

The `revtex4-1` document class of the American Physical Society *

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This file embodies the implementation of the APS REVTeX 4.1 document class for electronic submissions to journals.

The distribution point for this work is <http://publish.aps.org/revtex4/>, which contains fully unpacked, prebuilt runtime files and documentation.

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*Work under hire to The American Physical Society.

†First revision of REVTeX4.0 (unreleased) by David Carlisle

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1 Using REVTeX

The file README has retrieval and installation information.

User documentation is presented separately in `auguide.tex`.

The file `template.aps` is a boilerplate file.

1.1 Bill of Materials

Following is a list of the files in this distribution arranged according to provenance.

1.1.1 Primary Source

One single file generates all.

```
%revtex4-1.dtx
%
```

1.1.2 Generated by `tex revtex4-1.dtx`

Typesetting this file under TeX itself runs the installer, which generates the package files.

```
%revtex4-1.cls, revtex4.ins, revtex4.drv, aps4-1.rtx,
%aps10pt4-1.rtx, aps11pt4-1.rtx, aps12pt4-1.rtx, revsymp.sty
%
```

1.1.3 Generated by `pdflatex revtex4-1.dtx`

Typesetting the source file under L^AT_EX generates the documentation.

```
%revtex4.pdf,
%
```

1.1.4 Auxiliary

The following are auxiliary files generated in the course of running L^AT_EX:

```
%revtex4.aux revtex4.idx revtex4.ind revtex4.log revtex4.toc
%
```

2 Code common to all modules

The following may look a bit kloutchy, but we want to require only one place in this file where the version number is stated, and we also want to ensure that the version number is embedded into every generated file.

Now we declare that these files can only be used with L^AT_EX 2_ε. An appropriate message is displayed if a different T_EX format is used.

```
1 %<*doc|kernel|aps|rmp|revsymp>
2 \NeedsTeXFormat{LaTeX2e}[1996/12/01]%
3 %</doc|kernel|aps|rmp|revsymp>
4 %<kernel>\ProvidesClass{revtex4-1}
5 %<aps>\ProvidesFile{aps4-1}
6 %<rmp>\ProvidesFile{apsrmp4-1}
7 %<10pt>\ProvidesFile{aps10pt4-1}
8 %<11pt>\ProvidesFile{aps11pt4-1}
9 %<12pt>\ProvidesFile{aps12pt4-1}
10 %<revsymp>\ProvidesPackage{revsymp4-1}
11 %<*doc>
12 \ProvidesFile{revtex4-1.dtx}
13 %</doc>
14 %<!*package&!options>
15 %<version>
16 [2010/07/25/20:33:00 4.1r (http://publish.aps.org/revtex4/ for documentation)]% \fileversion
17 %</!*package&!options>
```

The current class name is remembered in `\class@name`. This is something of a kloutch, relying as it does on knowledge of the implementation of `\ProvidesPackage`.

```
18 %<kernel>\let\class@name\@gtempa
```

3 The driver module driver

This module, consisting of the present section, typesets the programmer's documentation, generating the `00readme.txt` and sample document as needed.

Because the only uncommented-out lines of code at the beginning of this file constitute the `driver` module itself, we can simply typeset the `.dtx` file directly, and there is thus rarely any need to generate the “driver” DOCSTRIP module. Module delimiters are nonetheless required so that this code does not find its way into the other modules.

The `\end{document}` command concludes the typesetting run.

```
19 %<*doc>
```

The driver uses packages `ltxdoc.sty`, `ltxdocext.sty`, `hyperref.sty`, and whatever font package has been selected.

```
20 \documentclass{ltxdoc}
21 \RequirePackage{ltxdocext}%
22 \let\url\undefined
23 \RequirePackage[colorlinks=true,linkcolor=blue]{hyperref}%
24 \expandafter\ifx\csname package@font\endcsname\@undefined\else
25 \expandafter\RequirePackage\expandafter{\csname package@font\endcsname}%
26 \fi
```

We ask for the usual indices and glossaries.

```
27 \CodelineIndex\EnableCrossrefs % makeindex -s gind.ist revtex4
28 \RecordChanges % makeindex -s gglo.ist -o revtex4.gls revtex4.glo
```

3.0.5 Docstrip and info directives

We use so many DOCSTRIP modules that we set the `StandardModuleDepth` counter to 1.

```
29 \setcounter{StandardModuleDepth}{1}
```

The following command retrieves the date and version information from this file.

```
30 \expandafter\GetFileInfo\expandafter{\jobname.dtx}%
```

3.1 The Frontmatter File

As promised above, here is the contents of the frontmatter file.

```
31 \begin{filecontents*}{00readme.tex}
32 \title{%
33 The \classname{revtex4-1} document class of the American Physical Society%
34 \protect\thanks{Work under hire to The American Physical Society.}%
35 }%
36 \author{Arthur Ogawa%
37 \protect\thanks{First revision of REV\TeX4.0 (unreleased) by David Carlisle}%
38 }%
39 \date{Version \fileversion, dated \filedate}%
40 \newcommand\revtex{REV\TeX}
41
42 \maketitle
43
44 This file embodies the implementation of the APS \revtex\ 4.1 document class
45 for electronic submissions to journals.
46
47 The distribution point for this work is
48 \url{http://publish.aps.org/revtex4/},
49 which contains fully unpacked, prebuilt runtime files and documentation.
50
51 \tableofcontents
52
53 \section{Using \protect\revtex}
```

54

55 The file `\file{README}` has retrieval and installation information.

56

57 User documentation is presented separately in `\file{auguide.tex}`.

58

59 The file `\file{template.aps}` is a boilerplate file.

60

61 `\changes{4.0a}{1998/01/16}{Initial version}`

62 `\changes{4.0a}{1998/01/31}{Move after process options, so \cs{clearpage} not in scope of twocol}`

63 `\changes{4.0a}{1998/01/31}{Rearrange the ordering so numerical ones come first. A0: David, what}`

64 `\changes{4.0a}{1998/01/31}{use font-dependent spacing}`

65 `\changes{4.0a}{1998/01/31}{4.0d had twoside option setting twoside switch to false}`

66 `\changes{4.0a}{1998/01/31}{Move after process options, so the following test works}`

67 `\changes{4.0a}{1998/01/31}{\print homepage}`

68 `\changes{4.0a}{1998/01/31}{protect against hyperref revtex kludges which are not needed now}`

69 `\changes{4.0a}{1998/06/10}{multiple preprint commands}`

70 `\changes{4.0a}{1998/06/10}{comma not space between email and homepage}`

71 `\changes{4.0a}{1998/06/10}{single space footnotes}`

72 `\changes{4.0b}{1999/06/20}{First modifications by Arthur Ogawa (mailto:arthur_ogawa at sbcglob)}`

73 `\changes{4.0b}{1999/06/20}{Added localization of \cs{figuresname}}`

74 `\changes{4.0b}{1999/06/20}{Added localization of \cs{tablesname}}`

75 `\changes{4.0b}{1999/06/20}{A0: all code for \protect\classoption{10pt} is in this module.}`

76 `\changes{4.0b}{1999/06/20}{A0: all code for \protect\classoption{11pt} is in this module.}`

77 `\changes{4.0b}{1999/06/20}{A0: all code for \protect\classoption{12pt} is in this module.}`

78 `\changes{4.0b}{1999/06/20}{A0: made aps.rtx part of revtex4.dtx}`

79 `\changes{4.0b}{1999/06/20}{A0: remove duplicates}`

80 `\changes{4.0b}{1999/06/20}{call \cs{print@floats}}`

81 `\changes{4.0b}{1999/06/20}{Defer assignment until \cs{AtBeginDocument} time.}`

82 `\changes{4.0b}{1999/06/20}{Defer decision until \cs{AtBeginDocument} time}`

83 `\changes{4.0b}{1999/06/20}{Define three separate environments, defer assignment to \cs{AtBeginD}`

84 `\changes{4.0b}{1999/06/20}{Frank Mittelbach, has stated in \protect\classname{multicol}: ‘‘The`

85 `\changes{4.0b}{1999/06/20}{Move this ‘‘complex’’ option to the front, where it can be overridden}`

86 `\changes{4.0b}{1999/06/20}{New option}`

87 `\changes{4.0b}{1999/06/20}{One-line caption sets flush left.}`

88 `\changes{4.0b}{1999/06/20}{only execute if appropriate}`

89 `\changes{4.0b}{1999/06/20}{Processing delayed to \cs{AtBeginDocument} time}`

90 `\changes{4.0b}{1999/06/20}{Removed invocation of nonexistent class option \protect\classoption{}`

91 `\changes{4.0b}{1999/06/20}{Restore all media size class option of \protect\file{classes.dtx}}`

92 `\changes{4.0b}{1999/06/20}{Stack \cs{preprint} args flush right at right margin.}`

93 `\changes{4.0c}{1999/11/13}{(A0, 115) If three or more preprints specified, set on single line, }`

94 `\changes{4.0c}{1999/11/13}{(A0, 129) section* within appendix was producing appendixname}`

95 `\changes{4.0c}{1999/11/13}{*-form mandates pagebreak}`

96 `\changes{4.0c}{1999/11/13}{also spelled ‘‘acknowledgements’’.}`

97 `\changes{4.0c}{1999/11/13}{Do not put by REVTeX in every page foot}`

98 `\changes{4.0c}{1999/11/13}{grid changes via ltxgrid procedures}`

99 `\changes{4.0c}{1999/11/13}{grid changes with ltxgrid}`

100 `\changes{4.0c}{1999/11/13}{Insert procedure \cs{checkindate}}`

101 `\changes{4.0c}{1999/11/13}{Lose compatability mode.}`

102 `\changes{4.0c}{1999/11/13}{New ltxgrid-based code, other bug fixes}`

103 `\changes{4.0c}{1999/11/13}{New option ‘‘checkin’’}`

104 \changes{4.0c}{1999/11/13}{Prevent an inner footnote from performing twice}
105 \changes{4.0d}{2000/04/10}{Also alter how lists get indented.}
106 \changes{4.0d}{2000/04/10}{eprint takes an optional argument, syntactical only in this case.}
107 \changes{4.0d}{2000/04/10}{New option}
108 \changes{4.0d}{2000/05/10}{More features and bug fixes: compatability with longtable and array}
109 \changes{4.0d}{2000/05/17}{make longtable trigger the head, too}
110 \changes{4.0d}{2000/05/18}{But alternative spelling is deprecated.}
111 \changes{4.0e}{2000/09/20}{New option showkeys}
112 \changes{4.0e}{2000/11/14}{Bug fixes and minor new features: title block affiliations can have
113 \changes{4.0e}{2000/11/21}{adornments above and below.}
114 \changes{4.0f}{2001/02/13}{Last bug fixes before release.}
115 \changes{4.0rc1}{2001/06/17}{Running headers always as if two-sided}
116 \changes{4.0rc1}{2001/06/18}{grid changes with push and pop}
117 \changes{4.0rc1}{2001/06/18}{grid changes with push and pop}
118 \changes{4.0rc4}{2001/07/23}{hyperref is no longer loaded via class option: use a usepackage st
119 \changes{4.1a}{2008/01/18}{(AO, 457) Endnotes to be sorted in with numerical citations.}%
120 \changes{4.1a}{2008/01/18}{(AO, 451) ‘‘Cannot have more than 256 cites in a document’’}%
121 \changes{4.1a}{2008/01/18}{(AO, 457) Endnotes to be sorted in with numerical citations.}%
122 \changes{4.1a}{2008/01/18}{(AO, 460) ‘‘Proper style is "FIG. 1. ..." (no colon)’’}%
123 \changes{4.1a}{2008/01/18}{(AO, 478) \cs{ds@letterpaper}, so that ‘‘letterpaper really is the d
124 \changes{4.1a}{2008/01/18}{(AO, 488) Change processing of options to allow an unused option to
125 \changes{4.1a}{2008/01/19}{(AO, 461) Change the csname revtex uses from @dotsep to ltxu@dotsep.
126 \changes{4.1a}{2008/01/19}{For natbib versions before 8.21, \cs{NAT@sort} was consulted only as
127 \changes{4.1b}{2008/05/29}{The csname substy@ext is now defined without a dot (.), to be comp
128 \changes{4.1b}{2008/06/01}{(AO) Implement bibnotes through \cs{frontmatter@footnote@produce} in
129 \changes{4.1b}{2008/06/01}{Add option reprint, opposite of preprint, and preferred alternative
130 \changes{4.1b}{2008/06/29}{(AO, 455) Be nice to a list within the abstract (assign \cs{@totalle
131 \changes{4.1b}{2008/06/30}{(AO) Structure the Abstract using the \texttt{bibliography} environm
132 \changes{4.1b}{2008/07/01}{(AO) coordinate \cs{if@twoside} with \cs{twoside@sw}}
133 \changes{4.1b}{2008/07/01}{(AO) make settings at class time instead of deferring them to later.
134 \changes{4.1b}{2008/07/01}{(AO) No longer need to test \cs{chapter} as of \texttt{natbib} versi
135 \changes{4.1b}{2008/07/01}{(AO) No longer use \cs{secnumarabic@sw}, instead use \cs{setup@secnu
136 \changes{4.1b}{2008/07/01}{(AO) Provide more diagnostics when \cs{@society} is assigned.}
137 \changes{4.1b}{2008/07/01}{(AO) provide option longbibliography}
138 \changes{4.1b}{2008/07/01}{Add \cs{@hangfroms@section}}
139 \changes{4.1b}{2008/07/01}{Break out \cs{@caption@fignum@sep}}
140 \changes{4.1b}{2008/07/01}{Class option galley sets \cs{preprintsty@sw} to false}
141 \changes{4.1b}{2008/07/01}{Code relating to new syntax for frontmatter has been placed in \file
142 \changes{4.1b}{2008/07/01}{Package textcase is now simply a required package}
143 \changes{4.1b}{2008/07/01}{Procedures \cs{@parse@class@options@society} and \cs{@parse@class@op
144 \changes{4.1b}{2008/07/01}{Read in all required packages together}
145 \changes{4.1b}{2008/07/01}{Remove options newabstract and oldabstract}
146 \changes{4.1b}{2008/08/01}{Section numbering via procedures \cs{secnums@rtx} and \cs{secnums@ar
147 \changes{4.1b}{2008/08/04}{As with author formatting, rag the right more, and assign \cs{@total
148 \changes{4.1b}{2008/08/04}{Rag the right even more: .8\cs{hsize}. Also, assign \cs{@totalleftma
149 \changes{4.1b}{2008/08/04}{The \texttt{rmp} journal substy selects \texttt{groupedaddress} by
150 \changes{4.1b}{2008/08/04}{Use \cs{setup@hook} to initialize all.}
151 \changes{4.1c}{2008/08/15}{Document class option longbibliography via \cs{substy@post}}
152 \changes{4.1d}{2009/03/27}{Definition of \cs{@fnsymbol} follows fixltx2e.sty}
153 \changes{4.1e}{2008/06/29}{(AO, 455) be nice to a list within the abstract}

```

154 \changes{4.1f}{2009/07/07}{(AO, 513) Add class option linewidths: number the lines a la \class
155 \changes{4.1f}{2009/07/07}{(AO, 516) Merged references are separated with a semicolon}
156 \changes{4.1f}{2009/07/10}{(AO, 520) Automatically produce \cs{bibliography} command when needed
157 \changes{4.1f}{2009/07/11}{(AO, 521) Lonely bibliography head}%
158 \changes{4.1f}{2009/07/11}{(AO, 522) Warn if software is expired}%
159 \changes{4.1f}{2009/07/15}{(AO, 523) Add class option nomerge, to turn off new natbib 8.3 synta
160 \changes{4.1f}{2009/07/20}{(AO, 524) Makes no sense if citations are superscript numbers and so
161 \changes{4.1f}{2009/10/05}{(AO, 530) \cs{@fnsymbol}: Failed to import fixltx2e.sty technology.
162 \changes{4.1g}{2009/10/07}{(AO, 525) Remove phantom paragraph above display math that is given
163 \changes{4.1g}{2009/10/07}{(AO, 538) \cs{MakeTextUppercase} inappropriately expands the double
164 \changes{4.1h}{2009/10/09}{(AO, 540) Remove expiry code in the release software}%
165 \changes{4.1i}{2009/10/23}{(AO, 541) Defer assignment of \cs{cite} until after natbib loads}
166 \changes{4.1j}{2009/10/24}{(AO, 549) Repairing natbib's \cs{BibitemShut} and \cs{bibAnnote}}
167 \changes{4.1j}{2009/10/25}{(AO, 545) hypertext capabilities off by default; enable with \classo
168 \changes{4.1j}{2009/10/25}{(AO, 552) Repair spacing in \cs{onlinecite}}
169 \changes{4.1k}{2009/11/06}{(AO, 554) give the \cs{newlabel} command syntax appropriate to the h
170 \changes{4.1n}{2009/11/06}{(AO, 565) restore 4.0 behavior: invoking class option preprint impli
171 \changes{4.1n}{2009/11/30}{(AO, 566) restore 4.0 behavior: flush column bottoms}
172 \changes{4.1n}{2009/12/05}{(AO, 569) Use of \classname{hyperref} interferes with column balanci
173 \changes{4.1n}{2009/12/09}{(AO, 569) execute the after-last-shipout procedures from within the
174 \changes{4.1n}{2010/01/02}{(AO, 571) Interface \cs{set@footnotewidth} for determining the set w
175 \changes{4.1n}{2010/01/02}{(AO, 572) Independent footnote counter for title block. Abstract foo
176 \changes{4.1n}{2009/12/13}{(AO, 573) arrange to load \classname{lineno} after any other package
177 \changes{4.1n}{2010/01/04}{(AO, 575) the default for journal prstper is longbibliography}%
178 \changes{4.1n}{2010/01/04}{(AO, 576) In .bst files, remove support for the annote field}%
179 \changes{4.1n}{2010/01/02}{(AO, 571) fine-tune spacing above and below widetext}%
180 \changes{4.1n}{2010/01/02}{(AO, 571) class file must set \cs{splittopskip}; fine tune \cs{skip}
181 \changes{4.1n}{2010/01/02}{(AO, 572) \cs{@makefntext} and \cs{frontmatter@makefntext} must be d
182 \changes{4.1o}{2010/02/02}{(AO, 575) Automatically incorporate the (Bib\TeX-generated) .bbl int
183 \changes{4.1o}{2010/02/05}{(AO, 549) Remove patch to natbib, which is now at version 8.31a}
184 \changes{4.1o}{2010/02/07}{(AO, 578) accommodate the possible space character preceding \cs{Bib
185 \changes{4.1o}{2010/02/05}{(AO, 579) Endnote shall comprise their own Bib\TeX\ entry type: @FOO
186 \changes{4.1o}{2010/02/10}{(AO, 580) Provide a document class option to turn off production of
187 \changes{4.1o}{2010/02/12}{(AO, 580) Control .bst at run time.}%
188 \changes{4.1o}{2010/02/09}{(AO, 581) Handle case: merged references, with first ending in a sto
189 \changes{4.1p}{2010/02/24}{(AO, 583) Provide interface to \classname{ltxgrid} \cs{onecolumn@gr
190 \changes{4.1p}{2010/02/24}{(AO, 584) Per MD, remove trailing space character from each journal
191 \changes{4.1q}{2010/04/01}{(AO, 586) When .bbl is pasted into the document, prevent automatic b
192 \changes{4.1q}{2010/04/13}{(AO, 588) Only write \revtex-specific BibTeX .bib data if the .bst s
193 \changes{4.1r}{2010/06/22}{(AO, 595) Provide \cs{lovname} along with other List of Videos defin
194
195 \end{filecontents*}

```

3.2 The Document Body

Here is the document body, containing only a `\DocInput` directive—referring to this very file. This very cute self-reference is a common `ltxdoc` idiom.

```

196 \begin{document}%
197 \expandafter\DocInput\expandafter{\jobname.dtx}%

```

```
198 \PrintChanges
199 \end{document}
```

And that is the end of the driver for the programmer's documentation.
200 %</doc>

4 Overview

REVT_EX is a L^AT_EX 2_ε document class, somewhat like a hybrid of the standard L^AT_EX `book` and `article` classes.

Certain packages are (should be) loaded by this class in any case: `amssymb`, `amsmath`, `bm`, `natbib`.

Certain packages are automatically loaded by this class when a corresponding class option has been invoked:

REVT _E X option	package
<code>amsfonts</code>	<code>amsfonts</code>
<code>amssymb</code>	<code>amssymb</code>
<code>aps</code>	<code>overcite</code>

Certain other packages are to be loaded by the document through explicit use of `\usepackage`. Some mentioned in the user documentation are `graphicx`, `longtable`, `hyperref`, and `bm`.

Certain commonly used packages are known to be incompatible with REVT_EX, among them `multicol` and `cite`. If such a package is found to be loaded, REVT_EX issues an error message and halts the job. Halting might be considered severe punishment for loading an incompatible package, but if we were to proceed, an even weirder error might be encountered further down the road.

This document class implements the substyle: a set of mutually exclusive class options that, in this case, allow the document class to address multiple societies. It also implements a sub-substyle, giving the journal of the given society. Any society may create a substyle; this file generates one for `aps`.

FIXME: should always load the `graphicx` package. No, allow user to load whichever graphics package is desired.

QUERY: since `amsfonts` and `amssymb` extend syntax, why not load them in any case?

Certain processing occurs at the endgame for reading in REVT_EX, thereby establishing precedence for assignments to L^AT_EX's (and REVT_EX's) parameters:

1. Figure out which society is operative and read in the indicated `.rtx` file.
2. Figure out which journal option is operative and execute the indicated journal command. This may lead to reading in a journal substyle `.rtx` file.
3. Figure out which pointsize is operative and execute the indicated pointsize command. This may lead to reading in a pointsize `.rtx` file.
4. Execute all of the document's options, in the order declared within the document.

5. Read in all required packages (like `natbib`, `amsmath`, `amssymb`), that were determined by class, society, and journal.
6. The last required package, if existing, is the document's style file, the `.rty` file. Note that the `.rty` file can override the assignments of `REVTEX`, `society`, `journal`, and required packages, and even load its own packages. It can also, via appendations to `\setup@hook`, override the setup code itself.
7. Execute all of the setup code accumulated. Such code can be queued by `REVTEX` itself, by the `society`, by the `journal`, or by the `pointsize`.
8. At this point, `REVTEX` has completed the process of inputting itself, and `LATEX` will now execute the `\AtEndOfClass` procedures.

`REVTEX` will have enqueued code to execute at `\AtBeginDocument` time, in two different queues. `\document@inithook` executes immediately upon encountering the `\begin{document}` statement, `\class@documenthook` at the end of all the code enqueued via `\AtBeginDocument`.

1. Install procedures to execute at the very end of the class's `\AtBeginDocument` processing, such as
 - (a) closing out the page grid
 - (b) putting out the `LastPage` label.
 - (c) issuing a `\bibliographystyle` command, based on the value set by the `society` substyle.
 - (d) setting default values for parameters used in the document. **FIXME:** differentiate between class's parameters that can wait until they are used in the document, and parameters that are used at `\AtBeginDocument` time.
2. Install procedures to execute the very last at `\AtEndDocument` time, such as the `\clearpage` processing.

Certain events are optionally scheduled for `\AtBeginDocument` time:

1. Setting default values for the Booleans and for other procedures used in formatting.
2. In response to class options options, adjusting parameters and procedures used in formatting.
3. Implementing the `eqsecnum` option, if required.
4. Setting the state engine for data commands.
5. Memorizing procedures for later use.
6. Setting type size and area, for use by later calculations.

Certain events are scheduled for `\class@enddocumenthook` time:

1. Print out the migrated floats or the end notes, if needed.
2. Close out the page grid.
3. Label the last page of the document
4. (`natbib`) prepare to read in the `.aux` file.

5 Writing journal-specific extensions to REVTeX

With this version of REVTeX, we introduce a somewhat different scheme for adapting REVTeX to the needs of a specific journal.

To create a journal substyle, you create new class options in REVTeX for the society, say `osa`, and any of that society's journals, one of which is, say, `josaa`, using the code for the APS as a guide. In particular, each of your new options should separately define `\@society` and `\@journal`. That for the former will be the same for all options relating to a particular society.

Then, for the society, you create a corresponding `.rtx` file, in our case `osa.rtx`. Within that file, you override procedures and parameter assignments as you see fit. Ideally they will be generally applicable to all of that society's journals (see the file `aps.rtx` for a realization of this scheme). Also within that file, you include a section of code for each journal, that for `josaa` looks like:

```
% \@ifx{\@journal\journal@josaa}{%
% code specific to the josaa
% }{}%
%
```

Thus far, the scheme is similar to that used in REVTeX 3.1. However, the new scheme does differ from the old in that the `.rtx` file should define no syntactical extensions to REVTeX.

6 The revtex4 Document Class

Above, we took advantage of 1) the L^AT_EX definition of `\ProvidesPackage` and 2) that the line of code immediately afterwards follows the `\ProvidesClass` statement above.

```
201 %<*kernel>
```

Print a banner in the log:

```
202 \GenericInfo{}\space
203 Copyright (c) 2009 The American Physical Society.^J
204 mailto:revtex@aps.org^J
205 Licensed under the LPPL:^^Jhttp://www.ctan.org/tex-archive/macros/latex/base/lppl.txt^^J
206 Arthur Ogawa <arthur_ogawa at sbcglobal dot net>^^J
207 Based on work by David Carlisle <david at dcarlisle.demon.co.uk>%
```

```
208 \@gobble
209 }%
```

6.1 Compatibility Processing

If the document has `\documentstyle{revtex4}`, then, instead of attempting to run in compatibility mode, just complain and exit.

```
210 \ifcompatibility
211   \edef\reserved@a{\errhelp{%
212     Change your \string\documentstyle\space statement to
213     \string\documentclass\space and rerun.
214   }}\reserved@a
215   \errmessage{You cannot run \class@name\space in compatibility mode}%
216   \expandafter\@end
217 \fi
```

7 Extensions to the L^AT_EX Kernel

```
218 %</kernel>
```

Here, we incorporate the utility, frontmatter, and page grid packages. The `ltxutil`, `ltxfront`, and `ltxgrid` source are distributed with REV_TE_X.

Here begins the options DOCSTRIP module.

```
219 %<*options>
```

7.1 Hooks

`\setup@hook` The procedure `\setup@hook` serves as the vehicle for all code that gives values to the class's parameters once all the society, journal, options, and packages have been processed.

Arrange for journal substyles to set their own default values.

```
220 \let\setup@hook\@empty
```

After preamble processing is complete, detect whether package `longtable` has been loaded and patch it.

```
221 \appdef\document@inithook{%
222   \switch@longtable
223   \let\LT@makecaption\LT@makecaption@rtx
224 }%
```

`\LT@makecaption` We override the caption processing method of the `longtable` package: space below the caption is created via strut instead of whitespace.

```
225 \def\LT@makecaption@rtx#1#2#3{%
226   \LT@mcol\LT@cols c{%
227     \hbox to\z@{%
228       \hss
229       \parbox[t]\LTcapwidth{%
230         \sbox\@tempboxa{#1{#2: }#3\unskip\nobreak\vrule\@width\z@\@height\z@\@depth .5\baselineskip
```

```

231     \ifdim\wd\@tempboxa>\hsize
232         #1{#2: }#3\unskip\nobreak\vrule\@width\z@\@height\z@\@depth .5\baselineskip
233     \else
234         \hbox to\hsize{\hfil\box\@tempboxa\hfil}%
235     \fi
236     \endgraf
237 }%
238 \hss
239 }%
240 }%
241 }%

\robust@boldmath Robustify the \boldmathcommand. If Team LATEX (or any package) ever gets
around to fixing this problem, we will bow out. (This fix relates to bug #394.)
242 \def\protectdef@boldmath{%
243 \expandafter\@ifnotrelax\csname boldmath \endcsname{}-{}%
244 \class@info{Robustifying \string\LaTeX's \string\boldmath\space command}%
245 \expandafter\let\csname boldmath \endcsname\boldmath
246 \expandafter\def\expandafter\boldmath\expandafter{\expandafter\protect\csname boldmath \endcs
247 }%
248 }%
249 \appdef\document@inithook{%
250 \protectdef@boldmath
251 }%

```

8 Compatability with the geometry package

The `geometry` package of Hideo Umeki provides a way to specify the metrics of the media and page layout. We want to ensure that REV_TE_X does not foreclose on the use of this or any other such package, nor to interfere with explicit assignments of such metric parameters within the document preamble.

The L^AT_EX parameters (resp. T_EX primitives) set by `geometry` are: `\paperwidth`, `\paperheight`, `\textwidth`, `\textheight`, `\topmargin`, `\headheight`, `\headsep`, `\footskip`, `\skip\footins`, `\marginparwidth`, `\marginparsep`, `\oddsidemargin`, `\evensidemargin`, `\columnsep`, `\hoffset`, `\voffset`, `\mag`, `\if@twocolumn`, `\if@twoside`, `\if@mparswitch`, `\if@reversemargin`,

REV_TE_X's assignments can be overridden by any package or other statement in the document preamble, so it should be compatible.

FIXME: one parameter is rendered semantically void (by `ltxgrid.dtx`): `\if@twocolumn`.

9 Options

9.1 Define Booleans Used in Options

The following Booleans are used within the document class to allow the document or the substyle to make selections of formatting. An explicit document class option

overrides an assignment made by a substyle.

9.2 Declare Options

9.2.1 Checkin: for Editorial Use

A document class option declaring that the document is being processed by the editorial staff.

This option should:

- put date in footer along with folio
- Have the effect of selecting the `preprint` class option.
- Have the effect of selecting the `showpacs` class option.
- specify that when a float is placed `h` or `H`, it will be allowed to break over pages. (Note: be sure that if the enclosed `tabular` has an optional argument, you change it to `[v]`, or remove it entirely.)

```
252 \DeclareOption{checkin}{%
253   \@booleantrue\dateinRH@sw
254   \@booleantrue\preprintsty@sw
255   \def\@pointsize{12}%
256   \@booleantrue\showPACS@sw
257   \@booleantrue\showKEYS@sw
258   \def\fp@proc@h{\allow@breaking@tables}%
259   \def\fp@proc@H{\allow@breaking@tables}%
260 }%
261 \@booleanfalse\dateinRH@sw
262 \def\checkindate{\dateinRH@sw{\tiny(\today)}}{}%
263 \def\allow@breaking@tables{%
264   \def\array@default{v}% tabular can break over pages
265   \@booleanfalse\floats@sw % table can break over pages
266 }%
```

9.2.2 Preprint Style

`\preprintsty@sw` The boolean `\preprintsty@sw` signifies that the document is to be formatted in preprint style.

```
267 \DeclareOption{preprint}{%
268   \@booleantrue\preprintsty@sw
269   \ExecuteOptions{12pt}%
270 }%
271 \DeclareOption{reprint}{%
272   \@booleanfalse\preprintsty@sw
273   \@booleantrue\twocolumn@sw
274   \ExecuteOptions{10pt}%
275 }%
276 \DeclareOption{manuscript}{%
```

```

277 \class@warn{Document class option manuscript is obsolete; use preprint instead}%
278 \ExecuteOptions{preprint}%
279 }%
280 \@booleanfalse\preprintsty@sw

```

`\showPACS@sw` If `\showPACS@sw` is true, print the PACS information in the title block, otherwise
`\showKEYS@sw` not. Similarly for `\showKEYS@sw` and the keywords.

9.2.3 Showing PACS and keywords

```

281 \DeclareOption{showpacs}{%
282   \@booleantrue\showPACS@sw
283 }%
284 \DeclareOption{noshowpacs}{%
285   \@booleanfalse\showPACS@sw
286 }%
287 \DeclareOption{showkeys}{%
288   \@booleantrue\showKEYS@sw
289 }%
290 \DeclareOption{noshowkeys}{%
291   \@booleanfalse\showKEYS@sw
292 }%
293 \@booleanfalse\showPACS@sw
294 \@booleanfalse\showKEYS@sw

```

9.2.4 Balance the last page when in two-column page grid

`\balancelastpage@sw` If we are in a two-column page grid, we may wish to balance the columns of the last page. This will be done automatically if the `twocolumn` document class option is chosen. This action will be turned off by the `nobalancelastpage`. A complementary class option, `balancelastpage` is also provided.

```

295 \DeclareOption{balancelastpage}{%
296   \@booleantrue\balancelastpage@sw
297 }%
298 \DeclareOption{nobalancelastpage}{%
299   \@booleanfalse\balancelastpage@sw
300 }%
301 \@booleantrue\balancelastpage@sw

```

9.2.5 Showing preprint numbers

`\preprint@sw` The boolean `\preprint@sw` signifies that the preprints (cf. `\preprint`) are to be formatted (usually on the title page). The option `preprintnumbers` declares to do so, `nopreprintnumbers` declares not to; the default is to follow `\preprintsty@sw`.

```

302 \DeclareOption{nopreprintnumbers}{\@booleanfalse\preprint@sw}%
303 \DeclareOption{preprintnumbers}{\@booleantrue\preprint@sw}%
304 \appdef\setup@hook{%
305   \@ifundefined\preprint@sw{\let\preprint@sw\preprintsty@sw}{}%
306 }%

```

9.2.6 Hypertext Option

```
307 \DeclareOption{hyperref}{%
```

The following code had been commented out, it is now truly a comment:

```
%\AtEndOfClass{%  
% \begingroup  
% \edef\@tempa{%  
% \let  
% \noexpand\@clsextension  
% \noexpand\@empty  
% \noexpand\RequirePackage{hyperref}%  
% \def\noexpand  
% \@clsextension{\@clsextension}%  
% }%  
% \expandafter  
% \endgroup  
% \@tempa  
%}%  
% \def\@pointsize{10}%  
%
```

If you have a hyper-foo enabled browser you may prefer this format which does not print the URL for the home page, but just makes the name a link, but by default print it so it works on paper.

```
308 \class@warn{Class option "hyperref" is no longer supported.^^JEmploy \string\usepackage{hyperr  
309 }%
```

9.2.7 Type Size

Use `\@pointsize=10` rather than `\@ptsize=0` to allow easy extensions to 9pt or whatever. Note: the three alternatives are mutually exclusive.

At this point, the parameter `\@pointsize` is set to `\undefined`: a society *must* give it a definition.

```
310 \DeclareOption{10pt}{\def\@pointsize{10}}%  
311 \DeclareOption{11pt}{\def\@pointsize{11}}%  
312 \DeclareOption{12pt}{\def\@pointsize{12}}%  
313 \let\@pointsize\undefined
```

9.2.8 Media Size

```
\paperheight  
\paperwidth 314 \DeclareOption{a4paper}{%  
315 \setlength\paperheight {297mm}%  
316 \setlength\paperwidth {210mm}%  
317 }%  
318 \DeclareOption{a5paper}{%  
319 \setlength\paperheight {210mm}%  
320 \setlength\paperwidth {148mm}%
```

```

321 }%
322 \DeclareOption{b5paper}{%
323     \setlength\paperheight {250mm}%
324     \setlength\paperwidth  {176mm}%
325 }%
326 \DeclareOption{letterpaper}{%
327     \setlength\paperheight {11in}%
328     \setlength\paperwidth  {8.5in}%
329 }%
330 \DeclareOption{legalpaper}{%
331     \setlength\paperheight {14in}%
332     \setlength\paperwidth  {8.5in}%
333 }%
334 \DeclareOption{executivepaper}{%
335     \setlength\paperheight {10.5in}%
336     \setlength\paperwidth  {7.25in}%
337 }%
338 \DeclareOption{landscape}{%
339     \setlength\@tempdima  {\paperheight}%
340     \setlength\paperheight {\paperwidth}%
341     \setlength\paperwidth  {\@tempdima}%
342 }%
    Effectively select letterpaper.
343 \ds@letterpaper

```

9.2.9 Bibnotes

`\frontmatter@footnote@produce` Frontmatter footnotes result from frontmatter commands like `\email`, `\homepage`, `\altaffiliation`, and `\thanks`. The default for `\frontmatter@footnote@produce` is `\frontmatter@footnote@produce@footnote`, which formats the frontmatter footnotes at the foot of the title page. The `bibnotes` class option defers them to the bibliography.

```

344 \DeclareOption{bibnotes}{\let\frontmatter@footnote@produce\frontmatter@footnote@produce@endnote}
345 \DeclareOption{nobibnotes}{\let\frontmatter@footnote@produce\frontmatter@footnote@produce@footnote}
346 \let\frontmatter@footnote@produce\frontmatter@footnote@produce@footnote
347 \appdef\class@enddocumenthook{\auto@bib}%

```

9.2.10 Footinbib

`\footinbib@sw` The boolean `\footinbib@sw` signifies that text footnotes are to be set in the bibliography, as endnotes.

The document may set the value one way or the other via the following two class options.

```

348 \DeclareOption{footinbib}{\@booleantrue\footinbib@sw}
349 \DeclareOption{nofootinbib}{\@booleanfalse\footinbib@sw}

```

The default value is `\false@sw`, and the society or journal may override the default.

```

350 \@booleanfalse\footinbib@sw

```

9.2.11 `altaffilletter`

`\altaffilletter@sw` Determine the procedure `\thefootnote` used in frontmatter: the footnote symbol used in titlepage footnotes.

```
351 \DeclareOption{altaffilletter}{\@booleantrue\altaffilletter@sw}%
352 \DeclareOption{altaffilsymbol}{\@booleanfalse\altaffilletter@sw}%
353 \@booleanfalse\altaffilletter@sw
```

9.2.12 `superbib`

`\place@bibnumber` The procedure `\place@bibnumber` produces the number at the head of the `\bibitem`, in the bibliography. By default, it has the `\bibnumfmt` meaning assigned by the `natbib` package. It may be overridden by `society`, `journal`, or by the document options.

```
354 \DeclareOption{superbib}{%
355 \let\place@bibnumber\place@bibnumber@sup
356 }%
357 \def\place@bibnumber{\NATx@bibnumfmt}%
```

`\place@bibnumber@sup` For producing the `\bibitem` device, we define two procedures to select from.
`\place@bibnumber@inl` Note that we could have used `natbib`'s `\ifNAT@super` switch, but it does not allow for altering the meaning of `\bibnumfmt`.

```
358 \def\place@bibnumber@sup#1{\textsuperscript{#1}}%
359 \def\place@bibnumber@inl#1{[#1]}%
```

9.2.13 `citeautoscript`

`\citeautoscript@sw` This class option allows you to automatically accommodate a change from non-superscripted, numbered references to superscripted, numbered references.

Note: you should always mark up your document with the assumption that references are *not* going to be superscripted. Otherwise this option has no hope of working properly.

```
360 \DeclareOption{citeautoscript}{\@booleantrue\citeautoscript@sw}%
361 \@booleanfalse\citeautoscript@sw
```

9.2.14 Variants on the Bibliography Style

REVT_EX anticipates that a society or journal will provide two related Bib_TE_X bibliography style variants, designating one as the default. A pair of document class options `longbibliography` and `nolongbibliography` allows the user to explicitly select between them.

`\longbibliography@sw` REVT_EX's default for `\longbibliography@sw` is `\false@sw`.

```
362 \DeclareOption{longbibliography}{\@booleantrue\longbibliography@sw}%
363 \DeclareOption{nolongbibliography}{\@booleanfalse\longbibliography@sw}%
364 \@booleanfalse\longbibliography@sw
```

`\eprint@enable@sw` The document class options `eprint` and `noeprint` give the user the ability to turn off production of the `eprint` field in the bibliography.

```

365 \DeclareOption{eprint}{\@booleantrue\eprint@enable@sw}%
366 \DeclareOption{noeprint}{\@booleanfalse\eprint@enable@sw}%
367 \@booleantrue\eprint@enable@sw

```

9.2.15 Simplex/Duplex Pages

`\twoside@sw` The flag `\twoside@sw` signifies that the document is to be formatted for duplex printing. After the preamble is processed, we align the value of the kernel `\newif` switch `\if@twoside` to that of `\twoside@sw`. `\if@twoside` itself is used in the kernel's `\cleardoublepage` and `\@outputpage` procedures.

```

368 \@booleanfalse\twoside@sw
369 \appdef\document@inithook{%
370 \twoside@sw{\@twosidetrue}{\@twosidefalse}%
371 }%

```

The complementary options `twoside` and `oneside` assert formatting for duplex or simplex printing, respectively. At the same time, we arrange for the selection of the page grid with respect to the marginal column: Because `\if@reversemargin` remains default (false), if duplex printing, this column will always be on the (right), if simplex printing, it will always be on the (outside). QUERY: correct choice? FIXME: assign `\if@mparswitch` later (and protect the assignment, too).

```

372 \DeclareOption{twoside}{\@booleantrue \twoside@sw\@mparswitchfalse}%
373 \DeclareOption{oneside}{\@booleanfalse\twoside@sw\@mparswitchtrue}%

```

9.2.16 Two-Column Page Grid

`\twocolumn@sw` The flag `\twocolumn@sw` signifies that the document is to be formatted in the two-column page grid.

If no options relating to page grid are invoked by `\AtBeginDcoument` time, we set default values. Up to that point, the class can check if `\twocolumn@sw` is `\undefined` to see if any related options have been invoked.

`onecolumn` specifies one-column page grid. The `twocolumn` class option employs the standard mechanism for changing the column grid: the `ltxgrid` package.

```

374 \DeclareOption{onecolumn}{\@booleanfalse\twocolumn@sw}%
375 \DeclareOption{twocolumn}{\@booleantrue \twocolumn@sw}%
376 \@booleanfalse\twocolumn@sw

```

The column grid is determined by the state of the switch `\twocolumn@sw` and is effected at `\class@documenthook` time. The society or journal file may re-define `\select@column@grid` to accomodate, e.g., more than two choices for the page grid.

Note that `\open@column@two` adds items to the Main Vertical List, so constitutes the true beginning of the document.

Note also that if the selected column grid is a one-column grid, there is nothing to do, because `ltxgrid` has already set that up via `\@begindocumenthook`.

```

377 \def\select@column@grid{%

```

```

378 \twocolumn@sw{%
379 \twocolumn@grid@setup
380 \open@twocolumn
381 }{%
382 \onecolumn@grid@setup

% \open@onecolumn
%

383 }%
384 }%
385 \appdef\class@documenthook{%
386 \select@column@grid
387 }%

```

`\clear@document` We install into `\class@enddocumenthook` a trap for the procedure `\clearpage` that attempts to end the current page. This procedure needs to be headpatched with `\close@column` to end the current page grid.

This procedure is executed after all typesetting is complete i.e., after items like `\printtables`, as well as all commands queued up by `\AtEndDocument`.

```

388 \appdef\setup@hook{%
389 \let\clearpage@ltx\clearpage
390 \prepdef\clear@document{\let\clearpage\clearpage@ltx\let\clear@document\@empty\close@column}%
391 \appdef\class@documenthook{%
392 \appdef\class@enddocumenthook{%
393 \let\clearpage\clear@document
394 }%
395 }%
396 }%

```

`\authoryear@sw` The boolean `\authoryear@sw` signifies that we are to use author-year citations rather than numerical citations.

The `author-year` class option selects “author-year” citations; `numerical` selects “numerical” citations. The former is the default.

```

397 \DeclareOption{author-year}{\@booleantrue\authoryear@sw}%
398 \DeclareOption{numerical}{\@booleanfalse\authoryear@sw}%
399 \@booleanfalse\authoryear@sw

```

`\galley@sw` The boolean `\galley@sw` signifies that the document is to be formatted in galley style.

Asserting both `\galley@sw` and `\preprintsty@sw` may produce strange formatting results, but it is not illegal. However, it *is* illegal to assert galley and any `twocolumn` option.

`galley` emulates setting the galleys of a two-column journal. CHANGED: this option should effectively set `\preprintsty@sw` false. NOTE: it makes no sense to assert both galley and `twocolumn`.

```

400 \DeclareOption{galley}{%
401 \ExecuteOptions{onecolumn}%

```

```

402 \@booleantrue\galley@sw
403 \@booleanfalse\preprintsty@sw
404 \appdef\setup@hook{%
405   \advance\textwidth-\columnsep
406   \textwidth.5\textwidth
407 }%
408 }%
409 \@booleanfalse\galley@sw

```

9.2.17 raggedbottom or flushbottom

`\raggedcolumn@sw` The class options `raggedbottom` and `flushbottom` determine whether the columns (page) are ragged bottom or flush bottom. Note that we do not select a default here; that is done by the journal substyle.

```

410 \DeclareOption{raggedbottom}{\@booleantrue\raggedcolumn@sw}
411 \DeclareOption{flushbottom}{\@booleanfalse\raggedcolumn@sw}
412 \@booleanfalse\raggedcolumn@sw
413 \appdef\setup@hook{%
414   \raggedcolumn@sw{raggedbottom}{flushbottom}%
415 }%

```

9.2.18 tightenlines

This class option specifies that standard leading is to be used to set the type. If lacking, the leading will be loose.

`\tightenlines@sw` The boolean `\tightenlines@sw` signifies that the leading is to be made standard amount. If false, it means that the leading is to be set extra open. Has no effect on 10pt size option.

```

416 \DeclareOption{tightenlines}{\@booleantrue\tightenlines@sw}
417 \@booleanfalse\tightenlines@sw

```

9.2.19 lengthcheck

`\lengthcheck@sw` The flag `\lengthcheck@sw` signifies that the length checking is in effect. It is up to the individual journal substyle to alter its formatting accordingly.

```

418 \@booleanfalse\lengthcheck@sw

```

This class option specifies that the formatted document should approach as closely as possible the formatting of an actual journal article to facilitate the author's performance of a length check.

FIXME: society or journal may have its own definition of this option.

```

419 \DeclareOption{lengthcheck}{%
420   \@booleantrue\lengthcheck@sw
421   \ExecuteOptions{reprint}%
422 }%

```

In addition, if length checking is in effect, we will enable the tally of text length.

```
423 \appdef\setup@hook{%
424 \lengthcheck@sw{\@booleantrue\tally@box@size@sw}{}%
425 }%
```

9.2.20 Draft and Final

`\draft@sw` The flag `\draft@sw` signifies that the document is to be formatted in draft mode.

```
426 \appdef\setup@hook{%
427 \draft@sw{\overfullrule 5\p@}{\overfullrule\z@}%
428 }%
```

Certain packages may pay attention to the class option `draft` that sets this Boolean.

```
429 \DeclareOption{draft}{\@booleantrue\draft@sw}%
430 \DeclareOption{final}{\@booleanfalse\draft@sw}%
431 \@booleanfalse\draft@sw
```

9.2.21 eqsecnum

`\eqsecnum@sw` The flag `\eqsecnum@sw` signifies that equations are to be numbered with the section, e.g., “Eq. (2.13)”.

```
432 \appdef\setup@hook{%
433 \eqsecnum@sw{%
434 \@addtoreset{equation}{section}%
435 \def\theequation@prefix{\arabic{section}.}%
436 }-%
437 }%
```

The `eqsecnum` class option signifies that equations are to be numbered within sections.

```
438 \DeclareOption{eqsecnum}{\@booleantrue\eqsecnum@sw}%
439 \@booleanfalse\eqsecnum@sw
```

9.2.22 secnumarabic

The `secnumarabic` class option signifies that sectioning commands are to be numbered arabic: the procedure `\secnums@arabic` is executed as the default. Otherwise, the procedure `\secnums@rtx` determines things. The society or journal may redefine either procedure, and may change the definition of `\setup@secnums` itself, thereby establishing a different default.

```
440 \appdef\setup@hook{%
441 \setup@secnums
442 }%
443 \DeclareOption{secnumarabic}{%
444 \def\setup@secnums{\secnums@arabic}%
445 }%
446 \def\setup@secnums{\secnums@rtx}%
```

The code that defines `\secnums@rtx` and `\secnums@arabic` appears in Section 14.4.

`fleqn` FIXME: model `fleqn` after `amsfonts`. I no longer understand why I said this. `fleqn.clo` is not a package, so it can simply be `\input`.

```
447 \DeclareOption{fleqn}{%
448   \input{fleqn.clo}%
449 }
```

9.2.23 floats/endfloats

`\floats@sw` The Boolean `\floats@sw` signifies that floats are to be floated; if false, that floats are to be deferred to the end of the document. By default, the former. Note that the state of this Boolean is to be changed by the document class in response to user-selected options.

This boolean and the assignment of its default value is done by the `ltxutil` package.

The Boolean `\floatp@sw` signifies that endfloats are to be set one per page; if false, that endfloats are to be set with multiple floats per page permitted. By default, the latter. Note that the state of this Boolean is to be changed by the document class in response to user-selected options. The default is established here.

These options control, via the Boolean `\floats@sw`, whether floats are to be migrated to the end of the document.

```
450 \DeclareOption{floats}{\@booleantrue\floats@sw\@booleanfalse\floatp@sw}
451 \DeclareOption{endfloats}{\@booleanfalse\floats@sw\@booleanfalse\floatp@sw}
452 \DeclareOption{endfloats*}{\@booleanfalse\floats@sw\@booleantrue\floatp@sw}
453 \@booleantrue\floats@sw
454 \@booleantrue\floatp@sw
```

9.2.24 titlepage/notitlepage

These options control, via `\titlepage@sw`, whether the title block is to be set on a separate page.

`\titlepage@sw` The flag `\titlepage@sw` signifies that a forced page break is to follow the title page: the article title appears on a page by itself.

```
455 \DeclareOption{titlepage}{\@booleantrue\titlepage@sw}
456 \DeclareOption{notitlepage}{\@booleanfalse\titlepage@sw}
457 \@booleanfalse\titlepage@sw
```

9.2.25 Substyle and Sub-substyle

`\change@society` If the society or, resp., journal has already been assigned, notify user whether it is being overridden.

```
458 \def\change@society#1{%
459   \def\@tempa{#1}%
```

```

460 \ifxundefined\@society{%
461 \class@info{Selecting society \@tempa}%
462 \let\@society\@tempa
463 }{%
464 \ifx{\@tempa\@society}{-}{%
465 \class@warn{Conflicting society \@tempa<>\@society; not selected}%
466 }%
467 }%
468 }%
469 \def\change@journal#1{%
470 \def\@tempa{#1}%
471 \ifxundefined\@journal{%
472 \class@info{Selecting journal \@tempa}%
473 \let\@journal\@tempa
474 }{%
475 \ifx{\@tempa\@journal}{-}{%
476 \class@warn{Conflicting journal \@tempa<>\@journal; not selected}%
477 }%
478 }%
479 }%

```

Here had been the class options relating to the APS. Now that all societies are on an equal footing, this code is in the respective .rtx file.

9.2.26 Optical Society of America

Here are the class options relating to the Optical Society of America.

Note: as of 2008, the only OSA module being distributed by ctan is `osajnl.rtx`. The class options declared here are, I think, unused.

```

480 \DeclareOption{osa}{\change@society{osa}\let\@journal\undefined}%
481 \DeclareOption{osameet}{\change@society{osa}\def\@journal{osameet}}%
482 \DeclareOption{opex}{\change@society{osa}\def\@journal{opex}}%
483 \DeclareOption{tops}{\change@society{osa}\def\@journal{tops}}%
484 \DeclareOption{josa}{\change@society{osa}\def\@journal{josa}}%

```

`\rtx@require@packages` The procedure `\rtx@require@packages` accumulates all `\RequirePackage` statements in the course of loading the document class. Carrying out these operations at that time is needed: `\ProcessOptions` must be executed first.

```

485 \let\rtx@require@packages\@empty

```

`\MakeUppercase` We load the `textcase` package of David Carlisle. Now that its bug of long standing has been repaired, we no longer need to doctor it up. And, because its loading has been deferred until `\rtx@require@packages` time, we no longer override \LaTeX here. Instead, the `textcase` package will be asked to do that.

`\MakeLowercase`

```

486 \appdef\rtx@require@packages{%
487 \RequirePackage[overload]{textcase}%
488 }%

```

The following code used to let the `textcase` commands override those of \LaTeX :

```

%\appdef\setup@hook{%
% \expandafter
% \let\csname MakeUppercase \expandafter\endcsname
%   \csname MakeTextUppercase \endcsname
% \expandafter
% \let\csname MakeLowercase \expandafter\endcsname
%   \csname MakeTextLowercase \endcsname
% }%
%
```

amsfonts The class option `amsfonts` has the same effect as if the document preamble contained a `\usepackage{amsfonts}` statement.

```

489 \DeclareOption{amsfonts}{%
490   \def\class@amsfonts{\RequirePackage{amsfonts}}%
491 }%
492 \DeclareOption{noamsfonts}{%
493   \let\class@amsfonts\@empty
494 }%
495 \appdef\rtx@require@packages{%
496   \@ifundefined\class@amsfonts{}{\class@amsfonts}%
497 }%
```

amssymb The class option `amssymb` has the same effect as if the document preamble contained a `\usepackage{amssymb}` statement.

```

498 \DeclareOption{amssymb}{%
499   \def\class@amssymb{\RequirePackage{amssymb}}%
500 }%
501 \DeclareOption{noamssymb}{%
502   \let\class@amssymb\@empty
503 }%
504 \appdef\rtx@require@packages{%
505   \@ifundefined\class@amssymb{}{\class@amssymb}%
506 }%
```

amsmath The class option `amsmath` has the same effect as if the document preamble contained a `\usepackage{amsmath}` statement.

We require version 1.2 (dated 1997/03/20) or later. The `\ver@amsmath.sty`, will

\LaTeX note: Certain \LaTeX procedures have an arbitrary and pointless restriction that they may be used only within the preamble. We get around this by preserving the procedures in private `\csnames`.

FIXME note: it is difficult to ensure that an error summary will be printed on the console at the very end, but `ltxgrid` allows accomplishing this via an interrupt, put down at `\AtEndDocument` time.

```

507 \DeclareOption{amsmath}{%
508   \def\class@amsmath{\RequirePackage{amsmath}[\ver@amsmath@prefer]}%
509 }%
510 \DeclareOption{noamsmath}{%
```

```

511 \let\class@amsmath\@empty
512 }%
513 \appdef\rtx@require@packages{%
514 \preserve@LaTeX
515 \@ifundefined\class@amsmath{}\class@amsmath}%
516 \appdef\class@enddocumenthook{\test@amsmath@ver}%
517 }%
518 \appdef\preserve@LaTeX{%
519 \let\@ifl@aded@LaTeX\@ifl@aded
520 \let\@ifpackageloaded@LaTeX\@ifpackageloaded
521 \let\@pkgextension@LaTeX\@pkgextension
522 \let\@ifpackagelater@LaTeX\@ifpackagelater
523 \let\@ifl@ter@LaTeX\@ifl@ter
524 \let\@ifl@t@r@LaTeX\@ifl@t@r
525 \let\@parse@version@LaTeX\@parse@version
526 }%
527 \appdef\restore@LaTeX{%
528 \let\@ifl@aded\@ifl@aded@LaTeX
529 \let\@ifpackageloaded\@ifpackageloaded@LaTeX
530 \let\@pkgextension\@pkgextension@LaTeX
531 \let\@ifpackagelater\@ifpackagelater@LaTeX
532 \let\@ifl@ter\@ifl@ter@LaTeX
533 \let\@ifl@t@r\@ifl@t@r@LaTeX
534 \let\@parse@version\@parse@version@LaTeX
535 }%
536 \def\test@amsmath@ver{%
537 \begingroup
538 \restore@LaTeX
539 \@ifpackageloaded{amsmath}{%
540 \@ifpackagelater{amsmath}{\ver@amsmath@prefer}{}%
541 \class@warn{%
542 You have loaded amsmath, version "\csname ver@amsmath.sty\endcsname",\MessageBreak
543 but this class requires version "\ver@amsmath@prefer", or later.\MessageBreak
544 Please update your LaTeX installation.
545 }%
546 }%
547 }{%
548 }%
549 \endgroup
550 }%
551 \def\ver@amsmath@prefer{2000/01/15 v2.05 AMS math features}%

```

9.2.27 Presenting Authors and Their Affiliations

Class options for presenting authors and their affiliations are now defined in `ltxfront.dtx`.

9.2.28 Typeset by REVTeX

`\byrevtex@sw` The flag `\byrevtex@sw` signifies that the document should bear an imprint to the effect that it was formatted by this document class.

The class option `byrevtex` signifies that you want the “Typeset by REVTeX” byline to appear on your formatted output. By default, no such byline appears.

```
552 \DeclareOption{byrevtex}{\@booleantrue\byrevtex@sw}%
553 \@booleanfalse\byrevtex@sw
```

9.3 Attempt to fix float placement failure

`\force@deferlist@sw` REVTeX uses the `ltxgrid` package, which provides the ability to attempt repairs when L^AT_EX’s float placement mechanism is about to fail, but that facility is turned off by default. Users should invoke the `floatfix` document class option to enable this L^AT_EX extension. If not, a helpful message is printed in the log, indicating how to work around the difficulty.

```
554 \DeclareOption{floatfix}{\@booleantrue\force@deferlist@sw}%
555 \DeclareOption{nofloatfix}{\@booleanfalse\force@deferlist@sw}%
556 \@booleanfalse\force@deferlist@sw
```

`\@fltovf` The L^AT_EX kernel error message `\@fltovf` may now be a bit more helpful to the user; likewise for the `\@fltstk` message of `ltxgrid`.

```
557 \gdef\@fltovf{%
558   \@latex@error{%
559     Too many unprocessed floats%
560     \force@deferlist@sw}{; try class option [floatfix]}}%
561   }\@ehb
562 }%
563 \def\@fltstk{%
564   \@latex@warning{%
565     A float is stuck (cannot be placed)%
566     \force@deferlist@sw}{; try class option [floatfix]}}%
567   }%
568 }
```

`\ltxgrid@info@sw` The two options `ltxgridinfo` and `outputdebug` turn on informative diagnostics within the package `ltxgrid`. Only people who really want to see this output will select these class options. Consult documentation for the `ltxgrid` package to see what output the related switches enable.

`\outputdebug@sw`

```
569 \DeclareOption{ltxgridinfo}{%
570   \@booleantrue\ltxgrid@info@sw
571   }\@booleantrue\ltxgrid@foot@info@sw
572 }%
573 \DeclareOption{outputdebug}{%
574   \@booleantrue\outputdebug@sw
575   \@booleantrue\ltxgrid@info@sw
576   \@booleantrue\ltxgrid@foot@info@sw
577   \traceoutput
578   }%
```

9.4 Option to relax page height

`\textheight@sw` The `ltxgrid` package can set text pages to their natural height or force them to the full text height; the latter is the default. If setting the pages with a variable length, the running foot will move up or down with the natural length of the text column. While I recommend against doing so, this option will turn that switch to the latter setting.

```
579 \DeclareOption{raggedfooter}{\@booleanfalse\textheight@sw}%
580 \DeclareOption{noraggedfooter}{\@booleantrue\textheight@sw}%
```

9.5 Selecting procedure for processing abstract

Code defining options `newabstract` and `oldabstract` has been removed.

9.6 Option to turn on diagnostics in the frontmatter

`\frontmatterverbose@sw` A diagnostic option, not for the average enduser, which reveals the workings of the frontmatter. This code interfaces to that of `ltxfront.dtx`.

```
581 \DeclareOption{frontmatterverbose}{\@booleantrue\frontmatterverbose@sw}%
582 \@booleanfalse\frontmatterverbose@sw
```

`\linenumbers@sw` An option to number the lines of type in the output in the manner of `lineno`.

At present, we use that very package to implement this functionality. This means that users may modify the workings of that package per its documentation (which see).

However, compatibility with `amsmath` requires that `lineno` be loaded afterwards. Therefore, we defer loading of this package until after the preamble is completed.

```
583 \DeclareOption{linenumbers}{%
584 \appdef
585 \class@documenthook{%
586 \RequirePackage{lineno}[2005/11/02 v4.41]%
587 \linenumbersep4pt\relax
588 \linenumbers\relax
589 }%
590 }%
```

By default, line numbering is off.

`\NAT@merge` Add class option `nomerge`, to turn off `natbib` 8.3 syntax for citation key. The default value of REVTeX 4.1 for `\NAT@merge` is `\thr@@`, which turns on the new syntax along with its semantics. Legacy documents that would be incompatible with the new syntax can be successfully processed with class option `nomerge`.

```
591 \DeclareOption{nomerge}{%
592 \appdef\setup@hook{%
593 \@ifnum{\NAT@merge>\z@}{\let\NAT@merge\z@}{}%
594 }%
595 }%
```

9.7 Default Option, Society, Journal, and pointsize

This change will not break OSA documents because that society is still built in to revtex4.

The procedure `\@parse@class@options@society` parses the options passed to this document class for the `\@society`. It is like `\ProcessOptions*` in that it accesses `\@optionlist{\@currname.\@current}`. Any undefined option is considered: if there is a corresponding .rtx file, it will change the society accordingly and define a placeholder class option for the society thus found (thus preventing a spurious "option not found" message).

The procedure `\@parse@class@options@` parses the document's options for any that set the `\csname` provided.

```

596 \def\@parse@class@options@society{%
597 \edef\@tempa{\@optionlist{\@currname.\@current}}%
598 \expandafter\@for\expandafter\CurrentOption\expandafter:\expandafter=\@tempa\do{%
599 \expandafter\@ifnotrelax\csname ds@\CurrentOption\endcsname}{}%
600 \IfFileExists{\CurrentOption\substyle@post.\substyle@ext}{%
601 \expandafter\change@society\expandafter{\CurrentOption}%
602 \expandafter\let\csname ds@\CurrentOption\endcsname\@empty
603 }{}}%
604 }%
605 }%
606 }%
607 \def\@parse@class@options@#1{%
608 \edef\@tempa{\@optionlist{\@currname.\@current}}%
609 \expandafter\@for\expandafter\CurrentOption\expandafter:\expandafter=\@tempa\do{%
610 \expandafter\@ifnotrelax\csname ds@\CurrentOption\endcsname{%
611 \begingroup\csname ds@\CurrentOption\endcsname
612 \@ifxundefined#1{%
613 \endgroup
614 }{%
615 \expandafter\endgroup\expandafter\def\expandafter#1\expandafter{#1}%
616 }%
617 }{}}%
618 }%
619 }%
620 \def\@parse@class@options@journal{%
621 \edef\@tempa{\@optionlist{\@currname.\@current}}%
622 \expandafter\@for\expandafter\CurrentOption\expandafter:\expandafter=\@tempa\do{%
623 \expandafter\@ifnotrelax\csname ds@\CurrentOption\endcsname{%
624 \begingroup
625 \csname ds@\CurrentOption\endcsname
626 \@ifxundefined\@journal{%
627 \endgroup
628 }{%
629 \expandafter\endgroup\expandafter\def\expandafter\@journal\expandafter{\@journal}%
630 }%
631 }{}}%

```

```

632 }%
633 }%
634 \def\@parse@class@options{%
635 \edef\@tempa{\@optionlist{\@currname.\@current}}%
636 \expandafter\@for\expandafter\CurrentOption\expandafter:\expandafter=\@tempa\do{%
637 \expandafter\@ifnotrelax\csname ds@\CurrentOption\endcsname{%
638 \begingroup
639 \csname ds@\CurrentOption\endcsname
640 \@ifundefined\@pointsize{%
641 \endgroup
642 }{%
643 \expandafter\endgroup\expandafter\def\expandafter\@pointsize\expandafter{\@pointsize}%
644 }%
645 }-%
646 \IfFileExists{\CurrentOption\substyle@post.\substyle@ext}{%
647 \expandafter\change@society\expandafter{\CurrentOption}%
648 \expandafter\let\csname ds@\CurrentOption\endcsname\empty
649 }-%
650 }%
651 }%
652 }%

```

The class option `hypertext` enables the built-in hypertext capabilities, which coincide with those of `custom-bib`-generated BibTeX styles using the guard code `hypertext`.

Note that APS has these capabilities turned off by default; Loading the `hyperref` package turns them on.

```

653 \DeclareOption{hypertext}{\hypertext@enable@ltx}%
654 \appdef\document@inithook{\@ifpackageloaded{hyperref}{\hypertext@enable@ltx}{}}%

```

The default handling for a document class option depends upon whether the `\@society` is defined.

If not, then hunt for a `.rtx` file with that name. If it exists, then we will take this option as the name of the society, otherwise, declare the option as not used.

(This behavior is similar to the L^AT_EX 2.09 handling, where one looked for a `.sty` file, except that in this case, we must provide for journal substyles that may be defined in the society file, or have their own journal substyle file.)

At the point where the class file is finished loading, we then read in the society file. That file can define further class options, such as the journal substyle.

For users, this will mean that they can specify the society and journal simply by specifying first the former and then the latter among their document class options. The society *must* have a corresponding `.rtx`.

```

655 %</options>
656 %<*package>

```

```

\@process@society
\@process@journal 657 \def\substyle@post{4-1}%
\@process@pointsize 658 \def\substyle@ext{rtx}%
659 \DeclareOption*{\@OptionNotUsed}%

```

A society substyle may define its own options, via `\DeclareOption`.

At the end of this document class, we process the society file, using `aps.rtx` if none has been specified in the document.

```
660 \def\@process@society#1{%
661 \@ifxundefined\@society{%
662 \class@warn{No Society specified, using default society #1}%
663 \def\@society{#1}\let\@journal\@undefined
664 }{%
665 \expandafter\input\expandafter{\@society\substyle@post.\substyle@ext}%
666 }%
```

A society substyle can encompass any number of journal substyles; we use the following procedure to invoke the proper one.

```
667 \def\@process@journal#1{%
668 \@ifxundefined\@journal{%
669 \class@warn{No journal specified, using default #1}%
670 \def\@journal{#1}%
671 }{%
672 \expandafter\expandafter
673 \expandafter\rtx@do@substyle
674 \expandafter\expandafter
675 \expandafter{\expandafter\@society\@journal}%
676 }%
677 \def\rtx@do@substyle#1{%
678 \InputIfFileExists{#1\substyle@post.\substyle@ext}{\csname rtx@#1\endcsname}%
679 }%
```

Document class options `10pt`, `11pt`, and `12pt` are implemented by REVTeX itself and determine `\@pointsize`. These provide formatting settings appropriate to the society's journals.

If not specified by the document, a value `\@pointsize@default` is used. This default can be set by the journal. Here, the society sets its default.

```
680 \def\@process@pointsize#1{%
681 \@ifxundefined\@pointsize{%
682 \def\@pointsize{#1}%
683 \class@warn{No type size specified, using default \@pointsize}%
684 }{%
685 \expandafter\expandafter
686 \expandafter\rtx@do@substyle
687 \expandafter\expandafter
688 \expandafter{\expandafter\@society\@pointsize pt}%
689 }%
```

9.8 Class-Asserted Options

Here we establish the default document class options. Those of the document itself will override these.

10 Procedures Dependent Upon Options

Here we introduce `classes.dtx` definitions for the page styles that people will expect to be able to use.

```

\ps@headings
\ps@myheadings 690 \def\ps@headings{%
691     \let\@oddfoot\@empty\let\@evenfoot\@empty
692     \def\@evenhead{\thepage\hfil\slshape\leftmark}%
693     \def\@oddhead{\slshape\rightmark}\hfil\thepage}%
694     \let\@mkboth\markboth
695     \def\sectionmark##1{%
696         \markboth {MakeUppercase{
697             \ifnum \c@secnumdepth >\z@
698                 \thesection\quad
699                 \fi
700             ##1}}{}}%
701     \def\subsectionmark##1{%
702         \markright {
703             \ifnum \c@secnumdepth >\@ne
704                 \thesubsection\quad
705                 \fi
706             ##1}}}%
707 \def\ps@myheadings{%
708     \let\@oddfoot\@empty\let\@evenfoot\@empty
709     \def\@evenhead{\thepage\hfil\slshape\leftmark}%
710     \def\@oddhead{\slshape\rightmark}\hfil\thepage}%
711     \let\@mkboth\@gobbletwo
712     \let\sectionmark\@gobble
713     \let\subsectionmark\@gobble
714     }%

\ps@article
\ps@article@final 715 \def\ps@article{%
\ps@preprint 716     \def\@evenhead{\let\\\heading@cr\thepage\quad\checkindate\hfil{\leftmark}}%
717     \def\@oddhead{\let\\\heading@cr{\rightmark}\hfil\checkindate\quad\thepage}%
718     \def\@oddfoot{}%
719     \def\@evenfoot{}%
720     \let\@mkboth\markboth
721     \let\sectionmark\@gobble
722     \let\subsectionmark\@gobble
723     }%
724 \def\ps@article@final{%
725     \def\@evenhead{\let\\\heading@cr\thepage\quad\checkindate\hfil{\leftmark}}%
726     \def\@oddhead{\let\\\heading@cr{\rightmark}\hfil\checkindate\quad\thepage}%
727     \def\@oddfoot{}%
728     \def\@evenfoot{}%
729     \let\@mkboth\markboth
730     \def\sectionmark##1{%
731         \markboth{

```

```

732     \MakeTextUppercase{%
733     \@ifnum{\c@secnumdepth >\z@}{\thesection\hskip 1em\relax}{}%
734     ##1%
735     }%
736     }{%
737     }%
738     \def\subsectionmark##1{%
739     \markright {%
740     \@ifnum{\c@secnumdepth >\@ne}{\thesubsection\hskip 1em\relax}{}%
741     ##1%
742     }%
743     }%
744 }%

745 \def\heading@cr{\unskip\space\ignorespaces}%

746 \def\ps@preprint{%
747   \def\@oddfont{\hfil\thepage\quad\checkindate\hfil}%
748   \def\@evenfont{\hfil\thepage\quad\checkindate\hfil}%
749   \def\@oddhead{}%
750   \def\@evenhead{}%
751   \let\@mkboth\@gobbletwo
752   \let\sectionmark\@gobble
753   \let\subsectionmark\@gobble
754 }%

755 \let\@oddhead\@empty
756 \let\@evenhead\@empty
757 \let\@oddfont\@empty
758 \let\@evenfont\@empty

```

`\lastpage@putlabel` Support the default meaning of `\@endpage`. Name of this macro (and the `\label` key) taken from [CTAN:/macros/latex/contrib/other/lastpage](https://ctan.org/ctan/packages/macros/latex/contrib/other/lastpage) with code optimised slightly.

```

759 \def\lastpage@putlabel{%
760   \if@filesw
761   \begingroup
762     \advance\c@page\m@ne
763     \immediate\write\@auxout{\string\newlabel{LastPage}{\thepage}{\thepage}}%
764   \endgroup
765   \fi
766 }%

```

Install a procedure into document endgame processing that labels the last page of the document. This is done just before the `.aux` file is closed, and does not require a `\shipout`, because it writes directly to the `.aux` file. Note that we assume no further `\shipouts` will be done past this point.

```

767 \appdef\clear@document{%
768   \do@output@cc1v{%
769     \lastpage@putlabel
770     \tally@box@size@sw{\total@text}{}%

```

```

771 }%
772 }%
773 \providecommand\write@column@totals{}%

```

11 Required Packages

CTAN:macros/latex/contrib/other/misc/url.sty

```

774 \appdef\rtx@require@packages{%
775 \RequirePackage{url}%
776 }%

```

12 Incompatible Packages

We wait until after the preamble is processed, then check for any packages that might have been loaded which we know to be incompatible with REVTeX.

The `multicol` package is incompatible with `ltxgrid`, which replaces it. The `cite` package is incompatible with `natbib`, which replaces its functionality. The functionality of the `mcite` package is provided by `natbib`.

```

777 \appdef\document@inithook{%
778 \incompatible@package{cite}%
779 \incompatible@package{mcite}%
780 \incompatible@package{multicol}%
781 }%

```

13 Society- and Journal-Specific Code

`\@journal` Journal test helper, used as

```

%\@ifx{\@journal\journal@pra}{%
% journal-specific setup
%\fi
%

```

Journal code might like to further specify (if as yet undefined) or distinguish on the following Booleans.

Note: the journal substyle code should only alter the value of one of these Booleans if the Boolean is `\undefined`. This convention is what makes the document's options take precedence over the values set by the journal.

FIXME: make this table an exhaustive listing of all the parameters set by the class options.

<code>\@pointsize</code>	(101112), depending on the type size
<code>\footinbib@sw</code>	true if footnotes are to be formatted in the bibliography
<code>\preprintsty@sw</code>	true for preprint and hyperpreprint
<code>\eqsecnum@sw</code>	true means that equations are numbered within sections
<code>\groupauthors@sw</code>	true means authors listed separately for each address
<code>\preprint@sw</code>	true means to produce the preprint numbers as part of the title block
<code>\showPACS@sw</code>	true means to produce the PACS as part of the title block
<code>\showKEYS@sw</code>	true means to produce the keywords as part of the title block
<code>\@affils@sw</code>	true means each affiliation is printed, for each author
<code>\runinaddress@sw</code>	true means author addresses are printed run-in
<code>\draft@sw</code>	true implies that PACS will be printed
<code>\tightenlines@sw</code>	true if preprint single spaced
<code>\lengthcheck@sw</code>	true if length checking is in effect
<code>\byrevtex@sw</code>	true means to announce “typeset by REVTeX”
<code>\titlepage@sw</code>	true for title is to be set on a separate page
<code>\twocolumn@sw</code>	true if two-column page grid
<code>\twocolumn@sw</code>	true if we are to automatically balance the columns of the last page
<code>\twoside@sw</code>	true means to format pages for duplex printing
<code>\floats@sw</code>	false means floats are migrated to end of document
<code>\floatp@sw</code>	true means endfloats are set one to a page
<code>\class@amsfonts</code>	if <code>\@empty</code> , means that <code>amsfonts</code> will <i>not</i> be loaded
<code>\class@amssymb</code>	if <code>\@empty</code> , means that <code>amssymb</code> will <i>not</i> be loaded
<code>\frontmatter@footnote</code>	if <code>\undefined</code> , means that the default (<code>\footnote</code>) will be used
<code>\place@bibnumber</code>	if <code>\undefined</code> , means that the default (inline) will be used

Note: if `\twocolumn@sw` and `\preprintsty@sw` are both false, then ‘galley’ style is in effect. The `galley` option invokes `onecolumn`, but does not affect the `\preprintsty@sw`.

Note: `\paperwidth` and `\paperheight` are not integrated into this scheme, and should be selected by the document alone.

14 Body

14.1 counters

The following definitions are probably identical to those in `classes.dtx`

```

782 \def\labelenumi{\theenumi.}
783 \def\theenumi{\arabic{enumi}}

784 \def\labelenumii{\theenumii}
785 \def\theenumii{\alph{enumii}}
786 \def\p@enumii{\theenumi}

787 \def\labelenumiii{\theenumiii.}
788 \def\theenumiii{\roman{enumiii}}
789 \def\p@enumiii{\theenumi(\theenumii)}

790 \def\labelenumiv{\theenumiv.}
791 \def\theenumiv{\Alph{enumiv}}
```

```

792 \def\p@enumiv{\p@enumiii\theenumiii}
793 \def\labelitemi{\textbullet}
794 \def\labelitemii{\normalfont\bfseries\textendash}
795 \def\labelitemiii{\textasteriskcentered}
796 \def\labelitemiv{\textperiodcentered}
797 \pagenumbering{arabic}

```

14.2 float parameters

from the old aps.sty. (DPC: same as article I think) AO: here, L^AT_EX's standard classes fail very poorly (the price of backward compatability): the values for `\floatpagefraction` and `\dblfloatpagefraction` need to be raised to avoid creating extremely short float pages.

```

798 \setcounter{topnumber}{2}
799 \def\topfraction{.9}
800 \setcounter{bottomnumber}{1}
801 \def\bottomfraction{.9}
802 \setcounter{totalnumber}{3}
803 \def\textfraction{.1}
804 \def\floatpagefraction{.9}
805 \setcounter{dbltopnumber}{2}
806 \def\dbltopfraction{.9}
807 \def\dblfloatpagefraction{.9}

```

14.3 List Environments

```

808 \newenvironment{verse}{%
809   \let\=\@centercr
810   \list{}{%
811     \itemsep\z@ \itemindent -1.5em\listparindent \itemindent
812     \rightmargin\leftmargin\advance\leftmargin 1.5em}\item[]%
813 }{%
814 \endlist
815 }%

816 \newenvironment{quotation}{%
817   \list{}{%
818     \listparindent 1.5em
819     \itemindent\listparindent
820     \rightmargin\leftmargin \parsep \z@ \@plus\p@\item[]%
821 }{%
822 \endlist
823 }%

824 \newenvironment{quote}{%
825   \list{}{%
826     \rightmargin\leftmargin}\item[]%
827 }{%
828 \endlist

```

```

829 }%
830 \def\descriptionlabel#1{%
831   \hspace\labelsep \normalfont\bfseries #1\unskip:%
832 }%
833 \newenvironment{description}{%
834   \list{}{%
835     \labelwidth\z@ \itemindent-\leftmargin
836     \let\makelabel\descriptionlabel
837   }%
838 }{%
839 \endlist
840 }%

```

14.4 Sectioning Commands

14.4.1 Sectioning Commands and Their Productions

The following counters are defined by LaTeX's standard document classes. We do likewise, then assign flag values to the productions, awaiting overrides.

```

841 \newcounter{part}%
842 \let\thepart\@undefined
843 \newcounter{section}%
844 \let\thesection\@undefined
845 \newcounter{subsection}[section]%
846 \let\thesubsection\@undefined
847 \newcounter{subsubsection}[subsection]%
848 \let\thesubsubsubsection\@undefined
849 \newcounter{paragraph}[subsubsection]%
850 \let\theparagraph\@undefined
851 \newcounter{subparagraph}[paragraph]%
852 \let\thesubparagraph\@undefined

```

The procedure invoked by `\setup@secnums` provides meanings for these productions.

`\secnums@rtx` These two procedures define the meanings of each of the productions of the counters of the sectioning commands, but only if nothing else has defined it.

`\secnums@arabic`

```

853 \def\secnums@rtx{%
854   \@ifundefined\thepart{%
855     \def\thepart{\Roman{part}}}%
856   }{%
857   \@ifundefined\thesection{%
858     \def\thesection    {\Roman{section}}}%
859   \def\p@section      {}%
860   }{%
861   \@ifundefined\thesubsection{%
862     \def\thesubsection  {\Alph{subsection}}}%
863   \def\p@subsection    {\thesection\,%
864   }{%
865   \@ifundefined\thesubsubsubsection{%

```

```

866 \def\thesubsubsection {\arabic{subsubsection}}%
867 \def\p@subsubsection {\thesection\,\thesubsection\,%
868 }{}%
869 \@ifundefined\theparagraph{%
870 \def\theparagraph {\alph{paragraph}}%
871 \def\p@paragraph {\thesection\,\thesubsection\,\thesubsubsection\,%
872 }{}%
873 \@ifundefined\thesubparagraph{%
874 \def\thesubparagraph {\arabic{subparagraph}}%
875 \def\p@subparagraph {\thesection\,\thesubsection\,\thesubsubsection\,\theparagraph\,%
876 }{}%
877 }%
878 \def\secnums@arabic{%
879 \@ifundefined\thepart{%
880 \def\thepart {\Roman{part}}%
881 }{}%
882 \@ifundefined\thesection{%
883 \def\thesection {\Roman{section}}%
884 \def\p@section {}%
885 }{}%
886 \@ifundefined\thesubsection{%
887 \def\thesubsection {\thesection.\arabic{subsection}}%
888 \def\p@subsection {}%
889 }{}%
890 \@ifundefined\thesubsubsection{%
891 \def\thesubsubsection {\thesubsection.\arabic{subsubsection}}%
892 \def\p@subsubsection {}%
893 }{}%
894 \@ifundefined\theparagraph{%
895 \def\theparagraph {\thesubsubsection.\arabic{paragraph}}%
896 \def\p@paragraph {}%
897 }{}%
898 \@ifundefined\thesubparagraph{%
899 \def\thesubparagraph {\theparagraph.\arabic{subparagraph}}%
900 \def\p@subparagraph {}%
901 }{}%
902 }%

```

14.4.2 The Acknowledgments Environment

This user-level markup produces a head introducing the acknowledgments, and acts as a wrapper for the text. In this implementation, it is an unnumbered section, but appears within the toc.

For compatiability's sake, we implement it under the alternative spelling `acknowledgements`.

```

903 \newenvironment{acknowledgments}{%
904 \acknowledgments@sw{%
905 \expandafter\section\expandafter*\expandafter{\acknowledgmentsname}%
906 }{}%

```

```

907 \par
908 \phantomsection
909 \addcontentsline{toc}{section}{\protect\numberline{}\acknowledgmentsname}%
910 }%
911 }{%
912 \par
913 }%
914 \@booleantrue\acknowledgments@sw
915 \newenvironment{acknowledgements}{%
916 \replace@environment{acknowledgements}{acknowledgments}%
917 }{%
918 \endacknowledgments
919 }%

```

14.4.3 Part Opener

section setup copied verbatim from revtex3 aps/osa. Does not explicitly depend on pointsize options.

```

920 \def\part{\par
921   \addvspace{4ex}%
922   \@afterindentfalse
923   \secdef\@part\@spart}%
924 \def\@part[#1]#2{%
925   \@ifnum{\c@secnumdepth >\m@ne}{%
926     \refstepcounter{part}%
927     \addcontentsline{toc}{part}{\thepart\hspace{1em}#1}%
928   }{%
929     \addcontentsline{toc}{part}{#1}%
930   }%
931   \begingroup
932     \parindent \z@ \raggedright
933     \interlinepenalty\@M
934     \@ifnum{\c@secnumdepth >\m@ne}{%
935       \Large \bf \partname~\thepart%
936       \par\nobreak
937     }{%
938       \huge \bf
939       #2%
940       \markboth{}{}\par
941     \endgroup
942     \nobreak
943     \vskip 3ex
944     \@afterheading
945   }%
946 \def\@spart#1{\parindent \z@ \raggedright
947   \interlinepenalty\@M
948   \huge \bf
949   #1\par}
950   \nobreak

```

```

951 \vskip 3ex
952 \@afterheading}

```

14.4.4 Stacked Heads

Here are the class default definitions for sectioning commands. A society or a journal substyle will likely override these definitions.

In doing so, you can customize the formatting for a particular level by defining, e.g., `\@hangfrom@section` or `\@subsectioncntformat`.

```

953 \def\section{%
954   \@startsection
955   {section}%
956   {1}%
957   {\z@}%
958   {0.8cm \@plus1ex \@minus .2ex}%
959   {0.5cm}%
960   {\normalfont\small\bfseries}%
961 }%

```

```

962 \def\subsection{%
963   \@startsection
964   {subsection}%
965   {2}%
966   {\z@}%
967   {.8cm \@plus1ex \@minus .2ex}%
968   {.5cm}%
969   {\normalfont\small\bfseries}%
970 }%

```

```

971 \def\subsubsection{%
972   \@startsection
973   {subsubsection}%
974   {3}%
975   {\z@}%
976   {.8cm \@plus1ex \@minus .2ex}%
977   {.5cm}%
978   {\normalfont\small\itshape}%
979 }%

```

14.4.5 Runin Heads

```

980 \def\paragraph{%
981   \@startsection
982   {paragraph}%
983   {4}%
984   {\parindent}%
985   {\z@}%
986   {-1em}%
987   {\normalfont\normalsize\itshape}%
988 }%

```

```

989 \def\subparagraph{%
990   \@startsection
991     {subparagraph}%
992     {5}%
993     {\parindent}%
994     {3.25ex \@plus1ex \@minus .2ex}%
995     {-1em}%
996     {\normalfont\normalsize\bfseries}%
997 }%

```

14.5 Math

`\theequation` We change the production of the equation counter so that we can accomodate the `eqsecnum` option.

```

998 \def\theequation{%
999   \theequation@prefix\arabic{equation}%
1000 }%
1001 \def\theequation@prefix{}%

```

14.6 Type Size-Dependent Settings

14.7 All Point Sizes

```

1002 \setcounter{secnumdepth}{4}

1003 \lineskip 1pt
1004 \normallineskip 1pt
1005 \def\baselinestretch{1}%

1006 \@lowpenalty 51
1007 \@medpenalty 151
1008 \@highpenalty 301

1009 \@beginparpenalty -\@lowpenalty
1010 \@endparpenalty -\@lowpenalty
1011 \@itempenalty -\@lowpenalty

1012 \arraycolsep 3pt
1013 \tabcolsep 2pt
1014 \arrayrulewidth .4pt
1015 \doublerulesep 2pt

1016 \skip\@mpfootins = 0pt

1017 \fboxsep = 3.0pt
1018 \fboxrule = 0.4pt

```

14.8 Figures

`figure` We define the `figure` environment. Later, we will horse around with its meaning in order to accomodate `\floats@sw`.

```

1019 \newenvironment{figure}
1020     {\@float{figure}}
1021     {\end@float}

```

```

1022 \newenvironment{figure*}
1023         {\@dblfloat{figure}}
1024         {\end@dblfloat}

1025 \def\listoffigures{\print@toc{lof}}%
1026 \def\l@figure{\@dottedtocline{1}{1.5em}{2.3em}}%

```

`\@makecaption` If caption is one line long, to be centered; if lines turn, then set justified.

```

1027 \newlength\abovecaptionskip
1028 \newlength\belowcaptionskip
1029 \setlength\abovecaptionskip{10\p@}
1030 \setlength\belowcaptionskip{2\p@}

    There is a hook \@caption@fignum@sep for determining the separator follow-
    ing the float number, e.g., “Fig.1”. Formerly, we had defined it to be “: ”, now
    the colon has been replace by a period (full stop).

1031 \long\def\@makecaption#1#2{%
1032   \par
1033   % \nobreak
1034   \vskip\abovecaptionskip
1035   \begingroup
1036   \small\rmfamily
1037   \sbox\@tempboxa{%
1038     \let\\heading@cr
1039     \@make@capt@title{#1}{#2}%
1040   }%
1041   \@ifdim{\wd\@tempboxa >\hsize}{%
1042     \begingroup
1043     \samepage
1044     \flushing
1045     \let\footnote\@footnotemark@gobble
1046     \@make@capt@title{#1}{#2}\par
1047   \endgroup
1048   }{%
1049     \global \@minipagefalse
1050     \hb@xt@\hsize{\hfil\unhbox\@tempboxa\hfil}%
1051   }%
1052 \endgroup
1053 \vskip\belowcaptionskip
1054 }%
1055 \def\@make@capt@title#1#2{%
1056   \@ifx@empty\float@link{\@firstofone}{\expandafter\href\expandafter{\float@link}}%
1057   {#1}\@caption@fignum@sep#2%
1058 }%
1059 \def\@footnotemark@gobble{%
1060   \@footnotemark
1061   \@ifnextchar[{\@gobble@opt@i}{\@gobble}%
1062 }%
1063 \def\@gobble@opt@i[#1]#2{%
1064 \def\@mpmakefntext#1{%

```

```

1065 \flushing
1066 \parindent=1em
1067 \noindent
1068 \hb@xt@1em{\hss\@makefnmark}%
1069 #1%
1070 }%
1071 \def\@caption@fignum@sep{. }%
1072 \def\setfloatlink{\def\float@link}%
1073 \let\float@link\@empty

```

`\thefigure` The figure counter and float placement defaults.

```

1074 \newcounter{figure}
1075 \renewcommand \thefigure {\@arabic\c@figure}

```

Note that we give the ‘!’ modifier by default. This is an effort to avoid the syndrome wherein a deferred float finds itself unqualified for placement, thereby getting carried until `\clearpage`.

```

1076 \def\fps@figure{tbp}
1077 \def\ftype@figure{1}
1078 \def\ext@figure{lof}
1079 \def\fnm@figure{\figurename~\thefigure}

```

We allocate a box register for use in tallying the column inches of floats of this type.

```

1080 \expandafter\newbox\csname fbox@\ftype@figure\endcsname
1081 \expandafter\setbox\csname fbox@\ftype@figure\endcsname\hbox{}%

```

14.8.1 Deferring figure Floats

We determine if figures are to float or be deferred until `\printfigures` time. If so, we open the stream that will receive the deferred document portions.

```

1082 \appdef\class@documenthook{%
1083 \do@if@floats{figure}{.fgx}%
1084 }%
1085 \appdef\class@enddocumenthook{%
1086 \printfigures\relax
1087 }%

```

`\printfigures` The user-level command `\printfigures` determines where the figures are to appear in a document in which `\floats@sw` is false. If the user invokes the `endfloats` class option and fails to insert a `\printfigures` command, the figures will be printed at the end of the document. If the command is given, but floats are not being deferred, it amounts to a no-op.

```

1088 \newcommand\printfigures{%
1089 \@ifstar{\true@sw}{\floatp@sw{\true@sw}{\false@sw}}%
1090 {%
1091 \print@float{figure}{\oneapage}%
1092 }{%
1093 \print@float{figure}{}%

```

```
1094 }%
1095 }%
```

`\xfloat@prep` We patch into the procedure `\xfloat@prep`. This patch applies to all floats (not figure alone) and makes the type center.

```
1096 \appdef\xfloat@prep{%
1097 \appdef\@parboxrestore{\centering}%
1098 %\let\@makefnmark\@makefnmark@latex
1099 }%
```

14.9 Tables

DPC: More or less taken from `revtex2 aps.sty`, but using `dcolumn` for decimal alignment.

`table` We define the `table` environment. Later, we will horse around with its meaning in order to accomodate `\floats@sw`.

```
1100 \newenvironment{table}
1101         {\@float{table}}
1102         {\end@float}
1103 \newenvironment{table*}
1104         {\@dblfloat{table}}
1105         {\end@dblfloat}
```

`\thetable` Table counter and default float placement declarations.

```
1106 \newcounter{table}
1107 \renewcommand\thetable{\@Roman\c@table}
```

Note that we give the ‘!’ modifier by default. This is an effort to avoid the syndrome wherein a deferred float finds itself unqualified for placement, thereby getting carried until `\clearpage`.

```
1108 \def\fps@table{tbp}
1109 \def\ftype@table{2}
1110 \def\ext@table{lot}
1111 \def\fnm@table{\tablename~\thetable}
```

We allocate a box register for use in tallying the column inches of floats of this type.

```
1112 \expandafter\newbox\csname fbox@\ftype@table\endcsname
1113 \expandafter\setbox\csname fbox@\ftype@table\endcsname\hbox{}%
1114 \def\listoftables{\print@toc{lot}}%
1115 \let\l@table\l@figure
```

`\table@hook` Assign a meaning to the hook installed into float processing.

`\squeezetable` By default floats are `\small`. The `\squeezetable` declaration makes them smaller (`\scriptsize`). In general you can locally redefine `\table@hook` to be whatever you like. (DPC: `\Huge\color{magenta}...?`)

```
1116 \def\table@hook{\small}%
1117 \def\squeezetable{\def\table@hook{\scriptsize}}%
1118 \appdef\@floatboxreset{\table@hook}%
```

14.9.1 Deferring table Floats

After all packages are loaded, we decide if tables will float or will be deferred until `\printtables` time.

We also deal with the possibility of `longtable` environments.

```
1119 \def\set@table@environments{%
1120 \floats@sw}{-%
1121 \let@environment{longtable@float}{longtable}%
1122 \let@environment{longtable}{longtable@write}%
1123 \let@environment{longtable*@float}{longtable*}%
1124 \let@environment{longtable*}{longtable*@write}%
1125 \let@environment{turnpage@float}{turnpage}%
1126 \let@environment{turnpage}{turnpage@write}%
1127 }%
1128 \do@if@floats{table}{.tbx}%
1129 }%
1130 \appdef\document@inithook{%
1131 \set@table@environments
1132 }%
1133 \appdef\class@enddocumenthook{%
1134 \printtables\relax
1135 }%
1136 \newenvironment{longtable@write}{-%
1137 \write@float{longtable}{table}%
1138 }-%
1139 \endwrite@float
1140 }%
1141 \newenvironment{longtable*@write}{-%
1142 \write@float{longtable*}{table}%
1143 }-%
1144 \endwrite@float
1145 }%
1146 \newenvironment{turnpage@write}{-%
1147 \immediate\write\tablewrite{\string\begin{turnpage}}%
1148 }-%
1149 \immediate\write\tablewrite{\string\end{turnpage}}%
1150 }%
```

`\printtables` The user-level command `\printtables` determines where the tables are to appear in a document in which `\floats@sw` is false. If the user invokes the `nofloats` and fails to insert a `\printtables` command, the tables will be printed at the end of the document. If the command is given, but floats are not being deferred, it amounts to a no-op.

```
1151 \newcommand\printtables{%
1152 \begingroup
1153 \let@environment{longtable}{longtable@float}%
1154 \let@environment{longtable*}{longtable*@float}%
1155 \let@environment{turnpage}{turnpage@anchored}%
1156 \prepdef\longtable{\trigger@float@par}%

```

```

1157 \expandafter\prepdef\csname longtable*\endcsname{\trigger@float@par}%
1158 \expandafter\prepdef\csname table@floats\endcsname{%
1159   \onecolumngrid@push
1160 }%
1161 \expandafter\appdef\csname endtable@floats\endcsname{%
1162   \onecolumngrid@pop
1163 }%
1164 \@ifstar{\true@sw}{\floatp@sw{\true@sw}{\false@sw}}%
1165 {%
1166   \print@float{table}{\oneapage}%
1167 }{%
1168   \print@float{table}{}%
1169 }%
1170 \endgroup
1171 }%
1172 \newenvironment{turnpage@anchored}{%
1173   \onecolumngrid@push
1174   \setbox\z@\vbox to\textwidth\bgroup
1175   \columnwidth\textheight
1176 }{%
1177   \vfil
1178   \egroup
1179   \rotatebox{90}{\box\z@}%
1180   \onecolumngrid@pop
1181 }%

```

14.10 Videos

`video` We define the `video` environment analogously to the `figure` and `table` environments; it is intended to contain a video.

```

1182 \newenvironment{video}
1183   {\@float{video}}
1184   {\end@float}%
1185 \newenvironment{video*}
1186   {\@dblfloat{video}}
1187   {\end@dblfloat}%

```

`\thevideo` The video counter, float placement defaults, strings.

```

1188 \newcounter{video}
1189 \renewcommand \thevideo {\@arabic\c@video}

```

File extension and localizable strings.

```

1190 \def\ext@video{lov}%
1191 \def\fname@video{Video}%
1192 \def\lovname{List of Videos}%

```

Float type and default placement.

```

1193 \def\fps@video{tbp}%
1194 \def\ftype@video{4}%
1195 \def\fnun@video{\fname@video~\thevideo}%

```

```

1196 \appdef\document@inithook{%
1197 \@ifxundefined\c@float@type}{%
1198 \global\setcounter{float@type}{8}%
1199 }%
1200 }%

```

We allocate a box register for use in tallying the column inches of floats of this type.

```

1201 \expandafter\newbox\csname fbox@\ftype@video\endcsname
1202 \expandafter\setbox\csname fbox@\ftype@video\endcsname\hbox{%

```

The documentation for the `hyperref` package, `hyperref.dtx` states: “classes or package which introduce new elements need to define an equivalent `\theH<name>` for every `\the<name>`” We do accordingly here.

```

1203 \let\theHvideo\thevideo

```

But `hyperref.dtx` goes on to say, “We do make a trap to make `\theH<name>` be the same as `\arabic{<name>}`, if `\theH<name>` is not defined...” However, it’s not doing that right now (as of 6.77u), and I cannot find any such code in there anymore.

```

1204 \def\listofvideos{\print@toc{lov}}%
1205 \let\l@video\l@figure

```

14.10.1 Deferring video Floats

We determine if videos are to float or be deferred until `\printvideos` time. If so, we open the stream that will receive the deferred document portions.

```

1206 \appdef\class@documenthook{%
1207 \do@if@floats{video}{.vdx}%
1208 }%
1209 \appdef\class@enddocumenthook{%
1210 \printvideos\relax
1211 }%

```

`\printvideos` The user-level command `\printvideos` determines where the videos are to appear in a document in which `\floats@sw` is false. If the user invokes the `endfloats` class option and fails to insert a `\printvideos` command, the videos will be printed at the end of the document. If the command is given, but floats are not being deferred, it amounts to a no-op.

```

1212 \newcommand\printvideos{%
1213 \@ifstar{\true@sw}{\floatp@sw{\true@sw}{\false@sw}}%
1214 {%
1215 \print@float{video}{\onepage}%
1216 }{%
1217 \print@float{video}{}%
1218 }%
1219 }%

```

15 Tabular

Every APS tabular has a double (Scotch) rule above and below. The column specifier “d” is implemented using the dcolumn package, if available. FIXME: always load dcolumn!

```
\tabular@hook
\endtabular@hook 1220 \def\endtabular@hook{}%
ruledtabular
    %\RequirePackage{dcolumn}%
    %
1221 \appdef\document@inithook{%
1222 \@ifpackageloaded{dcolumn}{%
1223 \expandafter\@ifnotrelax\csname NC@find@d@endcsname}{}%
1224 \newcolumnstype{d}{D{.}{.}{-1}}%
1225 }%
1226 }{}%
1227 }%
1228 \def\toprule{\hline\hline}%
1229 \def\colrule{\hline}%
1230 \def\botrule{\hline\hline}%
1231 \newenvironment{ruledtabular}{%
1232 \def\array@default{v}%
1233 \appdef\tabular@hook{\def\@halignto{to\hsize}}%
1234 \let\tableleft@skip@default\tableleft@skip
1235 \let\tableleft@skip\tableleft@skip@float
1236 \let\tabmid@skip@default\tabmid@skip
1237 \let\tabmid@skip\tabmid@skip@float
1238 \let\tabright@skip@default\tabright@skip
1239 \let\tabright@skip\tabright@skip@float
1240 \let\array@row@pre@default\array@row@pre
1241 \let\array@row@pre\array@row@pre@float
1242 \let\array@row@pst@default\array@row@pst
1243 \let\array@row@pst\array@row@pst@float
1244 \appdef\array@row@rst{%
1245 \let\array@row@pre\array@row@pre@default
1246 \let\array@row@pst\array@row@pst@default
1247 \let\tableleft@skip\tableleft@skip@default
1248 \let\tabmid@skip\tabmid@skip@default
1249 \let\tabright@skip\tabright@skip@default
1250 \appdef\tabular@hook{\let\@halignto\@empty}%
1251 }%
1252 }{}%
1253 }%
```

16 Footnote Text

```
\@makefntext We customize the presentation of the footnote mark: it will not be italic.
\@makefnmark
```

```

1254 \def\@makefntext#1{%
1255   \def\baselinestretch{1}%
1256   \parindent1em%
1257   \noindent
1258   \hb@xt@1.8em{%
1259     \hss\@makefnmark
1260   }%
1261   #1%
1262   \par
1263 }%
1264 \def\@makefnmark{%
1265   \hbox{%
1266     \@textsuperscript{%
1267       \normalfont\@thefnmark
1268     }%
1269   }%
1270 }%

```

16.1 Citations, Bibliography, Endnotes

16.1.1 Bibliography

Load Patrick Daly's `natbib` package, <ftp://ctan.tug.org/macros/latex/contrib/supported/natbib>

Note that `natbib` assumes that it loads over a document class, such as the `article` class, that has already defined `thebibliography` and `\@listi`.

Note also that `natbib` also installs a command `\NAT@set@cites` into `\AtBeginDocument` which presumes that the proper `\bibpunct` command has been issued.

Note that the macro `\NAT@sort` controls whether citations are left alone (`\NAT@sort=0`), sorted (`\NAT@sort=1`), or sorted and compressed (`\NAT@sort=2`). Since we give `natbib` the `sort&compress` option, if you prefer `sort`, you need only `\let\NAT@sort` to be `\@ne`. However, if you prefer the effect of having neither `sort` nor `sort&compress`, you must `\let\NAT@sort` to be `\z@` and you must also define `\let\NAT@cmprs` to be `\z@`.

As of version 8.2, `natbib` now no longer binds at the point where it is read in. This means that we can freely change `\NAT@sort`, `\NAT@cmprs`, and the new `\NAT@merge`. Henceforth, we require that this later version be used.

For other `natbib` customizations, you may proceed as if you were going to use the `natbib.cfg` file: anything that you can modify by this means is fair game. Once REVTeX is finished loading, you can assert any definitions for `natbib` that you wish.

```

\rev@citete We define variants on natbib's commands \citet, \citealp, and \citealpnun.
\rev@citealp \rev@citealpnun uses a numerical citation. \rev@citealp and \rev@citealpnun
\rev@citealpnun are the aliases of \onlinecite, \rev@citete that of \textcite.

```

In each case, we invoke `\rtx@swap@citea` to effect different productions between multiple arguments to the `\cite` command.

`\rev@citealpnum` provides textual citations where superscript citations are the default. These should be accessible via the `\citet` command.

Therefore we remember how to do a numerical citation even when the superscript citation has been selected.

```

1271 \expandafter\DeclareRobustCommand
1272 \expandafter\rev@citet
1273 \expandafter{%
1274 \expandafter\beginngroup
1275 \expandafter\rtx@swap@citea
1276 \expandafter\g@bbblefirsttoken
1277 \csname citet \endcsname
1278 }%
1279 \expandafter\DeclareRobustCommand
1280 \expandafter\rev@citealp
1281 \expandafter{%
1282 \expandafter\beginngroup
1283 \expandafter\rtx@swap@citea
1284 \expandafter\g@bbblefirsttoken
1285 \csname citealp \endcsname
1286 }%
1287 \expandafter\DeclareRobustCommand
1288 \expandafter\rev@citealpnum
1289 \expandafter{%
1290 \expandafter\beginngroup
1291 \expandafter\rtx@swap@citenum
1292 \expandafter\g@bbblefirsttoken
1293 \csname citealp \endcsname
1294 }%
1295 \def\rtx@swap@citenum{%
1296 \rtx@swap@citea
1297 \let\cite\NAT@citenum
1298 \let\NAT@mbox\mbox
1299 \let\citeyear\NAT@citeyear
1300 \let\NAT@space\NAT@spacechar
1301 }%
1302 \def\g@bbblefirsttoken{%
1303 \expandafter\true@sw
1304 \expandafter\@empty
1305 }%

```

`\rtx@citesuper` We prepare to redefine `natbib`'s procedure `\NAT@citesuper`, which is executed when setting a superscript citation. The `\hspace` is removed: in any case, it should really be `\hspace*`, to prevent an unwanted pagebreak.

```

1306 \newcommand\rtx@citesuper[3]{%
1307 \ifNAT@swa
1308 \leavevmode
1309 \unskip
1310 % \hspace{1\p@}%
1311 \textsuperscript{\normalfont#1}%

```

```

1312 \if*#3*\else\ (#3)\fi
1313 \else
1314 #1%
1315 \fi
1316 \endgroup
1317 }%

```

`\@makefnmark@cite` We define a procedure that will set a footnote mark the same way that a citation is set. If footnotes are put in the bibliography with `\footinbib@sw`, then the corresponding mark should look the same as the result of a `\cite`. This is how we do it.

```

1318 \def\@makefnmark@cite{\begingroup\NAT@swattrue\@cite{\@thefnmark}}{-}}%

```

`\rtx@bibsection` Prepare to override `natbib`'s definition of `\bibsection`.

```

1319 \def\rtx@bibsection{%
1320 \@ifx@empty\refname{%
1321 \par
1322 }{%
1323 % \let\@hangfroms@section\@hang@froms
1324 \expandafter\section\expandafter*\expandafter{\refname}%
1325 \@nbreaktrue
1326 }%
1327 }%

```

`\rtx@swap@citea` The procedures `\rtx@def@citea`, `\rtx@def@citea@close`, and `\rtx@def@citea@box`
`\rtx@def@citea` can take over the management of `natbib`'s `\@citea` macro to effect more sophisticated behavior of the punctuation between textual citations. The switch is performed by `\rtx@swap@citea`.
`\rtx@def@citea@close`
`\rtx@def@citea@box`

In these procedures, we use `\count@` to count the number of arguments of the `\cite` command, and we use `\c@NAT@ctr` to keep track of which argument we are processing. The latter counter is created by `natbib` and used there solely in bibliography processing, where it keeps track of the reference number. We take over its use in these macros, but only locally; therefore these procedures should work properly, even within the bibliography. **FIXME:** check whether this is true!

Because we are using a scratch counter `\count@`, we are vulnerable to other \TeX programmers who patch in to `natbib`'s processing and who might use that counter at the same time we are doing so. This is a potential source of trouble for us. **FIXME:** store the value of `\count@` in a private `\csname!`

Note that `\rtx@def@citea` begins the same as `\NAT@def@citea`, which it replaces, then makes further decisions based on the values of the counters.

Note also that, in `natbib`, the replacement part of `\NAT@def@citea@close` could be rewritten as `\NAT@def@citea\prepdef\@citea{\NAT@close}`, which would then obviate the need for us to override its meaning.

Note, too, the effect of `\rtx@def@citea@box`, which replaces `\NAT@def@citea@box`, is almost the same as the latter, except the entire `\@citea` is given as the argument of `\NAT@mbox`.

Finally, bear in mind that the English (and some American editors) do not place a comma before the “and”; our procedures do (but they could be rewritten with that convention).

```

1328 \def\rtx@swap@citea{%
1329 \let\NAT@def@citea\rtx@def@citea
1330 \let\NAT@def@citea@close\rtx@def@citea@close
1331 \let\NAT@def@citea@box\rtx@def@citea@box
1332 }%
1333 \def\rtx@def@citea{%
1334 \def\@citea{\NAT@separator\NAT@space}%
1335 \advance\c@NAT@ctr\@ne
1336 \@ifnum{\count@>\tw@}{%
1337 \@ifnum{\c@NAT@ctr=\count@}{\appdef\@citea{\NAT@conj\NAT@space}}{}%
1338 }{%
1339 \def\@citea{\NAT@space\NAT@conj\NAT@space}%
1340 }%
1341 }%
1342 \def\rtx@def@citea@close{%
1343 \rtx@def@citea
1344 \prepdef\@citea{\NAT@close}%
1345 }%
1346 \def\rtx@def@citea@box{%
1347 \rtx@def@citea@close
1348 \expandafter\def\expandafter\@citea\expandafter{\expandafter\NAT@mbox\expandafter{\@citea}}%
1349 }%
1350 \def\NAT@conj{and}%

```

`\BibitemShut` We remember a temporary patch to `natbib`'s definition of `\BibitemShut`.

```

\BibAnnote 1351 \def\NAT@BibitemShut#1{%
1352 \def\@bibstop{#1}%
1353 \let\bibitem@Stop\bibitemStop
1354 \let\bibitem@NoStop\bibitemNoStop
1355 \@ifx{\bibitemShut\relax}{\let\@bibitemShut\@empty}{%
1356 \expandafter\def\expandafter\@bibitemShut\expandafter{\bibitemShut}%
1357 }%
1358 }%

```

The following is a bug fix to `natbib` version 8.31b.

```

1359 \def\BibitemShut@ltx#1{%
1360 \unskip
1361 \def\@bibstop{#1}%
1362 \let\bibitem@Stop\bibitemStop
1363 \let\bibitem@NoStop\bibitemNoStop
1364 \@ifx{\bibitemShut\relax}{\let\@bibitemShut\@empty}{%
1365 \expandafter\def\expandafter\@bibitemShut\expandafter{\bibitemShut}%
1366 }%
1367 }%

%\providecommand{\BibAnnote}[3]{%
% \BibitemShut{#1}%

```

```

% \def\@tempa{#3}\@ifx{\@tempa\@empty}{-}{-}%
% \begin{quotation}\noindent
% \textsc{Key:}\ #2\ \textsc{Annotation:}\ \@tempa
% \end{quotation}%
% }%
% \ignorespaces
%}%
%\def\@bibitemShut{}%
%

1368 \newenvironment{thebibliography}{-}{-}%
1369 \let\@listi\@empty
1370 \appdef\rtx@require@packages{%
1371 \RequirePackage[sort&compress]{natbib}[2009/11/07 8.31a (PWD, AD)]%
1372 \let\@environment{NAT@thebibliography}{thebibliography}%
1373 \let\@environment{thebibliography}{rtx@thebibliography}%
1374 \let\bibliographystyle@latex\bibliographystyle
1375 \let\NAT@citesuper\rtx@citesuper

\NAT@bibsetnum We define the sectioning command to use when starting the bibliography and
\NAT@bibsetup gently coax natbib into using the formatting procedures that we want it to use.
\bibpreamble This way of setting up thebibliography automatically sets the label width
\newblock based on the largest number used within the bibliography. This scheme will not
\bibnumfmt work properly using the author/year style of bib entry, though.
\NAT@merge We define \bibnumfmt to be \place@bibnumber, which is a macro managed by
REVTeX. If the document defines \bibnumfmt, then that definition will be used
instead, which is what the natbib package gives as its programming interface.

We set \NAT@merge to \tw@, which turns on natbib's mcite capabilities. This
is the default setting. If numerical citations are not to be used, then \NAT@merge
should be set to \one (syntax is still enabled, but semantics are turned off).

1376 \let\bibsection\rtx@bibsection
1377 \let\NATx@bibsetnum\NAT@bibsetnum
1378 \def\NAT@bibsetnum#1{%
1379 \setlength{\topsep}{\z@}%
1380 \NATx@bibsetnum{\ref{LastBibItem}}}%
1381 }%
1382 \let\NATx@bibsetup\NAT@bibsetup
1383 \def\NAT@bibsetup{%
1384 \setlength{\labelwidth}{\z@}%
1385 \setlength{\labelsep}{\z@}%
1386 \setlength{\itemindent}{\z@}%
1387 \setlength{\listparindent}{\z@}%
1388 \setlength{\topsep}{\z@}%
1389 \setlength{\parsep}{\z@}%
1390 \NATx@bibsetup
1391 }%
1392 \let\bibpreamble\@empty
1393 \def\newblock{\ }%
1394 \let\NATx@bibnumfmt\bibnumfmt

```

```

1395 \def\bibnumfmt{\place@bibnumber}%
1396 \let\NAT@merge\thr@@
1397 \let\NAT@citeyear\citeyear
1398 \let\onlinecite\rev@citealp
1399 \let\textcite\rev@citet

```

The following is needed until natbib is at 8.31b.

```

1400 \ifx{\BibitemShut\NAT@BibitemShut}{%
1401 \class@info{Repairing natbib's \string\BibitemShut}%
1402 \let\BibitemShut\BibitemShut@ltx
1403 }{}%

```

`\bibliographystyle` We arrange for the selection of bibliography style to occur either due to the document's explicit `\bibliographystyle` statement or via the journal substyle.

Note that REVTeX is incompatible with any package that patches `\bibliographystyle`. Since `natbib` does this, we need a fix.

The Boolean `\bibliographystyle@sw` signifies that the document contains explicit `\bibliographystyle` markup. If, on the contrary, the bibliography style is set by the the society or the journal, then no explicit `\bibliographystyle` command appears in the document instance. In this case `\bibliographystyle@sw` will be `\false@sw`.

```

1404 \let\bibliographystyle@latex\bibliographystyle
1405 \def\bibliographystyle{@booleantrue\bibliographystyle@sw\def\@bibstyle}%
1406 \@booleanfalse\bibliographystyle@sw

```

The following had been bug fixes to `natbib` version 8.31a.

```

%\def\bibitemStop{\@bibitemShut}%
%\def\NAT@bibitem@cont{%
% \let\bibitem@Stop\bibitemContinue
% \let\bibitem@NoStop\bibitemContinue
%}%
%

```

The following are alterations to `natbib` version 8.31a to accommodate the possible space character preceding `\BibitemShut`, and to handle the case of merged references, where the first ends with a stop character.

```

1407 \def\NAT@bibitem@cont{%
1408 \let\bibitem@Stop\bibitemContinue@Stop
1409 \let\bibitem@NoStop\bibitemContinue
1410 }%
1411 \def\bibitemNoStop{%
1412 \@ifx@empty\@bibitemShut{.\spacefactor\@mmm\space}{\@bibitemShut}%
1413 }%
1414 \def\bibitemContinue{%
1415 \@ifx@empty\@bibitemShut{;\spacefactor\@mmm\space}{\@bibitemShut}%
1416 }%

```

```

1417 \def\bibitemContinue@Stop{%
1418 \ifx@empty\bibitemShut{\spacefactor\@mmm\space}{\@bibitemShut}%
1419 }%

```

We used to customize one of the productions of `natbib`, but no longer.

```

%\let\bibitemContinue\bibitemContinue@rtx
%

```

Here ends the code to be executed at `\rtx@require@packages` time.

```

1420 }%

```

Redefine a macro of `natbib` so that merged references are separated with a semicolon.

```

% \def\bibitemContinue@rtx{;\spacefactor\@mmm\space}%
%

```

`\onlinecite` We extend `natbib`'s syntax with two commands to set a citation on the baseline (as opposed to superscripted) and as text (rather than parenthetical), respectively. A journal substyle that makes citations be superscripted or parenthetical as the case may be, should ensure that the author has continued access to these two styles.

Note that the society or journal substyle override the meanings of `\@onlinecite` or `\@textcite` given here.

```

1421 \DeclareRobustCommand\onlinecite{\@onlinecite}%
1422 \DeclareRobustCommand\textcite{\@textcite}%

```

`\bibliography` Provide a hook for supplying Bib_TE_X a bibliographic database that may contain, say, footnotes.

Note that Bib_TE_X chokes if the argument of the `\bibdata` command has null fields, hence these tests.

```

1423 \let\bibliography@latex\bibliography
1424 \def\bibliography#1{%
1425 \auto@bib@empty
1426 \begingroup
1427 \let\auto@bib@innerbib@empty
1428 \ifx@empty{\pre@bibdata}{%
1429 \bibliography@latex{#1}%
1430 }{%
1431 \@ifempty{#1}{%
1432 \expandafter\bibliography@latex\expandafter{\pre@bibdata}%
1433 }{%
1434 \expandafter\bibliography@latex\expandafter{\pre@bibdata,#1}%
1435 }%
1436 }%
1437 \endgroup
1438 }%
1439 \let\pre@bibdata@empty

```

`rtx@thebibliography` We put a tail patch into `\thebibliography` and a headpatch into `\endthebibliography`.
`\present@bibnote` Here we provide a default treatment for frontmatter notes deferred to

the bibliography; a journal substyle might want to override the definition of `\present@bibnote`.

We make provisions for the case where there are no `\bibitems` for the bibliography: we produce no bibliography head at all.

```
1440 \newenvironment{rtx@thebibliography}[1]{%
1441 \NAT@thebibliography{#1}%
1442 \let\@TBN@opr\present@bibnote
1443 \@FMN@list
1444 }{%
```

The following line was commented out:

```
%\endnotesinbib
%
```

The `\auto@bib@innerbib` directive has been moved from the begin processing to the end processing. This means that the content of the `thebibliography` environment can itself prevent the automatic reading in of the `.bbl` file. This would be needed when the user has pasted in the content of the `.bbl` file into the document itself, something required by APS and AIP editorial direction.

```
1445 \auto@bib@innerbib
1446 \edef\@currentlabel{\arabic{NAT@ctr}}%
1447 \label{LastBibItem}%
1448 \endNAT@thebibliography
1449 \aftergroup\auto@bib@empty
1450 }%
1451 \def\present@bibnote#1#2{%
1452 \item[%
1453 \textsuperscript{%
1454 \normalfont
1455 \Hy@raisedlink{\hyper@anchorstart{frontmatter.#1}\hyper@anchorend}%
1456 \begingroup
1457 \csname c@\mpfn@endcsname#1\relax
1458 \frontmatter@thefootnote
1459 \endgroup
1460 }%
1461 ]#2\par
```

The following line was commented out:

```
%\global\let\NAT@bibitem@first@sw\@secondoftwo
%
```

```
1462 }%
```

`write@bibliographystyle` We wish to delay committing the `\bibliographystyle` until as late as possible. The journal substyle will define a default bibliography style, and the document's explicit `\bibliographystyle` command, if any, will override that default.

The `\bibstyle` command is allowed appear quite late in the `.aux` file. We now delay the automatic writing of the `\bibstyle` command to the end of the job.

The procedure `\write@bibliographystyle` tests whether a `\bibliographystyle` command has already been given. If not, it effectively executes the needed `\bibliographystyle` command, then neutralizes itself (we only need to do this once per job).

If the document lacks explicit `\bibliographystyle` markup, we execute `\@bibdataout@rev`, a hook for REVTeX-aware processing.

```
1463 \def\write@bibliographystyle{%
1464   \ifxundefined\@bibstyle{}{%
1465     \expandafter\bibliographystyle@latex\expandafter{\@bibstyle}%
1466     \bibliographystyle@sw{}\@bibdataout@rev}%
1467   }%
1468   \global\let\write@bibliographystyle\relax
1469 }%
1470 \AtEndDocument{\write@bibliographystyle}%
```

```
\rtx@@citetp We wish to extend natbib to move spaces and citations around a superscript-style
\rtx@citex citation, imitating Donald Arseneau's cite package with the super.
\super@cite@let The \rtx@@citetp procedure is substituted for \NAT@@citetp; it then calls
\super@cite@end the \rtx@citex procedure and implements the features of the citeautoscript
\super@cite@swap class option. In the end, \@citex is called with its customary parameters.
```

The document should be marked up as if citations were *not* superscripted, and then if you select a journal substyle that has superscripted citations, REVTeX will do its best to alter the formatting of the `\cites` to accomodate superscript style.

Only citations set as superscript are affected by this procedure, because we check `\@cite` against `\NAT@citesuper`.

Here's a subtle point: when is the argument of `\super@cite@swap` not the same as the token `\@let@token`? Answer: when the latter is `\@sptoken`! This case has to be handled separately.

Note that whether a punctuation is movable is determined by the definition of a particular control sequence name. A society or journal can alter things: to remove a character from the set, do, say, `\expandafter\let\csnamertx@automove;\endcsname\relax`. To add a character to the set, do, say, `\expandafter\let\csnamertx@automove;\endcsname\@empty`.

Implementation note: due to a TeX peculiarity, we have to check for the case where `\@let@token` is a space token *before* we parse forward. At issue is the corner case where an end of file is at hand. If we were to let `\super@cite@swap` parse forward, we would encounter a TeX end-of-file error. Note that the test will be true in many distinct cases: the file ends, the next character is a line terminator, the next character is a space.

```
1471 \def\rtx@@citetp[#1]{\@ifnextchar[{\rtx@citex[#1]}{\rtx@citex[] [#1]}}%
1472 \def\rtx@citex[#1][#2]#3{%
1473   \begingroup
1474   \def\@tempa[#1][#2]{#3}}%
1475   \ifx{\@cite\NAT@citesuper}{%
1476     \leavevmode
```

```

1477 \skip@\lastskip
1478 \unskip
1479 \super@cite@let
1480 }{%
1481 \super@cite@end
1482 }%
1483 }%
1484 \def\super@cite@let{%
1485 \futurelet\@let@token\super@cite@check
1486 }%
1487 \def\super@cite@end{%
1488 \aftergroup\@citex\expandafter\endgroup\@tempa
1489 }%
1490 \def\super@cite@check{%
1491 \@ifx{\@let@token\@sptoken}{%
1492 \super@cite@end
1493 }{%
1494 \super@cite@swap
1495 }%
1496 }%
1497 \long\def\super@cite@swap#1{%
1498 \expandafter\@ifx\expandafter{\csname rtx@automove#1\endcsname\@empty}{%
1499 #1%
1500 \super@cite@let
1501 }{%
1502 \super@cite@end
1503 #1%
1504 }%
1505 }%
1506 \expandafter\let\csname rtx@automove.\endcsname\@empty
1507 \expandafter\let\csname rtx@automove,\endcsname\@empty
1508 \expandafter\let\csname rtx@automove:\endcsname\@empty
1509 \expandafter\let\csname rtx@automove;\endcsname\@empty

```

The following must execute only after `natbib` is loaded and has set up its parameters (which it does at `\AtBeginDocument` time). If superscript citations have been selected, and if the `citeautoscript` class option has been selected, we patch into `natbib`'s mechanism to migrate punctuation around the citation, as in class `cite` with the `superscript` option.

```

1510 \appdef\class@documenthook{%
1511 \citeautoscript@sw{%
1512 \@ifx{\@cite\NAT@citesuper}{%
1513 \let\NAT@@citetp\rtx@@citetp
1514 }{}%
1515 }{}%
1516 }%

```

Resolve an incompatibility between `natbib` and `listings`. The latter package tests `\chapter` (which has now been `\let` to `\relax` as a side effect `natbib`'s use of L^AT_EX's `\@ifundefined`).

We couch our fix in such terms that will not be disruptive if `\chapter` is actually defined at this point.

```
%\ifx{\chapter\relax}{\let\chapter\@undefined}{}%
%
```

16.1.2 `\endnotes` and `\rtx@bibnotes`

`\mini@note` QUERY: how do footnotes get thrown to the bibliography. `\footinbib@sw` appears to be irrelevant.

```
1517 \def\mini@note{\save@note\mini@notes}%Implicit #2
1518 \def\save@note#1#2{%
1519   \stepcounter\@mpfn
1520   \protected@xdef\@thefnmark{\thempfn}%
1521   \@footnotemark
1522   \expandafter\g@addto@macro
1523   \expandafter#1%
1524   \expandafter{%
1525     \expandafter \@footnotetext
1526     \expandafter {\@thefnmark}{#2}%
1527     }%
1528 }%
1529 \long\def\@footnotetext#1{\def\@thefnmark{#1}\@footnotetext}%
1530 \let\mini@notes\@empty
```

`\endnote` A version of footnote that appears in the bibliography, or where `\printendnotes` appears.

```
%\def\@endnote{%
% \begingroup
% \aftergroup\@footnotemark
% \aftergroup\@endnotetext
% \@ifnextchar[{%
%   \@xendnote
% }{%
%   \stepcounter{footnote}%
%   \protected@xdef\@tempa{\thefootnote}%
%   \expandafter\@xendnote\expandafter[\the\c@footnote]%
% }%
%}%
%
```

```
\@xendnote %\def\unused@xendnote[#1]{%
% \begingroup
% \c@footnote#1\relax
% \end{macrocode}
% New for 4.1
% \begin{macrocode}
% \unrestored@protected@xdef\@endnotelabel{Note\thefootnote}%
% \authoryear@sw{%
```

```

% \unrestored@protected@xdef\@thefnmark{\noexpand\ref{\@endnotelabel}}%
% }{%
% \unrestored@protected@xdef\@thefnmark{\@endnotelabel}%
% }%
% \end{macrocode}
% Was:
% \unrestored@protected@xdef\@thefnmark{endnote\thefootnote}%
% End 4.1 changes
% \begin{macrocode}
% \endgroup
% \endgroup
%}%
%\def\@endnotemark{%
% \expandafter\cite\expandafter{\@thefnmark}%
%}%
%
1531 \def\rev@citemark#1{%
1532 \expandafter\cite\expandafter{\@thefnmark}%
1533 }%
1534 \def\rev@endtext#1{%
1535 \let\@endnotelabel\@thefnmark
1536 \@endnotetext
1537 }%

```

`\endnote@ext` The macro `\endnote@ext` is the file extension for the auxiliary file holding footnotes. The `\bibdata@app` and `\bibdata@ext` macros are used to form the name of a BibTeX database file holding footnotes.

```

1538 \def\endnote@ext{.end}%
1539 \def\bibdata@app{Notes}%
1540 \def\bibdata@ext{bib}%

```

`\@endnotetext` The procedure `\@endnotetext` writes a BibTeX .bib file for the purpose of inserting a footnote into the (numbered, unsorted) bibliography.

We need to define `\pre@bibdata` to be `\jobname\endnote@ext`, and we probably should define `\endnote@ext` to be something like “Notes.bib”.

In each case, the material to be written out requires robustification, provided by `\endnote@relax`. The commands `\label`, `\index`, and `\glossary`, which are robustified for `\markright` and `\addcontentsline`, are likewise robustified here.

Procedure `\@endnotetext@note` is the alias for `\@endnotetext` when the endnotes are to be processed separately from the bibliography (generally true when citations are not sorted).

```

%\long\def\unused@endnotetext@note#1{%
% \@ifxundefined\@endnoteout{%
% \newwrite\@endnoteout
% \gdef\endnote@stream{\jobname\endnote@ext}%
% \immediate\openout\@endnoteout\endnote@stream\relax
% }{%
% \begingroup

```

```

% \endnote@relax
% \immediate\write\@endnoteout{\string\@doendnote{\@endnotelabel}{#1}}%
% \endgroup
%}%
%
```

\@doendnote is obsolete.

```

%\def\@doendnote#1#2{\bibitem{#1}#2}%
%
```

Procedure `\@endnotetext` is the operative procedure when the endnotes are to be collated in with the other references, typically true when numerical citations are being used. The technique involves writing a .bib file (`\@bibdataout`) with each endnote typed as a `@FOOTNOTE` entry.

Timing note: doing `\openout` should be deferred until the beginning of the document, as is done here. This allows one to make a format (revtex4-1.dtx.fmt) file out of this class.

```

1541 \long\def\@endnotetext#1{%
1542   \begingroup
1543     \endnote@relax
1544     \immediate\write\@bibdataout{%
1545       @FOOTNOTE{%
1546         \@endnotelabel,%
```

The key field is recommended in cases where there is no author (see revtex4-1.dtxbtxdoc).

```

1547     key="\@endnotelabel",%
```

The note field is simply the content of the footnote.

```

1548     note="#1"%
1549   }%
1550 }%
1551 \endgroup
1552 }%
1553 \newwrite\@bibdataout
```

`\endnote@relax` At `\AtBeginDocument` time, we open the job's revtex4-1.dtx.bib file.

Procedure `\endnote@relax` robustifies commands that ought not to be expanded when the endnote is written out. Note the similarity between `\endnote@relax` and `\protected@write`.

```

1554 \def\endnote@relax{%
1555   \let\label\relax \let\index\relax \let\glossary\relax
1556   \let\cite\relax \let\ref\relax \let\pageref\relax
1557   \let\(\relax \let\)\relax \let\ \relax \let\ \relax
1558   \let~\relax
```

```

%\let\protect\noexpand
%
```

```
1559 \let \protect \@unexpandable@protect
1560 \newlinechar'\^M%
```

```
%\newlinechar'\ %
%
```

```
1561 \let\begin\relax \let\end\relax
1562 }%
```

`\@bibdataout@init` At `\AtBeginDocument` time, we open the job's `revtex4-1.dtx.bib` file. The hook
`\@bibdataout@aps` is available for use by a society to place its own `@CONTROL` record in the
`\@bibdataout` stream.

```
1563 \appdef\class@documenthook{\@bibdataout@init}%
1564 \def\@bibdataout@init{%
1565 \immediate\openout\@bibdataout\pre@bibdata.\bibdata@ext\relax
1566 }%
1567 \def\@bibdataout@rev{%
1568 \immediate\write\@bibdataout{%
```

The entry that controls processing of the `revtex4-1.dtx.bst` file has entry type
`@CONTROL`. The citation key (`REVTEX41Control`) is effectively a version number,
which the `revtex4-1.dtx.bst` can use to interpret the bib entry.

```
1569 @CONTROL{%
1570 REVTEX41Control%
```

Say if we want the `eprint` field disabled. Otherwise accept the default of the
`revtex4-1.dtx.bst`.

```
1571 \eprint@enable@sw}{,eprint=""}%
1572 }%
1573 }%
```

Place a `\citation` into the auxiliary file corresponding to this entry.

```
1574 \if@filesw
1575 \immediate\write\@auxout{\string\citation{REVTEX41Control}}%
1576 \fi
1577 }%
```

`\printendnotes` We have removed the endnotes facility from REVTeX, so the `\printendnotes`
command now does nothing.

Moving footnotes to the bibliography is now accomplished through the auto-
matic generation of a job BiBTeX database (called `\pre@bibdata`) containing the
footnotes.

```
1578 \def\printendnotes{%
1579 \class@warn{The \string\printendnotes\space command no longer serves any function. Please remo
1580 }%
```

`\@endnotesinbib` We define a function `\@endnotesinbib`, and a variant `\@endnotesinbibliography`.
`\@endnotesinbibliography` The former is invoked at the start of the end processing for `\end{thebibliography}`;
the latter is a synonym.

The procedure typesets the footnotes that are to appear in the bibliography; the default is to simply arrange for the footnote counter to be reset at the start of the document.

Note that this code make the assumption that the counter used in `thebibliography` is `\c@NAT@ctr`.

Here is the sole place where `\footinbib@sw` has an effect, other code simple assigning its value. If it is false, or `\authoryear@sw` is true, then footnotes are handled by the default mechanism.

```
1581 \def\make@footnote@endnote{%
1582 \footinbib@sw{%
1583 \authoryear@sw}{%
1584 \ltx@footnote@push
1585 \def\thempfn{Note\thefootnote}%
1586 \let\ltx@footmark\rev@citemark
1587 \let\ltx@foottext\rev@endtext
```

The endnotes facility has been removed. Also, there is no need to queue up `\auto@bib` here, since it is always queued up elsewhere.

```
% \appdef\class@enddocumenthook{\auto@bib}%
% \let\printendnotes\relax
%
```

```
1588 }%
1589 }{}%
1590 }%

1591 \def\ltx@footnote@push{%
1592 \let\ltx@footmark@latex\ltx@footmark
1593 \let\ltx@foottext@latex\ltx@foottext
1594 \let\thempfn@latex\thempfn
1595 \def\ltx@footnote@pop{%
1596 \let\ltx@footmark\ltx@footmark@latex
1597 \let\ltx@foottext\ltx@foottext@latex
1598 \let\thempfn\thempfn@latex
1599 }%
1600 }%
```

The switchover to setting footnotes in the bibliography changes the meaning of `\footnote` and substitutes the synonym for `\@endnotesinbib`.

We arrange for the procedure `\make@footnote@endnote` to be executed at `\class@documenthook` time (we mustn't do this earlier because the meaning of `\@footnotemark` must not be changed before then, for the sake of `ltxutil.dtx`).

```
1601 \appdef\class@documenthook{%
1602 \make@footnote@endnote
1603 }%
```

<code>\auto@bib</code>	Under some circumstances, we must typeset the bibliography automatically. If the
<code>\auto@bib@empty</code>	document requires footnotes to be set in the bibliography (effectively, class option
<code>\test@bbl@sw</code>	<code>footinbib</code>), or that frontmatter footnotes be set in the bibliography (effectively,
<code>\bibitem@set</code>	class option <code>bibnotes</code>), but contains no explicit <code>\bibliography</code> statement.

```
\auto@bib@innerbib
\thebibliography@nogroup
```

Note that this facility is not able to work more than once per document. If multiple bibliographys are required (e.g., per article), it will be the responsibility of the journal style to restore `\auto@bib` to its original meaning so it can be re-invoked.

In procedure `\auto@bib`, we first test for the presence of frontmatter footnotes deferred to the bibliography. If none, we further test for the presence of `\bibitem` commands in the job's `revtex4-1.dtx.bbl` file. If either condition is met, we ask for a bibliography. We know that the document itself lacks a `\bibliography` statement, so we know the argument of the `\bibliography` that we will issue.

```

1604 \def\auto@bib{%
1605 \@ifx@empty\FMN@list{%
1606 \footinbib@sw{%
1607 \ifnum{\csname c@\mpfn\endcsname>\z@}{%
1608 \true@sw
1609 }{%
1610 \test@bbl@sw
1611 }%
1612 }{%
1613 \test@bbl@sw
1614 }%
1615 }{%
1616 \true@sw
1617 }%
1618 {%
1619 \bibliography{}}%
1620 }-}%
1621 }%
1622 \def\auto@bib@empty{%
1623 \let\auto@bib\@empty
1624 }%

```

Testing the `revtex4-1.dtx.bbl` file involves defanging all expected commands and processing that file inside a box register (that will be simply discarded). We provide a new meaning for the `\bibitem` command: it queues a Boolean.

```

1625 \def\test@bbl@sw{%
1626 \setbox\z@\vbox\bgroup
1627 \let\providecommand\providecommand@j@nk
1628 \let\bibfield@gobbletwo
1629 \let\bibinfo@gobbletwo
1630 \let\translation@gobble
1631 \let\BibitemOpen\@empty
1632 \let\bibitemStop\@empty
1633 \let\bibitemNoStop\@empty
1634 \let\EOS\@empty
1635 \let\BibitemShut@gobble
1636 \let\bibAnnoteFile@gobbletwo
1637 \let\bibAnnote@gobblethree
1638 \let\textbf@gobble
1639 \let\emph@gobble

```

```

1640 \@booleanfalse\bibitem@sw
1641 \let\bibitem\bibitem@set
1642 \auto@bib@innerbib
1643 \bibitem@sw{\aftergroup\true@sw}{\aftergroup>false@sw}%
1644 \egroup
1645 }%

```

The `\bibitem@set` is an alias for `\bibitem` for the purpose of detecting a non-trivial bibliography.

```

1646 \newcommand\bibitem@set[1] [] {%
1647 \bibitem@sw}{%
1648 \@booleantrue\bibitem@sw
1649 \aftergroup\@booleantrue\aftergroup\bibitem@sw
1650 }%
1651 }%

```

The `\auto@bib@innerbib` procedure reads in the `revtex4-1.dtx.bbl` file (if it exists) within a context where its `thebibliography` environment does nothing, not even establishing a group.

```

1652 \def\auto@bib@innerbib{%
1653 \begingroup
1654 \let\environment{thebibliography}{thebibliography@nogroup}%
1655 \bibliography{}%
1656 \endgroup
1657 }%

```

Environment `thebibliography@nogroup` is an alias of the `thebibliography` environment that cancels itself. It assumes that it is called within a `thebibliography` environment.

```

1658 \def\thebibliography@nogroup#1{%
1659 \endgroup
1660 \def\@currenvir{thebibliography}%
1661 }%
1662 \def\endthebibliography@nogroup{\begingroup}%

```

The following should be part of `revtex4-1.dtxltxutil`.

```

1663 \long\def \@gobblethree #1#2#3{%
1664 \def\providecommand@j@nk#1[#2]{%
1665 \@ifnum{#2=\z@}{\def\j@nk}{%
1666 \@ifnum{#2=\@ne}{\def\j@nk##1}{%
1667 \@ifnum{#2=\tw@}{\def\j@nk##1##2}{%
1668 \@ifnum{#2=\thr@@}{\def\j@nk##1##2##3}{%
1669 }%
1670 }%
1671 }%
1672 }%
1673 }%

```

17 Initial setup

The standard LaTeX document classes execute certain commands that are best deferred until `\class@documenthook` time. Here, we effectively split `\pagenumbering` into two halves, with a default definition for `\thepage` and an initialization of `\c@page` at `\class@documenthook` time.

The meaning of `\thepage` can be overridden by `society`, `journal`, or anywhere within the document preamble, and the counter itself will be preset at the beginning of the document.

```
1674 \def\thepage{\@arabic\c@page}%
    Note that this code is executed at \setup@hook time to allow for the possibility
    of overrides by packages like geometry.
1675 \appdef\setup@hook{%
1676   \tabbingsep \labelsep
1677   \leftmargin\leftmarginI
1678   \labelwidth\leftmargin\advance\labelwidth-\labelsep
1679   \let\@listi\@listI
1680   \@listi
1681 }%
1682 %   \begin{macrocode}
1683 %
1684 % We ensure that the ‘‘environment’’ component mark (implemented by \file{ltxgrid.dtx})
1685 % is initialized properly (via a hook, itself defined via \file{ltxutil.dtx}).
1686 %   \begin{macrocode}
1687 \appdef\class@documenthook{%
1688   \global\c@page\@ne
1689   \def\curr@envir{document}%
1690   \mark@envir{\curr@envir}%
1691 }%
```

```
\open@onecolumn When setting the column grid, we have to override the procedure for formatting
\open@column@two lists. Because \twocolumngrid requires rebalancing columns at some points, type-
                    setting must employ only the manipulation of \leftskip and \rightskip, and
                    must avoid the use of \moveleft, \moveright, and \parshape.
```

It is one of the stranger features of T_EX that these two separate mechanisms exist. The latter three have the effect of adding things to the Main Vertical List that cannot be removed and later added back with all their properties intact.

In detail, `\moveleft`, say, adds a box to the MVL with its reference point shifted horizontally by some amount relative to the reference point of the enclosing list. If that box is removed from the MVL (via a `\lastbox` operation in the output routine), and later thrown back to the MVL, the shift of the box will have been “forgotten” by T_EX. This is a bug, but not one “acceptable to D. E. Knuth”, so it will never be fixed.

```
1692 \def\open@onecolumn{%
1693   \open@column@one\@ne
1694   \set@colht
1695   \@floatplacement
```

```

1696 \@dblfloatplacement
1697 }%
1698 \def\open@twocolumn{%
1699 \open@column@mlt\tw@
1700 \set@colht
1701 \@floatplacement
1702 \@dblfloatplacement
1703 \sloppy
1704 \let\set@listindent\set@listindent@
1705 }%

```

18 \appendix

```
1706 %\newif\ifappendixon
```

Note that, within appendices, equations are numbered within sections (appendices).

```

1707 \def\appendix{%
1708 \par
1709 %\appendixontrue
1710 \setcounter{section}\z@
1711 \setcounter{subsection}\z@
1712 \setcounter{subsubsection}\z@
1713 \def\thesubsection{\arabic{subsection}}%
1714 \def\thesubsubsection{\alph{subsubsection}}%
1715 \@addtoreset{equation}{section}%
1716 \def\theequation@prefix{\thesection}%
1717 \addtocontents{toc}{\protect\appendix}%
1718 \@ifstar{%
1719 \def\thesection{\unskip}%
1720 \def\theequation@prefix{A.}%
1721 }{%
1722 \def\thesection{\Alph{section}}%
1723 }%
1724 }%

```

19 Changing the page grid

19.1 Avoiding Grid Changes

In preprint styles, “wide text” is a no-op, and the title page processing involves no grid change.

`\title@column` Provide default meanings for `\title@column` and `\close@column`, in case they were never defined. Note that the society or journal substyle may define `\title@column` or `\close@column`: this code will not override.

```

1725 \def\title@column#1{%
1726 \minipagefootnote@init
1727 #1%

```

```

1728 \minipagefootnote@foot
1729 }%
1730 \def\close@column{%
1731 \newpage
1732 }%

```

19.2 Galley Style: Margin Changes

A variant of preprint processing. Emulate journal appearance somewhat.

```

widetext@galley DPC: We're in galley style so do a lob sided display environment.
                QUERY: How can we be sure that we are in galley style? ANSWER: as noted
                elsewhere, require that both \twocolumn@sw and \preprintsty@sw be false.
1733 \def\galley@outdent{\rightmargin-\columnwidth\advance\rightmargin-\columnsep}%
1734 \let\widetext@outdent\@empty
1735 \newenvironment{widetext@galley}{%
1736 \list{}{%
1737 \topsep \z@skip
1738 \listparindent \parindent
1739 \itemindent \parindent
1740 \leftmargin \z@
1741 \parsep \z@\@plus\p@
1742 \widetext@outdent
1743 \relax
1744 }%
1745 \item\relax
1746 }{
1747 \endlist
1748 }%

```

19.3 Grid Changing Via ltxgrid

In case `twocolumngrid` has been invoked, switch column grid using the column grid-changing commands. Supply stub definitions of those commands here.

```

\title@column@grid The title block always starts at the top of a new page.
\close@column@grid Note that, for the procedure \close@column@grid, we balance columns by
                    switching to the one-column page grid.
1749 \def\title@column@grid#1{%
1750 \minipagefootnote@init
1751 \onecolumngrid
1752 \begingroup
1753 \let\@footnotetext\frontmatter@footnotetext
1754 %<ignore> \let\set@footnotewidth\set@footnotewidth@two
1755 \ltx@no@footnote
1756 #1%
1757 \endgroup
1758 \twocolumngrid
1759 \minipagefootnote@foot

```

```

1760 }%
1761 \def\close@column@grid{%
1762 \balancepage@sw{%
1763 \onecolumngrid
1764 %<ignore> \twocolumngrid
1765 }{}%
1766 }%

```

`widetext@grid` We slip into the one-column page grid within the scope of this environment. Note that we set adornments above and below the `widettext`. These are set as leaders, so they will disappear at a page break.

```

1767 \newenvironment{widetext@grid}{%
1768 \par\ignorespaces
1769 \setbox\widetext@top\vbox{%
1770 %<ignore> \vskip15\p@
1771 \hb@xt@\hsize{%
1772 \leaders\hrule\hfil
1773 \vrule\@height6\p@
1774 }%
1775 %<ignore> \vskip6\p@
1776 }%
1777 \setbox\widetext@bot\hb@xt@\hsize{%
1778 \vrule\@depth6\p@
1779 \leaders\hrule\hfil
1780 }%
1781 \onecolumngrid
1782 \vskip10\p@
1783 \dimen@ht\widetext@top\advance\dimen@\dp\widetext@top
1784 \cleaders\box\widetext@top\vskip\dimen@
1785 %<ignore> \let\set@footnotewidth\set@footnotewidth@two
1786 \vskip6\p@
1787 \prep@math@patch
1788 }{}%
1789 \par
1790 \vskip6\p@
1791 \setbox\widetext@bot\vbox{%
1792 \hb@xt@\hsize{\hfil\box\widetext@bot}%
1793 %<ignore> \vskip14\p@
1794 }%
1795 \dimen@ht\widetext@bot\advance\dimen@\dp\widetext@bot
1796 \cleaders\box\widetext@bot\vskip\dimen@
1797 \vskip8.5\p@
1798 \twocolumngrid\global\@ignoretrue
1799 \@endpetrue
1800 }%
1801 \newbox\widetext@top
1802 \newbox\widetext@bot

```

Decide, finally, how the page grid is to be manipulated.

```

1803 \def\set@page@grid{%
1804 \twocolumn@sw{%
    The following two assignments determine what procedures are to be executed when
    the footnote set width is calculated, and how footnotes are to be composed at the
    bottom of the page. A society or journal wishing to do otherwise will override this
    code.
1805 \let\set@footnotewidth\set@footnotewidth@two
1806 \let\compose@footnotes\compose@footnotes@two
1807 \let@environment{widetext}{widetext@grid}%
1808 \let\title@column\title@column@grid
1809 \let\close@column\close@column@grid
1810 }{%
1811 \let@environment{widetext}{widetext@galley}%
1812 \preprintsty@sw{%

```

Change the page grid not at all.

```

1813 }{%
    If we are galley style, change the page margin only.
1814 \galley@sw{%
1815 \let\widetext@outdent\galley@outdent
1816 }{}%
1817 }%
1818 }%
1819 }%
1820 \appdef\setup@hook{\set@page@grid}%

```

20 Old font commands

```

1821 \DeclareOldFontCommand{\rm}{\normalfont\rmfamily}{\mathrm}
1822 \DeclareOldFontCommand{\sf}{\normalfont\sffamily}{\mathsf}
1823 \DeclareOldFontCommand{\tt}{\normalfont\ttfamily}{\mathtt}
1824 \DeclareOldFontCommand{\bf}{\normalfont\bfseries}{\mathbf}
1825 \DeclareOldFontCommand{\it}{\normalfont\itshape}{\mathit}
1826 \DeclareOldFontCommand{\sl}{\normalfont\slshape}{\@nomath\sl}
1827 \DeclareOldFontCommand{\sc}{\normalfont\scshape}{\@nomath\sc}
1828 \DeclareRobustCommand*\cal{\@fontswitch\relax\mathcal}
1829 \DeclareRobustCommand*\mit{\@fontswitch\relax\mathnormal}

```

21 English-Language Texts

As this class is just for English language journals, we could hardwire these texts, but to make it easier to use this as a basis for the code for similar journal styles, separate out all the fixed text strings into babel-style macros of the form `\...name`

Note: for babel compatibility, use version 1999/05/05 v3.6x or later.

Some of these might need changing in the society-specific code.

`\today` Procedure `\today` is used in the article class, but not in this document class.

```

1830 \def\today{\ifcase\month\or
1831   January\or February\or March\or April\or May\or June\or
1832   July\or August\or September\or October\or November\or December\fi
1833   \space\number\day, \number\year}

\notesname  Text entity \notesname had been used in \printendnotes. However, we have
             removed the endnotes facility from REVTeX.

             %\def\notesname{Notes}
             %

\partname   Text entity \partname is used in \@part.
1834 \def\partname{Part}

\tocname    Text entity \tocname is used in \tableofcontents, as defined in the standard
             LATEX book class.
1835 \def\tocname{Contents}

\lofname    Text entity \lofname is used in \listoffigures, as defined in the standard LATEX
             book class.
1836 \def\lofname{List of Figures}

\lotname    Text entity \lotname is used in \listoftables, as defined in the standard LATEX
             book class.
1837 \def\lotname{List of Tables}

\refname    Text entity \refname is used in thebibliography.
1838 \def\refname{References}

\indexname  Text entity \indexname is used in theindex, as defined in the standard LATEX
             book class.
1839 \def\indexname{Index}

\figurename Text entity \figurename is used in figure, \figuresname in \printfigures.
1840 \def\figurename{FIG.}
1841 \def\figuresname{Figures}%

\tablename Text entity \tablename is used in table, \tablesname in \printtables.
1842 \def\tablename{TABLE}
1843 \def\tablesname{Tables}%

\abstractname Text entity \abstractname is used in abstract.
1844 \def\abstractname{Abstract}

\appendixesname Text entity \appendixesname is used in TOC.
\appendixname 1845 \def\appendixesname{Appendixes}%
1846 \def\appendixname{Appendix}%

```

`\acknowledgmentsname` Text entity `\acknowledgmentsname` is used in acknowledgments.
1847 `\def\acknowledgmentsname{Acknowledgments}`

`\journalname` This should be set by the society journal options, eg ‘pra’.
1848 `\def\journalname{??}`

`\copyrightname` Default layout does not assign copyright, but a journal that wants to might use this.
1849 `\def\copyrightname{??}`

`\andname` The text string “and” for use in author lists.
1850 `\def\andname{and}`

`\@pacs@name` The text string prepended to PACS numbers, resp. to keywords.
`\@keys@name` 1851 `\def\@pacs@name{PACS numbers: }%`
1852 `\def\@keys@name{Keywords: }%`

`\ppname` The text string “pp” for use in page ranges.
1853 `\def\ppname{pp}`

`\numbername` The text string “number” for use in article reference.
1854 `\def\numbername{number}`

`\volumename` The text string “volume” for use in article reference.
1855 `\def\volumename{volume}`

`\Dated@name` These texts are used in the `\date`, et al. commands.
`\Received@name` 1856 `\def\Dated@name{Dated: }%`
`\Revised@name` 1857 `\def\Received@name{Received }%`
`\Accepted@name` 1858 `\def\Revised@name{Revised }%`
`\Published@name` 1859 `\def\Accepted@name{Accepted }%`
1860 `\def\Published@name{Published }%`

22 Legacy Commands

We define some commands left over from version 3.1, or give default meanings. Some definitions can be overridden in the document preamble or in included packages.

Note on the namespace: command names like `\REV@name` are used here, because it is not clear that any of this code is generally useful.

```
1861 \def\address{\replace@command\address\affiliation}%
1862 \def\altaddress{\replace@command\altaddress\altaffiliation}%
1863 \newenvironment{references}{%
1864 \class@warn@end{The references environment is not supported; use thebibliography instead.}
1865 \gdef\references{\thebibliography{}}\references
1866 }{%
1867 \endthebibliography
```

```

1868 }%
1869 \def\draft{%
1870 \class@warn@end{Command \string\draft\space is obsolete;^^JInvoke option draft instead.}%
1871 \@booleantrue\draft@sw
1872 }%
1873 \def\tighten{%
1874 \class@warn@end{Command \string\tighten\space is obsolete;^^JInvoke option tightenlines instead.}%
1875 \@booleantrue\tightenlines@sw
1876 }%
1877 \def\tableline{%
1878 \noalign{%
1879 \class@warn@end{Command \string\tableline\space is obsolete;^^JUse \string\colrule\space instead.}%
1880 \global\let\tableline\colrule
1881 }%
1882 \tableline
1883 }%
1884 \def\case{\replace@command\case\frac}%
1885 \def\slantfrac{\replace@command\slantfrac\frac}%
1886 \def\tablenote{\replace@command\tablenote\footnote}%
1887 \def\tablenotemark{\replace@command\tablenotemark\footnotemark}%
1888 \def\tablenotetext{\replace@command\tablenotetext\footnotetext}%
1889 % Lose the following definition:
1890 \DeclareRobustCommand\REV@text[1]{%
1891 \relax
1892 \ifmmode
1893 \mathchoice
1894 {\hbox{{\everymath{\displaystyle }#1}}}%
1895 {\hbox{{\everymath{\textstyle }#1}}}%
1896 {\hbox{{\everymath{\scriptstyle }#1}}}%
1897 {\hbox{{\everymath{\scriptscriptstyle }#1}}}%
1898 \glb@settings
1899 \else
1900 \mbox{#1}%
1901 \fi
1902 }%
1903 % Lose the following definition:
1904 \DeclareRobustCommand\REV@bbox[1]{%
1905 \relax
1906 \ifmmode
1907 \mathchoice
1908 {\hbox{{\everymath{\displaystyle }#1}}}%
1909 {\hbox{{\everymath{\textstyle }#1}}}%
1910 {\hbox{{\everymath{\scriptstyle }#1}}}%
1911 {\hbox{{\everymath{\scriptscriptstyle }#1}}}%
1912 \glb@settings
1913 \else
1914 \mbox{#1}%
1915 \fi
1916 }%
1917 \DeclareRobustCommand\REV@bm[1]{%

```

```

1918 \class@warn@end{To use \string\bm, please load the bm package!}%
1919 \global\let\bm\relax
1920 }%
1921 \def\FL{\obsolete@command\FL}%
1922 \def\FR{\obsolete@command\FR}%
1923 \def\narrowtext{\obsolete@command\narrowtext}%
1924 \def\mediumtext{\obsolete@command\mediumtext}%
1925 \newenvironment{quasitable}{%
1926 \let@environment{tabular}{longtable}%
1927 }{%
1928 }%

\text If not otherwise defined, give default meanings to certain commands. FIXME:
\bm \bibinfo?
\bibinfo 1929 \let\text\REV@text
\ reprint 1930 \let\bm\REV@bm
\url 1931 \appdef\setup@hook{%
1932 \providecommand\bibinfo[2]{#2}%
1933 \providecommand\reprint[2][ ]{#2}%
1934 %\providecommand\url[1]{#1}%
1935 }%

\bbox
1936 \def\bbox#1{%
1937 \class@warn@end{\string\bbox\space is obsolete,^^Jload the bm package and use \string\bm\space
1938 \global\let\bbox\relax
1939 }%

\mathletters
1940 \newenvironment{mathletters}{%
1941 \class@warn@end{Environment {mathletters} is obsolete;^^Jload the amsmath package and use {sub
1942 \global\let\mathletters\@empty
1943 }{%
1944 }%

\eqnum
1945 \def\eqnum#1{%
1946 \class@warn@end{\string\eqnum\space is obsolete, load the amsmath package and use \string\tag!
1947 \global\let\eqnum\@gobble
1948 }%

We read in the symbol definitions.
1949 \appdef\rtx@require@packages{%
1950 \RequirePackage{revsymb4-1}%
1951 }%
1952 \appdef\class@documenthook{\revsymb@inithook}%

```

23 Patches for lineno.sty

The `lineno` package detects the case where the package has been loaded and the document invokes `\linelabel`, but the `\linenumbers` command has not been issued: it treats this case as an error.

It is wrong for validity of document syntax to be dependent upon package semantics: we make the condition a warning rather than an error.

```
1953 \def\LN@LError@org{%
1954 \PackageError{lineno}{%
1955 \string\linelabel\space without \string\linenumbers
1956 }{%
1957 Just see documentation. (New feature v4.11)%
1958 }%
1959 \@gobble
1960 }%
1961 \def\LN@LError@ltx{%
1962 \PackageWarning{lineno}{%
1963 To make the \string\linelabel\space command work, you must issue the \string\linenumbers\ com
1964 }%
1965 \@gobble
1966 }%
```

If appropriate, enable line numbering within the abstract.

This mechanism applies generally: Create the box in a context in which the meaning of `\par` has been patched by `lineno`, then `\unvbox` the box in a context where `\set@linepenalties` has been executed, and follow up with `\@linenumberpar`, which forces a visit to the output routine just there. Note that here, we have to de-fang `\LN@parpgbrk`, which would otherwise causes the appearance of a box with depth -1000 points. Go figure.

```
1967 \appdef\class@documenthook{%
1968 \@ifx{\LN@LError\LN@LError@org}{%
1969 \class@info{Overriding \string\LN@LError}%
1970 \let\LN@LError\LN@LError@ltx
1971 }{%
1972 \@ifpackageloaded{lineno}{%
1973 \@ifxundefined{\set@linepenalties}{%
1974 \def\prep@absbox{\set@linepenalties}%
1975 \def\post@absbox{\let\LN@parpgbrk\@empty\@linenumberpar}%
1976 }%
1977 }{%
1978 }%
```

One may well ask: how to obtain line numbering within an alignment in a float? This objective, along with line numbering within footnotes, would require extraordinary measures. The float would have to be thrown onto the MVL in order to acquire its line numbers, but that fragment of MVL would then have to be protected from being shipped out. The question of how to coordinate those lines' numbers with those of lines in the MVL would also require dealing with.

24 Endgame for the Document Class

We provide for a “job macro package” that can override definitions and assignments made by the class or any other packages it loads.

24.1 Job Macro Package

You can create a “job macro package” for your document that will be read in automatically every time your document is processed. Thus, if your job is a file called `myarticle.tex`, then the file `myarticle.rty` will be read in just the same as if you had placed a `\usepackage{myarticle.rty}` statement immediately following your `\documentclass` statement.

Within your `.rty` file, you can define and use control sequence names that use the `@` character and you can override any of the definitions or assignments made by the REV_TEX document class or the selected journal substyle. That is, you have the power to really mess things up badly.

If you choose to have a job macro package, you are well advised to read the L^AT_EX guide to document classes, `clsguide.tex` or read up on the subject in a book like the L^AT_EX Companion.

The file `template.rty` contains a template for creating your own job macro package.

```
1979 \appdef\rtx@require@packages{%
1980 \InputIfFileExists{\jobname.rty}{-}{-}%
1981 }%
```

24.2 Endgame Processing for the Document Class

The remaining steps in processing the document class involve determining the needed society, journal, and pointsize from the document’s class options and inputting the needed files or executing the indicated procedures.

Note that the society file is expected to declare options that will allow us to determine the journal involved, and the society and journal themselves determine the which pointsize options are declared, along with their meanings.

Note also that required packages are read in only after the document options have been processed, because the latter can affect the former.

Finally, the setup code is executed: this is code that depends on the meanings of the switches we define and on the code within the packages we load.

Note that there are other hooks in use: `\document@inithook`, which is executed right at the beginning of the document, and `\class@documenthook`, which serves as a vehicle for any `\AtBeginDocument` code we might wish to execute.

FIXME: use `\class@documenthook` only for things that bear on the MVL; use `\document@inithook` for all patches to procedures defined within the preamble.

Remember that `natbib` changes its state at `\AtBeginDocument` time, so we have to install our own code at a later point in the processing.

We determine the proper `\@society` by examining the document’s class options.

1982 `\@parse@class@options@society`

Then, we input the society's substyle (which may in turn lead to loading a journal substyle or a pointsize substyle). The substyle should not assume the value of any class option: instead, it should install code into `\setup@hook`.

1983 `\@process@society{aps}%`

Now that the society has defined the class options relating to journals, and has defined `\@journal@default`, we can process the journal substyle. We parse the options for one that sets `\@journal`.

1984 `\@parse@class@options@\@journal`

And we process the journal. Note that *it is an error* for a society file to fail to define `\@journal@default`.

1985 `\expandafter\@process@journal\expandafter{\@journal@default}%`

Now that the society and journal have finished defining any options relating to point size, we process the class options for any that set `\@pointsize`.

1986 `\@parse@class@options@\@pointsize`

And we process the pointsize. Note that it is an error for the society and journal to leave `\@pointsize@default` undefined at this point, however, the journal may have overridden the assignment of the society.

1987 `\expandafter\@process@pointsize\expandafter{\@pointsize@default}%`

Next, we process the class options for once and all. Doing so sets values for some of the Booleans that were introduced along with the `\DeclareOption` statements above.

CHANGE: We process the options in the order declared in the document; this gives the document greater control.

1988 `\@options`

Now that the class options have been processed, we can load all the packages that we know need loading.

1989 `\rtx@require@packages`

At this point, the society substyle, the journal substyle, and the pointsize have all been processed, along with the document class options. Some of these have left things for later; we do these now.

`\setup@hook` This portion of the code for this class file *must* appear at the very end: The procedure `\setup@hook` should be executed at the very end of the class file. Any code that relies on the value of any of the `@sw` switches or will patch the code of one of the required packages should be executed here.

1990 `\setup@hook`

Warn if past maturation date. This code to be enabled only in beta software.

1991 `%<*ignore>`

1992 `\def\rtx@fin@year{2010}%`

1993 `\def\rtx@fin@month{01}%`

```

1994 \def\rtx@fin@day{01}%
1995 \def\rtx@fin@warn{%
1996 \@ifnum{\rtx@fin@year>\the\year\relax}{\true@sw}{%
1997 \@ifnum{\rtx@fin@month>\the\month\relax}{\true@sw}{%
1998 \@ifnum{\rtx@fin@day>\the\day\relax}{\true@sw}{%
1999 \false@sw
2000 }%
2001 }%
2002 }%
2003 {%
2004 \class@info{Beta software expires \rtx@fin@year-\rtx@fin@month-\rtx@fin@day; updates availab
2005 }{%
2006 \class@warn{Outdated software expired \rtx@fin@year-\rtx@fin@month-\rtx@fin@day; please retr
2007 }%
2008 }%
2009 %</ignore>

```

In shipping (non-beta) software, the following line should be commented out.

```

%\appdef\class@enddocumenthook{\rtx@fin@warn}%
%

```

End of the class file.

```

2010 %</package>

```

25 Symbols: the revsymb module

We immediately define a utility command: this module's warning.

```

2011 %<*revsymb>
2012 \def\REVSYMB@warn#1{\PackageWarningNoLine{revsymb}{#1}}%

```

\lambdabar

```

2013 \DeclareRobustCommand\lambdabar{%
2014 \bgroup
2015 \def\@tempa{%
2016 \hbox{%
2017 \raise.73\ht\z@
2018 \hb@xt@\z@{%
2019 \kern.25\wd\z@
2020 \vrule \@width.5\wd\z@\@height.1\p@\@depth.1\p@
2021 \hss
2022 }%
2023 \box\z@
2024 }%
2025 }%
2026 \mathchoice
2027 {\setbox\z@\hbox{\displaystyle \lambda}\@tempa}%
2028 {\setbox\z@\hbox{\textstyle \lambda}\@tempa}%
2029 {\setbox\z@\hbox{\scriptstyle \lambda}\@tempa}%

```

```

2030      {\setbox\z@\hbox{\$ \scriptscriptstyle\lambda$}\@tempa}%
2031 \egroup
2032 }%

\openone DPC: Really should use a font that includes this glyph. Unfortunately not in AMS
ones, but is in bbold, cmbb. (I think, must check), FIXME: check for bbold.
2033 \DeclareRobustCommand\openone{\leavevmode\hbox{\small11\normalsize\kern-.33em1}}%

\corresponds Jörg Knappen suggests the replacements: replace \corresponds with \triangleq,
\overdots source amssymb; replace \overcirc with \mathring, source latex2e; replace
\overcirc \overdots with \ddot, source amsmath.
Any use of any of these commands will result in a warning message at the end
of the log file. If the corresponding package is not loaded, a definition will quietly
be provided.
2034 \DeclareRobustCommand\corresponds{\replace@command\corresponds\triangleq}%
2035 \DeclareRobustCommand\overcirc{\replace@command\overcirc\mathring}%
2036 \DeclareRobustCommand\overdots{\replace@command\overdots\ddot}%
2037 \DeclareRobustCommand\REV@triangleq{%
2038   {\lower.2ex\hbox{=}}{\kern-.75em\triangle}%
2039 }%
2040 \DeclareRobustCommand\REV@ddot[1]{%
2041   \@ontopof{#1}{\cdots}{1.0}\mathord{\box2}%
2042 }%

\succsim These version 3.1 commands are always supplied, but the definitions in amssymb
\precsim are preferred.
\lessim 2043 \DeclareRobustCommand\altsuccsim{\succ\kern-.9em\sim\kern.3em}%
\gtrsim 2044 \DeclareRobustCommand\altprecsim{\prec\kern-1em\sim\kern.3em}%
\alt 2045 \let\REV@succsim\altsuccsim
\agt 2046 \let\REV@precsim\altprecsim
2047 \DeclareRobustCommand\REV@lessim{\mathrel{\mathpalette\vereq{<}}}%
2048 \DeclareRobustCommand\REV@gtrsim{\mathrel{\mathpalette\vereq{>}}}%
2049 \DeclareRobustCommand\alt{\lessim}
2050 \DeclareRobustCommand\agt{\gtrsim}
2051 \def\vereq#1#2{%
2052   \lower3\p@\vbox{%
2053     \baselineskip1.5\p@
2054     \lineskip1.5\p@
2055     \ialign{ \$\m@th#1\hfill##\hfil$ \crr#2\crr\sim\crr }%
2056   }%
2057 }%

\tensor
\overstar 2058 \DeclareRobustCommand\tensor[1]{\@ontopof{#1}{\leftrightharpoonup}{1.15}\mathord{\box2}}
\loarrow 2059 \DeclareRobustCommand\overstar[1]{\@ontopof{#1}{\ast}{1.15}\mathord{\box2}}
\roarrow 2060 \DeclareRobustCommand\loarrow[1]{\@ontopof{#1}{\leftarrow}{1.15}\mathord{\box2}}
2061 \DeclareRobustCommand\roarrow[1]{\@ontopof{#1}{\rightarrow}{1.15}\mathord{\box2}}

```

`\@ontopof`

```
2062 \def \@ontopof#1#2#3{%
2063   {%
2064     \mathchoice
2065       {\@ontopof{#1}{#2}{#3}\displaystyle \scriptstyle }%
2066       {\@ontopof{#1}{#2}{#3}\textstyle \scriptstyle }%
2067       {\@ontopof{#1}{#2}{#3}\scriptstyle \scriptscriptstyle}%
2068       {\@ontopof{#1}{#2}{#3}\scriptscriptstyle\scriptscriptstyle}%
2069   }%
2070 }%
```

`\@@ontopof` Same as REVTeX3, more or less.

```
2071 \def \@@ontopof#1#2#3#4#5{%
2072   \setbox\z@\hbox{#4#1$}%
2073   \setbox\@ur\hbox{#5#2$}%
2074   \setbox\tw@\null\ht\tw@\ht\z@ \dp\tw@\dp\z@
2075   \@ifdim\wd\z@>\wd\@ur{%
2076     \setbox\@ur\hbxt@{\wd\z@\hss\box\@ur\hss}%
2077     \mathord{\rlap{\raise#3\ht\z@\box\@ur}\box\z@}%
2078   }{%
2079     \setbox\@ur\hbxt@{.9\wd\@ur\hss\box\@ur\hss}%
2080     \setbox\z@\hbxt@{\wd\@ur\hss$#4\relax#1\hss}%
2081     \mathord{\rlap{\copy\z@}\raise#3\ht\z@\box\@ur}%
2082   }%
2083 }%
```

`\frac` Deal with legacy `\frac`: if `amsfonts` not loaded, defined in such a way as to ask for that package. Also, says to use `\mathfrac` instead.

```
2084 \DeclareRobustCommand\frac{%
2085   \REVSymb@warn{%
2086     Command \string\frac\space unsupported:^^J%
2087     please use \string\mathfrac\space instead.%
2088   }%
2089   \global\let\frac\mathfrac
2090   \frac
2091 }%
2092 \DeclareRobustCommand\REV@mathfrac{%
2093   \REVSymb@warn{%
2094     Command \string\mathfrac\space undefined:^^J%
2095     please specify the amsfonts or amssymb option!%
2096   }%
2097   \global\let\mathfrac\@firstofone
2098   \mathfrac
2099 }%
```

`\Bbb` Deal with legacy `\Bbb`: if `amsfonts` not loaded, defined in such a way as to ask for that package. Also, says to use `\mathbb` instead.

```
2100 \DeclareRobustCommand\Bbb{%
2101   \REVSymb@warn{%
```

```

2102 Command \string\Bbb\space unsupported:^^J%
2103 please use \string\mathbb\space instead.%
2104 }%
2105 \global\let\Bbb\mathbb
2106 \Bbb
2107 }%
2108 \DeclareRobustCommand\REV@mathfrak{%
2109 \REVSymb@warn{%
2110 Command \string\mathbb\space undefined:^^J%
2111 please specify the amsfonts or amssymb option!%
2112 }%
2113 \global\let\mathbb\@firstofone
2114 \mathbb
2115 }%

```

`\Bigglb` Deal with legacy bold delimiters. Each of the following takes an implicit argument consisting of the delimiter to be made big and bold. **FIXME:** `\DeclareBoldMathCommand` is not the right tool!

```

2116 \def\Bigglb{\REV@boldopen \Bigg}%
2117 \def\Biglb {\REV@boldopen \Big }%
2118 \def\bigglb{\REV@boldopen \bigg}%
2119 \def\biglb {\REV@boldopen \big }%
2120 \def\Biggrb{\REV@boldclose\Bigg}%
2121 \def\Bigrb {\REV@boldclose\Big }%
2122 \def\biggrb{\REV@boldclose\bigg}%
2123 \def\bigrb {\REV@boldclose\big }%
2124 \def\REV@pmb#1{%
2125 \hbox{%
2126 \setbox\z@=\hbox{#1}%
2127 \kern-.02em\copy\z@\kern-\wd\z@
2128 \kern .04em\copy\z@\kern-\wd\z@
2129 \kern-.02em
2130 \raise.04em\copy\z@
2131 }%
2132 }%
2133 \def\REV@boldopen #1#2{\mathopen {\REV@pmb{#1#2}}}%
2134 \def\REV@boldclose#1#2{\mathclose{\REV@pmb{#1#2}}}%

```

`\revsymb@inithook` Package dependencies are taken care of at `\setup@hook` time.

```

2135 \def\revsymb@inithook{%
2136 \@ifxundefined\dddote{\let\dddote\REV@dddote}{}%
2137 \@ifxundefined\triangleq{\let\triangleq\REV@triangleq}{}%
2138 \@ifxundefined\succsim{\let\succsim\altsuccsim}{}%
2139 \@ifxundefined\precsim{\let\precsim\altprecsim}{}%
2140 \@ifxundefined\lessim{\let\lessim\REV@lessim}{}%
2141 \@ifxundefined\gtrsim {\let\gtrsim \REV@gtrsim }{%
2142 \@ifxundefined\mathfrak{\let\mathfrak\REV@mathfrak}{}%
2143 \@ifxundefined\mathbb{\let\mathbb\REV@mathbb}{}%
2144 }%

```

2145 %</revsymp>

26 The 10pt class option: the 10pt module

The file `aps10pt.rtx` is read in by the `revtex4` document class if `\@pointsize` has the value 10.

2146 %<*10pt>

26.1 Defend Against Forseeable Errors

Protect this file from being read in by anything but REVTeX.

```
2147 \ifx\undefined\substyle@ext
2148 \def\@tempa{%
2149 \endinput
2150 \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
2151 }%
2152 \expandafter\else
2153 \def\@tempa{%
2154 \expandafter\fi\@tempa
2155 \class@info{RevTeX pointsize 10pt selected}%

2156 \def\normalsize{%
2157 \setfontsize\normalsize\@xpt{11.5}%
2158 \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2159 \belowdisplayskip \abovedisplayskip
2160 \abovedisplayshortskip \abovedisplayskip
2161 \belowdisplayshortskip \abovedisplayskip
2162 \let\@listi\@listI
2163 }%

2164 \def\small{%
2165 \setfontsize\small\@ixpt{10.5}%
2166 \abovedisplayskip 8.5\p@ \@plus3\p@ \@minus4\p@
2167 \belowdisplayskip \abovedisplayskip
2168 \abovedisplayshortskip \z@ \@plus2\p@
2169 \belowdisplayshortskip 4\p@ \@plus2\p@ \@minus2\p@
2170 \def\@listi{%
2171 \leftmargin\leftmarginI
2172 \topsep 4\p@ \@plus2\p@ \@minus2\p@
2173 \parsep 2\p@ \@plus\p@ \@minus\p@
2174 \itemsep \parsep
2175 }%
2176 }%

2177 \def\footnotesize{%
2178 \setfontsize\footnotesize\@viipt{9.5pt}%
2179 \abovedisplayskip 6\p@ \@plus2\p@ \@minus4\p@
2180 \belowdisplayskip \abovedisplayskip
2181 \abovedisplayshortskip \z@ \@plus\p@
```

```

2182 \belowdisplayshortskip 3\p@ \@plus\p@ \@minus2\p@
2183 \def\@listi{%
2184   \leftmargin\leftmargini
2185   \topsep 3\p@ \@plus\p@ \@minus\p@
2186   \parsep 2\p@ \@plus\p@ \@minus\p@
2187   \itemsep \parsep
2188 }%
2189 }%

2190 \def\scriptsize{%
2191   \@setfontsize\scriptsize\@viipt\@viipt
2192 }%
2193 \def\tiny{%
2194   \@setfontsize\tiny\@vpt\@vpt
2195 }%
2196 \def\large{%
2197   \@setfontsize\large\@xiipt{14pt}%
2198 }%
2199 \def\Large{%
2200   \@setfontsize\Large\@xivpt{18pt}%
2201 }%
2202 \def\LARGE{%
2203   \@setfontsize\LARGE\@xviipt{22pt}%
2204 }%
2205 \def\huge{%
2206   \@setfontsize\huge\@xxpt{25pt}%
2207 }%
2208 \def\Huge{%
2209   \@setfontsize\Huge\@xxvpt{30pt}%
2210 }%

```

The values of these margin parameters are dependent upon `\twoside@sw`; any society or journal that has its own preferences should override these assignments by doing `\appdef\setup@hook`.

```

2211 \appdef\setup@hook{%
2212   \twoside@sw{%
2213     % \oddsidemargin -.1in
2214     % \evensidemargin -.4in
2215     \oddsidemargin -20pt
2216     \evensidemargin -20pt
2217     \marginparwidth 107pt
2218   }{%
2219     \oddsidemargin -.25in
2220     \evensidemargin -.25in
2221     \marginparwidth 30pt
2222   }%
2223 }%

2224 \marginparsep 6pt
2225 \topmargin -61pt

```

```

2226 \headheight 25pt
2227 \headsep 16pt

2228 \topskip 10pt
2229 \splittopskip\topskip

2230 \footskip 30pt

2231 \textheight = 56pc
2232 \textwidth42.5pc

2233 \columnsep 1.5pc
2234 \columnseprule 0pt

2235 \footnotesep 1pt
2236 \skip\footins 39pt plus 4pt minus 12pt
2237 \def\footnoterule{%
2238 \dimen@\skip\footins\divide\dimen@\tw@
2239 \kern-\dimen@\hrule width.5in\kern\dimen@
2240 }%

2241 \floatsep 12pt plus 2pt minus 2pt
2242 \textfloatsep 20pt plus 2pt minus 4pt
2243 \intextsep 12pt plus 2pt minus 2pt

2244 \dblfloatsep 12pt plus 2pt minus 2pt
2245 \dbltextfloatsep 20pt plus 2pt minus 4pt

2246 \@fptop 0pt plus 1fil
2247 \@fpsep 8pt plus 2fil
2248 \@fpbot 0pt plus 1fil
2249 \@dblftop 0pt plus 1fil
2250 \@dblfpsep 8pt plus 2fil
2251 \@dblfpbot 0pt plus 1fil

2252 \marginparpush 5pt

2253 \parskip 0pt plus 1pt
2254 \parindent 10pt
2255 \emergencystretch8\p@

2256 \partopsep 2pt plus 1pt minus 1pt

2257 \leftmargini 25pt
2258 \leftmarginii 22pt
2259 \leftmarginiii 18.7pt
2260 \leftmarginiv 17pt
2261 \leftmarginv 10pt
2262 \leftmarginvi 10pt

2263 \def\@listI{%
2264 \leftmargin\leftmargini
2265 \parsep 4\p@ plus2\p@ minus\p@
2266 \topsep 8\p@ plus2\p@ minus4\p@
2267 \itemsep 4\p@ plus2\p@ minus\p@
2268 }%

```

```

2269 \labelsep 4pt
2270 \def\@listii{%
2271   \leftmargin\leftmarginii
2272   \labelwidth\leftmarginii
2273   \advance\labelwidth-\labelsep
2274   \topsep 4\p@ plus2\p@ minus\p@
2275   \parsep 2\p@ plus\p@ minus\p@
2276   \itemsep \parsep
2277 }%

2278 \def\@listiii{%
2279   \leftmargin\leftmarginiii
2280   \labelwidth\leftmarginiii
2281   \advance\labelwidth-\labelsep
2282   \topsep 2\p@ plus\p@ minus\p@
2283   \parsep \z@
2284   \partopsep \p@ plus\z@ minus\p@
2285   \itemsep \topsep
2286 }%

2287 \def\@listiv{%
2288   \leftmargin\leftmarginiv
2289   \labelwidth\leftmarginiv
2290   \advance\labelwidth-\labelsep
2291 }%

2292 \def\@listv{%
2293   \leftmargin\leftmarginv
2294   \labelwidth\leftmarginv
2295   \advance\labelwidth-\labelsep
2296 }%

2297 \def\@listvi{%
2298   \leftmargin\leftmarginvi
2299   \labelwidth\leftmarginvi
2300   \advance\labelwidth-\labelsep
2301 }%

2302 %</10pt>

```

27 The 11pt class option: the 11pt module

The file 11pt.rtx is read in by the revtex4 document class if \@pointsizes has the value 11.

```
2303 %<*11pt>
```

27.1 Defend Against Forseeable Errors

Protect this file from being read in by anything but REVTeX.

```
2304 \ifx\undefined\substyle@ext
```

```

2305 \def\@tempa{%
2306 \endinput
2307 \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
2308 }%
2309 \expandafter\else
2310 \def\@tempa{%
2311 \expandafter\fi\@tempa
2312 \class@info{RevTeX pointsize 11pt selected}%

2313 \def\normalsize{%
2314 \setfontsize\normalsize\@xipt{13.6}%
2315 \abovedisplayskip 11\p@ \@plus3\p@ \@minus6\p@
2316 \belowdisplayskip \abovedisplayskip
2317 \abovedisplaysshortskip \abovedisplayskip
2318 \belowdisplaysshortskip \abovedisplayskip
2319 \let\@listi\@listI
2320 }%

2321 \def\small{%
2322 \setfontsize\small\@xpt\@xipt
2323 \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2324 \abovedisplaysshortskip \z@ \@plus3\p@
2325 \belowdisplaysshortskip 6\p@ \@plus3\p@ \@minus3\p@
2326 \def\@listi{\leftmargin\leftmarginI
2327 \topsep 6\p@ \@plus2\p@ \@minus2\p@
2328 \parsep 3\p@ \@plus2\p@ \@minus\p@
2329 \itemsep \parsep
2330 }%
2331 \belowdisplayskip \abovedisplayskip
2332 }%

2333 \def\footnotesize{%
2334 \setfontsize\footnotesize\@ixpt{11}%
2335 \abovedisplayskip 8\p@ \@plus2\p@ \@minus4\p@
2336 \abovedisplaysshortskip \z@ \@plus\p@
2337 \belowdisplayshortskip 4\p@ \@plus2\p@ \@minus2\p@
2338 \def\@listi{\leftmargin\leftmarginI
2339 \topsep 4\p@ \@plus2\p@ \@minus2\p@
2340 \parsep 2\p@ \@plus\p@ \@minus\p@
2341 \itemsep \parsep
2342 }%
2343 \belowdisplayskip \abovedisplayskip
2344 }%

2345 \def\scriptsize{%
2346 \setfontsize\scriptsize\@viiipt{9.5}%
2347 }%
2348 \def\tiny{%
2349 \setfontsize\tiny\@viipt\@viipt
2350 }%
2351 \def\large{%
2352 \setfontsize\large\@xiipt{14}%

```

```

2353 }%
2354 \def\Large{%
2355   \@setfontsize\Large\@xvpt{18}%
2356 }%
2357 \def\LARGE{%
2358   \@setfontsize\LARGE\@xxvpt{22}%
2359 }%
2360 \def\huge{%
2361   \@setfontsize\huge\@xxxpt{25pt}%
2362 }%
2363 \def\Huge{%
2364   \@setfontsize\Huge\@xxvpt{30pt}%
2365 }%
2366 %</11pt>

```

28 The 12pt class option: the 12pt module

The file 12pt.rtx is read in by the revtex4 document class if \@pointsize has the value 12.

```
2367 %<*12pt>
```

28.1 Defend Against Forseeable Errors

Protect this file from being read in by anything but REVTeX.

```

2368 \ifx\undefined\substyle@ext
2369 \def\@tempa{%
2370 \endinput
2371 \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
2372 }%
2373 \expandafter\else
2374 \def\@tempa{%
2375 \expandafter\fi\@tempa
2376 \class@info{RevTeX pointsize 12pt selected}%
2377 \def\normalsize{%
2378   \@setfontsize\normalsize\@xipt{14pt}%
2379   \abovedisplayskip 12\p@ \@plus3\p@ \@minus7\p@
2380   \belowdisplayskip \abovedisplayskip
2381   \abovedisplayshortskip \z@ plus3\p@
2382   \belowdisplayshortskip 6.5\p@ \@plus3.5\p@ \@minus3\p@
2383   \let\@listi\@listI
2384 }%
2385 \def\small{%
2386   \@setfontsize\small\@xipt{14.5pt}%
2387   \abovedisplayskip 8\p@ \@plus3\p@ \@minus6\p@
2388   \belowdisplayskip \abovedisplayskip
2389   \abovedisplayshortskip \z@ \@plus3\p@

```

```

2390 \belowdisplayshortskip 6.5\p@ \@plus3.5\p@ \@minus3\p@
2391 \def\@listi{%
2392   \leftmargin\leftmargini
2393   \topsep 9\p@ \@plus3\p@ \@minus5\p@
2394   \parsep 4.5\p@ \@plus2\p@ \@minus\p@
2395   \itemsep \parsep
2396 }%
2397 }%

      Same baselineskip as \small ?
2398 \def\footnotesize{%
2399   \@setfontsize\footnotesize\@xpt{14.5pt}%
2400   \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2401   \belowdisplayskip \abovedisplayskip
2402   \abovedisplayshortskip \z@ \@plus3\p@
2403   \belowdisplayshortskip 6\p@ \@plus3\p@ \@minus3\p@
2404   \def\@listi{%
2405     \leftmargin\leftmargini
2406     \topsep 6\p@ \@plus2\p@ \@minus2\p@
2407     \parsep 3\p@ \@plus2\p@ \@minus\p@
2408     \itemsep \parsep
2409   }%
2410 }%

2411 \def\scriptsize{%
2412   \@setfontsize\scriptsize\@viiipt{9.5pt}%
2413 }%
2414 \def\tiny{%
2415   \@setfontsize\tiny\@viipt{7pt}%
2416 }%
2417 \def\large{%
2418   \@setfontsize\large\@xivpt{18pt}%
2419 }%
2420 \def\Large{%
2421   \@setfontsize\Large\@xviipt{22pt}%
2422 }%
2423 \def\LARGE{%
2424   \@setfontsize\LARGE\@xxpt{25pt}%
2425 }%
2426 \def\huge{%
2427   \@setfontsize\huge\@xxvpt{30pt}%
2428 }%
2429 \let\Huge=\huge
2430 %</12pt>

```

29 Page parameters

This code is common to both 11pt and 12pt.

```
2431 %<*11pt|12pt>
```

```

2432 \appdef\setup@hook{%
2433 \twoside@sw{%
2434 \oddsidemargin Opt
2435 \evensidemargin Opt
2436 \marginparwidth 60pt
2437 }{%
2438 \oddsidemargin Opt
2439 \evensidemargin Opt
2440 \marginparwidth 44pt
2441 }%
2442 }%

2443 \marginparsep 10pt

2444 \topmargin -37pt

2445 \headheight 12pt
2446 \headsep 25pt

2447 \topskip 10pt
2448 \splittopskip\topskip

2449 \footskip 30pt

2450 \textheight=665.5\p@

2451 \appdef\setup@hook{%
2452 \tightenlines@sw{%
2453 \def\baselinestretch{1}%
2454 }{%
2455 \def\baselinestretch{1.5}%
2456 }%
2457 }%

2458 \textwidth 468pt

2459 \columnsep 10pt
2460 \columnseprule 0pt

2461 \footnotesep 1pt
2462 \skip\footins 25.25pt plus 4pt minus 12pt
2463 \def\footnoterule{%
2464 \dimen@\skip\footins\divide\dimen@\f@ur
2465 \kern-\dimen@\hrule width.5in\kern\dimen@
2466 }%

2467 \floatsep 14pt plus 2pt minus 4pt
2468 \textfloatsep 20pt plus 2pt minus 4pt
2469 \intextsep 14pt plus 4pt minus 4pt

2470 \dblfloatsep 14pt plus 2pt minus 4pt
2471 \dbltextfloatsep 20pt plus 2pt minus 4pt

2472 \@fptop 0pt plus 1fil
2473 \@fpsep 10pt plus 2fil
2474 \@fpbot 0pt plus 1fil

```

```

2475 \@dblftop 0pt plus 1fil
2476 \@dblfpsep 10pt plus 2fil%
2477 \@dblfpbot 0pt plus 1fil
2478 \marginparpush 7pt
2479 \parskip 0pt plus 1pt
2480 \parindent 15pt
2481 \emergencystretch8\p@
2482 \partopsep 3pt plus 2pt minus 2pt
2483 \leftmargini 30pt
2484 \leftmarginii 26pt
2485 \leftmarginiii 22pt
2486 \leftmarginiv 20pt
2487 \leftmarginv 12pt
2488 \leftmarginvi 12pt
2489 \def\@listI{\leftmargin\leftmargini \parsep 5\p@ plus2.5\p@ minus\p@
2490 \topsep 10\p@ plus4\p@ minus6\p@
2491 \itemsep 5\p@ plus2.5\p@ minus\p@
2492 }%
2493 \labelsep 6pt
2494 \def\@listii{\leftmargin\leftmarginii
2495 \labelwidth\leftmarginii\advance\labelwidth-\labelsep
2496 \topsep 5\p@ plus2.5\p@ minus\p@
2497 \parsep 2.5\p@ plus\p@ minus\p@
2498 \itemsep \parsep
2499 }%
2500 \def\@listiii{\leftmargin\leftmarginiii
2501 \labelwidth\leftmarginiii\advance\labelwidth-\labelsep
2502 \topsep 2.5\p@ plus\p@ minus\p@
2503 \parsep \z@ \partopsep \p@ plus\z@ minus\p@
2504 \itemsep \topsep
2505 }%
2506 \def\@listiv{\leftmargin\leftmarginiv
2507 \labelwidth\leftmarginiv\advance\labelwidth-\labelsep
2508 }%
2509 \def\@listv{\leftmargin\leftmarginv
2510 \labelwidth\leftmarginv\advance\labelwidth-\labelsep
2511 }%
2512 \def\@listvi{\leftmargin\leftmarginvi
2513 \labelwidth\leftmarginvi\advance\labelwidth-\labelsep
2514 }%
2515 %</11pt|12pt>

```

30 The aps class extension: the aps module

The file `aps.rtx` is read in by the `revtex4` document class if `\@society` has the value `aps`.

Here, code specific to APS journals is separated out from the REVTeX document class. (Other societies can customize REVTeX by supplying their own .rtx file.)

This class extension file is a model for a class extension you might write yourself.

First, incorporate a `\ProvidesFile` command with an optional argument giving the version information, e.g.,

```
% \ProvidesFile{foo}[2001/09/11 v1.1 Docinfo]%
%
```

Within the society substyle, there are two things we must do as well: define the default journal,

```
% \def\@journal@default{pra}%
%
```

And do likewise for the point size:

```
% \def\@pointsize@default{10}%
%
```

We first define some text entities (amounting to journal abbreviations), then some APS-specific initialisations, then code for particular APS journals. In the latter case, the choice is keyed off the macro `\@journal`.

```
2516 %<*aps>
```

30.1 Defend Against Foreseeable Errors

Protect this file from being read in by anything but REVTeX.

```
2517 \ifx\undefined\substyle@ext
2518 \def\@tempa{%
2519 \endinput
2520 \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
2521 }%
2522 \expandafter\else
2523 \def\@tempa{%
2524 \expandafter\fi\@tempa
2525 \class@info{RevTeX society APS selected}%
```

Here are the class options relating to the APS:

```
2526 \DeclareOption{pra}{\change@journal{pra}}%
2527 \DeclareOption{prb}{\change@journal{prb}}%
2528 \DeclareOption{prc}{\change@journal{prc}}%
2529 \DeclareOption{prd}{\change@journal{prd}}%
2530 \DeclareOption{pre}{\change@journal{pre}}%
2531 \DeclareOption{prl}{\change@journal{prl}}%
2532 \DeclareOption{prstab}{\change@journal{prstab}}%
2533 \DeclareOption{prstper}{\change@journal{prstper}}%
2534 \DeclareOption{rmp}{\change@journal{rmp}}%
```

30.2 Abbreviations

The following macros constitute typing shortcuts for certain journal names.

```
2535 \def\ao{Appl.\ Opt.}%
2536 \def\ap{Appl.\ Phys.}%
2537 \def\apl{Appl.\ Phys.\ Lett.}%
2538 \def\apj{Astrophys.\ J.}%
2539 \def\bell{Bell Syst.\ Tech.\ J.}%
2540 \def\jqe{IEEE J.\ Quantum Electron.}%
2541 \def\assp{IEEE Trans.\ Acoust.\ Speech Signal Process.}%
2542 \def\aprop{IEEE Trans.\ Antennas Propag.}%
2543 \def\mtt{IEEE Trans.\ Microwave Theory Tech.}%
2544 \def\iovs{Invest.\ Ophthalmol.\ Vis.\ Sci.}%
2545 \def\jcp{J.\ Chem.\ Phys.}%
2546 \def\jmo{J.\ Mod.\ Opt.}%
2547 \def\josa{J.\ Opt.\ Soc.\ Am.}%
2548 \def\josaa{J.\ Opt.\ Soc.\ Am.\ A}%
2549 \def\josab{J.\ Opt.\ Soc.\ Am.\ B}%
2550 \def\jpp{J.\ Phys.\ (Paris)}%
2551 \def\nat{Nature (London)}%
2552 \def\oc{Opt.\ Commun.}%
2553 \def\ol{Opt.\ Lett.}%
2554 \def\pl{Phys.\ Lett.}%
2555 \def\pra{Phys.\ Rev.\ A}%
2556 \def\prb{Phys.\ Rev.\ B}%
2557 \def\prc{Phys.\ Rev.\ C}%
2558 \def\prd{Phys.\ Rev.\ D}%
2559 \def\pre{Phys.\ Rev.\ E}%
2560 \def\prl{Phys.\ Rev.\ Lett.}%
2561 \def\rmp{Rev.\ Mod.\ Phys.}%
2562 \def\pspie{Proc.\ Soc.\ Photo-Opt.\ Instrum.\ Eng.}%
2563 \def\sjqe{Sov.\ J.\ Quantum Electron.}%
2564 \def\vr{Vision Res.}%
```

30.3 APS Setup

Here we define the default procedures for APS journals. Individual APS journals may override these definitions.

30.3.1 Title block

The specifics of the title block. Apply to all APS journals; individual journals may override these settings.

`\@fnsymbol` The L^AT_EX kernel definition of `\@fnsymbol` is overridden. The definition in `revtex4-1.dtxfixltx2e.sty` serves as a guide to the new way to symbol, working in both text- and math modes.

`revtex4-1.dtxfixltx2e.sty` duplicates some features of `revtex4-1.dtxltxgrid` and `revtex4-1.dtxltxutil`, however, so it may be incompatible with REV_TE_X. In case

it is not loaded, we must provide a meaning for `\TextOrMath`, which that package makes robust. I believe that it is `\@fnsymbol` itself that ought to be robustified. eTeX further complicates matters; we do not especially accomodate it.

Not! `\TextOrMath` must be made robust in any case (Bug 530). I return things to follow core L^AT_εX 2_ε (revtex4-1.dtxlatex.ltx).

```

2565 \def\@fnsymbol#1{%
2566 \ensuremath{%
2567 \ifcase#1\or
2568 *\or
2569 \dagger\or
2570 \ddagger\or
2571 \mathsection\or
2572 \mathparagraph\or
2573 % \|\or
2574 **\or
2575 \dagger\dagger\or
2576 \ddagger\ddagger\else
2577 \mathsection\mathsection\or
2578 \mathparagraph\mathparagraph\or
2579 ***\or
2580 \dagger\dagger\dagger\or
2581 \ddagger\ddagger\ddagger\else
2582 \mathsection\mathsection\mathsection\or
2583 \mathparagraph\mathparagraph\mathparagraph\or
2584 %
2585 \@ctrerr
2586 \fi
2587 }%
2588 }%
2589 \appdef\document@inithook{%
2590 \@ifxundefined\TextOrMath{%
2591 \DeclareRobustCommand\TextOrMath{\@ifmmode{\false@sw}{\true@sw}}%
2592 }{}%
2593 }%
2594 \let\thefootnote@latex\thefootnote

```

We assign the default titlepage style for APS; a journal or document instance may override by invoking one of the other `\clo@...` procedures defined in REVTeX.

```

2595 \clo@groupedaddress

```

`\titlepage`

```

2596 \renewenvironment{titlepage}{%
2597 \let\wastwocol@sw\twocolumn@sw
2598 \onecolumngrid
2599 \newpage
2600 \thispagestyle{titlepage}%
2601 \c@page\z@

```

A comment: “article.cls sets this to one not zero?”

```

2602 }{%
2603 \wastwocol@sw{\twocolumngrid}{\newpage}%
2604 }%

```

`\frontmatter@abstractheading` APS Journals all set the abstract head the same way, with no head. However, if the user has specified the `preprint` class option, then the abstract will have a head.

```

2605 \def\frontmatter@abstractheading{%
2606 \preprintsty@sw{%
2607 \begingroup
2608 \centering\large
2609 \abstractname
2610 \par
2611 \endgroup
2612 }{%
2613 }%

```

`\frontmatter@abstractwidth` All APS journals set the abstract to the same width.

```

2614 \def\frontmatter@abstractwidth{400\p@}%

```

`\frontmatter@abstractfont` All APS journals set the abstract body the same way.

```

2615 \def\frontmatter@abstractfont{%
2616 \small
2617 \parindent1em\relax
2618 \adjust@abstractwidth
2619 }%
2620 \def\adjust@abstractwidth{%
2621 \dimen@\textwidth\advance\dimen@-\frontmatter@abstractwidth
2622 \divide\dimen@\tw@
2623 \galley@sw{%
2624 \advance\rightskip\tw@\dimen@
2625 }{%
2626 \advance\leftskip\dimen@
2627 \advance\rightskip\dimen@
2628 }%
2629 \@totalleftmargin\leftskip
2630 }%

```

All APS journal preprints use separate titlepage and full-width abstract.

In effect, we establish a society default value for `\preprintsty@sw`, and for `\titlepage@sw`.

```

2631 \@booleanfalse\preprintsty@sw
2632 \@booleantrue\titlepage@sw

```

We choose the page style for all APS journals. The journal may override by inserting its own code in `\setup@hook`. Users wishing to customize their documents will be able to invoke a `\pagestyle` command anywhere in the preamble; it will override the assignments here.

Here is the big switch for APS preprints. Note that `\preprintsty@swis` also consulted in various procedures, but we assume its value does not change after `\setup@hook` time.

```
2633 \appdef\setup@hook{%
2634   \preprintsty@sw{%
2635     \ps@preprint
2636     \def\frontmatter@abstractwidth{\textwidth}%
2637     \def\frontmatter@affiliationfont{\it}%
2638     \let\section\section@preprintsty
```

The following line of code had been commented out at this point.

```
% \let\@hangfrom@section\@hangfrom@section@preprintsty
%

2639   \let\subsection\subsection@preprintsty
2640   \let\subsubsection\subsubsection@preprintsty
2641 }{%
2642   \ps@article
2643 }%
2644 }%
```

`\frontmatter@authorformat` All APS journals set the author list the same. The leading is 11.5 points, and there is 11.5 points of extra space above the first author line (which amounts to the same thing as 11.5 points extra below the title) for a total of 23 points base-to-base.

```
2645 \def\frontmatter@authorformat{%
2646   \skip@\@flushglue
2647   \@flushglue\z@ plus.3\hsize\relax
2648   \centering
2649   \advance\baselineskip\p@
2650   \parskip11.5\p@\relax
2651   \@flushglue\skip@
```

The following line of code had been commented out at this point.

```
%\preprintsty@sw}{}%
% \addvspace{0\p@}%
}%%
%

2652 }%
```

`\frontmatter@above@affilgroup` The default amount of space above affiliation. APS Journals have 24 points b-b above an affiliation group.

```
2653 \def\frontmatter@above@affilgroup{%
```

The following line of code had been commented out at this point.

```
%\preprintsty@sw}{}%
% \addvspace{11\p@}%
}%%
%
```

2654 }%

`\frontmatter@above@affiliation` The default amount of space above affiliation. APS Journals have no extra space
`matter@above@affiliation@script` between author group down to common affiliation.

```
2655 \def\frontmatter@above@affiliation@script{%
2656 \skip@\@flushglue
2657 \@flushglue\z@ plus.3\hsize\relax
2658 \centering
2659 \@flushglue\skip@
2660 \addvspace{3.5\p@}%
2661 }%
2662 \def\frontmatter@above@affiliation{%
2663 \preprintsty@sw{}}%
```

The following line of code had been commented out at this point.

```
% \addvspace{12\p@}%
%
```

2664 }%

2665 }%

`\frontmatter@affiliationfont` All APS journals set the affiliation the same.

```
2666 \def\frontmatter@affiliationfont{%
2667 \small\it
2668 }%
```

`\frontmatter@collaboration@above` PRL: 1.5 points extra: 13 points base-to-base above.

```
2669 \def\frontmatter@collaboration@above{%
2670 \preprintsty@sw{%
2671 }{%
2672 \parskip1.5\p@\relax
2673 }%
2674 }%
```

`\frontmatter@setup` All APS journals set the title page using the same font and size. However, justification varies for the title block elements, so we assert none here.

```
2675 \def\frontmatter@setup{%
2676 \normalfont
2677 }%
```

`\frontmatter@title@above` All APS journals set the article title the same.

`\frontmatter@title@format` Note: Spacing from title to author is 23 points base-to-base.

```
\frontmatter@title@below 2678 \def\frontmatter@title@above{\addvspace{6\p@}}%
2679 \def\frontmatter@title@format{\large\bfseries\centering\parskip\z@skip}%
2680 \def\frontmatter@title@below{}}%
```

`\frontmatter@makefnmark` All APS journals share this procedure for setting the titlepage footnote text.

```
2681 \def\@author@parskip{3\p@}%
2682 \def\frontmatter@makefnmark{%
```

```

2683 \@textsuperscript{%
2684 \normalfont\@thefnmark
2685 }%
2686 }%
2687 \def\frontmatter@authorbelow{%
2688 \addvspace{3\p@}%
2689 }%

```

`\frontmatter@RRAP@format` All APS journals use the same format for the “Received, Revised, etc.” block on the title page.

Change note: 11.5 points b-b from author/affiliation down to date.

```

2690 \def\frontmatter@RRAP@format{%
2691 \small
2692 \centering

```

The following line of code had been commented out at this point.

```

% \preprintsty@sw{\parskip.5ex\relax}%
%

```

```

2693 \everypar{\hbox\bgroup(\@gobble@leavemode@uppercase)}%
2694 \def\par{\@ifvmode{\unskip}\egroup\@par}}%
2695 }%
2696 \def\punct@RRAP{;\egroup\hbox\bgroup}%
2697 \def\@gobble@leavemode@uppercase#1#2{\expandafter\MakeTextUppercase}%

```

`\frontmatter@PACS@format`

```

2698 \def\frontmatter@PACS@format{%
2699 \addvspace{11\p@}%
2700 \footnotesize
2701 \adjust@abstractwidth
2702 \parindent\z@
2703 \parskip\z@skip
2704 \samepage
2705 }%

```

`\frontmatter@keys@format`

```

2706 \def\frontmatter@keys@format{%
2707 \footnotesize
2708 \adjust@abstractwidth
2709 \parindent\z@
2710 \samepage
2711 }%

```

`\ps@titlepage` Title page style. Currently empty except for preprint header, which consists of all the `\preprint` arguments, stacked flush right at the right margin.

```

2712 \def\ps@titlepage{%
2713 \def\@oddhead{%
2714 \hfill
2715 \preprint@sw%

```

```

2716     \expandafter\produce@preprints\expandafter{\@preprint}%
2717   }{}%
2718 }%
2719 \let\@evenhead\@oddhead
2720 \def\@oddfoot{%
2721   \hb@xt@\z@\{byrevtex\hss}%
2722   \hfil
2723   \preprintsty@sw{\thepage}{}%
2724   \quad\checkindate
2725   \hfil
2726 }%
2727 \let\@evenfoot\@oddfoot
2728 }%
2729 \def\byrevtex{\byrevtex@sw{Typeset by REV\TeX}{}}%

```

\produce@preprints

```

2730 \def\produce@preprints#1{%
2731   \vtop to \z@{%
2732     \def\baselinestretch{1}%
2733     \small
2734     \let\preprint\preprint@count
2735     \count@\z@
2736     #1%
2737     \@ifnum{\count@>\tw@}{%
2738       \hbox{%
2739         \let\preprint\preprint@hlist
2740         #1%
2741         \setbox\z@\lastbox
2742       }%
2743     }{%
2744       \let\preprint\preprint@cr
2745       \halign{\hfil##\cr#1\cr}%
2746       \par
2747       \vss
2748     }%
2749   }%
2750 }%
2751 \def\preprint@cr#1{#1\cr}%
2752 \def\preprint@count#1{\advance\count@\@ne}%
2753 \def\preprint@hlist#1{#1\hbox{, }}%

```

30.3.2 Stacked Heads

All APS journals put a period (.), followed by quad space, after the section number. Also, no hanging section number.

```

2754 \def\@seccntformat#1{\csname the#1\endcsname.\quad}%
2755 \def\@hang@from#1#2#3{#1#2#3}%

```

Note that in the following, we wish to set the section head uppercase, so we use David Carlisle's `\MakeTextUppercase`. However, because this procedure

effectively parses its argument (looking for things to *not* translate), it has to be invoked in such a way that the argument of the `\section` command is passed to it as its own argument.

To accomplish this, we use the `\@hangfrom@` hook, which was developed for this purpose.

```

2756 \def\section{%
2757   \@startsection
2758     {section}%
2759     {1}%
2760     {\z@}%
2761     {0.8cm \@plus1ex \@minus .2ex}%
2762     {0.5cm}%
2763     {%
2764       \normalfont\small\bfseries
2765       \centering
2766     }%
2767 }%
2768 \def\@hangfrom@section#1#2#3{\@hangfrom{#1#2}\MakeTextUppercase{#3}}%
2769 \def\@hangfroms@section#1#2{#1\MakeTextUppercase{#2}}%

2770 \def\subsection{%
2771   \@startsection
2772     {subsection}%
2773     {2}%
2774     {\z@}%
2775     {.8cm \@plus1ex \@minus .2ex}%
2776     {.5cm}%
2777     {%
2778       \normalfont\small\bfseries
2779       \centering
2780     }%
2781 }%

2782 \def\subsubsection{%
2783   \@startsection
2784     {subsubsection}%
2785     {3}%
2786     {\z@}%
2787     {.8cm \@plus1ex \@minus .2ex}%
2788     {.5cm}%
2789     {%
2790       \normalfont\small\itshape
2791       \centering
2792     }%
2793 }%

```

30.3.3 Runin Heads

```

2794 \def\paragraph{%
2795   \@startsection

```

```

2796     {paragraph}%
2797     {4}%
2798     {\parindent}%
2799     {\z@}%
2800     {-1em}%
2801     {\normalfont\normalsize\itshape}%
2802 }%

2803 \def\subparagraph{%
2804   \@startsection
2805     {subparagraph}%
2806     {5}%
2807     {\parindent}%
2808     {3.25ex \@plus1ex \@minus .2ex}%
2809     {-1em}%
2810     {\normalfont\normalsize\bfseries}%
2811 }%

```

`\section@preprintsty` Here are the formatting procedures specific to the preprint style; the only difference
`\subsection@preprintsty` is that the heads are flush left instead of centered.

```

\subsubsection@preprintsty 2812 \def\section@preprintsty{%
2813   \@startsection
2814     {section}%
2815     {1}%
2816     {\z@}%
2817     {0.8cm \@plus1ex \@minus .2ex}%
2818     {0.5cm}%
2819     {%
2820       \normalfont\small\bfseries
2821     }%
2822   }%
2823 }%
2824 %\def\@hangfrom@section@preprintsty#1#2#3{\@hangfrom{#1#2}\MakeTextUppercase{#3}}%

2825 \def\subsection@preprintsty{%
2826   \@startsection
2827     {subsection}%
2828     {2}%
2829     {\z@}%
2830     {.8cm \@plus1ex \@minus .2ex}%
2831     {.5cm}%
2832     {%
2833       \normalfont\small\bfseries
2834     }%
2835   }%
2836 }%

2837 \def\subsubsection@preprintsty{%
2838   \@startsection
2839     {subsubsection}%
2840     {3}%
2841     {\z@}%

```

```

2842     {.8cm \@plus1ex \@minus .2ex}%
2843     {.5cm}%
2844     {%
2845     \normalfont\small\itshape
2846 %     \centering
2847     }%
2848 }%

```

By default, APS journals set titlepage notes as footnotes.

```

\let\frontmatter@footnote@produce\frontmatter@footnote@produce@footnote
%
```

30.3.4 Table of Contents

The toc will itself make an entry in the toc, but we temporarily turn off toc formatting for the duration.

```

2849 \def\@pnumwidth{1.55em}%
2850 \def\@tocrmarg {2.55em}%
2851 \def\@dotsep{2}%
2852 \def\ltxu@dotsep{4.5pt}%
2853 \setcounter{tocdepth}{3}%

2854 \def\tableofcontents{%
2855 \addtocontents{toc}{\string\tocdepth@munge}%
2856 \print@toc{toc}%
2857 \addtocontents{toc}{\string\tocdepth@restore}%
2858 }%

2859 \def\tocdepth@munge{%
2860 \let\l@section@saved\l@section
2861 \let\l@section@gobble@tw@
2862 }%
2863 \def@gobble@tw@#1#2{%}
2864 \def\tocdepth@restore{%
2865 \let\l@section\l@section@saved
2866 }%

```

The following definition of `\l@part` is a variant on the definition of `\l@sections` in `ltxutil.dtx`.

```

2867 \def\l@part#1#2{\addpenalty{\@secpenalty}%
2868 \begingroup
2869 \set@tocdim@pagenum\@tempboxa{#2}%
2870 % \@tempdima 3em %
2871 \parindent \z@
2872 \rightskip\tocleft@pagenum plus 1fil\relax
2873 \skip@\parfillskip\parfillskip\z@
2874 \addvspace{2.25em plus\p@}%
2875 \large \bf %
2876 \leavevmode\ignorespaces#1\unskip\nobreak\hskip\skip@
2877 \hb@xt@\rightskip{\hfil\unhbox\@tempboxa}\hskip-\rightskip\hskip\z@skip

```

```

2878 \par
2879 \nobreak %
2880 \endgroup
2881 }%

```

`\l@section` Determine which TOC elements are automatically indented.

We set the TOC to the standard of RMP. If APS has its own specification, we will code it, and RMP must override.

```

2882 \def\tocleft@{\z@}%
2883 \def\tocdim@min{5\p@}%
2884 \def\l@section{%
2885 \l@sections}{section}% Implicit #3#4
2886 }%
2887 \def\l@f@section{%
2888 \addpenalty{\@secpenalty}%
2889 \addvspace{1.0em plus\p@}%
2890 %\bf
2891 }%
2892 \def\l@subsection{%
2893 \l@sections{section}{subsection}% Implicit #3#4
2894 }%
2895 \def\l@subsubsection{%
2896 \l@sections{subsection}{subsubsection}% Implicit #3#4
2897 }%
2898 \def\l@paragraph#1#2{%
2899 \def\l@subparagraph#1#2{%

```

Activate the auto TOC processing.

```

2900 \let\toc@pre\toc@pre@auto
2901 \let\toc@post\toc@post@auto

```

30.3.5 Default column bottom

All APS journal styles have flush bottoms.

```

2902 \@booleanfalse\raggedcolumn@sw

```

30.3.6 Table alignment style

`\tableleft@skip@float` All APS publications have the same table specification: Scotch rules above and
`\tabmid@skip@float` below, centered in column.

```

\tableleft@skip@float 2903 \def\tableleft@skip@float{\z@ plus\hsize}%
\array@row@pre@float 2904 \def\tabmid@skip@float{\@flushglue}%
\array@row@pst@float 2905 \def\tabright@skip@float{\z@ plus\hsize}%
2906 \def\array@row@pre@float{\hline\hline\noalign{\vskip\doublerulesep}}%
2907 \def\array@row@pst@float{\noalign{\vskip\doublerulesep}\hline\hline}%

```

30.3.7 Footnote formatting

We customize the formatting of footnotes for all APS journals.

`\@makefntext`

```
2908 \long\def\@makefntext#1{%
2909 \def\baselinestretch{1}%
2910 \leftskip1em%
2911 \parindent1em%
2912 \noindent
2913 \nobreak\hskip-\leftskip
2914 \hb@xt@\leftskip{%
2915 \hss\@makefnmark\ %
2916 }%
2917 #1%
2918 \par
2919 }%
```

`\frontmatter@makefntext` We ensure that frontmatter footnotes format similarly to body footnotes. But we provide our own hypertext anchor, otherwise not provided.

```
2920 \long\def\frontmatter@makefntext#1{%
2921 \def\baselinestretch{1}%
2922 \leftskip1em%
2923 \parindent1em%
2924 \noindent
2925 \nobreak\hskip-\leftskip
2926 \Hy@raisedlink{\hyper@anchorstart{frontmatter.\expandafter\the\csname c@\@mpfn\endcsname}\hyphen}
2927 \hb@xt@\leftskip{%
2928 \hss\@makefnmark\ %
2929 }%
2930 #1%
2931 \par
2932 }%
```

30.3.8 Appendix

`\appendix`

```
\@hangfrom@appendix 2933 \prepdef\appendix{%
\@hangfroms@appendix 2934 \par
\@appendixcntformat 2935 \let\@hangfrom@section\@hangfrom@appendix
2936 %\let\@hangfroms@section\@hangfroms@appendix
2937 \let\@sectioncntformat\@appendixcntformat
2938 }%
2939 \def\@hangfrom@appendix#1#2#3{%
2940 #1%
2941 \@ifempty{#2}{%
2942 #3%
2943 }{%
2944 #2\@ifempty{#3}{-}\ #3}%
2945 }%
```

```

2946 }%
2947 \def\@hangfroms@appendix#1#2{%
2948 #1#2%
2949 }%
2950 \def\@appendixcntformat#1{\appendixname\ \csname the#1\endcsname}%

```

30.3.9 Bibliography

Customize REVTeX for the journal substyle; this task requires three components: the BIBTeX `apsrev.bst` and `apsrmp.bst` style files, and customizations of the `thebibliography` environment.

`\@bibstyle` Define the argument of the `\bibliographystyle` command (if the document does not do so). The user must have installed a `.bst` file of the corresponding name. This file will then be used by BIBTeX when compiling the document's `.bbl` file.

To generate `apsrev.bst`, use `custom-bib` version 4.21 or later. Run the `.bst` generator, `makebst.tex`, and accept all defaults, with the following exceptions:

1. LANGUAGE FIELD: **l:** `lang`—Use language field to switch hyphenation patterns for title
2. PRESENTATIONS: **b:** `pres,pres-bf`—Presentation, speaker bold face
3. ORDERING OF REFERENCES: **c:** `seq-no`—Citation order (unsorted, like `unsrt.bst`)
4. ORDER ON VON PART: **x:** `vonx`—Sort without von part (de la Maire after Mahone)
5. AUTHOR NAMES: **i:** `nm-init,ed-au`—Initials + surname (J. F. Smith)
6. POSITION OF JUNIOR: *****: `jnr1st`—Junior comes last as Smith, John, Jr.
7. TYPEFACE FOR AUTHORS IN LIST OF REFERENCES: **u:** `nmft,nmft-def`—User defined author font (`\bibnamefont`)
8. FONT FOR FIRST NAMES: **u:** `fnm-def`—First names in user defined font (`\bibfnamefont`)
9. EDITOR NAMES IN INCOLLECTION ETC: **a:** `nmfted`—Editors in collection like authors font
10. FONT FOR 'AND' IN LIST: **r:** `nmand-rm`—'And' in normal font (JONES and JAMES)
11. FONT OF CITATION LABELS IN TEXT: **u:** `lab,lab-def`—User defined citation font (`\citenamefont`)
12. FONT FOR 'AND' IN CITATIONS: **r:** `and-rm`—Cited 'and' in normal font
13. DATE FORMAT: *****: `yr-par`—Date in parentheses as (May 1993)

14. DATE EMPTY: -: `date-nil-x`—If date is empty, then do not produce the surrounding punctuation (parens, brackets, colon, comma)
15. TITLE OF ARTICLE: `d: tit-qq`—Title and punctuation in double quotes (“Title,” ..)
16. INPROCEEDINGS CHAPTER AND PAGES, LIKE INBOOK: -: `inproceedings-chapter`—produce pages after chapter, just as in InBook
17. TITLE PRESENT IN ARTICLE, INCOLLECTION, AND INPROCEEDINGS: `x: jtit-x`—Title is ignored
18. INPROCEEDINGS CHAPTER AND PAGES, LIKE INBOOK: `y: inproceedings-chapter`—produce pages after chapter, just as in InBook
19. ARTICLE BOOKTITLE PRESENT: : `article-booktitle`—format booktitle
20. ARTICLE SERIES PRESENT: : `article-series`—article can has series
21. JOURNAL NAME FONT: `r: jttl-rm`—Journal name normal font
22. JOURNAL NAME WITH ADDRESS: `y: journal-address`—Include address field (in parentheses) along with journal name
23. BOOK TITLE FIELDS: `y: book-bt`—Field ‘booktitle’, or if absent field ‘title’, is book title
24. THESIS TITLE OPTIONAL: : `thesis-title-o`—Title is optional: no warning issued if empty
25. TECHNICAL REPORT TITLE: `b: trtit-b`—Tech. report title like books
26. TECHNICAL REPORT INSTITUTION: : `techreport-institution-par`—format tech report institution like book publisher
27. JOURNAL VOLUME: `b: vol-bf`—Volume bold as `vol(num)`
28. JOURNAL VOL AND NUMBER: `x: vnum-x`—Journal vol, without number as 34
29. VOLUME PUNCTUATION: `c: volp-com`—Volume with comma as `vol(num), ppp`
30. PAGE NUMBERS: `f: jpg-1`—Only start page number
31. BOOK EDITOR W/O AUTHOR: : `book-editor-booktitle`—Book permits empty author, produces title before editor in this case
32. INBOOK PERMITS TITLE, BOOKTITLE, AUTHOR, EDITOR: `a: inbook-editor-booktitle`—Allow using both title/booktitle, both author/editor

33. CONFERENCE ADDRESS FOR BOOK, INBOOK, INCOLLECTION, IN-PROCEEDINGS, PROCEEDINGS: **a: bookaddress**—Italic booktitle followed by bookaddress in roman
34. NUMBER AND SERIES FOR BOOK, INBOOK, INCOLLECTION, IN-PROCEEDINGS, PROCEEDINGS: ***: num-xser**—Allows number without series and suppresses word "number"
35. WORD NUMBER CAPITALIZED FOR NUMBER AND SERIES: **c: number-cap**—Capitalize word 'number' as: "Number 123"
36. WORD CHAPTER CAPITALIZED: **c: chapter-cap**—Capitalize word 'chapter' as: 'Chapter 42'
37. COMBINING NUMBER AND SERIES: **x: series-number**—Series number as: 'Springer Lecture Notes No. 125'
38. POSITION OF NUMBER AND SERIES: **b: numser-booktitle**—After book title and conference address, and before editors
39. VOLUME AND SERIES FOR BOOKS/COLLECTIONS: **s: ser-vol**—Series, vol. 23
40. VOLUME AND SERIES FORMATTING: **y: ser-rm**—format series roman, even when used with volume
41. WORD VOLUME CAPITALIZED FOR VOLUME AND SERIES: **y: volume-cap**—Capitalize word 'volume', as: 'Volume 7 in Lecture Series'
42. POSITION OF VOLUME AND SERIES FOR INCOLLECTION, INBOOK, AND INPROCEEDINGS: **e: ser-ed**—Series and volume after booktitle and before editors
43. JOURNAL NAME PUNCTUATION: **x: jnm-x**—Space after journal name
44. PAGES IN BOOK: ***: pg-bk,book-chapter-pages**—As chapter and page: chapter 42, page 345
45. PUBLISHER IN PARENTHESES: **d: pub-date**—Publisher with address and date in parentheses (Oxford, 1994)
46. EMPTY PUBLISHER PARENTHESES: **y: ay-empty-pub-parens-x**—eliminate parentheses altogether if nothing inside
47. PUBLISHER POSITION: **: pre-pub**—Publisher before volume, chapter, pages
48. **: : pre-edn**—Edition before publisher
49. **: p: pre-pub,pre-edn**—Edition, publisher, volume, chapter, pages
50. ISBN NUMBER: ***: isbn**—Include ISBN for books, booklets, etc.

51. ISSN NUMBER: *: `issn`—Include ISSN for periodicals
52. DOI NUMBER: a: `doi-link,doi`—Doi forms a link to the publication, anchored to the volume or title
53. EDITOR IN COLLECTIONS: b: `edby`—In booktitle, edited by .. (where .. is names)
54. PUNCTUATION BETWEEN SECTIONS (BLOCKS): c: `blk-com`—Comma between blocks
55. FINAL PUNCTUATION: c: `fin-endbibitem`—Command at end instead of period
56. ABBREVIATE WORD ‘PAGES’: a: `pp`—‘Page’ abbreviated as p. or pp.
57. ABBREVIATE WORD ‘EDITORS’: a: `ed`—‘Editor’ abbreviated as ed. or eds.
58. OTHER ABBREVIATIONS: a: `abr`—Abbreviations of such words
59. ABBREVIATION FOR ‘EDITION’: a: `ednx`—‘Edition’ abbreviated as ‘ed’
60. EDITION NUMBERS: n: `ord`—Numerical editions as 1st, 2nd, 3rd, etc
61. STORED JOURNAL NAMES: a: `jabr`—Abbreviated journal names
62. FONT OF ‘ET AL’: i: `etal-it`—Italic et al
63. ADDITIONAL REVTeX DATA FIELDS: r: `revdata,eprint,url,url-blk,translation`—Include REVTeX data fields collaboration, eid, eprint, archive, url, translation
64. SLACcitation FIELD: : `SLACcitation`—Produce SLACcitation field
65. Numpages DATA FIELD: *: `numpages-x`—Do not include numpages field
66. URL ADDRESS: *: `url,url-prefix-x`—URL without prefix (default: ‘URL ’)
67. REFERENCE COMPONENT TAGS: b: `bibinfo`—Reference component tags like `\bibinfo` in the content of `\bibitem`
68. ELEMENT TAGS: b: `bibfield`—Element tags like `\bibfield` in the content of `\bibitem`
69. COMPATIBILITY WITH PLAIN TEX: *: `nfss`—Use LaTeX commands which may not work with Plain TeX

A file `apsrev.dbj` file equivalent to the following should result:

```

%\input docstrip
%\preamble
%-----
%*** REVTeX-compatible Phys Rev 2010-02-12 ***
%\endpreamble
%\postamble
%End of customized bst file
%\endpostamble
%\keepsilent
%\askforoverwritefalse
%\def\MBopts{\from{merlin.mbs}{%
% head,\MBopta}
%\from{physjour.mbs}{\MBopta}
%\from{geojour.mbs}{\MBopta}
%\from{photjour.mbs}{\MBopta}
%\from{merlin.mbs}{tail,\MBopta}}
%\def\MBopta{%
% ay,%: Author-year with some non-standard interface
% nat,%: Natbib for use with natbib v5.3 or later
% lang,%: Use language field to switch hyphenation patterns for title
% pres,pres-bf,%: Presentation, speaker bold face
% seq-no,%: Citation order (unsorted, only meaningful for numericals)
% vonx,%: Sort without von part (de la Maire after Mahone)
% nm-init,ed-au,%: Initials + surname (J. F. Smith)
% jnrlst,%: Junior comes last as Smith, John, Jr.
% nmft,nmft-def,%: User defined author font (\bibnamefont)
% fnm-def,%: First names in user defined font (\bibfnamefont)
% nmfted,%: Editors incollection like authors font
% nmand-rm,%: 'And' in normal font (JONES and JAMES)
% lab,lab-def,%: User defined citation font (\citenamefont)
% and-rm,%: Cited 'and' in normal font
% keyxyr,%: Year blank when KEY replaces missing author (for natbib 7.0)
% blkyear,%: Missing date left blank
% yr-par,%: Year in parentheses as (1993)
% dtrev,%: Date as year month
% date-nil-x,%: If date is empty, then do not produce the surrounding punctuation (parens, brackets)
% tit-qq,%: Title and punctuation in double quotes ('Title,' ..)
% inproceedings-chapter,%: produce pages after chapter, just as in InBook
% jtitt-x,%: Title is ignored
% inproceedings-chapter,%: produce pages after chapter just as in InBook
% article-booktitle,%: format booktitle
% article-series,%: article can has series
% jtitt-rm,%: Journal name normal font
% journal-address,%: Include address field (in parentheses) along with journal name
% book-bt,%: Field 'booktitle', or if absent field 'title', is book title
% thesis-title-o,%: Title is optional: no warning issued if empty
% trtit-b,%: Tech. report title like books
% techreport-institution-par,%: format tech report institution like book publisher
% vol-bf,%: Volume bold as {\bf vol}(num)
% vnum-x,%: Journal vol, without number as 34

```

```

% volp-com,%: Volume with comma as vol(num), ppp
% jpg-1,%: Only start page number
% book-editor-booktitle,%: Book permits empty author, produces title before editor in this case
% inbook-editor-booktitle,%: Allow using both title/booktitle, both author/editor
% bookaddress,%: Italic booktitle followed by bookaddress in roman
% num-xser,%: Allows number without series and suppresses word "number"
% number-cap,%: Capitalize word 'number' as: "Number 123"
% chapter-cap,%: Capitalize word 'chapter' as: 'Chapter 42'
% series-number,%: Series number as: 'Springer Lecture Notes No. 125'
% numser-booktitle,%: After book title and conference address, and before editors
% ser-vol,%: Series, vol. 23
% ser-rm,%: format series roman , even when used with volume
% volume-cap,%: Capitalize word 'volume', as: 'Volume 7 in Lecture Series'
% ser-ed,%: Series and volume after booktitle and before editors
% jnm-x,%: Space after journal name
% pg-bk,book-chapter-pages,%: As chapter and page: chapter 42, page 345
% pub-date,%: Publisher with address and date in parentheses (Oxford, 1994)
% ay-empty-pub-parens-x,%: eliminate parentheses altogether if nothing inside
% pre-pub,pre-edn,%: Edition, publisher, volume, chapter, pages
% isbn,%: Include ISBN for books, booklets, etc.
% issn,%: Include ISSN for periodicals
% doi-link,doi,%: Doi forms a link to the publication, anchored to the volume or title
% edby,%: In booktitle, edited by .. (where .. is names)
% blk-com,%: Comma between blocks
% fin-endsbibitem,%: Command at end instead of period
% pp,%: 'Page' abbreviated as p. or pp.
% ed,%: 'Editor' abbreviated as ed. or eds.
% abr,%: Abbreviations of such words
% ednx,%: 'Edition' abbreviated as 'ed'
% ord,%: Numerical editions as 1st, 2nd, 3rd, etc
% jabr,%: Abbreviated journal names
% etal-it,%: Italic et al
% revdata,eprint,url,url-blk,translation,%: Include REVTeX data fields collaboration, eid, eprint
% SLACcitation,%: Produce SLACcitation field
% numpages-x,%: Do not include numpages field
% url,url-prefix-x,%: URL without prefix (default: 'URL ')
% bibinfo,%: Reference component tags like \bibinfo in the content of \bibitem
% bibfield,%: Element tags like \bibfield in the content of \bibitem
% nfss,%: Use LaTeX commands which may not work with Plain TeX
%,{%
% }}
%\generate{\file{apsrev4-1.bst}{\MBopts}}
%\endbatchfile
%
```

30.3.10 Comparing apsrev.bst and apsrmp.bst

These two bibliographic styles differ as follows: `apsrev.dbj` has the following guard codes, which `apsrmp.dbj` does not:

- `seq-no`— Citation order (unsorted, like `unsrt.bst`)
- `nm-init,ed-au`— Initials + surname (J. F. Smith)
- `blkyear`— Missing date left blank
- `date-nil-x`— If date is empty, then do not produce the surrounding punctuation (parens, brackets, colon, comma)
- `inproceedings-chapter`— produce pages after chapter, just as in `InBook`
- `techreport-institution-par`— format tech report institution like book publisher
- `vnum-x`— Journal vol, without number as ‘34’
- `pub-date`— Publisher with address and date in parentheses (Oxford, 1994)
- `pre-pub`— Edition, publisher, volume, chapter, pages. Note that both use guard code `pre-edn`.

`apsrmp.dbj` has the following guard codes, which `apsrev.dbj` does not:

- `nm-rev1`— Only first name reversed, initials (AGU style: Smith, J. F., H. K. Jones)
- `dt-beg`— Date after authors
- `vnum-sp`— Journal vol (num) as ‘34 (2)’
- `pp-last`— Pages at end, but before any notes
- `pub-par`— Publisher in parentheses
- `school-par`— School/address in parens: ‘(school, address)’
- `bkedcap`— ‘Name Editor,’ as above, editor upper case
- `and-com`— Comma even with 2 authors as ‘Tom, and Harry’

We ensure that the journal substyle has the first word in the matter by installing the (default) APS code later on (see Section 30.6).

`\authoryear@sw` Numerical citations: default value of `\authoryear@sw` is false.

2951 `\@booleanfalse\authoryear@sw`

`\bibpunct` The following commands effectively establish the style in which `\cite` commands are formatted. You can think of them as the second needed component for the bibliography.

Set up for APS numerical citations (once the packages are loaded). The journal substyle can override these choices.

Note that, prior to `natbib` version 8.21, changing `\NAT@sort` at this late hour would not be totally effective; you would have to give `natbib` the relevant options

at load time. From version 8.21 on, \NAT@sort and \NAT@cmprs are not bound at all.

```
2952 \appdef\setup@hook{%
2953 \bibpunct{[]-[]}{,}{n}{,}{,}%
2954 }%
```

\pre@bibdata Set up to write endnotes to a .bib file; its data will be incorporated into the bibliography.

```
2955 \def\pre@bibdata{\jobname\bibdata@app}%
```

\bibsection We define the sectioning command to use when starting the bibliography.

```
2956 \appdef\setup@hook{%
2957 \def\bibsection{%
2958 \par
2959 \onecolumngrid@push
2960 \begingroup
2961 \baselineskip26\p@
2962 \bib@device{\textwidth}{245.5\p@}%
2963 \endgroup
2964 \nobreak\@nobreaktrue
2965 \addvspace{19\p@}%
2966 \par
2967 \onecolumngrid@pop
2968 }%
2969 }%
```

\bib@device We define the sectioning command to use when starting the bibliography.

\bibpreamble 2970 \def\bib@device#1#2{%

\bibsep 2971 \hb@xt@\z@{%

\newblock 2972 \hb@xt@#1{%

2973 \hfil

2974 \phantomsection

2975 \addcontentsline {toc}{section}{\protect\numberline{}}\refname}%

2976 % \hyper@anchorstart {\@currentHref }%

2977 \hb@xt@#2{%

2978 \skip@\z@\@plus-1fil\relax

2979 \leaders\hrule height.25 \p@ depth.25 \p@ \hskip\z@\@plus1fil

2980 \hskip\skip@

2981 \hskip\z@\@plus0.125fil\leaders\hrule height.375\p@ depth.375\p@ \hskip\z@\@plus0.75fil \hs

2982 \hskip\skip@

2983 \hskip\z@\@plus0.25 fil\leaders\hrule height.5 \p@ depth.5 \p@ \hskip\z@\@plus0.5 fil \hs

2984 \hskip\skip@

2985 \hskip\z@\@plus0.375fil\leaders\hrule height.625\p@ depth.625\p@ \hskip\z@\@plus0.25fil \hs

2986 % \hskip\skip@

2987 % \hfil

2988 }%

2989 % \hyper@anchorend

2990 \hfil

2991 }%

```

2992 \hss
2993 }%
2994 }%
2995 \appdef\setup@hook{%
2996 \let\bibpreamble\@empty
2997 \bibsep\z@\relax
2998 \def\newblock{\ }%
2999 }%

```

\bibfont We define the font switch that applies to the body of the bibliography.

```

3000 \appdef\setup@hook{%
3001 \def\bibfont{%
3002 \small
3003 \@clubpenalty\clubpenalty
3004 }%
3005 }%

```

30.3.11 Index

FIXME: the following call to `\twocolumn` appears wrong if we were in two-column grid.

```

3006 \newenvironment{theindex}{%
3007 \columnseprule \z@
3008 \columnsep 35\p@
3009 \c@secnumdepth-\maxdimen
3010 \onecolumngrid@push
3011 \section{\indexname}%
3012 \thispagestyle{plain}%
3013 \parindent\z@
3014 \parskip\z@ plus.3\p@\relax
3015 \let\item\@idxitem
3016 \onecolumngrid@pop
3017 }{%
3018 %\onecolumngrid@pop
3019 }%
3020 %
3021 \def\@idxitem{\par\hangindent 40\p@}%
3022 %
3023 \def\subitem{\par\hangindent 40\p@ \hspace*{20\p@}}%
3024 %
3025 \def\subsubitem{\par\hangindent 40\p@ \hspace*{30\p@}}%
3026 %
3027 \def\indexspace{\par \vskip 10\p@ plus5\p@ minus3\p@\relax}%

```

30.4 Journal- and Pointsize-Specific Code

After this substyle is read in, we will execute the code specific to the selected journal: execute the `society/journal .rtx` file if it exists, or execute the `society/journal`

macro (if the latter is not defined, it will `\relax` out). Here we define the default journal.

```
3028 \def\@journal@default{pra}%
```

30.5 Typesize-Specific Code

After this society file is read in, we will process the `\@pointsize`-specific code. Here we define the default.

```
3029 \def\@pointsize@default{10}%
```

Note: the convention in REVTeX and its substyles is that the substyle must not override any explicit class options declared by the document. This means that the various Booleans of Section 9 may be assigned here only if they are still undefined at this point.

For the APS, we supply code specific to journals PRA, PRB, PRC, PRD, PRE, PRL, and RMP. At present, they are identical, with the exception of PRB and RMP.

For most all of the APS journals, the journal-dependent code is relatively meager and is therefore embedded in this file. However, the RMP code is sufficiently extensive that splitting it out into a separate file is more convenient.

30.5.1 pra

There is no code specific to pra.

```
3030 \def\rtx@apspra{%
3031 \class@info{APS journal PRA selected}%
3032 }%
```

30.5.2 prb

We define a `\citealp`-like procedure that uses a numerical citation; it is for use in the PRB journal.

```
3033 \def\rtx@apsprb{%
3034 \class@info{APS journal PRB selected}%
```

PRB requires superscript citations. We use Patrick Daly's `natbib` package, and `hyperref` and other packages are already set up to cope with this.

`\bibpunct` By default, PRB selects the `bibnotes` option. We also set up for numerical citations.

```
3035 \let\frontmatter@footnote@produce\frontmatter@footnote@produce@endnote
3036 \appdef\setup@hook{%
3037 \bibpunct}{-}{-}{s}{-}{\textsuperscript{,}}%
3038 \let\onlinecite\rev@citealpnum
3039 }%
```

`\pre@bibdata` Set up to write endnotes to a .bib file; its data will be incorporated into the bibliography.

```
3040 \def\pre@bibdata{\jobname\bibdata@app}%
```

Invoke `superbib` option. If the document makes a selection of its own, it will override this assignment.

```
3041 \let\place@bibnumber\place@bibnumber@sup
      End of prb code.
3042 }%
```

30.5.3 prc

There is no code specific to `prc`.

```
3043 \def\rtx@apsprc{%
3044 \class@info{APS journal PRC selected}%
3045 }%
```

30.5.4 prd

There is no code specific to `prd`.

```
3046 \def\rtx@apsprd{%
3047 \class@info{APS journal PRD selected}%
3048 }%
```

30.5.5 pre

There is no code specific to `pre`.

```
3049 \def\rtx@apspre{%
3050 \class@info{APS journal PRE selected}%
3051 }%
```

30.5.6 prl

```
3052 \def\rtx@apsprl{%
3053 \class@info{APS journal PRL selected}%
```

In PRL, the default is the `bibnotes` option, and the Acknowledgments section has no head.

The References head is a device that may be described as a lozenge centered on the baseline, 71 points wide by 2 points thick, with the ends tapering to a half point in thickness. Space above 26 points base to base, below 31 base to base.

FIXME: this code may confound geometry

```
3054 \let\frontmatter@footnote@produce\frontmatter@footnote@produce@endnote
3055 \@booleanfalse\acknowledgments@sw
3056 \appdef\setup@hook{%
3057 \def\bibsection{%
3058 \par
3059 \begingroup
3060 \baselineskip26\p@
3061 \bib@device{\hsize}{72\p@}%
3062 \endgroup
3063 \nobreak\@nobreaktrue
```

```

3064 \addvspace{19\p@}%
3065 }%
3066 }%

```

Implement length checking. Use the `times` and `mathtime` packages, plus whatever other processing is required to make the formatted output be true to the metrics of the journal.

```

3067 \appdef\setup@hook{%
3068 \lengthcheck@sw{%
3069 \RequirePackage{times}%

```

Wait. Do not use `mathtime` after all. APS has their own way of doing math pi, involving Adobe Mathematical Pi and other fonts.

```

% \RequirePackage{mathtime}%
%

```

```

3070 }{}%
3071 }%

```

A PRL does not have numbered sections.

```

3072 \c@secnumdepth=-\maxdimen

```

Note: we defer this code until after type size file is read in.

```

3073 \appdef\setup@hook{%
3074 \@ifnum{\@pointsize=10\relax}{%
3075 \lengthcheck@sw{%
3076 \def\large{%
3077 \setfontsize\large{12.5}{14\p@}%
3078 }%
3079 \def\normalsize{%
3080 \setfontsize\normalsize{10.5}\@xiipt
3081 \abovedisplayskip 6\p@ \@plus6\p@ \@minus5\p@
3082 \belowdisplayskip \abovedisplayskip
3083 \abovedisplayshortskip \abovedisplayskip
3084 \belowdisplayshortskip \abovedisplayskip
3085 \let\@listi\@listI
3086 }%
3087 \def\small{%
3088 \setfontsize\small{9.5}\@xipt
3089 \abovedisplayskip 5\p@ \@plus5\p@ \@minus4\p@
3090 \belowdisplayskip \abovedisplayskip
3091 \abovedisplayshortskip \abovedisplayskip
3092 \belowdisplayshortskip \abovedisplayskip
3093 \let\@listi\@listI
3094 }%
3095 \DeclareMathSizes{12.5}{12.5}{9}{6}%
3096 \DeclareMathSizes{10.5}{10.5}{7.5}{5}%
3097 \DeclareMathSizes{9.5}{9.5}{7.0}{5}%
3098 }{}%
3099 \def\normalsize{%
3100 \setfontsize\normalsize\@xpt\@xiipt

```

```

3101 \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
3102 \belowdisplayskip \abovedisplayskip
3103 \abovedisplayshortskip \abovedisplayskip
3104 \belowdisplayshortskip \abovedisplayskip
3105 \let\@listi\@listI
3106 }%
3107 }%
3108 }-{}%
3109 }%
3110 \textheight = 694.0\p@
      End of prl code.
3111 }%

```

30.5.7 per

Here is code specific to per.

```

3112 \def\rtx@apsprstper{%
3113 \class@info{APS journal PRST-PER selected}%
      To first order, PER is the same as PRB, with superscript citations.
3114 \rtx@apsprb
      Per Mark Doyle (2009-12-22), the default is longbibliography.
3115 \@booleantrue\longbibliography@sw
      “Section heads are bold, centered (Roman numeral, Latin letter)”
      Article titles do not have surrounding double-quotes!
      End of prb code.
3116 }%

```

30.5.8 prstab

There is no code specific to prstab.

```

3117 \def\rtx@apsprstab{%
3118 \class@info{APS journal PRSTAB selected}%
3119 }%

```

30.5.9 rmp

If this option has been selected, we will read in the needed code from the file `apsrmp.rtx`.

30.6 Establish APS Defaults

`\footinbib@sw` All APS journals except RMP effectively invoke the `footinbib` option. We rely on the RMP-specific code to override this assignment.

```

3120 \@booleantrue\footinbib@sw

```

`\@bibdataout@init` Procedure `\@bibdataout@aps` has the job of writing the control record into the job's `\jobnamerevtex4-1.dtx.bib` file, where it will adjust the options to `revtex4-1.dtx.bst` processing. It is installed into the initialization procedure `\@bibdataout@init`, and its meaning is set by the society (APS) and journal. For all but RMP, we select the Physical Review style. For the latter case, we change the meaning, per the code in `apsrmp.rtx`.

```
3121 \appdef\@bibdataout@rev{\@bibdataout@aps}%
3122 \def\@bibdataout@aps{%
3123 \immediate\write\@bibdataout{%
```

An entry that controls processing of the `revtex4-1.dtx.bst` file has entry type `@CONTROL`.

```
3124 @CONTROL{%
3125   apsrev41Control%
```

Say whether we want long bibliography style (the default), or the abbreviated style.

```
3126   \longbibliography@sw{%
3127     ,author="00",editor="1",pages="1",title="0",year="0"%
3128   }{%
3129     ,author="08",editor="1",pages="0",title="",year="1"%
3130   }%
3131 }%
3132 }%
```

Place a `\citation` into the auxiliary file corresponding to this entry.

```
3133 \if@filesw
3134 \immediate\write\auxout{\string\citation{apsrev41Control}}%
3135 \fi
3136 }%
```

`\place@bibnumber` We install code that will select the presentation for `\bibitems` and govern the `\@bibstyle` \LaTeX processing.

```
3137 \let\place@bibnumber\place@bibnumber@inl
3138 \def\@bibstyle{apsrev\substyle@post}%
```

```
%\appdef\setup@hook{%
% \longbibliography@sw{%
% \appdef\@bibstyle{long}%
% }{}%
%}%
%
```

30.7 APS Sanity Checking

Rule: if `\place@bibnumber` is `\place@bibnumber@sup` (citations are numbered and set superscript), then it makes no sense for `\footinbib@sw` to be `\false@sw` (footnotes set in the bibliography, as endnotes). If both conditions prevailed,

then the document would have footnotes and citations both as superscript arabic numbers, but independently numbered, which would be confusing.

Any society that provides for both superscript numbered citations as well as for numbered footnotes should check for this same condition, and deal with it.

Note: an alternative would be for footnotes to use the same sequence of footnote devices that are used by the frontmatter footnotes (`\frontmatter@thefootnote` instead of arabic numbers).

In this case, we would want to refrain from resetting `\c@footnote` at the end of the title page formatting. We would also want to treat body footnotes identically to frontmatter footnotes: the assignments in `\titleblock@produce` would persist throughout the document.

But APS do not choose to go that route.

```
3139 \appdef\setup@hook{%
3140 \@ifx{\place@bibnumber\place@bibnumber@sup}{%
3141 \footinbib@sw}{%
3142 \class@warn{Citations are superscript numbers: footnotes must be endnotes; changing to that
3143 \@booleantrue\footinbib@sw
3144 }%
3145 }{}}%
3146 }%
```

Here ends the substyle for society APS.

```
3147 %</aps>
```

31 The rmp journal substyle: the rmp module

The file `apsrmp.rtx` is read in by the `revtex4` document class if `\@society` has the value `aps` and `\@journal` has the value `rmp`.

It is read at the end of the `aps.rtx`, so all definitions and assignments in that file are operative unless overridden here.

```
3148 %<*rmp>
```

Protect this file from being read in by anything but REVTeX.

```
3149 \ifx\undefined\substyle@ext
3150 \def\@tempa{%
3151 \endinput
3152 \GenericWarning{I must be read in by REVTeX! (Bailing out)}}%
3153 }%
3154 \expandafter\else
3155 \def\@tempa{%
3156 \expandafter\fi\@tempa
```

Protect this file from being read in as a society instead of a journal. In such a case, `\@journal` will be undefined.

```
3157 \@ifxundefined\@journal{%
```

One alternative: abort the document. Another alternative: try to recover: force load the `aps` society file

```

3158 \class@warn{Please specify the REVTeX options [aps,rmp]!}%
3159 \@@end
3160 }{}%

Log the journal substyle.
3161 \class@info{APS journal RMP selected}%

```

31.1 Frontmatter

We assign the titlepage style for RMP; a document instance may override by invoking one of the class options of REVTeX.

```
3162 \clo@groupedaddress
```

```
\frontmatter@setup
```

```

3163 \def\frontmatter@setup{%
3164 \normalfont\sffamily\raggedright
3165 }%

```

`\PACS@warn` Per Mark Doyle, RMP never displays the PACS, so they don't want the 'use showpacs' warning spit out.

```
3166 \def\PACS@warn{RMP documents do not display PACS. Your \string\pacs\space will be ignored}%
```

```
\frontmatter@title@above
```

```

\frontmatter@title@format 3167 \def\frontmatter@title@above{}%
\frontmatter@title@below 3168 \def\frontmatter@title@format{\Large\bfseries\raggedright}% HelveticaNeue-Medium(Italic) 14pt.
3169 \def\frontmatter@title@below{\advspace{12\p@}}% 24pt b-b down to first author

```

`\frontmatter@authorformat` Set the rag to a milder value, because we want to do true ragged right typesetting, as opposed to the L^AT_EX default, which gives very poor results.

Note: author font is 9.8bp. 19.2bp/14.3bp above/below.

```

3170 \def\frontmatter@authorformat{%
3171 \preprintsty@sw{\vskip0.5pc\relax}{}%
3172 \@tempskipa\@flushglue
3173 \@flushglue\z@ plus.8\hsize
3174 \raggedright\advance\leftskip.5in\relax
3175 \@flushglue\@tempskipa
3176 \parskip\z@skip
3177 \@totalleftmargin\leftskip
3178 }%

```

`\frontmatter@affiliationfont` The hook `\frontmatter@affiliationfont` controls the formatting of affiliations and affiliation groups. The hook `\frontmatter@above@affilgroup` is invoked just before proceeding with author/affiliation processing. The `\frontmatter@above@affiliation` is the amount of space above affiliations in the `groupedaddress` style, and `\frontmatter@above@affiliation@script` is that for `superscriptaddress`.

Note: affiliation font is 9.03/10.4bp, 14.3bp/19.2bp b-b above/below

```

3179 \def\frontmatter@affiliationfont{% Helvetica 9/10.2
3180 \small\slshape\selectfont\baselineskip10.5\p@\relax

```

```

3181 \@tempskipa\@flushglue
3182 \@flushglue\z@ plus.8\hsize
3183 \raggedright\advance\leftskip.5in\relax
3184 \@flushglue\@tempskipa
3185 \@totalleftmargin\leftskip
3186 \let\def@after@address\def@after@address@empty
3187 }%
3188 \def\frontmatter@above@affilgroup{\addvspace{7.2\p@}}% additional leading above an author
3189 \def\frontmatter@above@affiliation{\addvspace{5.3\p@}}%
3190 \def\frontmatter@above@affiliation@script{}%

```

Set up the default RMP style for title block authors and affiliations. We assign the titlepage style for RMP; a document instance may override by invoking one of the class options of REVTeX.

This command should override the effect of the corresponding command in the society substyle, and any document class option bearing on same will in turn override.

```
3191 \clo@groupedaddress
```

`\frontmatter@RRAP@format` Note: in RMP, if we are not in preprint mode, the date will not be produced.
Note: Helvetica C/lc, 8.98bp, space above: 16.3bp b-b.

```

3192 \def\frontmatter@RRAP@format{%
3193   \addvspace{7.3\p@}%
3194   \small
3195   \raggedright\advance\leftskip.5in\relax
3196   \@totalleftmargin\leftskip
3197 }%
3198 \def\produce@RRAP#1{%
3199   \@ifempty{#1}{-}{%
3200     \@ifvmode{\leavevmode}{-}%
3201     \unskip(\ignorespaces#1\unskip)\quad
3202   }%
3203 }%

```

`\frontmatter@abstractheading` Space above 21.8bp b-b.

```

3204 \def\frontmatter@abstractheading{%
3205   \preprintsty@sw{%
3206     \begingroup
3207     \centering\large
3208     \abstractname
3209     \par
3210     \endgroup
3211     \vspace{.5pc}%
3212   }{}%
3213 }%

```

`\frontmatter@abstractfont` TimesTen 8.93bp/9.6bp X 360bp, indented 36bp, with 21.9/37.6bp b-b above/below

```
3214 \def\frontmatter@abstractfont{%
```

```

3215 \footnotesize
3216 \hspace{360pt}
3217 \leftskip=0.5in
3218 \parindent\z@
3219 \@totalleftmargin\leftskip
3220 }%

```

`\frontmatter@preabstractspace` Space above and space below abstract in title block. Should be 22/36 points
`\frontmatter@postabstractspace` base-to-base.

```

3221 \def\frontmatter@preabstractspace{7.7pt}%
3222 \def\frontmatter@postabstractspace{24.6pt}%

```

FIXME: Not done: PACS. FIXME: TOC: Head is same as

32 :

HelveticaNeue 8.98. 32/22bp b-b above/below, Body: TimesTen 8/10.5.

32.1 General Text

If not in preprint mode, RMP sets the type size to 10/12 point. Note: s/b 11.6bp leading
 FIXME: define `\normalsize` only if nobody else has done so.

```

3223 \appdef\setup@hook{%
3224 \preprintsty@sw{}{%
3225 \def\normalsize{%
3226 \@setsize\normalsize{12pt}\xpt\@xpt
3227 \abovedisplayskip 10pt plus2pt minus5pt
3228 \belowdisplayskip \abovedisplayskip
3229 \abovedisplayshortskip \abovedisplayskip
3230 \belowdisplayshortskip \abovedisplayskip
3231 \let\@listi\@listI
3232 }%
3233 }%
3234 }%

```

Footnote mods:

```

3235 \footnotesep 9.25pt
3236 \skip\footins 36pt plus 4pt minus 12pt
3237 \def\footnoterule{%
3238 \dimen@\skip\footins\divide\dimen@\thr@@
3239 \kern-\dimen@\hrule width.5in\kern\dimen@
3240 }%

```

32.2 Sectioning

We override the meaning of `\secnums@rtx`. The class option `secnumarabic` will continue to work.

```

3241 \def\secnums@rtx{%

```

```

3242 \@ifundefined\thepart{%
3243 \def\thepart{\Roman{part}}%
3244 }{}%
3245 \@ifundefined\thesection{%
3246 \def\thesection {\Roman{section}}%
3247 \def\p@section {}%
3248 }{}%
3249 \@ifundefined\thesubsection{%
3250 \def\thesubsection {\Alph{subsection}}%
3251 \def\p@subsection {\thesection.}%
3252 }{}%
3253 \@ifundefined\thesubsubsection{%
3254 \def\thesubsubsection {\arabic{subsubsection}}%
3255 \def\p@subsubsection {\thesection.\thesection.}%
3256 }{}%
3257 \@ifundefined\theparagraph{%
3258 \def\theparagraph {\alph{paragraph}}%
3259 \def\p@paragraph {\thesection.\thesubsection.\thesubsubsection.}%
3260 }{}%
3261 \@ifundefined\thesubparagraph{%
3262 \def\thesubparagraph {\arabic{subparagraph}}%
3263 \def\p@subparagraph {\thesection.\thesubsection.\thesubsubsection.\theparagraph.}%
3264 }{}%
3265 }%

```

In RMP, put a period (.), followed by ‘nut space’, after the section number. Also, hang the section number (the L^AT_EX default).

```

3266 \def\@secntformat#1{\csname the#1\endcsname.\hskip0.5em\relax}%

```

Note that we wish to set the section head uppercase, so we use David Carlisle’s `\MakeTextUppercase`. However, because this procedure effectively parses its argument (looking for things to *not* translate), it has to be invoked in such a way that the argument of the `\section` command is passed to it as its own argument.

To accomplish this, we use the `\@hangfrom@` hook, which was developed for this purpose.

```

3267 \def\section{%
3268 \startsection{section}{1}{\z@}{0.8cm plus1ex minus.2ex}{0.4cm}%
3269 {%
3270 \small\sffamily\bfseries\selectfont
3271 \raggedright
3272 \parindent\z@
3273 }%
3274 }%
3275 \def\@hangfrom@section#1#2#3{\@hangfrom{#1#2}\MakeTextUppercase{#3}}%
3276 \def\@hangfroms@section#1#2{#1\MakeTextUppercase{#2}}%
3277 \def\subsection{%
3278 \startsection{subsection}{2}{\z@}{0.8cm plus1ex minus.2ex}{0.4cm}%
3279 {%
3280 \small\sffamily\bfseries
3281 \raggedright

```

```

3282   \parindent\z@
3283   }%
3284 }%
3285 \def\subsubsection{%
3286   \@startsection{subsubsection}{3}{\z@}{.8cm plus1ex minus.2ex}{0.4cm}%
3287   {%
3288     \small\sffamily\selectfont
3289     \raggedright
3290     \parindent\z@
3291   }%
3292 }%
3293 \def\paragraph{%
3294   \@startsection{paragraph}{4}{\z@}{.8cm plus1ex minus.2ex}{-1em}%
3295   {%
3296     \small\slshape\selectfont
3297     \raggedright
3298     \parindent\z@
3299   }%
3300 }%
3301 \def\subparagraph{%
3302   \@startsection{subparagraph}{4}{\parindent}{3.25ex plus1ex minus.2ex}{-1em}%
3303   {\normalsize\bfseries\selectfont}%
3304 }%
3305 %
3306 \setcounter{tocdepth}{4}% FIXME: has no effect

```

\appendix

```

\@hangfrom@appendix 3307 \appdef\appendix{%
\@hangfrom@appendix 3308 \let\@hangfrom@section\@hangfrom@appendix
\@appendixcntformat 3309 \let\@sectioncntformat\@appendixcntformat
3310 }%
3311 \def\@hangfrom@appendix#1#2#3{%
3312 #1%
3313 \@ifempty{#2}{%
3314 #3%
3315 }{%
3316 #2\@ifempty{#3}{:\ #3}%
3317 }%
3318 }%
3319 \def\@hangfrom@appendix#1#2{%
3320 #1\appendixname\@ifempty{#2}{:\ #2}%
3321 }%
3322 \def\@appendixcntformat#1{\appendixname \ \csname the#1\endcsname}%

```

32.3 Figure and Table Caption Formatting

\@makecaption

```

3323 \setlength\belowcaptionskip{2\p@}
3324 \long\def\@makecaption#1#2{%

```

```

3325 \vskip\abovecaptionskip
3326 \vbox{%
3327   \flushing
3328   \small\rmfamily
3329   \noindent
3330   #1\@caption@fignum@sep#2\par
3331 }%
3332 \vskip\belowcaptionskip
3333 }%
3334 \def\@caption@fignum@sep{\nobreak\hskip.5em plus.2em\ignorespaces}%

```

32.4 Citations and Bibliography

Customize REV_T_EX for the journal substyle; this task requires three components: a BIB_T_EX .bst style file, customizing code for natbib, and customizations of the thebibliography environment.

`\@bibstyle` Define the argument of the `\bibliographystyle` command (if the document does not do so).

The user must have installed a .bst file of the corresponding name. This file will then be used by BIB_T_EX when compiling the document's .bbl file.

To generate apsrmp.bst, use custom-bib version 3.89d1 or later. Run the .bst generator, makebst.tex, with the following options:

1. STYLE OF CITATIONS: **a:** ay—Author-year with some non-standard interface
2. AUTHOR: *****: nat—Natbib for use with natbib v5.3 or later
3. LANGUAGE FIELD: **l:** lang—Use language field to switch hyphenation patterns for title
4. PRESENTATIONS: **b:** pres,pres-bf—Presentation, speaker bold face
5. ORDER ON VON PART : **x:** vonx—Sort without von part (de la Maire after Mahone)
6. AUTHOR NAMES: **a:** nm-rev1—Only first name reversed, initials (AGU style: Smith, J. F., H. K. Jones)
7. POSITION OF JUNIOR : *****: jnrlst—Junior comes last as Smith, John, Jr.
8. TYPEFACE FOR AUTHORS IN LIST OF REFERENCES: **u:** nmft,nmft-def—User defined author font (`\bibnamefont`)
9. FONT FOR FIRST NAMES : **u:** fnm-def—First names in user defined font (`\bibfnamefont`)
10. EDITOR NAMES IN INCOLLECTION ETC: **a:** nmfted—Editors in collection like authors font

11. FONT FOR ‘AND’ IN LIST: **r: nmand-rm**—‘And’ in normal font (JONES and JAMES)
12. FONT OF CITATION LABELS IN TEXT : **u: lab,lab-def**—User defined citation font (`\citenamefont`)
13. FONT FOR ‘AND’ IN CITATIONS : **r: and-rm**—Cited ‘and’ in normal font
14. LABEL WHEN AUTHORS MISSING : ***: keyxyr**—Year blank when KEY replaces missing author (for natbib 7.0)
15. DATE POSITION: **b: dt-beg**—Date after authors
16. DATE FORMAT : **m: yr-com**—Date preceded by comma as ‘, 1993’
17. INCLUDE MONTHS: **m: aymth**—Include month in date
18. REVERSED DATE : **r: dtrev**—Date as year month
19. TRUNCATE YEAR : ***: note-yr**—Year text full as 1990–1993 or ‘in press’
20. TITLE OF ARTICLE: **d: tit-qq**—Title and punctuation in double quotes (“Title,” ..)
21. TITLE PRESENT IN ARTICLE, INCOLLECTION, AND INPROCEEDINGS: **x: jtitt-x**—Title is ignored
22. INPROCEEDINGS CHAPTER AND PAGES, LIKE INBOOK: **y: inproceedings-chapter**—produce pages after chapter just as in InBook
23. ARTICLE BOOKTITLE PRESENT: **?: article-booktitle**—format booktitle
24. ARTICLE SERIES PRESENT: **?: article-series**—article can has series
25. JOURNAL NAME FONT: **r: jttl-rm**—Journal name normal font
26. JOURNAL NAME WITH ADDRESS: **y: journal-address**—Include address field (in parentheses) along with journal name
27. BOOK TITLE FIELDS: **y: book-bt**—Field ‘booktitle’, or if absent field ‘title’, is book title
28. THESIS TITLE OPTIONAL: **?: thesis-title-o**—Title is optional: no warning issued if empty
29. TECHNICAL REPORT TITLE: **b: trtit-b**—Tech. report title like books
30. JOURNAL VOLUME: **b: vol-bf**—Volume bold as **vol**(num)
31. JOURNAL VOL AND NUMBER: **s: vnum-sp**—Journal vol (num) as 34 (2)
32. VOLUME PUNCTUATION: **c: volp-com**—Volume with comma as vol(num),
ppp

33. PAGE NUMBERS: **f: jpg-1**—Only start page number
34. POSITION OF PAGES: **e: pp-last**—Pages at end but before any notes
35. BOOK EDITOR W/O AUTHOR: : **book-editor-booktitle**—Book permits empty author, produces title before editor in this case
36. INBOOK PERMITS TITLE, BOOKTITLE, AUTHOR, EDITOR: **a: inbook-editor-booktitle**—Allow using both title/booktitle, both author/editor
37. CONFERENCE ADDRESS FOR BOOK, INBOOK, INCOLLECTION, INPROCEEDINGS, PROCEEDINGS: **a: bookaddress**—Italic booktitle followed by bookaddress in roman
38. NUMBER AND SERIES FOR BOOK, INBOOK, INCOLLECTION, INPROCEEDINGS, PROCEEDINGS: ***: num-xser**—Allows number without series and suppresses word "number"
39. WORD NUMBER CAPITALIZED FOR NUMBER AND SERIES: **c: number-cap**—Capitalize word 'number' as: "Number 123"
40. WORD CHAPTER CAPITALIZED: **c: chapter-cap**—Capitalize word 'chapter' as: 'Chapter 42'
41. COMBINING NUMBER AND SERIES: **x: series-number**—Series number as: 'Springer Lecture Notes No. 125'
42. POSITION OF NUMBER AND SERIES: **b: numser-booktitle**—After book title and conference address, and before editors
43. VOLUME AND SERIES FOR BOOKS: **s: ser-vol**—Series, vol. 23
44. VOLUME AND SERIES FORMATTING: **y: ser-rm**—format series roman, even when used with volume
45. WORD VOLUME CAPITALIZED FOR VOLUME AND SERIES: **y: volume-cap**—Capitalize word 'volume', as: 'Volume 7 in Lecture Series'
46. POSITION OF VOLUME AND SERIES FOR INCOLLECTION, INBOOK, AND INPROCEEDINGS: **e: ser-ed**—Series and volume after booktitle and before editors
47. JOURNAL NAME PUNCTUATION: **x: jnm-x**—Space after journal name
48. PAGES IN BOOK: ***: pg-bk, book-chapter-pages**—As chapter and page: chapter 42, page 345
49. PUBLISHER IN PARENTHESES: **p: pub-par**—Publisher in parentheses
50. EMPTY PUBLISHER PARENTHESES: **y: ay-empty-pub-parens-x**—eliminate parentheses altogether if nothing inside

51. PUBLISHER POSITION: **e: pre-edn**—Edition before publisher
52. SCHOOL: **p: school-par**—school/address in parens: ‘(school, address)’
53. ISBN NUMBER: ***: isbn**—Include ISBN for books, booklets, etc.
54. ISSN NUMBER: ***: issn**—Include ISSN for periodicals
55. DOI NUMBER: **a: doi-link,doi**—Doi forms a link to the publication, anchored to the volume or title
56. ‘EDITOR’ AFTER NAMES: **a: bkedcap**—‘Name Editor,’ as above, editor upper case
57. EDITOR IN COLLECTIONS: **b: edby**—In booktitle, edited by .. (where .. is names)
58. PUNCTUATION BETWEEN SECTIONS : **c: blk-com**—Comma between blocks
59. FINAL PUNCTUATION: **c: fin-endsbibitem**—Command at end instead of period
60. ABBREVIATE WORD ‘PAGES’ : **a: pp**—‘Page’ abbreviated as p. or pp.
61. ABBREVIATE WORD ‘EDITORS’: **a: ed**—‘Editor’ abbreviated as ed. or eds.
62. OTHER ABBREVIATIONS: **a: abr**—Abbreviations of such words
63. ABBREVIATION FOR ‘EDITION’ : **a: ednx**—‘Edition’ abbreviated as ‘ed’
64. EDITION NUMBERS: **n: ord**—Numerical editions as 1st, 2nd, 3rd, etc
65. STORED JOURNAL NAMES: **a: jabr**—Abbreviated journal names
66. COMMA BEFORE ‘AND’: **c: and-com**—Comma even with 2 authors as ‘Tom, and Harry’
67. FONT OF ‘ET AL’: **i: etal-it**—Italic et al
68. ADDITIONAL REVTeX DATA FIELDS: **r: revdata,eprint,url,url-blk,translation**—Include REVTeX data fields collaboration, eid, eprint, archive, url, translation
69. SLACcitation FIELD: **?: SLACcitation**—Produce SLACcitation field
70. NUMPAGES DATA FIELD: ***: numpages-x**—Do not include numpages field
71. REFERENCE COMPONENT TAGS: **b: bibinfo**—Reference component tags like `\bibinfo` in the content of `\bibitem`
72. ELEMENT TAGS: **b: bibfield**—Element tags like `\bibfield` in the content of `\bibitem`

73. COMPATIBILITY WITH PLAIN TEX: *: nfss—Use LaTeX commands which may not work with Plain TeX

A file `apsrmp.dbj` file equivalent to the following should result:

```

%\input docstrip
%\preamble
%-----
%*** REVTeX-compatible RMP 2010-02-12 ***
%\endpreamble
%\postamble
%End of customized bst file
%\endpostamble
%\keepsilent
%\askforoverwritefalse
%\def\MBopts{\from{merlin.mbs}{%
% head,\MBopta}
%\from{physjour.mbs}{\MBopta}
%\from{geojour.mbs}{\MBopta}
%\from{photjour.mbs}{\MBopta}
%\from{merlin.mbs}{tail,\MBopta}}
%\def\MBopta{%
% ay, %: Author-year with some non-standard interface
% nat, %: Natbib for use with natbib v5.3 or later
% lang, %: Use language field to switch hyphenation patterns for title
% pres,pres-bf, %: Presentation, speaker bold face
% vonx, %: Sort without von part (de la Maire after Mahone)
% nm-rev1, %: Only first name reversed, initials (AGU style: Smith, J. F., H. K. Jones)
% jnrlst, %: Junior comes last as Smith, John, Jr.
% nmft,nmft-def, %: User defined author font (\bibnamefont)
% fmm-def, %: First names in user defined font (\bibnamefont)
% nmfted, %: Editors incollection like authors font
% nmand-rm, %: 'And' in normal font (JONES and JAMES)
% lab,lab-def, %: User defined citation font (\citenamefont)
% and-rm, %: Cited 'and' in normal font
% keyxyr, %: Year blank when KEY replaces missing author (for natbib 7.0)
% dt-beg, %: Date after authors
% yr-par, %: Year in parentheses as (1993)
% dtrev, %: Date as year month
% date-nil-x, %: If date is empty, then do not produce the surrounding punctuation (parens, brackets)
% tit-qq, %: Title and punctuation in double quotes (''Title,'' ...)
% inproceedings-chapter, %: produce pages after chapter, just as in InBook
% jtitt-x, %: Title is ignored
% inproceedings-chapter, %: produce pages after chapter just as in InBook
% article-booktitle, %: format booktitle
% article-series, %: article can has series
% jttl-rm, %: Journal name normal font
% journal-address, %: Include address field (in parentheses) along with journal name
% book-bt, %: Field 'booktitle', or if absent field 'title', is book title
% thesis-title-o, %: Title is optional: no warning issued if empty

```

```

% trtit-b,%: Tech. report title like books
% techreport-institution-par,%: format tech report institution like book publisher
% vol-bf,%: Volume bold as {\bf vol}(num)
% vnum-sp,%: Journal vol (num) as 34 (2)
% volp-com,%: Volume with comma as vol(num), ppp
% jpg-1,%: Only start page number
% pp-last,%: Pages at end but before any notes
% book-editor-booktitle,%: Book permits empty author, produces title before editor in this case
% inbook-editor-booktitle,%: Allow using both title/booktitle, both author/editor
% bookaddress,%: Italic booktitle followed by bookaddress in roman
% num-xser,%: Allows number without series and suppresses word "number"
% number-cap,%: Capitalize word 'number' as: "Number 123"
% chapter-cap,%: Capitalize word 'chapter' as: 'Chapter 42'
% series-number,%: Series number as: 'Springer Lecture Notes No. 125'
% numser-booktitle,%: After book title and conference address, and before editors
% ser-vol,%: Series, vol. 23
% ser-rm,%: format series roman , even when used with volume
% volume-cap,%: Capitalize word 'volume', as: 'Volume 7 in Lecture Series'
% ser-ed,%: Series and volume after booktitle and before editors
% jnm-x,%: Space after journal name
% pg-bk,book-chapter-pages,%: As chapter and page: chapter 42, page 345
% pub-par,%: Publisher in parentheses
% ay-empty-pub-parens-x,%: eliminate parentheses altogether if nothing inside
% pre-edn,%: Edition before publisher
% school-par,%: school/address in parens: '(school, address)'
% isbn,%: Include ISBN for books, booklets, etc.
% issn,%: Include ISSN for periodicals
% doi-link,doi,%: Doi forms a link to the publication, anchored to the volume or title
% bkedcap,%: 'Name Editor,' as above, editor upper case
% edby,%: In booktitle, edited by .. (where .. is names)
% blk-com,%: Comma between blocks
% fin-endbibitem,%: Command at end instead of period
% pp,%: 'Page' abbreviated as p. or pp.
% ed,%: 'Editor' abbreviated as ed. or eds.
% abr,%: Abbreviations of such words
% ednx,%: 'Edition' abbreviated as 'ed'
% ord,%: Numerical editions as 1st, 2nd, 3rd, etc
% jabr,%: Abbreviated journal names
% and-com,%: Comma even with 2 authors as 'Tom, and Harry'
% etal-it,%: Italic et al
% revdata,eprint,url,url-blk,translation,%: Include REVTeX data fields collaboration, eid, eprint
% SLACcitation,%: Produce SLACcitation field
% numpages-x,%: Do not include numpages field
% url,url-prefix-x,%: URL without prefix (default: 'URL ')
% bibinfo,%: Reference component tags like \bibinfo in the content of \bibitem
% bibfield,%: Element tags like \bibfield in the content of \bibitem
% nfss,%: Use LaTeX commands which may not work with Plain TeX
%,{%
% }}
%\generate{\file{apsrmp4-1.bst}{\MBopts}}

```

```
%\endbatchfile
%
```

For a comparison between `apsrmp.bst` and `apsrev.bst`, see Section [30.3.10](#).

```
3335 \def\@bibstyle{apsrmp\substyle@post}%
```

`\authoryear@sw` Author-year citations: default value of `\authoryear@sw` is true.

```
3336 \@booleantrue\authoryear@sw
```

`\@bibdataout@rmp` When the journal is RMP, the meaning of the procedure `\@bibdataout@aps` needs to be different because of the way the author names are formatted. In other respects, it is the same.

```
3337 \def\@bibdataout@aps{%
3338 \immediate\write\@bibdataout{%
```

An entry that controls processing of the `revtex4-1.dtx.bst` file has entry type `@CONTROL`. This entry's cite key is `apsrmp41Control`, which serves as a version number.

```
3339 @CONTROL{%
3340   apsrmp41Control%
```

Say whether we want long bibliography style (the default), or the abbreviated style.

```
3341   \longbibliography@sw{%
3342     ,author="03",editor="0",pages="1",title="0",year="0"%
3343   }{%
3344     ,author="0B",editor="0",pages="0",title="",year="1"%
3345   }%
3346 }%
3347 }%
```

Place a `\citation` into the auxiliary file corresponding to this entry.

```
3348 \if@filesw
3349 \immediate\write\@auxout{\string\citation{apsrmp41Control}}%
3350 \fi
3351 }%
```

`\bibpunct` The following commands effectively establish the style in which `\cite` commands are formatted. You can think of them as the second needed component for the bibliography.

`\bibpreamble` Set up for author-year citations: when `\NAT@set@cites` executes (at `\begin{document}` time), the `\@biblabel` will be set to `\NAT@biblabel`.

`\newblock` Per Karie Friedman (`friedman@phys.washington.edu`), multiple citations are separated by semicolons, e.g., (Jones, 1999; Abbott and Smith, 2000; Wortley, 2001a), and multiple citations by the same author by commas, e.g., Abela et al. (1995, 1997a, 1997b). The third argument of `\bibpunct` handles the former.

The fifth argument puts a comma after the author when the year is not in parens: (Lee et al., 1996).

Incidentally, this `\bibpunct` command specifies the `natbib` default values.

`\eprint` RMP requires the `\eprint` field in the bib entry to be set off with the word “eprint”.

```
3378 \def\eprint#1{eprint #1}%
```

32.5 Table of Contents

We set up for auto-sizing of certain TOC elements.

To do this, we override the definitions for the default TOC font (`\toc@font`), and define formatting for the needed elements (`\l@...`). Finally, we activate the autosizing by assigning `\toc@pre` and `\toc@post`.

`\toc@font` Set the formatting characteristics of the auto-indenting part of the TOC.

```
3379 \def\toc@font{%
3380 \footnotesize\rmfamily
3381 \def\{\space\ignorespaces}%
3382 }%
3383 \def\ltxu@dotsep{5.5pt}%
```

`\l@section` Determine which TOC elements are automatically indented.

```
3384 \def\tocleft@{\z@}%
3385 \def\tocdim@min{5\p@}%
3386 \def\l@section{%
3387 \l@sections{}{section}% Implicit #3#4
3388 }%
3389 \def\l@subsection{%
3390 \l@sections{section}{subsection}% Implicit #3#4
3391 }%
3392 \def\l@subsubsection{%
3393 \l@sections{subsection}{subsubsection}% Implicit #3#4
3394 }%
3395 %\def\l@subsubsection#1#2{}%
3396 \def\l@paragraph#1#2{}%
3397 \def\l@subparagraph#1#2{}%
```

Activate the TOC processing.

```
3398 \let\toc@pre\toc@pre@auto
3399 \let\toc@post\toc@post@auto
3400 %</rmp>
```

Here ends the programmer’s documentation.

Change History

4.0a	comma not space between email and homepage	5
General: 4.0d had twoside option setting twoside switch to false	Initial version	5

Move after process options, so <code>\clearpage</code> not in scope of <code>twocolumn</code>	5	call <code>\print@floats</code>	5
Move after process options, so the following test works	5	Defer assignment until <code>\AtBeginDocument</code> time. . .	5, 68
multiple preprint commands . . .	5	Defer decision until <code>\AtBeginDocument</code> time	5
print homepage	5, 18	Define three separate environments, defer assignment to <code>\AtBeginDocument</code> time. . .	5, 69
protect against hyperref revtex kludges which are not needed now	5, 18	First modifications by Arthur Ogawa (mailto:arthur_ogawa at sbcglobal dot net)	5
Rearrange the ordering so numerical ones come first. AO: David, what does this mean? . .	5	Frank Mittelbach, has stated in <code>multicol</code> : “The kernel command <code>\footnotetext</code> should not be modified.” Thus, I have removed David Carlisle’s redefinition of that command. Note, however, that later versions of <code>multicol</code> do not require this workaround. Belt and suspenders.	5, 50
single space footnotes	5, 50	Move this “complex” option to the front, where it can be overridden by “simple” options. . .	5, 18
use font-dependent spacing . . .	5	New option	5
<code>\lastpage@putlabel</code> : Move after process options, so <code>\clearpage</code> not in scope of <code>twocolumn</code> . . .	35	One-line caption sets flush left. . .	5
<code>\openone</code> : use font-dependent spacing	81	only execute if appropriate . . .	5
<code>\preprintsty@sw</code> : comma not space between email and homepage	16	Processing delayed to <code>\AtBeginDocument</code> time . . .	5, 43, 46
Rearrange the ordering so numerical ones come first. AO: David, what does this mean? . .	16	Removed invocation of nonexistent class option <code>groupauthors</code> and all other class options that should only be invoked by the document. (Otherwise precedence of class options does not work.)	5, 33
<code>\ps@preprint</code> : Move after process options, so the following test works	34	Restore all media size class option of <code>_classes.dtx</code>	5
<code>\ps@titlepage</code> : multiple preprint commands	99	Stack <code>\preprint</code> args flush right at right margin.	5
<code>\twoside@sw</code> : 4.d had <code>twoside</code> option setting <code>twoside</code> switch to false	21	<code>\figurename</code> : Added localization of <code>\figuresname</code>	73
4.0b		<code>\paperwidth</code> : Restore all media size class option of <code>_classes.dtx</code> . .	18
<code>@makecaption</code> : One-line caption sets flush left.	44	<code>\preprintsty@sw</code> : Move this “complex” option to the front, where it can be overridden by “simple” options.	16
General: Added localization of <code>\figuresname</code>	5	<code>\printfigures</code> : call <code>\print@floats</code>	45
Added localization of <code>\tablename</code>	5		
AO: all code for <code>10pt</code> is in this module.	5, 84		
AO: all code for <code>11pt</code> is in this module.	5, 87		
AO: all code for <code>12pt</code> is in this module.	5, 89		
AO: made <code>aps.rtx</code> part of <code>revtex4.dtx</code>	5, 92		
AO: remove duplicates	5		

<code>\printtables</code> : only execute if appropriate	47	<code>\produce@preprints</code> : (AO, 115) If three or more preprints specified, set on single line, with commas.	100
<code>\ps@preprint</code> : Defer decision until <code>\AtBeginDocument</code> time	34	<code>\ps@preprint</code> : Do not put by REVTeX in every page foot	35
<code>\ps@titlepage</code> : Stack <code>\preprint</code> args flush right at right margin.	99	Insert procedure <code>\checkindate</code>	34, 35
<code>\roarrow</code> : AO: remove duplicates	81	<code>\ps@titlepage</code> : Insert procedure <code>\checkindate</code>	99
<code>\showKEYS@sw</code> : New option	17		
<code>\tablename</code> : Added localization of <code>\tablename</code>	73		
4.0c		4.0d	
<code>@appendixcntformat</code> : (AO, 129) section* within appendix was producing appendixname	105	General: Also alter how lists get indented.	5
<code>@makecaption</code> : Prevent an inner footnote from performing twice	44	But alternative spelling is deprecated.	5, 40
General: (AO, 115) If three or more preprints specified, set on single line, with commas.	5	eprint takes an optional argument, syntactical only in this case.	5
(AO, 129) section* within appendix was producing appendixname	5	make longtable trigger the head, too	5
*-form mandates pagebreak	5	More features and bug fixes: compatability with longtable and array packages. Now certainly incompatible with multi-col.	5
also spelled “acknowledgements”.	5, 40	New option	5
Do not put by REVTeX in every page foot	5	<code>\open@column@two</code> : Also alter how lists get indented.	68
grid changes via ltxgrid procedures	5	<code>\preprint@sw</code> : New option	17
grid changes with ltxgrid	5, 70, 114	<code>\printtables</code> : make longtable trigger the head, too	47
Insert procedure <code>\checkindate</code>	5	<code>\url</code> : eprint takes an optional argument, syntactical only in this case.	76
Lose compatability mode.	5, 14	4.0e	
New ltxgrid-based code, other bug fixes	5	General: adornments above and below.	5
New option “checkin”	5, 16	Bug fixes and minor new features: title block affiliations can have ancillary data, just like authors; clearpage processing revamped, with floats staying in order; widetext ornaments.	5
Prevent an inner footnote from performing twice	5	New option showkeys	5
<code>\close@column@grid</code> : grid changes with ltxgrid	70	<code>widetext@grid</code> : adornments above and below.	71
<code>\frontmatter@abstractfont</code> : (AO, 123) add parskip to the abstract.	96	<code>\showKEYS@sw</code> : New option showkeys	17
<code>widetext@grid</code> : grid changes via ltxgrid procedures	71		
<code>\open@column@two</code> : Grid changes with ltxgrid	68		
<code>\printfigures</code> : *-form mandates pagebreak	45		
<code>\printtables</code> : *-form mandates pagebreak	47		

4.0f	General: Last bug fixes before release.	5			
4.0rc1	General: grid changes with push and pop	5, 114			
	Running headers always as if two-sided	5			
	<code>\bibsection</code> : grid changes with push and pop	113			
	<code>\ps@preprint</code> : Running headers always as if two-sided	34			
4.0rc4	General: hyperref is no longer loaded via class option: use a usepackage statement instead	5, 18			
4.1a	<code>\@endnotesinbibliography</code> : (AO, 457) Endnotes to be sorted in with numerical citations.	64			
	<code>\@endnotetext</code> : (AO, 457) Endnotes to be sorted in with numerical citations.	62, 115			
	<code>\@makecaption</code> : (AO, 460) “Proper style is ”FIG. 1. ...” (no colon)”	44			
	<code>\@xendnote</code> : (AO, 457) Endnotes to be sorted in with numerical citations.	61			
	General: (AO, 451) “Cannot have more than 256 cites in a document”	5			
	(AO, 457) Endnotes to be sorted in with numerical citations.	5			
	(AO, 460) “Proper style is ”FIG. 1. ...” (no colon)”	5			
	(AO, 461) Change the csname revtex uses from @dotsep to ltxu@dotsep. The former is understood in mu. (What we wanted was a dimension.)	5, 103			
	(AO, 478) <code>\ds@letterpaper</code> , so that “letterpaper really is the default”	5			
	(AO, 488) Change processing of options to allow an unused option to specify society and journal	5, 31			
	For natbib versions before 8.21, <code>\NAT@sort</code> was consulted only as natbib was being read in. Now it is fully dynamic.	5			
	<code>\authoryear@sw</code> : (AO, 457) Endnotes to be sorted in with numerical citations.	22, 112, 132			
	<code>\bibliography</code> : (AO, 457) Endnotes to be sorted in with numerical citations.	57			
	<code>\bibpunct</code> : For natbib versions before 8.21, <code>\NAT@sort</code> was consulted only as natbib was being read in. Now it is fully dynamic.	113			
	<code>\paperwidth</code> : (AO, 478) <code>\ds@letterpaper</code> , so that “letterpaper really is the default”	19			
	<code>\toc@font</code> : (AO, 461) Change the csname revtex uses from @dotsep to ltxu@dotsep. The former is understood in mu. (What we wanted was a dimension.)	134			
4.1b	<code>\@appendixcntformat</code> : Add <code>\@changfroms@section</code>	125			
	<code>\@makecaption</code> : Break out <code>\@caption@fignum@sep</code>	125			
	<code>\@parse@class@options@</code> : Procedures <code>\@parse@class@options@society</code> and <code>\@parse@class@options@journal</code> and friends	31			
	General: (AO) Implement bibnotes through <code>\frontmatter@footnote@produce</code> instead of <code>\bibnotes@sw</code>	5			
	(AO) No longer need to test <code>\chapter</code> as of natbib version 8.2	5, 61			
	(AO) No longer use <code>\secnumarabic@sw</code> , instead use <code>\setup@secnums</code>	5, 24			
	(AO) Provide more diagnostics when <code>\@society</code> is assigned.	5			
	(AO) Structure the Abstract using the <code>\bibliography</code> environment	5, 39			
	(AO) coordinate <code>\if@twoside</code> with <code>\twoside@sw</code>	5			
	(AO) make settings at class time instead of deferring them to later.	5, 18, 122, 123			

(AO) provide option longbibliography	5, 20	<code>\byrevtex@sw</code> : (AO) make settings at class time instead of deferring them to later.	29
(AO, 455) Be nice to a list within the abstract (assign <code>\@totalleftmargin</code>).	5	<code>\change@journal</code> : (AO) Provide more diagnostics when <code>\@society</code> is assigned.	25
Add <code>\@changefroms@section</code>	5, 124	<code>\draft@sw</code> : (AO) make settings at class time instead of deferring them to later.	24
Add option reprint, opposite of reprint, and preferred alternative to <code>twocolumn</code>	5	<code>\floatp@sw</code> : (AO) make settings at class time instead of deferring them to later.	25
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