The **cornell** document class for LaTeX 2ε[*]

Sergio Gelato[†]   Daniel Kartch[‡]   Steve Holland[§]

Aleksey Nogin[¶]   Andrew Myers, Nate Nystrom[‖]

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Abstract

This document class modifies the standard **report** class to conform with the requirements of the Graduate School at Cornell University for the layout of Ph.D. dissertations and Master's theses. It is a modified version of Sergio Gelato's **crnlphd** class, which was an update of the old **cuphdthesis** and **cuphdtitlepage** style files, incorporating changes for the new LaTeX 2ε as well as a few other improvements.

Contents

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[*]This file has version number v2.9 dated 2008/4/17.

[†]The author acknowledges inspiration from a preexisting style file for LaTeX 2.09, adapted from Leslie Lamport's **report** style by Rob McCurley, Alex Aiken, Donna Bergmark, and other anonymous contributors.

[‡]Most of the work of converting the old LaTeX2.09 thesis style files to a LaTeX 2ε document class was done by the first author, who distributed it as **crnlphd**. I only made a few modifications to allow it to handle Master's theses and fixed a few minor bugs caused by updates in the LaTeX 2ε source release.

[§]I made only a few bugfixes and changes to keep it up to date with the current instructions from the thesis secretary. In particular, I added the "halfcornellheadings" and "smallerheadings" options.

[¶]Added "draft", "semifinal" and "final" options.

[‖]Corrected interline spacing to really be double spacing (i.e, 24pt for 12pt text). Changed "cornell" pagestyle to center page numbers at the bottom of the page, and fixed centering of copyright and dedication. Automatically sized page in PDF mode.

1 Introduction

This document describes the LaTeX 2_ε document class cornell, suitable[1] for the production of dissertations and theses at Cornell University. The latest version of this document class should be available at http://tam.cornell.edu/Computer/cuthesis/.

1.1 Usage

This document class can be used both in LaTeX 2_ε native mode and in compatibility mode. To use it in native mode, say

```
\documentclass{cornell}
```

at the beginning of your LaTeX source file. To use it in compatibility mode, say

```
\documentstyle{cornell}
```

---

[1]In the authors' opinion, but with no guarantee that other users will agree. The authors shall not be liable for any consequence, good or bad, of other people's use of this software.

If you are only starting to key in the text of your dissertation, can rely on continued availability of LaTeX 2_ε, and do not need any packages that do have not yet been updated for LaTeX 2_ε, you should probably use native mode. If you have significant amounts of text already in existence, you should try using native mode: in the author's experience, the conversion is trivial if you didn't use too many undocumented tricks (or style options that rely on such).

This document class can be used with either `pdflatex` or with `latex`. The `\ifpdf` macro can be used to test whether `pdflatex` is being used.

Many TeX installations are configured so that A4 paper is the default paper size, whereas Cornell theses are printed on letter size paper. If `pdflatex` is being used, the page size should be automatically set correctly by the document class. Otherwise, if text is not centered on the page, check that "letter" size (8.5in by 11in) is the default. For `dvips`, this is set by a configuration file under the TeX distribution, typically in a path like `/usr/share/texmf/dvips/config/config.ps`. The default size for `pdflatex` is set in a configuration file like `.../pdftexconfig.tex` or `.../pdftex.cfg`.

1.2 Options and packages

`phd`
`master`   The author can specify whether the document is to be typeset as a Ph.D. dissertation or a Master's thesis with the phd and master options. The default is phd.

`latexheadings`
`cornellheadings`
`halfcornellheadings`   The author can choose between the standard LaTeX 2_ε chapter headings, those shown in the example in the grad school thesis guidelines (all caps centered at the top of the page), or half way in between with the latexheadings, cornellheadings, or halfcornellheadings options. The default is cornellheadings, which follows the format specification of November 2006. The halfcornellheadings option is apparently no longer acceptable.

`draft`
`twoside`
`11pt`
`12pt`   Formally, all style options supported by the report document class are also supported by the cornell class, although support for some options, like twocolumn, may be incomplete. The draft option causes the text to be formatted with "single" spacing instead of the required "double" spacing. This may be of use in drafting, or for formatting private copies. For such purposes, the twoside option may also be of use, as well as 11pt or 12pt (when draft is used, the 10pt is the default).

`final`
`semifinal`   The final style option (which is the default) will produce the "double" spacing 12pt document as required for the production of the archival copies of the dissertation. 10pt and 11pt options specify font sizes that are too small and will be overridden (and a warning will be issued to inform you of this) if used in conjunction with the final option. The semifinal is identical to final, except that it highlights all horizontal overflows with a black solid rule.

`\ifdraft`
`\iffinal`   The `\ifdraft` and `\iffinal` macros (which will always be the opposites of one another) may be used to check whether the draft option or the [semi]final one is in effect.

`tocprelim`   tocprelim option causes the preliminary sections to be listed in the table of contents. By default, preliminary sections are not listed in the table of contents.

`smallerheadings`
`normalsizeheadings`   A new option (now the default) smallerheadings reduces the size of the normally-

huge LaTeX headings to something more reasonable. normalsizeheadings is used to select the conventional LaTeX chapter and heading sizes.

In both native and compatibility mode, the options should be specified as optional arguments to the `\documentclass` (respectively `\documentstyle`) command. But note that many former options are now regarded as *packages*, and should be loaded (in native mode) by `\usepackage{⟨name⟩}` instead. In compatibility mode, they are still named in the optional argument to `\documentstyle`.

A number of packages have been tested with this format and appear to work. These are: array, dcolumn, indentfirst, longtable, epsf, drafthead, showkeys, hyperref. There is no known reason why other packages like epsfig, color, graphics should not also work. As for options, some of these packages may not be appropriate when producing copies to be filed with the Graduate school. The author finds drafthead and showkeys useful in draft copies generated during the revision process.

Please be careful about using packages that change the default fonts. There is no guarantee that these fonts will be acceptable to the thesis secretary. The 12pt Times font is not currently accepted, but 12pt Palatino, Bookman, and Helvetica, and are. (Use packages `palatino`, `helvet`, and `bookman` respectively to get these fonts.)

hangcaption   If you want more sensible caption wrapping (single spaced, second line indents), insert the commands

```
\usepackage{hangcaption}
\renewcommand{\caption}[1]{\singlespacing\hangcaption{#1}\normalspacing}
```

after the `\documentclass` line in your LaTeX file.

1.3   Sample thesis

A sample thesis document is included with the distribution of this style file, named `sampleThesis.tex`. This is a good starting point for writing the thesis.

2   Arrangement of contents

A dissertation must contain the following parts, in the order listed. Only parts explicitly designated as optional may be omitted. The current version of this file does not support all of the optional parts.

1. Title page

2. Copyright page

3. Abstract

4. Biographical sketch

5. Dedication (*optional*)

6. Acknowledgements

7. Table of Contents

8. List of Tables

9. List of Figures (or List of Illustrations)

10. List of abbreviations (*optional*)

11. List of symbols (*optional*)

12. Preface (*optional*)

13. Text

14. Appendix (or Appendices) (apparently *not* optional, at least according to the letter of the instructions)

15. Bibliography (or References, or Works Cited)

16. Glossary (*optional*)

17. Index (*optional*)

Some macros and environments are provided to ease the formatting of these parts.

2.1   Title page

\maketitle   The title page is produced by the standard LaTeX macro \maketitle, with no arguments. Prior to invoking it, you should declare the title of the document
\title   using the \title macro, your name (exactly as registered with the Graduate
\author   School) with the \author macro, and the conferraldate with the \conferraldate
\conferraldate macro. The syntax of this last macro is

$$\texttt{\textbackslash conferraldate\{}\langle month\rangle\texttt{\}\{}\langle year\rangle\texttt{\}}$$

For Master's theses you will also need to specify the field of the degree (i.e. Master
\degreefield of Science, Master of Engineering, etc...) with the \degreefield macro. The default is Master of Science.

2.2   Copyright page

\makecopyright   The \makecopyright macro should be invoked after \maketitle to produce a
\makepublicdomain copyright page. Alternatively, you can use \makepublicdomain to produce a page with the message "This document is in the public domain." Or you can produce a blank page simply by typing \mbox{}\clearpage, or by inserting one by hand. Note that the absence of a copyright declaration does *not* place your dissertation in the public domain. In order to place your dissertation in the public domain, you must declare it as such explicitly.

Prior to calling \makecopyright, you may specify a different name for the copyright holder (the default is the name given through the \author macro) and

for the copyright year (the default being the conferral year listed on the title page).
\copyrightholder You should do this with the macros `\copyrightholder` and `\copyrightyear`
\copyrightyear which are invoked as follows:

> \copyrightholder{⟨*name*⟩}
>
> \copyrightyear{⟨*year*⟩}

2.3   Abstract page(s)

abstract The abstract environment has been modified to comply with the requirements of
the Graduate School. Should you wish to change the title used in the abstract
from its default (which is the title used on the title page of the dissertation), the
\abstracttitle macro `\abstracttitle`, to be used exactly as `\title`, is provided.

2.4   Biographical sketch

biosketch A special environment biosketch is provided for the biographical sketch.

2.5   Dedication

The format of the dedication is essentially free, but you may want to use the
dedication dedication environment for this purpose. This environment will center the text of
your dedication vertically on the page. The dedication is optional.

2.6   Acknowledgements

acknowledgements An environment acknowledgements is provided for the acknowledgements section.

2.7   Table of Contents, List of Tables, List of Figures

\contentspage Use the macros `\contentspage`, `\tablelistpage`, and `\figurelistpage`, in this
\tablelistpage order, to produce the required table of contents and lists of tables and figures.
\figurelistpage

2.8   List of Abbreviations, List of Symbols, Preface

\abbrlist These sections are optional. Macros `\abbrlist`, `\symlist`, and `\preface` should
\symlist be invoked to indicate the beginning of each of these sections. These macros
\preface act much like `\chapter*`, which they invoke. The main difference is that if the
tocprelim option is used, entries will be made into the table of contents.

2.9   Text

You should begin the text section of the thesis (normally divided into chapters)
with the following commands:

```
\normalspacing
\setcounter{page}{1}
```

```
\pagenumbering{arabic}
\pagestyle{cornell}
```

The last of these commands controls the way pages are numbered throughout the text (except for the first page of each chapter, which uses `\pagestyle{plain}`; this happens automatically, without the need for you to take any special precautions). The default is to place page numbers in the upper right corner of each page (except that if you use the twoside option, even-numbered pages will have the number in the upper left corner). The graduate school allows, and some departments require, the numbers to be centered at the top of each page. Use `\pagestyle{cornellc}` if you wish page numbers to be centered.

2.10 Appendix

\appendix As in the report style, use the `\appendix` macro to mark the end of the last ordinary chapter and the start of the appendices. Then use a new `\chapter{⟨title⟩}` to start each appendix. Appendices will automatically be "numbered" alphabetically.

2.11 Bibliography

thebibliography Use the thebibliography environment to generate the bibliography. Or have BIBTEX do the work for you[2] The cornell document class modifies this environment slightly. You probably shouldn't use the openbib option for production of the archival copies of your dissertation.

\bibname The default name for this section is **Bibliography**. You may change it by changing the expansion of `\bibname`, as in

```
\renewcommand{\bibname}{References}
```

2.12 Glossary, Index

These sections are optional. The author didn't have time to think about how to generate them. If you want them, you are on your own.

3 Configurable parameters

3.1 Interline spacing

The dissertation is double spaced by default. If you want to modify the spacings, \changespacing use the `\changespacing` macro. For example,

```
\changespacing{\normalspacing}{1}
```

---

[2]The author has not actually tried this.

will cause everything to be single spaced by default, while

```
\changespacing{\singlespacing}{2}
```

will cause everything to be double spaced, even the text within footnotes and bibliography entries which is normally single spaced.

\singlespacing   The \singlespacing macro switches to single interline spacing. This can be useful within long tables that don't otherwise fit on a page. This is not true single spacing, which would have six lines per inch and would appear too dense. Rather, it is single spacing as the LaTeX article class understands it, with lines 14.5 points apart.

\doublespacing   The \doublespacing macro switches to double spacing between lines, with six lines per inch and 24 points between lines. This is not double spacing as LaTeX typically understands it, but rather as the rest of the world does.

\normalspacing   The \normalspacing macro restores normal interline spacing, whatever that is (\doublespacing by default).

\footnotespacing   The \footnotespacing macro switches to footnote spacing. This is equivalent to \singlespacing by default, but you may want to redefine this with, *e.g.,*

```
\renewcommand{\footnotespacing}{\doublespacing}
```

\singlespacingplus   Four other macros are provided to set potentially useful spacings. Ordinar-
\realsinglespacing ily you should not need to use any of these macros. \singlespacingplus sets
\realdoublespacing 1.5 spacing, while \realsinglespacing sets real six-lines-per-inch spacing. The
\listspacing \realdoublespacing macro has the same effect as the \doublespacing macro and is included for backward compatibility with old versions of this document class. \listspacing sets the spacing between lines in various list-like sections of the thesis, such as the table of contents and the lists of tables and figures. By default it is the same as \singlespacing.

3.2   Font sizes

\titlesize The \titlesize macro lets you change the font size used for the title of your dissertation on the title page, should the default be unsuitable for any reason. For example, you could do

```
\titlesize{\LARGE}
```

\authorsize   Similarly, the \authorsize macro lets you change the size of font used to print the author's name.

\subtitlesize   There is also a \subtitlesize macro that controls the size of font used to typeset the words "A Dissertation ..." on the title page.

4 Internals

1 ⟨class⟩\NeedsTeXFormat{LaTeX2e}[1995/12/01]

2 ⟨class⟩\ProvidesClass{cornell}
3 [2008/4/17 v2.9
4 ⟨class⟩   Cornell University thesis class]

4.1 Driver for this document

The docstrip program will extract the following driver from this file:

```
 5 ⟨*driver⟩
 6 \documentclass{ltxdoc}
 7 \EnableCrossrefs
 8 %\DisableCrossrefs % Say \DisableCrossrefs if index is ready
 9 \RecordChanges
10 %\OnlyDescription % Comment out for implementation details
11 \CodelineIndex
12 \begin{document}
13   \DocInput{cornell.dtx}
14   \PrintIndex
15   \PrintChanges
16 \end{document}
17 ⟨/driver⟩
```

4.2 Option processing

First we set up conditionals to determine whether this is a Ph.D. disseration or a Master's thesis, and use Ph.D. by default.

```
18 \newif\ifphd
19 \DeclareOption{phd}{\phdtrue}
20 \DeclareOption{master}{\phdfalse}
21 \ExecuteOptions{phd}
```

Flag to tell if we need to change the default chapter headings.

```
22 \newif\ifcornellheadings
23 \newif\ifhalfcornellheadings
24 \newif\ifsmallerheadings
25 \DeclareOption{latexheadings}{\cornellheadingsfalse \halfcornellheadingsfalse}
26 \DeclareOption{cornellheadings}{\cornellheadingstrue \halfcornellheadingsfalse}
27 \DeclareOption{halfcornellheadings}{\halfcornellheadingstrue \cornellheadingsfalse}
28 \DeclareOption{normalsizeheadings}{\smallerheadingsfalse}
29 \DeclareOption{smallerheadings}{\smallerheadingstrue}
30 \ExecuteOptions{cornellheadings}
31 \ExecuteOptions{smallerheadings}
```

The font size is mandated to be 12pt. If final is set, we override options 10pt and 11pt with a warning.

```
32 \DeclareOption{10pt}{%
33  \iffinal%
```

```
34    \OptionNotUsed%
35    \ClassWarningNoLine{cornell}{Font size 10pt not allowed; using 12pt}%
36  \else%
37    \PassOptionsToClass{10pt}{report}%
38  \fi%
39 }
40 \DeclareOption{11pt}{%
41  \final%
42    \OptionNotUsed%
43    \ClassWarningNoLine{cornell}{Font size 11pt not allowed; using 12pt}%
44  \else%
45    \PassOptionsToClass{11pt}{report}%
46  \fi
47 }
```

We add an option to include the preliminary sections into the table of contents. This is option tocprelim. By default, the preliminary sections are *not* included.

\prelim@contents Internally, macro `\prelim@contents` is called with the title of the section as an argument to generate the table of contents entry. By default, this macro is a do-nothing; with the tocprelim option it is changed to actually invoke `\addcontentsline`. Preliminary sections are treated as sections, not chapters, for the table of contents. The thesis secretary may or may not approve of this.

```
48 \newcommand{\prelim@contents}[1]{}
49 \DeclareOption{tocprelim}{%
50  \renewcommand{\prelim@contents}[1]{\addcontentsline{toc}{section}{#1}}
51 }
```

Define the draft, semifinal and final options that create the `\iffinal` and `\ifdraft` macros.

```
52 \DeclareOption{draft}{%
53  \let\ifdraft\iftrue%
54  \let\iffinal\iffalse%
55  \PassOptionsToClass{final}{report}%
56 }
57 \DeclareOption{final}{%
58  \let\ifdraft\iffalse%
59  \let\iffinal\iftrue%
60  \PassOptionsToClass{final}{report}%
61 }
62 \DeclareOption{semifinal}{%
63  \let\ifdraft\iffalse%
64  \let\iffinal\iftrue%
65  \PassOptionsToClass{draft}{report}%
66 }
67 %
68 % We pass all remaining options to the standard \textsf{report} class.
69 %    \begin{macrocode}
70 \DeclareOption*{%
71  \PassOptionsToClass{\CurrentOption}{report}%
```

```
72 }
```

All options must be processed now, so that we can load the report class right away.

```
73 \ExecuteOptions{final}
74 \ProcessOptions
```

4.3   Report class

We now load the report class, forcing the 12pt option as noted above.

```
75 \iffinal\LoadClass[12pt]{report}[1994/06/01]\else\LoadClass{report}[1994/06/01]\fi
```

We now apply our modifications to the standard report class.

4.4   PDF support

The following code to define \ifpdf is borrowed from Heiko Oberdiek's ifpdf.sty package.

```
76 \newif\ifpdf
77 \ifx\pdfoutput\undefined
78 \else
79   \ifx\pdfoutput\relax
80   \else
81     \ifcase\pdfoutput
82     \else
83       \pdftrue
84     \fi
85   \fi
86 \fi
```

If we are in PDF mode, set the page size correctly:

```
87 \ifpdf
88   \setlength{\pdfpagewidth}{8.5in}
89   \setlength{\pdfpageheight}{11in}
90 \fi
```

4.5   Chapter headings

\@makechapterhead   If the chapter heading style shown in the grad school thesis guide is used, we
\@makeschapterhead   modify the commands which output the chapter headings to place it in all caps
at the top of the page.

```
91 \ifcornellheadings
92   \def\@makechapterhead#1{%
93     \begin{center}%
94       \MakeUppercase{\@chapapp\space \thechapter} \\
95       \MakeUppercase{\bfseries #1}
96     \end{center}%
97     }
98   \def\@makeschapterhead#1{%
```

```
99        \begin{center}%
100          \MakeUppercase{\bfseries #1}
101        \end{center}%
102        }
103 \fi
104 \ifhalfcornellheadings
105    \def\@makeschapterhead#1{%
106        \begin{center}%
107          \MakeUppercase{\bfseries #1}
108        \end{center}%
109        }
110    \def\@makechapterhead#1{%
111      \vspace*{50\p@}%
112      {\parindent \z@ \raggedright \normalfont
113        \ifnum \c@secnumdepth >\m@ne
114            \huge\bfseries \@chapapp\space \thechapter
115            \par\nobreak
116            \vskip 20\p@
117        \fi
118        \interlinepenalty\@M
119        \singlespacing \Huge \bfseries #1\par\nobreak
120        \vskip 40\p@
121      }}
122    \ifsmallerheadings
123      \def\@makechapterhead#1{%
124        {\parindent \z@ \raggedright \normalfont
125          \ifnum \c@secnumdepth >\m@ne
126              \LARGE\bfseries \@chapapp\space \thechapter
127              \par\nobreak
128          \fi
129          \interlinepenalty\@M
130          \singlespacing \LARGE \bfseries #1\par\nobreak
131        }}
132    \fi
133 \fi
134
135 \ifsmallerheadings
136 \renewcommand\section{\@startsection {section}{1}{\z@}%
137                                     {-3.5ex \@plus -1ex \@minus -.2ex}%
138                                     {2.3ex \@plus.2ex}%
139                                     {\normalfont\large\bfseries}}
140 \fi
141
```

4.6   Footnotes

Footnotes should be the same size as the main text.

```
142 \renewcommand{\footnotesize}{\normalsize}
```

They can be single spaced.

\@makefntext We redefine the standard macro `\@makefntext` to use `\footnotespacing` (defined below as `\singlespacing`, but modifiable by the user) and to restore `\normalspacing` afterwards.

```
143 \renewcommand{\@makefntext}[1]{%
144   \parindent 1em%
145   \noindent
146   \footnotespacing
147   \hbox to 1.8em{\hss\@makefnmark}#1
148   \par\normalspacing
149 }
```

4.7 Subscripts

Subscripts should be made larger than the default, just to be on the safe side.

```
150 \renewcommand{\defaultscriptratio}{.75}
151 \renewcommand{\defaultscriptscriptratio}{.6}
```

4.8 Page layout

The interior margin must be increased to at least 1.5 inches. An extra 0.1 inch is added to all margins to compensate for copier enlargement. Various other page layout parameters are reset here.

This part of the code may not be very robust when twocolumn is used. (No attempt has yet been made to get the margins right in that case.) But then, dissertations really shouldn't use twocolumn.

```
152 \setlength\headsep{25\p@}
153 \if@twocolumn
154 \else
155   \setlength\topmargin{-0.4in}
156   \setlength\headheight{0.16667in}
157   \setlength\headsep{0.33333in}
158   \setlength\textheight{8.8in}
159   \setlength\footskip{0.5in}
160   \setlength\oddsidemargin{.6in}
161   \setlength\evensidemargin{.6in}
162   \setlength\textwidth{5.80in}
163   \setlength\marginparsep{0.1in}
164   \setlength\marginparwidth{0.8in}
165 \fi
166 \if@compatibility
167   \setlength\topmargin{0\p@}
168 \else
169 \fi
```

4.9 Page styles

\ps@cornell We define a cornell page style. This has page numbers centered at the bottom of each page.

```
170 \newcommand{\ps@cornell}{%
171 \def\@oddhead{}
172 \def\@oddfoot{\hfil\thepage\hfil}%
173 \def\@evenhead{}%
174 \def\@evenfoot{\@oddfoot}%
175 \def\chaptermark##1{}%
176 \def\sectionmark##1{}%
177 }
```

\ps@oldcornell   We also define the oldcornell page style, which places page numbers at the outside
                  upper corner of each page. This is the old behavior of the textsfcornell page style.

```
178 \newcommand{\ps@oldcornell}{%
179 \def\@oddhead{{\slshape\rightmark}\hfil\thepage}%
180 \def\@oddfoot{}%
181 \def\@evenhead{\thepage\hfil{\slshape\leftmark}}%
182 \def\@evenfoot{}%
183 \def\chaptermark##1{}%
184 \def\sectionmark##1{}%
185 }
```

\ps@cornellc   For the sake of people in Engineering and of any other interested parties, we also
                 define a cornellc page style in which the page numbers are centered at the top of
                 each page.

```
186 \newcommand{\ps@cornellc}{%
187 \def\@oddhead{\hfil\thepage\hfil}%
188 \def\@oddfoot{}%
189 \def\@evenhead{\@oddhead}%
190 \def\@evenfoot{}%
191 \def\chaptermark##1{}%
192 \def\sectionmark##1{}%
193 }
```

We prefer predictable interline spacing over fixed page length. Thus:

```
194 \raggedbottom
```

Individual users are free to override this by using `\flushbottom` in the preamble.

4.10   Section names

The LaTeX default section names are acceptable, except for the table of contents
which must be called "Table of Contents", not just "Contents". LaTeX 2_ε conve-
niently provides a macro to configure this.

```
195 \renewcommand{\contentsname}{Table of Contents}
```

LaTeX 2_ε also provides `\bibname`, `\listtablename`, `\listfigurename`; the default
values are adequate for our purposes.

The following code modifies the appearance of entries in the List of Figures
and in the List of Tables. It is being retained for historic reasons.

```
196 \renewcommand{\l@figure}{\@dottedtocline{1}{1.5em}{2.6em}}
```

```
197 \let\l@table\l@figure
198
199 \renewenvironment{thebibliography}[1]
200     {\chapter*{\bibname
201        \@mkboth{\uppercase{\bibname}}{\uppercase{\bibname}}}%
202      \list{\@biblabel{\arabic{enumiv}}}%
203          {\settowidth\labelwidth{\@biblabel{#1}}%
204           \leftmargin\labelwidth
205           \advance\leftmargin\labelsep
206    \itemsep=12pt
207           \@openbib@code
208           \usecounter{enumiv}%
209           \let\p@enumiv\@empty
210           \renewcommand\theenumiv{\arabic{enumiv}}}%
211      \sloppy\clubpenalty4000\widowpenalty4000%
212      \sfcode`\.=\@m\relax
213      \addcontentsline{toc}{chapter}{\bibname}
214      \listspacing{bib}}
215     {\def\@noitemerr
216      {\@latex@warning{Empty `thebibliography' environment}}%
217      \normalspacing
218      \endlist}
```

Preliminary sections are handled here.

```
219 % \changes{v2.1}{1998/09/20}{Fixed title bug}
220 \newcommand{\@titlesize}{\fontsize{18}{24}\selectfont}
221 \newcommand{\@subtitlesize}{\fontsize{12}{24}\selectfont}
222 \newcommand{\@authorsize}{\normalsize\doublespacing} % No Pharaoh he.
223 \newcommand{\@conferralmonth}{January}
224 \newcommand{\@conferralyear}{1995}
225
226 \newcommand{\titlesize}[1]{\renewcommand{\@titlesize}{#1}}
227 \newcommand{\subtitlesize}[1]{\renewcommand{\@subtitlesize}{#1}}
228 \newcommand{\authorsize}[1]{\renewcommand{\@authorsize}{#1}}
229 \newcommand{\conferraldate}[2]{%
230   \renewcommand{\@conferralmonth}{#1}
231   \renewcommand{\@conferralyear}{#2}
232 }
233 \newcommand{\@degreefield}{Master of Science}
234 \newcommand{\degreefield}[1]{\renewcommand{\@degreefield}{#1}}
235
236 \renewcommand{\maketitle}{%
237   \begin{titlepage}%
238     \realsinglespacing
239     \begin{center}%
240       \hrule height 0.5in width 0pt % force vertical space at top
241       \@titlesize \expandafter\uppercase\expandafter{\@title}
242     \end{center}
243     \vfill
244     \begin{center}
```

```
245       \@subtitlesize
246       A \ifphd Dissertation \else Thesis \fi \\
247       Presented to the Faculty of the Graduate School \\
248       of Cornell University \\
249       in Partial Fulfillment of the Requirements for the Degree of \\
250       \ifphd Doctor of Philosophy \else \@degreefield \fi
251     \end{center}
252     \vfill
253     \begin{center}
254       \@authorsize
255       by \\
256       \@author \\
257       \@conferralmonth\ \@conferralyear
258     \end{center}
259     \vspace{0.25in}
260   \end{titlepage}
261 }
262
263 \renewenvironment{titlepage}{%
264   \typeout{Title page}
265   \pagestyle{empty}
266   \doublespacing
267 }{%
268   \normalspacing\clearpage
269 }
```

Copyright page (What? Not in public domain? Shame on you...)

```
270 \newenvironment{copyrightpage}{%
271   \typeout{Copyleft page}
272   \pagestyle{empty}
273   \null\vfill
274   \begin{center}
275 }{%
276   \end{center}
277   \vfill\null
278   \newpage
279   \clearpage%
280 }
281
282 \newcommand{\makecopyright}{%
283   \begin{copyrightpage}
284   \copyright\ \@copyrightyear{} \@copyrightholder \\
285   ALL RIGHTS RESERVED
286   \end{copyrightpage}%
287 }
288 \newcommand{\@copyrightholder}{\@author}
289 \newcommand{\@copyrightyear}{\@conferralyear}
290
291 \newcommand{\copyrightholder}[1]{\renewcommand{\@copyrightholder}{#1}}
292 \newcommand{\copyrightyear}[1]{\renewcommand{\@copyrightyear}{#1}}
```

```
293
294 \newcommand{\makepublicdomain}{%
295   \begin{copyrightpage}
296   This document is in the public domain.
297   \end{copyrightpage}%
298 }
```

Abstract page

```
299 \newlength{\@abhdskip}%
300 \renewenvironment{abstract}{
301   \typeout{Abstract}
302   \setlength{\@abhdskip}{.6in}
303   \addtolength{\@abhdskip}{-\topmargin}
304   \addtolength{\@abhdskip}{-\headheight}
305   \addtolength{\@abhdskip}{-\headsep}
306   \addtolength{\@abhdskip}{-\baselineskip}
307   \begin{center}%
308     \vspace*{\@abhdskip}%
309     \ifphd%
310       {\def\\{\noexpand\\} \xdef\@abstracttitle{\@abstracttitle}}
311       \expandafter\uppercase\expandafter{\@abstracttitle} \\
312       \@author,\ Ph.D. \\
313       Cornell University\ \@conferralyear%
314     \else
315       \normalsize \bfseries\selectfont
316       ABSTRACT
317     \fi%
318     \vspace{0.5\baselineskip}
319   \end{center}%
320   \pagestyle{empty}
321   \thispagestyle{empty}
322 }{%
323   \clearpage
324 }
325
326 \newcommand{\@abstracttitle}{\@title}
327 \newcommand{\abstracttitle}[1]{\renewcommand{\@abstracttitle}{#1}}
```

Biographical sketch

```
328 \newenvironment{biosketch}{%
329   \typeout{Vita}
330   \pagestyle{plain}
331   \pagenumbering{roman}
332   \setcounter{page}{3}
333   \prelim@contents{Biographical Sketch}
334   \chapter*{Biographical Sketch}
335 %  \chapter*{%
336 %    \begin{center}
337 %      \vspace{-2in}
338 %      \normalsize
```

```
339 %       BIOGRAPHICAL SKETCH
340 %     \end{center}
341 %   }
342 }{%
343   \clearpage
344 }
```

Dedication

```
345 \newenvironment{dedication}{%
346   \prelim@contents{Dedication}
347   \null\vfill
348   \begin{center}
349 }{
350   \end{center}
351   \vfill\null
352   \clearpage
353 }
```

Acknowledgements

```
354 \newenvironment{acknowledgements}{%
355   \prelim@contents{Acknowledgements}
356   \chapter*{Acknowledgements}
357 %   \chapter*{%
358 %     \begin{center}
359 %       \vspace{-2in}
360 %       \normalsize
361 %       ACKNOWLEDGEMENTS
362 %     \end{center}
363 %   }
364 }{%
365   \cleardoublepage
366 }
367
368 \newcommand{\contentspage}{%
369   \listspacing{toc}
370   \label{toc}
371   \prelim@contents{\contentsname}
372   \tableofcontents
373   \normalspacing
374   \clearpage
375 }
376
377 \newcommand{\tablelistpage}{%
378   \listspacing{tab}
379   \label{lot}
380   \prelim@contents{\listtablename}
381   \listoftables
382   \normalspacing
383   \clearpage
384 }
```

```
385
386 \newcommand{\figurelistpage}{%
387   \listspacing{fig}
388   \label{lof}
389   \prelim@contents{\listfigurename}
390   \listoffigures
391   \normalspacing
392   \clearpage
393 }
```

The following three sections are optional. We define macros to start new chapters, but that is all.

```
394 \newcommand{\abbrlist}{%
395   \listspacing{abbr}
396   \prelim@contents{List of Abbreviations}
397   \chapter*{List of Abbreviations}
398 }
399
400 \newcommand{\symlist}{%
401   \listspacing{sym}
402   \prelim@contents{List of Symbols}
403   \chapter*{List of Symbols}
404 }
405
406 \newcommand{\preface}{%
407   \listspacing{pref}
408   \prelim@contents{Preface}
409   \chapter*{Preface}
410 }
```

This sets up the interline spacing for normal text, small text, and footnote text, and defines the various spacing macros. Because the interline spacing for normal text is set to 12 points, the spacing macros can do the straightforward thing, except for \singlespacing, which tries to be backward compatible with article.

```
411 \renewcommand\normalsize{%
412   \@setfontsize\normalsize\@xiipt{12}%
413   \abovedisplayskip 12\p@ \@plus3\p@ \@minus7\p@
414   \abovedisplayshortskip \z@ \@plus3\p@
415   \belowdisplayshortskip 6.5\p@ \@plus3.5\p@ \@minus3\p@
416   \def\@listi{\leftmargin\leftmargini
417             \parsep 5\p@  \@plus2.5\p@ \@minus\p@
418             \topsep 10\p@ \@plus4\p@    \@minus6\p@
419             \itemsep \z@  \@plus2.5\p@ \@minus\p@}%
420   \belowdisplayskip \abovedisplayskip
421 }
422 \renewcommand\small{%
423   \@setfontsize\small\@xipt{11}%
424   \abovedisplayskip 11\p@ \@plus3\p@ \@minus6\p@
425   \abovedisplayshortskip \z@ \@plus3\p@
```

```
426     \belowdisplayshortskip 6.5\p@ \@plus3.5\p@ \@minus3\p@
427     \def\@listi{\leftmargin\leftmargini
428               \topsep 9\p@ \@plus3\p@ \@minus5\p@
429               \parsep 4.5\p@ \@plus2\p@ \@minus\p@
430               \itemsep \z@  \@plus2\p@ \@minus\p@}%
431     \belowdisplayskip \abovedisplayskip
432 }
433 \renewcommand\footnotesize{%
434     \@setfontsize\footnotesize\@xpt\@xpt
435     \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
436     \abovedisplayshortskip \z@ \@plus3\p@
437     \belowdisplayshortskip 6\p@ \@plus3\p@ \@minus3\p@
438     \def\@listi{\leftmargin\leftmargini
439               \topsep 6\p@ \@plus2\p@ \@minus2\p@
440               \parsep 3\p@ \@plus2\p@ \@minus\p@
441               \itemsep \parsep}%
442     \belowdisplayskip \abovedisplayskip
443 }
444
445 \newcommand{\realsinglespacing}{%
446   \let\CS=\@currsize\renewcommand{\baselinestretch}{1.0}\CS}
447 \newcommand{\singlespacing}{%
448   \let\CS=\@currsize\renewcommand{\baselinestretch}{1.208333}\CS}
449 \newcommand{\singlespacingplus}{%
450   \let\CS=\@currsize\renewcommand{\baselinestretch}{1.5}\CS}
451 \newcommand{\doublespacing}{%
452   \let\CS=\@currsize\renewcommand{\baselinestretch}{2}\CS}
453 \newcommand{\realdoublespacing}{%
454   \let\CS=\@currsize\renewcommand{\baselinestretch}{2}\CS}
455 \newcommand{\normalspacing}{\doublespacing}
456 \newcommand{\footnotespacing}{\singlespacing}
457 \newcommand{\listspacing}[1]{\singlespacing} % extra arg is extensibility hook
458 \newcommand{\changespacing}[2]{%
459   \renewcommand{#1}{%
460     \let\CS=\@currsize\renewcommand{\baselinestretch}{#2}\CS}%
461 }
462 \ifdraft\changespacing{\normalspacing}{1}\fi
463 \newcommand{\changenormalspacing}[1]{\renewcommand{\normalspacing}{#1}}
464 \normalspacing
465
466 % redefine to do singlespacing
467 \def \@floatboxreset {%
468         \reset@font
469         \normalsize
470         \singlespacing
471         \@setminipage
472 }
```

End (for now)