemindent{-0.3in}}{\%\addcontentsline{toc}{section}{References}}\leftmargin\labelwidth\advance\leftmargin\labelsep\def\newblock{\hskip .11em plus .33em minus -.07em}\sloppy\singlespacing\endlist\end{verbatim}

Unlike the main bibliography, a per-chapter bibliography has an entry in the table of contents.

\begin{verbatim}
\addcontentsline{toc}{section}{References}
\leftmargin\labelwidth\advance\leftmargin\labelsep
\end{verbatim}
Per-chapter bibliography, entries not numbered.

\newenvironment{Bibliographychno}{}{\endlist}{\endthechbibliographyno}

\def\thechbibliographyno#1{\section*{References}\@mkboth{References}{References}}

\begin{thechbibliographyno}{99}{\textheight 556pt}{\list{[\arabic{enumi}]}{\settowidth\labelwidth{[#1]}\addcontentsline{toc}{section}{References}\leftmargin\labelwidth\advance\leftmargin\labelsep\usecounter{enumi}}}
5.4. The *chapabstract* environment

Per-chapter abstract.

\begin{chapabstract}

\def\chapabshead{
\typeout{Abstract}
\centerline{\bf Abstract}
\addcontentsline{toc}{section}{Abstract}
\singlespacing
\baselineskip=14pt
\noindent}

\def\chapabstail{
%
\setlength{\@abhdskip}{.5in}
\addtolength{\@abhdskip}{\topmargin}
}

UNK: Why are the lines in this command commented out? What would they have done?

5.5. The *chapack* environment

Per-chapter acknowledgment.

\begin{chapack}

\def\chapackhead{
\typeout{Acknowledgments}
\vskip 35 pt
\leftline{\bf Acknowledgments}
\vskip 8pt
\addcontentsline{toc}{section}{Acknowledgments}
\baselineskip=1pt}

\def\chapacktail{
%
\setlength{\@abhdskip}{.5in}
\addtolength{\@abhdskip}{\topmargin}
}

UNK: Why are these lines commented out?

5.6. The *dedication* environment

Formats a dedication page.
\newenvironment{dedication}{\dedhead}{\dedtail}

The \dedhead command sets up the start of the environment. First it clears any floats. Then it sets the page style to empty, with no header or footer. After 170 points of vertical skip, there starts a centering environment.

\def\dedhead{
  \clearpage
  \thispagestyle{empty}
  \vspace*{170pt}
  \begin{center}
}\% End \dedhead

The \dedtail command is executed at the end of the dedication environment. It terminates the centering environment and then forces a paragraph and two big skips.

\def\dedtail{
  \end{center}
  \par\bigskip\bigskip
  \leftline{\hfill\auth@r\hbox to 15pt{}}
  \par
  \leftline{\% End \leftline
  \sl
  \hfill New Mexico Institute of Mining and Technology\%}
  \hbox to 15pt{}
}\% End \dedtail

Next we set the author's name, 15 points left of the right margin.

\leftline{\hfill\auth@r\hbox to 15pt{}}

The next line is the institution's name in slanted font, also 15 points left of the right margin.

\leftline{\% End \leftline
  \sl
  \hfill New Mexico Institute of Mining and Technology\%}
  \hbox to 15pt{}
}\% End \dedtail

5.7. The preface environment

Encloses a preface.

\newenvironment{preface}{\prefacehead}{\prefacetail}

The \prefacehead command sets up the environment. It uses the starred form of the \chapter command to create an unnumbered chapter; see Section 4.4, “\chapter” (p. 6).
The \prefacetail command is executed at the end of the environment. It starts out by forcing a paragraph break, followed by two big skips. Then it displays the author's name 15 points from the right margin, followed by the left-justified institution name and graduation date; see Section 4.8, “\graduationdate” (p. 8). Finally, the page style is set back to plain, meaning that successive pages will display a page number.

\begin{verbatim}
def\prefacetail%
{%
 \par\bigskip\bigskip
 \leftline{
 \hfill\auth@r\hbox to 15pt{}}
 \leftline{\sl New Mexico Institute of Mining and Technology}
 \leftline{\sl \graduationdate}
 \thispagestyle{plain}%
}% End \prefacetail
\end{verbatim}

5.8. The references environment

Alternate bibliography section.

\begin{verbatim}
\newenvironment{References}{\citehead}{\citetail}
def\citehead%
{%
 \clearpage
 \pagemode{plain}%
}% End \citehead
def\citetail%
{%
 \clearpage
 \thispagestyle{plain}%
}% End \citetail
\end{verbatim}

5.9. The titlepage environment

Formats the separate title page.

\begin{verbatim}
def\titlepage%
{%
\thispagestyle{empty}
 \vspace*{5pt}
 \baselineskip=22.5pt plus .5pt minus .2 pt
\end{verbatim}
The title is centered in large boldface type, followed by a 25-point skip, the word “by” centered, another 25-point skip, and the author’s name, centered. For \ti@tle, see Section 4.20, “\title” (p. 14); for \AUTH@R, see Section 4.3, “\author” (p. 5).

\begin{center}
  \large\bf\ti@tle
\end{center}
\vspace{25pt}
\centerline{by}
\vspace{25pt}
\centerline{\AUTH@R}

The \vfill inside this centering environment pushes the remaining text to the bottom of the page. I think it would be more logical to move it just before the centering environment, but apparently it does work the way they wrote it. For the \d@gree function, see Section 4.7, “\degree” (p. 8).

\begin{center}
  \vfill
  Submitted in Partial Fulfillment\`
  of the Requirements for the Degree of\`
  \d@gree
\end{center}
\vspace{25pt}
\centerline{New Mexico Institute of Mining and Technology}
\centerline{Socorro, New Mexico}
% End \titlepage

5.10. The vita environment

For Curriculum Vitae.

\newenvironment{vita}{\vitahead}{\vitatail}
\def\vitahead{
  \clearpage
  \thispagestyle{empty}
}

Prints the centered title; discourages page breaks; skips down the page; and adds an entry to the table of contents.

\centerline{\Large VITA}
\par
\nobreak
\vskip 20pt
\baselineskip=22.5pt plus .5pt minus .2pt
\addtocontents{toc}
{%
  \protect
  \noindent Vita \protect\hfill
%
}% End \vitahead
At the end of the vita is a large vertical space, then the address that was set by Section 4.1, “address” (p. 5).

\def\vitatail{
  \par
  \vspace{50pt}
  \par
  \noindent
  Permanent address:
  \parbox[t]{2in}{\raggedright\addr@ss}
}% End \vitatail

6. Internal commands

The commands below are used by the package, and not designed to be called by users.

6.1. \@chapter

Here is the \@chapter command. This is a service command used by \chapter. Argument #1 is the chapter title text to be used in the table of contents; #2 is the full title to appear in the chapter heading.

Much of this is lifted directly from the stock \report.cls file. The narrative below focuses on the differences from the stock file.

\def\@chapter[#1]#2{
  \ifnum\c@secnumdepth>\m@ne
    \refstepcounter{chapter}
    \typeout{\@chapapp\space\thechapter.}
    \addcontentsline{toc}{chapter}{\protect\numberline{\thechapter.}#1}
  \else
    \addcontentsline{toc}{chapter}{#1}
  \fi
  \chaptermark{#1}
  \addtocontents{lof}{\protect\addvspace{10pt}}
  \addtocontents{lot}{\protect\addvspace{10pt}}
  \@makechapterhead{#2} \@afterheading
}

Everything above here is exactly the same as in the stock style file.

The \ifx construct compares two tokens to see if they have the same definition. The \appfl@g command is the text “APPENDIX”; the \chapapp command is either that or “CHAPTER”. So, basically, we are testing whether we are in the appendices. The test \ifnum\value{chapter}=1 tests to see if this is the first appendix; if so, it asserts \pagestyle{plain} to suppress any running head.

\ifx\chapapp\appfl@g{}
  \ifnum\value{chapter}=1
    \pagestyle{plain}
  \fi
\else
  \ifnum\value{chapter}=1

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The page style invoked by the line `\pagestyle{thesheadings}` above is defined in Section 6.5, “ps@thesheadings: Define the thesheadings page style” (p. 28).

### 6.2. \chaptertype

Not a user-level command; used by Section 4.18, “\tableofcontents” (p. 13).

The `\@schaptertype` command is invoked by the short-form command, `\chaptertype*{...}`.

The first entries in the table of contents are always the lists of figures and tables. The `\addvspace` commands add an extra ten points of space after the entry.

The `\@schaptertype` command is invoked by the short-form command, `\chaptertype*{...}`. Again, this curious multiple definition of a command. The first will be superseded by the second, which displays the chapter number on a separate line if the `secnumdepth` specifies chapter numbering.
For \@makeschapterhead, see Section 6.6, \textquotedblleft@schapter\textquotedblright (p. 29).

Here is the \@makechaptertypehead command. It is called only from \chaptertype. As far as I can tell, it is identical to \@makechapterhead.

\begin{verbatim}
\def\@makechaptertypehead#1{
  \vspace*{0pt}  
  \parindent 0pt  
  \centering  
  \ifnum \c@secnumdepth >\m@ne  
    \large\bf @chapapp{} \thechapter  
    \par  
    \vskip 15pt  
  \fi  
  \large \bf #1  
  \par  
  \nobreak  
  \vskip 35pt}
\end{verbatim}

6.3. \texttt{\doublespacing}

Turns double-spacing on after a single-spaced section. See the remarks about \@currsize in Section 6.7, \texttt{\singlespacing} (p. 29).

\begin{verbatim}
\newcommand{\doublespacing}{%  
  \let\CS=\@currsize  
  \renewcommand{\baselinestretch}{1.75}  
  \tiny  
  \CS}
\end{verbatim}

6.4. \texttt{\@makechapterhead}

This command composes the heading of a new chapter.

\begin{verbatim}
\def\@makechapterhead#1{
  \vspace*{0pt}  
  \parindent 0pt  
  \centering  
  \ifnum \c@secnumdepth >\m@ne  
    \large\bf @chapapp{} \thechapter  
    \par  
    \vskip 15pt  
  \fi  
  \large \bf #1  
  \par  
  \nobreak  
  \vskip 35pt}
\end{verbatim}
On the next line we start an anonymous environment to localize the appearance changes. The \parindent command changes to an unindented paragraph.

\begin{verbatim}
{% Start group
 \parindent 0pt
\end{verbatim}

The \centering command causes lines to be centered until the end of the environment.

\begin{verbatim}
\centering
\end{verbatim}

The \ifnum construct executes the indented lines only if secnumdepth is nonnegative, that is, if we are numbering chapters. The next line selects large boldface type, and displays the chapter type (CHAPTER or APPENDIX) followed by one space and the chapter number. The \par forces a paragraph break, after which the chapter title is displayed, also in large bold type.

\begin{verbatim}
\ifnum \c@secnumdepth >\m@ne
 \large\bf \chapapp{} \thechapter
 \par
 \vskip 15pt
\fi
\large \bf #1
\end{verbatim}

Next, another paragraph break. The \nobreak command discourages a page break at this point (rather unlikely if each chapter starts on a new page), and then we skip down 35 points.

\begin{verbatim}
\par
\nobreak
\vskip 35pt
\end{verbatim}

\end{verbatim}

6.5. \ps@thesheadings: Define the thesheadings page style

This command is invoked by the \chapter command to set up a page style for regular (non-appendix) chapters. Compare this with the definitions of \ps@headings and \ps@myheadings in the stock report.cls file.

\begin{verbatim}
\def\ps@thesheadings%
{\% \let@mkboth@gobbletwo
 \def\oddevenhead\centerline{\rm \thepage}\par
 \vskip 15pt
 \fi
 \large \bf #1
}\% End \@makechapterhead
\end{verbatim}

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6.6. \@schapter

This is a service function used by the \chapter* command. Compare it with Section 6.1, “\chapter” (p. 25).

\def\@schapter#1% {
  \thispagestyle{plain}
  \addcontentsline{toc}{chapter}{#1}
  \makeschapterhead{#1}
  \afterheading
} % End \@schapter

Here is the \@makeschapterhead command. It takes one argument, the type of chapter head. It is invoked by Section 5.2, “The acknowledgments environment” (p. 15); Section 5.1, “The abstract environment” (p. 15); and Section 6.2, “\chaptertype” (p. 26).

\def\@makeschapterhead#1% {
  \vspace*{0pt}
  Start a group to localize the style changes in the chapter head. Set up unindented paragraphs; center each line; switch to a large, boldface font; and display the type of chapter.

  \parindent 0pt
  \centering
  \large \bf #1%

  Force another paragraph break, discourage a page break here, and skip 30 discardable points vertically.

  \par
  \nobreak
  \vskip 30pt
} % End group
% End \@makeschapterhead

6.7. \singlespacing

Changes to single spacing. Used by Section 5.3, “The bibliography environments” (p. 17).

A bit of searching for \@currsize on the Web led me to believe that it is some ancient misfeature. See, for example, the setspace.sty package.\footnote{http://www.cam.ctan.org/tex-archive/macros/latex/contrib/setspace/setspace.sty}

\newcommand{\singlespacing}%
{\let\CS=\@currsize
 \renewcommand{\baselinestretch}{1.0}
 \tiny}
7. Calling `\@startsection`

From an excellent tutorial page[^1], we find that the `\@startsection` command is used by all the various sectioning commands. This command is defined in the `latex.ltx` file.

It takes six arguments.

- **{NAME}**
  - Name of the section command, e.g., `{paragraph}`.

- **{LEVEL}**
  - Depth of the section command, e.g., 0 for part, 1 for chapter, 2 for section. This value is compared to the `secnumdepth` and `tocdepth` counters to control numbering of sections and the depth of the table of contents.

- **{INDENT}**
  - How far the heading should be indented. For no indent, use `\z@`, shorthand for zero points.

- **{BEFORESKIP}**
  - If positive, the vertical rubber length to be inserted before the heading.
  
  - If negative, the first paragraph after the heading will not be indented, and the absolute value of the length is inserted before the heading.

- **{AFTERSKIP}**
  - If positive, the vertical rubber length to insert after the heading.
  
  - If negative, use a run-in heading (make it the first part of the first paragraph), and insert its absolute value as horizontal space between the heading and the next word of the paragraph.

- **{STYLE}**
  - Commands that alter the style of the heading.