

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 [2009/10/08:11:23 4.1g (http://publish.aps.org/revtex4/ for documentation)]%FileInfo
16 %</*!package!options>
17 %<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.

```
18 %<*doc>
```

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

```
19 \documentclass{ltxdoc}
```

```

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

```

We ask for the usual indices and glossaries.

```

26 \CodelineIndex\EnableCrossrefs % makeindex -s gind.ist revtex4
27 \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.

```

28 \setcounter{StandardModuleDepth}{1}

```

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

```

29 \expandafter\GetFileInfo\expandafter{\jobname.dtx}%

```

3.1 The Frontmatter File

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

```

30 \begin{filecontents*}{00readme.tex}
31 \title{%
32 The \classname{revtex4-1} document class of the American Physical Society%
33 \protect\thanks{Work under hire to The American Physical Society.}%
34 }%
35 \author{Arthur Ogawa%
36 \protect\thanks{First revision of REV\TeX4.0 (unreleased) by David Carlisle}%
37 }%
38 \date{Version \fileversion, dated \filedate}%
39 \newcommand\revtex{REV\TeX}
40
41 \maketitle
42
43 This file embodies the implementation of the APS \revtex\ 4.1 document class
44 for electronic submissions to journals.
45
46 The distribution point for this work is
47 \url{http://publish.aps.org/revtex4/},
48 which contains fully unpacked, prebuilt runtime files and documentation.
49
50 \tableofcontents
51
52 \section{Using \protect\revtex}
53
54 The file \file{README} has retrieval and installation information.
55
56 User documentation is presented separately in \file{auguide.tex}.

```

57

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

59

60 `\changes{4.0a}{1998/01/16}{Initial version}`
61 `\changes{4.0a}{1998/01/31}{Move after process options, so \cs{clearpage} not in scope of twocol}`
62 `\changes{4.0a}{1998/01/31}{Rearrange the ordering so numerical ones come first. A0: David, what}`
63 `\changes{4.0a}{1998/01/31}{use font-dependent spacing}`
64 `\changes{4.0a}{1998/01/31}{4.0d had twoside option setting twoside switch to false}`
65 `\changes{4.0a}{1998/01/31}{Move after process options, so the following test works}`
66 `\changes{4.0a}{1998/01/31}{print homepage}`
67 `\changes{4.0a}{1998/01/31}{protect against hyperref revtex kludges which are not needed now}`
68 `\changes{4.0a}{1998/06/10}{multiple preprint commands}`
69 `\changes{4.0a}{1998/06/10}{comma not space between email and homepage}`
70 `\changes{4.0a}{1998/06/10}{single space footnotes}`
71 `\changes{4.0b}{1999/06/20}{First modifications by Arthur Ogawa (mailto:arthur_ogawa at sbcglob}`
72 `\changes{4.0b}{1999/06/20}{Added localization of \cs{figuresname}}`
73 `\changes{4.0b}{1999/06/20}{Added localization of \cs{tablename}}`
74 `\changes{4.0b}{1999/06/20}{A0: all code for \protect\classoption{10pt} is in this module.}`
75 `\changes{4.0b}{1999/06/20}{A0: all code for \protect\classoption{11pt} is in this module.}`
76 `\changes{4.0b}{1999/06/20}{A0: all code for \protect\classoption{12pt} is in this module.}`
77 `\changes{4.0b}{1999/06/20}{A0: made aps.rtx part of revtex4.dtx}`
78 `\changes{4.0b}{1999/06/20}{A0: remove duplicates}`
79 `\changes{4.0b}{1999/06/20}{call \cs{print@floats}}`
80 `\changes{4.0b}{1999/06/20}{Defer assignment until \cs{AtBeginDocument} time.}`
81 `\changes{4.0b}{1999/06/20}{Defer decision until \cs{AtBeginDocument} time}`
82 `\changes{4.0b}{1999/06/20}{Define three separate environments, defer assignment to \cs{AtBeginD}}`
83 `\changes{4.0b}{1999/06/20}{Frank Mittelbach, has stated in \protect\classname{multicol}: ‘‘The`
84 `\changes{4.0b}{1999/06/20}{Move this ‘‘complex’’ option to the front, where it can be overridden}`
85 `\changes{4.0b}{1999/06/20}{New option}`
86 `\changes{4.0b}{1999/06/20}{One-line caption sets flush left.}`
87 `\changes{4.0b}{1999/06/20}{only execute if appropriate}`
88 `\changes{4.0b}{1999/06/20}{Processing delayed to \cs{AtBeginDocument} time}`
89 `\changes{4.0b}{1999/06/20}{Removed invocation of nonexistent class option \protect\classoption{}`
90 `\changes{4.0b}{1999/06/20}{Restore all media size class option of \protect\file{classes.dtx}}`
91 `\changes{4.0b}{1999/06/20}{Stack \cs{preprint} args flush right at right margin.}`
92 `\changes{4.0c}{1999/11/13}{(A0, 115) If three or more preprints specified, set on single line,}`
93 `\changes{4.0c}{1999/11/13}{(A0, 129) section* within appendix was producing appendixname}`
94 `\changes{4.0c}{1999/11/13}{*-form mandates pagebreak}`
95 `\changes{4.0c}{1999/11/13}{also spelled ‘‘acknowledgements’’.}`
96 `\changes{4.0c}{1999/11/13}{Do not put by REVTeX in every page foot}`
97 `\changes{4.0c}{1999/11/13}{grid changes via ltxgrid procedures}`
98 `\changes{4.0c}{1999/11/13}{grid changes with ltxgrid}`
99 `\changes{4.0c}{1999/11/13}{Insert procedure \cs{checkindate}}`
100 `\changes{4.0c}{1999/11/13}{Lose compatability mode.}`
101 `\changes{4.0c}{1999/11/13}{New ltxgrid-based code, other bug fixes}`
102 `\changes{4.0c}{1999/11/13}{New option ‘‘checkin’’}`
103 `\changes{4.0c}{1999/11/13}{Prevent an inner footnote from performing twice}`
104 `\changes{4.0d}{2000/04/10}{Also alter how lists get indented.}`
105 `\changes{4.0d}{2000/04/10}{eprint takes an optional argument, syntactical only in this case.}`
106 `\changes{4.0d}{2000/04/10}{New option}`

107 \changes{4.0d}{2000/05/10}{More features and bug fixes: compatability with longtable and array
108 \changes{4.0d}{2000/05/17}{make longtable trigger the head, too}
109 \changes{4.0d}{2000/05/18}{But alternative spelling is deprecated.}
110 \changes{4.0e}{2000/09/20}{New option showkeys}
111 \changes{4.0e}{2000/11/14}{Bug fixes and minor new features: title block affiliations can have
112 \changes{4.0e}{2000/11/21}{adornments above and below.}
113 \changes{4.0f}{2001/02/13}{Last bug fixes before release.}
114 \changes{4.0rc1}{2001/06/17}{Running headers always as if two-sided}
115 \changes{4.0rc1}{2001/06/18}{grid changes with push and pop}
116 \changes{4.0rc1}{2001/06/18}{grid changes with push and pop}
117 \changes{4.0rc4}{2001/07/23}{hyperref is no longer loaded via class option: use a usepackage st
118 \changes{4.1a}{2008/01/18}{(AO, 457) Endnotes to be sorted in with numerical citations.}%
119 \changes{4.1a}{2008/01/18}{(AO, 451) ‘‘Cannot have more than 256 cites in a document’’}%
120 \changes{4.1a}{2008/01/18}{(AO, 457) Endnotes to be sorted in with numerical citations.}%
121 \changes{4.1a}{2008/01/18}{(AO, 460) ‘‘Proper style is "FIG. 1. ..." (no colon)’’}%
122 \changes{4.1a}{2008/01/18}{(AO, 478) \cs{ds@letterpaper}, so that ‘‘letterpaper really is the d
123 \changes{4.1a}{2008/01/18}{(AO, 488) Change processing of options to allow an unused option to
124 \changes{4.1a}{2008/01/19}{(AO, 461) Change the csname revtex uses from @dotsep to ltxu@dotsep.
125 \changes{4.1a}{2008/01/19}{For natbib versions before 8.21, \cs{NAT@sort} was consulted only as
126 \changes{4.1b}{2008/05/29}{The csname substy@ext is now defined without a dot (.), to be comp
127 \changes{4.1b}{2008/06/01}{(AO) Implement bibnotes through \cs{frontmatter@footnote@produce} in
128 \changes{4.1b}{2008/06/01}{Add option reprint, opposite of preprint, and preferred alternative
129 \changes{4.1b}{2008/06/29}{(AO, 455) Be nice to a list within the abstract (assign \cs{@totalle
130 \changes{4.1b}{2008/06/30}{(AO) Structure the Abstract using the \texttt{bibliography} environm
131 \changes{4.1b}{2008/07/01}{(AO) coordinate \cs{if@twoside} with \cs{twoside@sw}}
132 \changes{4.1b}{2008/07/01}{(AO) make settings at class time instead of deferring them to later.
133 \changes{4.1b}{2008/07/01}{(AO) No longer need to test \cs{chapter} as of \texttt{natbib} versi
134 \changes{4.1b}{2008/07/01}{(AO) No longer use \cs{secnumarabic@sw}, instead use \cs{setup@secnum
135 \changes{4.1b}{2008/07/01}{(AO) Provide more diagnostics when \cs{@society} is assigned.}
136 \changes{4.1b}{2008/07/01}{(AO) provide option longbibliography}
137 \changes{4.1b}{2008/07/01}{Add \cs{@changfrms@section}}
138 \changes{4.1b}{2008/07/01}{Break out \cs{@caption@fignum@sep}}
139 \changes{4.1b}{2008/07/01}{Class option galley sets \cs{preprintsty@sw} to false}
140 \changes{4.1b}{2008/07/01}{Code relating to new syntax for frontmatter has been placed in \file
141 \changes{4.1b}{2008/07/01}{Package textcase is now simply a required package}
142 \changes{4.1b}{2008/07/01}{Procedures \cs{@parse@classoptions@society} and \cs{@parse@class@op
143 \changes{4.1b}{2008/07/01}{Read in all required packages together}
144 \changes{4.1b}{2008/07/01}{Remove options newabstract and oldabstract}
145 \changes{4.1b}{2008/08/01}{Section numbering via procedures \cs{secnums@rtx} and \cs{secnums@ar
146 \changes{4.1b}{2008/08/04}{As with author formatting, rag the right more, and assign \cs{@total
147 \changes{4.1b}{2008/08/04}{Rag the right even more: .8\cs{hsize}. Also, assign \cs{@totalleftma
148 \changes{4.1b}{2008/08/04}{The \texttt{rmp} journal substy selects \texttt{groupedaddress} by
149 \changes{4.1b}{2008/08/04}{Use \cs{setup@hook} to initialize all.}
150 \changes{4.1c}{2008/08/15}{Document class option longbibliography via \cs{substy@post}}
151 \changes{4.1d}{2009/03/27}{Definition of \cs{@fnsymbol} follows fixltx2e.sty}
152 \changes{4.1e}{2008/06/29}{(AO, 455) be nice to a list within the abstract}
153 \changes{4.1f}{2009/07/07}{(AO, 513) Add class option linenumbers: number the lines a la \file
154 \changes{4.1f}{2009/07/07}{(AO, 516) Merged references are separated with a semicolon}
155 \changes{4.1f}{2009/07/10}{(AO, 520) Automatically produce \cs{bibliography} command when neede
156 \changes{4.1f}{2009/07/11}{(AO, 521) Lonely bibliography head}%

```

157 \changes{4.1f}{2009/07/11}{(A0, 522) Warn if software is expired}%
158 \changes{4.1f}{2009/07/15}{(A0, 523) Add class option nomerge, to turn off new natbib 8.3 synta
159 \changes{4.1f}{2009/07/20}{(A0, 524) Makes no sense if citations are superscript numbers and so
160 \changes{4.1f}{2009/10/05}{(A0, 530) \cs{@fnsymbol}: Failed to import fixltx2e.sty technology.
161 \changes{4.1g}{2009/10/07}{(A0, 525) Remove phantom paragraph above display math that is given
162 \changes{4.1g}{2009/10/07}{(A0, 538) \cs{MakeTextUppercase} inappropriately expands the double
163 \changes{4.1h}{2009/10/09}{(A0) Remove expiry code in the release software}%
164
165 \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.

```

166 \begin{document}%
167 \expandafter\DocInput\expandafter{\jobname.dtx}%
168 \PrintChanges
169 \end{document}

```

And that is the end of the driver for the programmer’s documentation.

```
170 %</doc>
```

4 Overview

`REVTEX` is a `LATEX 2ε` document class, somewhat like a hybrid of the standard `LATEX 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_EX 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 `REVTEX`, among them `multicol` and `cite`. If such a package is found to be loaded, `REVTEX` 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 REVTeX, thereby establishing precedence for assignments to L^AT_EX's (and REVTeX'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`, `amsfonts`, `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 L^AT_EX 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 `\begindocument` 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.

```
171 %<*kernel>
    Print a banner in the log:
172 \GenericInfo{}\space
173 Copyright (c) 2009 The American Physical Society.^J
174 mailto:revtex@aps.org^J
175 Licensed under the LPPL:^^Jhttp://www.ctan.org/tex-archive/macros/latex/base/lppl.txt^^J
176 Arthur Ogawa <arthur_ogawa at sbcglobal dot net>^^J
177 Based on work by David Carlisle <david at dcarlisle.demon.co.uk>%
178 \@gobble
179 }%
```

6.1 Compatibility Processing

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

```
180 \if@compatibility
181   \edef\reserved@a{\errhelp%
182     Change your \string\documentstyle\space statement to
183     \string\documentclass\space and rerun.
184   }\reserved@a
185   \errmessage{You cannot run \class@name\space in compatibility mode}%
186   \expandafter\@end
187 \fi
```

7 Extensions to the L^AT_EX Kernel

```
188 %</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.

```
189 %<*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.

```
190 \let\setup@hook\@empty
```

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

```

191 \appdef\document@inithook{%
192 \switch@longtable
193 \let\LT@makecaption\LT@makecaption@rtx
194 }%

```

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

```

195 \def\LT@makecaption@rtx#1#2#3{%
196 \LT@mcol\LT@cols c{%
197 \hbox to\z@{%
198 \hss
199 \parbox[t]\LT@capwidth{%
200 \sbox\@tempboxa{#1#2: }#3\unskip\nobreak\vrule\@width\z@\@height\z@\@depth .5\baselineskip
201 \ifdim\wd\@tempboxa>\hsize
202 #1#2: }#3\unskip\nobreak\vrule\@width\z@\@height\z@\@depth .5\baselineskip
203 \else
204 \hbox to\hsize{\hfil\box\@tempboxa\hfil}%
205 \fi
206 \endgraf
207 }%
208 \hss
209 }%
210 }%
211 }%

```

`\robust@boldmath` Robustify the `\boldmath` command. If Team L^AT_EX (or any package) ever gets around to fixing this problem, we will bow out. (This fix relates to bug #394.)

```

212 \def\protectdef@boldmath{%
213 \expandafter@ifnotrelax\csname boldmath \endcsname}{-}{%
214 \class@info{Robustifying \string\LaTeX's \string\boldmath\space command}%
215 \expandafter\let\csname boldmath \endcsname\boldmath
216 \expandafter\def\expandafter\boldmath\expandafter{\expandafter\protect\csname boldmath \endcsname
217 }%
218 }%
219 \appdef\document@inithook{%
220 \protectdef@boldmath
221 }%

```

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`,

REVTeX'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.)

```

222 \DeclareOption{checkin}{%
223   \@booleantrue\dateinRH@sw
224   \@booleantrue\preprintsty@sw
225   \def\@pointsize{12}%
226   \@booleantrue\showPACS@sw
227   \@booleantrue\showKEYS@sw
228   \def\fp@proc@h{\allow@breaking@tables}%
229   \def\fp@proc@H{\allow@breaking@tables}%
230 }%
231 \@booleanfalse\dateinRH@sw
232 \def\checkindate{\dateinRH@sw{\tiny(\today)}}{}}%
233 \def\allow@breaking@tables{%
234   \def\array@default{v}% tabular can break over pages
235   \@booleanfalse\floats@sw % table can break over pages
236 }%
```

9.2.2 Preprint Style

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

```
237 \DeclareOption{preprint}{%
238   \@booleantrue\preprintsty@sw
239   \ExecuteOptions{12pt}%
240 }%
241 \DeclareOption{reprint}{%
242   \@booleanfalse\preprintsty@sw
243   \@booleantrue\twocolumn@sw
244   \ExecuteOptions{10pt}%
245 }%
246 \DeclareOption{manuscript}{%
247   \class@warn{Document class option manuscript is obsolete; use preprint instead}%
248   \ExecuteOptions{preprint}%
249 }%
250 \@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

```
251 \DeclareOption{showpacs}{%
252   \@booleantrue\showPACS@sw
253 }%
254 \DeclareOption{noshowpacs}{%
255   \@booleanfalse\showPACS@sw
256 }%
257 \DeclareOption{showkeys}{%
258   \@booleantrue\showKEYS@sw
259 }%
260 \DeclareOption{noshowkeys}{%
261   \@booleanfalse\showKEYS@sw
262 }%
263 \@booleanfalse\showPACS@sw
264 \@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.

```
265 \DeclareOption{balancelastpage}{%
266   \@booleantrue\balancelastpage@sw
267 }%
268 \DeclareOption{nobalancelastpage}{%
269   \@booleanfalse\balancelastpage@sw
```



```

270 }%
271 \@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`.

```

272 \DeclareOption{nopreprintnumbers}{\@booleanfalse\preprint@sw}%
273 \DeclareOption{preprintnumbers}{\@booleantrue\preprint@sw}%
274 \let\preprint@sw\preprintsty@sw

```

9.2.6 Hypertext Option

```

275 \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.

```

276 \class@warn{Class option "hyperref" is no longer supported.^^JEmploy \string\usepackage{hyperr
277 }%

```

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.

```

278 \DeclareOption{10pt}{\def\@pointsize{10}}%
279 \DeclareOption{11pt}{\def\@pointsize{11}}%

```

```

280 \DeclareOption{12pt}{\def\@pointsize{12}}%
281 \let\@pointsize\@undefined

```

9.2.8 Media Size

```

\paperheight
\paperwidth 282 \DeclareOption{a4paper}{%
283     \setlength\paperheight {297mm}%
284     \setlength\paperwidth  {210mm}%
285 }%
286 \DeclareOption{a5paper}{%
287     \setlength\paperheight {210mm}%
288     \setlength\paperwidth  {148mm}%
289 }%
290 \DeclareOption{b5paper}{%
291     \setlength\paperheight {250mm}%
292     \setlength\paperwidth  {176mm}%
293 }%
294 \DeclareOption{letterpaper}{%
295     \setlength\paperheight {11in}%
296     \setlength\paperwidth  {8.5in}%
297 }%
298 \DeclareOption{legalpaper}{%
299     \setlength\paperheight {14in}%
300     \setlength\paperwidth  {8.5in}%
301 }%
302 \DeclareOption{executivepaper}{%
303     \setlength\paperheight {10.5in}%
304     \setlength\paperwidth  {7.25in}%
305 }%
306 \DeclareOption{landscape}{%
307     \setlength\@tempdima  {\paperheight}%
308     \setlength\paperheight {\paperwidth}%
309     \setlength\paperwidth  {\@tempdima}%
310 }%
    Effectively select letterpaper.
311 \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.

```

312 \DeclareOption{bibnotes}{\let\frontmatter@footnote@produce\frontmatter@footnote@produce@endnote
313 \DeclareOption{nobibnotes}{\let\frontmatter@footnote@produce\frontmatter@footnote@produce@footn
314 \let\frontmatter@footnote@produce\frontmatter@footnote@produce@footnote

```

```
315 \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.

```
316 \DeclareOption{footinbib}{\@booleantrue\footinbib@sw}
```

```
317 \DeclareOption{nofootinbib}{\@booleanfalse\footinbib@sw}
```

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

```
318 \@booleanfalse\footinbib@sw
```

9.2.11 altaffilletter

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

```
319 \DeclareOption{altaffilletter}{\@booleantrue\altaffilletter@sw}%
```

```
320 \DeclareOption{altaffilsymbol}{\@booleanfalse\altaffilletter@sw}%
```

```
321 \@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.

```
322 \DeclareOption{superbib}{%
```

```
323 \let\place@bibnumber\place@bibnumber@sup
```

```
324 }%
```

```
325 \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`.

```
326 \def\place@bibnumber@sup#1{\textsuperscript{#1}}%
```

```
327 \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.

```

328 \DeclareOption{citeautoscript}{\@booleantrue\citeautoscript@sw}%
329 \@booleanfalse\citeautoscript@sw

```

9.2.14 Variants on the Bibliography Style

REVT_{EX} anticipates that a society or journal will provide two related Bib_{TEX}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`.

Here is a suggested convention for societies and journals that provide two alternative Bib_{TEX} styles: if one is named, say, `apsrev.bst`, then name the alternative `apsrevlong.bst`. Then invoke the code:

```

%\appdef\setup@hook{%
% \longbibliography@sw{%
% \appdef\bibstyle{long}%
% }{}%
%}%
%
```

```

330 \DeclareOption{longbibliography}{\@booleantrue\longbibliography@sw}%
331 \DeclareOption{nolongbibliography}{\@booleanfalse\longbibliography@sw}%
332 \@booleanfalse\longbibliography@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.

```

333 \@booleanfalse\twoside@sw
334 \appdef\document@inithook{%
335 \twoside@sw{\@twosidetrue}{\@twosidefalse}%
336 }%
```

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).

```

337 \DeclareOption{twoside}{\@booleantrue \twoside@sw\@mparswitchfalse}%
338 \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 `\AtBeginDocument` 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.

We install into `\class@enddocumenthook` all tasks that we know must be completed at `\AtEndDocument` time. The first thing it does is end the current paragraph. The last is to return us to one-column page grid. (This procedure is executed after all typesetting is complete i.e., after items like `\printtables`.)

```
339 \def\clear@document{%
340 \close@column
341 }%
```

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

```
342 \DeclareOption{onecolumn}{\@booleanfalse\twocolumn@sw}%
343 \DeclareOption{twocolumn}{\@booleantrue \twocolumn@sw}%
344 \@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`.

```
345 \def\select@column@grid{%
346 \twocolumn@sw{%
347 \open@twocolumn
348 }{%
349 % \open@onecolumn
350 }%
351 }%
352 \appdef\class@documenthook{%
353 \select@column@grid
354 }%
```

`\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.

```
355 \DeclareOption{author-year}{\@booleantrue\authoryear@sw}%
356 \DeclareOption{numerical}{\@booleanfalse\authoryear@sw}%
357 \@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`.

```
358 \DeclareOption{galley}{%
359   \ExecuteOptions{onecolumn}%
360   \@booleantrue\galley@sw
361   \@booleanfalse\preprintsty@sw
362   \appdef\setup@hook{%
363     \advance\textwidth-\columnsep
364     \textwidth.5\textwidth
365   }%
366 }%
367 \@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.

```
368 \DeclareOption{raggedbottom}{\@booleantrue\raggedcolumn@sw}
369 \DeclareOption{flushbottom}{\@booleanfalse\raggedcolumn@sw}
370 \@booleanfalse\raggedcolumn@sw
371 \appdef\setup@hook{%
372   \raggedcolumn@sw{\raggedbottom}{\flushbottom}%
373 }%
```

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.

```
374 \DeclareOption{tightenlines}{\@booleantrue\tightenlines@sw}
375 \@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.

```
376 \@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.

```
377 \DeclareOption{lengthcheck}{%
378 \@booleantrue\lengthcheck@sw
379 \ExecuteOptions{reprint}%
380 }%
```

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

```
381 \appdef\setup@hook{%
382 \lengthcheck@sw{\@booleantrue\tally@box@size@sw}{}%
383 }%
```

9.2.20 Draft and Final

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

```
384 \appdef\setup@hook{%
385 \draft@sw{\overfullrule 5\p@}{\overfullrule\z@}%
386 }%
```

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

```
387 \DeclareOption{draft}{\@booleantrue\draft@sw}%
388 \DeclareOption{final}{\@booleanfalse\draft@sw}%
389 \@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)”.

```
390 \appdef\setup@hook{%
391 \eqsecnum@sw{%
392 \@addtoreset{equation}{section}%
393 \def\theequation@prefix{\arabic{section}.}%
394 }{ }%
395 }%
```

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

```
396 \DeclareOption{eqsecnum}{\@booleantrue\eqsecnum@sw}%
397 \@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.

```
398 \appdef\setup@hook{%
399 \setup@secnums
400 }%
401 \DeclareOption{secnumarabic}{%
402 \def\setup@secnums{\secnums@arabic}%
403 }%
404 \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`.

```
405 \DeclareOption{fleqn}{%
406 \input{fleqn.clo}%
407 }%
```

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.

```
408 \DeclareOption{floats}{\@booleantrue\floats@sw\@booleanfalse\floatp@sw}
409 \DeclareOption{endfloats}{\@booleanfalse\floats@sw\@booleanfalse\floatp@sw}
410 \DeclareOption{endfloats*}{\@booleanfalse\floats@sw\@booleantrue\floatp@sw}
411 \@booleantrue\floats@sw
412 \@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.

```
413 \DeclareOption{titlepage}{\@booleantrue\titlepage@sw}
```



```

414 \DeclareOption{notitlepage}{\@booleanfalse\titlepage@sw}
415 \@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
`\change@journal` is being overridden.

```

416 \def\change@society#1{%
417   \def\@tempa{#1}%
418   \@ifxundefined\@society{%
419     \class@info{Selecting society \@tempa}%
420     \let\@society\@tempa
421   }{%
422     \ifx{\@tempa\@society}{ }{%
423       \class@warn{Conflicting society \@tempa<>\@society; not selected}%
424     }%
425   }%
426 }%
427 \def\change@journal#1{%
428   \def\@tempa{#1}%
429   \@ifxundefined\@journal{%
430     \class@info{Selecting journal \@tempa}%
431     \let\@journal\@tempa
432   }{%
433     \ifx{\@tempa\@journal}{ }{%
434       \class@warn{Conflicting journal \@tempa<>\@journal; not selected}%
435     }%
436   }%
437 }%

```

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.

```

438 \DeclareOption{osa}{\change@society{osa}\let\@journal\@undefined}%
439 \DeclareOption{osameet}{\change@society{osa}\def\@journal{osameet}}%
440 \DeclareOption{opex}{\change@society{osa}\def\@journal{opex}}%
441 \DeclareOption{tops}{\change@society{osa}\def\@journal{tops}}%
442 \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.

```

443 \let\rtx@require@packages\@empty

```

`\MakeUppercase` We load the `textcase` package of David Carlisle. Now that its bug of long standing
`\MakeLowercase` 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.

```
444 \appdef\rtx@require@packages{%
445 \RequirePackage[overload]{textcase}%
446 }%
```

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.

```
447 \DeclareOption{amsfonts}{%
448 \def\class@amsfonts{\RequirePackage{amsfonts}}%
449 }%
450 \DeclareOption{noamsfonts}{%
451 \let\class@amsfonts\@empty
452 }%
453 \appdef\rtx@require@packages{%
454 \@ifxundefined\class@amsfonts{\class@amsfonts}%
455 }%
```

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

```
456 \DeclareOption{amssymb}{%
457 \def\class@amssymb{\RequirePackage{amssymb}}%
458 }%
459 \DeclareOption{noamssymb}{%
460 \let\class@amssymb\@empty
461 }%
462 \appdef\rtx@require@packages{%
463 \@ifxundefined\class@amssymb{\class@amssymb}%
464 }%
```

`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

L^AT_EX note: Certain L^AT_EX 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.

```

465 \DeclareOption{amsmath}{%
466   \def\class@amsmath{\RequirePackage{amsmath}[\ver@amsmath@prefer]}%
467 }%
468 \DeclareOption{noamsmath}{%
469   \let\class@amsmath\@empty
470 }%
471 \appdef\rtx@require@packages{%
472   \preserve@LaTeX
473   \@ifundefined\class@amsmath{\class@amsmath}%
474   \appdef\class@enddocumenthook{\test@amsmath@ver}%
475 }%
476 \appdef\preserve@LaTeX{%
477   \let\@ifl@aded@LaTeX\@ifl@aded
478   \let\@ifpackage@loaded@LaTeX\@ifpackage@loaded
479   \let\@pkg@extension@LaTeX\@pkg@extension
480   \let\@ifpackage@later@LaTeX\@ifpackage@later
481   \let\@ifl@ter@LaTeX\@ifl@ter
482   \let\@ifl@t@r@LaTeX\@ifl@t@r
483   \let\@parse@version@LaTeX\@parse@version
484 }%
485 \appdef\restore@LaTeX{%
486   \let\@ifl@aded\@ifl@aded@LaTeX
487   \let\@ifpackage@loaded\@ifpackage@loaded@LaTeX
488   \let\@pkg@extension\@pkg@extension@LaTeX
489   \let\@ifpackage@later\@ifpackage@later@LaTeX
490   \let\@ifl@ter\@ifl@ter@LaTeX
491   \let\@ifl@t@r\@ifl@t@r@LaTeX
492   \let\@parse@version\@parse@version@LaTeX
493 }%
494 \def\test@amsmath@ver{%
495   \begingroup
496   \restore@LaTeX
497   \@ifpackage@loaded{amsmath}{%
498     \@ifpackage@later{amsmath}{\ver@amsmath@prefer}{}%
499     \class@warn{%
500       You have loaded amsmath, version "\csname ver@amsmath.sty\endcsname",\MessageBreak
501       but this class requires version "\ver@amsmath@prefer", or later.\MessageBreak
502       Please update your LaTeX installation.
503     }%
504   }%
505 }{%
506 }%
507 \endgroup

```

```
508 }%
509 \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.

```
510 \DeclareOption{byrevtex}{\@booleantrue\byrevtex@sw}%
511 \@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.

```
512 \DeclareOption{floatfix}{\@booleantrue\force@deferlist@sw}%
513 \DeclareOption{nofloatfix}{\@booleanfalse\force@deferlist@sw}%
514 \@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`.

```
515 \gdef\@fltovf{%
516 \latex@error{%
517 Too many unprocessed floats%
518 \force@deferlist@sw}{; try class option [floatfix]}%
519 }\@ehb
520 }%
521 \def\@fltstk{%
522 \latex@warning{%
523 A float is stuck (cannot be placed)%
524 \force@deferlist@sw}{; try class option [floatfix]}%
525 }%
526 }%
```

`\ltxgrid@info@sw` `\outputdebug@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.

```
527 \DeclareOption{ltxgridinfo}{\@booleantrue\ltxgrid@info@sw}%
528 \DeclareOption{outputdebug}{\@booleantrue\outputdebug@sw}%
```

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.

```
529 \DeclareOption{raggedfooter}{\@booleanfalse\textheight@sw}%
530 \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`.

```
531 \DeclareOption{frontmatterverbose}{\@booleantrue\frontmatterverbose@sw}%
532 \@booleanfalse\frontmatterverbose@sw
```

`\linenumbers@sw` An option to number the lines of type in the output in the manner of `revtex4-1.dtxlineno.sty`.

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).

```
533 \DeclareOption{linenumbers}{%
534 \appdef\rtx@require@packages{%
535 \RequirePackage{lineno}[2005/11/02 v4.41]%
536 \linenumbersep4pt\relax
537 \linenumbers\relax
538 }%
539 }%
```

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@mergeis \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`.

```
540 \DeclareOption{nomerge}{%
541 \appdef\setup@hook{%
542 \@ifnum{\NAT@merge>\z@}{\let\NAT@merge\z@}{}%
543 }%
544 }%
```

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.

```

545 \def\@parse@class@options@society{%
546 \edef\@tempa{\@optionlist{\@currname.\@current}}%
547 \expandafter\@for\expandafter\CurrentOption\expandafter:\expandafter=\@tempa\do{%
548 \expandafter\@ifnotrelax\csname ds@\CurrentOption\endcsname}{}%
549 \IfFileExists{\CurrentOption\substyle@post.\substyle@ext}{%
550 \expandafter\change@society\expandafter{\CurrentOption}%
551 \expandafter\let\csname ds@\CurrentOption\endcsname\@empty
552 }{}%
553 }%
554 }%
555 }%
556 \def\@parse@class@options@#1{%
557 \edef\@tempa{\@optionlist{\@currname.\@current}}%
558 \expandafter\@for\expandafter\CurrentOption\expandafter:\expandafter=\@tempa\do{%
559 \expandafter\@ifnotrelax\csname ds@\CurrentOption\endcsname{%
560 \begingroup\csname ds@\CurrentOption\endcsname
561 \@ifundefined#1{%
562 \endgroup
563 }{}%
564 \expandafter\endgroup\expandafter\def\expandafter#1\expandafter{#1}%
565 }%
566 }{}%
567 }%
568 }%
569 \def\@parse@class@options@journal{%
570 \edef\@tempa{\@optionlist{\@currname.\@current}}%
571 \expandafter\@for\expandafter\CurrentOption\expandafter:\expandafter=\@tempa\do{%
572 \expandafter\@ifnotrelax\csname ds@\CurrentOption\endcsname{%
573 \begingroup
574 \csname ds@\CurrentOption\endcsname
575 \@ifundefined\@journal{%
576 \endgroup
577 }{}%
578 \expandafter\endgroup\expandafter\def\expandafter\@journal\expandafter{\@journal}%
579 }%
580 }{}%

```

```

581 }%
582 }%
583 \def\@parse@class@options{%
584 \edef\@tempa{\@optionlist{\@currname.\@current}}}%
585 \expandafter\@for\expandafter\CurrentOption\expandafter:\expandafter=\@tempa\do{%
586 \expandafter\@ifnotrelax\csname ds@\CurrentOption\endcsname{%
587 \begingroup
588 \csname ds@\CurrentOption\endcsname
589 \@ifxundefined\@pointsize{%
590 \endgroup
591 }{%
592 \expandafter\endgroup\expandafter\def\expandafter\@pointsize\expandafter{\@pointsize}%
593 }%
594 }{%
595 \IfFileExists{\CurrentOption\substyle@post.\substyle@ext}{%
596 \expandafter\change@society\expandafter{\CurrentOption}%
597 \expandafter\let\csname ds@\CurrentOption\endcsname\@empty
598 }{}%
599 }%
600 }%
601 }%

```

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_EX2.09 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`.

```

602 %</options>
603 %<*package>

```

```

\@process@society
\@process@journal 604 \def\substyle@post{4-1}%
\@process@pointsize 605 \def\substyle@ext{rtx}%
606 \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.

```

607 \def\@process@society#1{%
608 \@ifxundefined\@society{%
609 \class@warn{No Society specified, using default society #1}%

```

```

610 \def\@society{#1}\let\@journal\@undefined
611 }{}%
612 \expandafter\input\expandafter{\@society\substyle@post.\substyle@ext}%
613 }%

```

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

```

614 \def\@process@journal#1{%
615 \@ifundefined\@journal{%
616 \class@warn{No journal specified, using default #1}%
617 \def\@journal{#1}%
618 }{}%
619 \expandafter\expandafter
620 \expandafter\rtx@do@substyle
621 \expandafter\expandafter
622 \expandafter{\expandafter\@society\@journal}%
623 }%
624 \def\rtx@do@substyle#1{%
625 \InputIfFileExists{#1\substyle@post.\substyle@ext}{\csname rtx@#1\endcsname}%
626 }%

```

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.

```

627 \def\@process@pointsize#1{%
628 \@ifundefined\@pointsize{%
629 \def\@pointsize{#1}%
630 \class@warn{No type size specified, using default \@pointsize}%
631 }{}%
632 \expandafter\expandafter
633 \expandafter\rtx@do@substyle
634 \expandafter\expandafter
635 \expandafter{\expandafter\@society\@pointsize pt}%
636 }%

```

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 637 \def\ps@headings{%

```



```

638     \let\@oddfoot\@empty\let\@evenfoot\@empty
639     \def\@evenhead{\thepage\hfil\slshape\leftmark}%
640     \def\@oddhead{\slshape\rightmark}\hfil\thepage}%
641     \let\@mkboth\markboth
642     \def\sectionmark##1{%
643         \markboth {\MakeUppercase{%
644             \ifnum \c@secnumdepth >\z@
645                 \thesection\quad
646                 \fi
647             ##1}}{}}%
648     \def\subsectionmark##1{%
649         \markright {%
650             \ifnum \c@secnumdepth >\@ne
651                 \thesubsection\quad
652                 \fi
653             ##1}}}%
654 \def\ps@myheadings{%
655     \let\@oddfoot\@empty\let\@evenfoot\@empty
656     \def\@evenhead{\thepage\hfil\slshape\leftmark}%
657     \def\@oddhead{\slshape\rightmark}\hfil\thepage}%
658     \let\@mkboth\@gobbletwo
659     \let\sectionmark\@gobble
660     \let\subsectionmark\@gobble
661     }%

\ps@article
\ps@article@final 662 \def\ps@article{%
\ps@preprint 663     \def\@evenhead{\let\\\heading@cr\thepage\quad\checkindate\hfil{\leftmark}}}%
664     \def\@oddhead{\let\\\heading@cr{\rightmark}\hfil\checkindate\quad\thepage}%
665     \def\@oddfoot{}%
666     \def\@evenfoot{}%
667     \let\@mkboth\markboth
668     \let\sectionmark\@gobble
669     \let\subsectionmark\@gobble
670 }%
671 \def\ps@article@final{%
672     \def\@evenhead{\let\\\heading@cr\thepage\quad\checkindate\hfil{\leftmark}}}%
673     \def\@oddhead{\let\\\heading@cr{\rightmark}\hfil\checkindate\quad\thepage}%
674     \def\@oddfoot{}%
675     \def\@evenfoot{}%
676     \let\@mkboth\markboth
677     \def\sectionmark##1{%
678         \markboth{%
679             \MakeTextUppercase{%
680                 \@ifnum{\c@secnumdepth >\z@}{\thesection\hskip 1em\relax}}{}}%
681         ##1%
682     }%
683     }{}%
684 }%
685     \def\subsectionmark##1{%

```

```

686     \markright {%
687         \@ifnum{\c@secnumdepth >\@ne}{\thesubsection\hskip 1em\relax}{}%
688         ##1%
689     }%
690 }%
691 }%

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

693 \def\ps@preprint{%
694     \def\@oddfoot{\hfil\thepage\quad\checkindate\hfil}%
695     \def\@evenfoot{\hfil\thepage\quad\checkindate\hfil}%
696     \def\@oddhead{}%
697     \def\@evenhead{}%
698     \let\@mkboth\@gobbletwo
699     \let\sectionmark\@gobble
700     \let\subsectionmark\@gobble
701 }%

702 \let\@oddhead\@empty
703 \let\@evenhead\@empty
704 \let\@oddfoot\@empty
705 \let\@evenfoot\@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.

```

706 \def\lastpage@putlabel{%
707     \if@filesw
708     \begingroup
709         \advance\c@page\m@ne
710         \immediate\write\@auxout{\string\newlabel{LastPage}{\thepage}}%
711     \endgroup
712     \fi
713 }%

```

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 invoke `\clearpage`: this means that no more typesetting should be done past this point.

```

714 \appdef\clear@document{%
715     \clearpage
716     \lastpage@putlabel
717     \tally@box@size@sw{\total@text}{}%
718 }%
719 \providecommand\write@column@totals{}%

```

11 Required Packages

[CTAN:macros/latex/contrib/other/misc/url.sty](https://ctan.org/ctan/packages/macros/latex/contrib/other/misc/url.sty)

```

720 \appdef\rtx@require@packages{%
721 \RequirePackage{url}%
722 }%

```

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`.

```

723 \appdef\document@inithook{%
724 \incompatible@package{cite}%
725 \incompatible@package{mcite}%
726 \incompatible@package{multicol}%
727 }%

```

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`

```

728 \def\labelenumi{\theenumi.}
729 \def\theenumi{\arabic{enumi}}

730 \def\labelenumii{\theenumii}
731 \def\theenumii{\alph{enumii}}
732 \def\p@enumii{\theenumi}

733 \def\labelenumiii{\theenumiii.}
734 \def\theenumiii{\roman{enumiii}}
735 \def\p@enumiii{\theenumi(\theenumii)}

736 \def\labelenumiv{\theenumiv.}
737 \def\theenumiv{\Alph{enumiv}}
```

```

738 \def\p@enumiv{\p@enumiii\theenumiii}
739 \def\labelitemi{\textbullet}
740 \def\labelitemii{\normalfont\bfseries\textendash}
741 \def\labelitemiii{\textasteriskcentered}
742 \def\labelitemiv{\textperiodcentered}
743 \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.

```

744 \setcounter{topnumber}{2}
745 \def\topfraction{.9}
746 \setcounter{bottomnumber}{1}
747 \def\bottomfraction{.9}
748 \setcounter{totalnumber}{3}
749 \def\textfraction{.1}
750 \def\floatpagefraction{.9}
751 \setcounter{dbltopnumber}{2}
752 \def\dbltopfraction{.9}
753 \def\dblfloatpagefraction{.9}

```

14.3 List Environments

```

754 \newenvironment{verse}{%
755   \let\=\@centercr
756   \list{}{%
757     \itemsep\z@ \itemindent -1.5em\listparindent \itemindent
758     \rightmargin\leftmargin\advance\leftmargin 1.5em}\item[]%
759 }{%
760 \endlist
761 }%

762 \newenvironment{quotation}{%
763   \list{}{%
764     \listparindent 1.5em
765     \itemindent\listparindent
766     \rightmargin\leftmargin \parsep \z@ \@plus\p@\item[]%
767 }{%
768 \endlist
769 }%

770 \newenvironment{quote}{%
771   \list{}{%
772     \rightmargin\leftmargin}\item[]%
773 }{%
774 \endlist

```

```

775 }%
776 \def\descriptionlabel#1{%
777   \hspace\labelsep \normalfont\bfseries #1\unskip:%
778 }%
779 \newenvironment{description}{%
780   \list{}{%
781     \labelwidth\z@ \itemindent-\leftmargin
782     \let\makelabel\descriptionlabel
783   }%
784 }{%
785   \endlist
786 }%

```

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.

```

787 \newcounter{part}%
788 \let\thepart\@undefined
789 \newcounter{section}%
790 \let\thesection\@undefined
791 \newcounter{subsection}[section]%
792 \let\thesubsection\@undefined
793 \newcounter{subsubsection}[subsection]%
794 \let\thesubsubsubsection\@undefined
795 \newcounter{paragraph}[subsubsection]%
796 \let\theparagraph\@undefined
797 \newcounter{subparagraph}[paragraph]%
798 \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`

```

799 \def\secnums@rtx{%
800   \@ifundefined\thepart{%
801     \def\thepart{\Roman{part}}}%
802   }{%
803   \@ifundefined\thesection{%
804     \def\thesection    {\Roman{section}}}%
805     \def\p@section    {}%
806   }{%
807   \@ifundefined\thesubsection{%
808     \def\thesubsection  {\Alph{subsection}}}%
809     \def\p@subsection  {\thesection\,%
810   }{%
811   \@ifundefined\thesubsubsubsection{%

```

```

812 \def\thesubsubsection {\arabic{subsubsection}}%
813 \def\p@subsubsection {\thesection\,\thesubsection\,%
814 }{}%
815 \@ifundefined\theparagraph{%
816 \def\theparagraph {\alph{paragraph}}%
817 \def\p@paragraph {\thesection\,\thesubsection\,\thesubsubsection\,%
818 }{}%
819 \@ifundefined\thesubparagraph{%
820 \def\thesubparagraph {\arabic{subparagraph}}%
821 \def\p@subparagraph {\thesection\,\thesubsection\,\thesubsubsection\,\theparagraph\,%
822 }{}%
823 }%
824 \def\secnums@arabic{%
825 \@ifundefined\thepart{%
826 \def\thepart {\Roman{part}}%
827 }{}%
828 \@ifundefined\thesection{%
829 \def\thesection {\Roman{section}}%
830 \def\p@section {}%
831 }{}%
832 \@ifundefined\thesubsection{%
833 \def\thesubsection {\thesection.\arabic{subsection}}%
834 \def\p@subsection {}%
835 }{}%
836 \@ifundefined\thesubsubsection{%
837 \def\thesubsubsection {\thesubsection.\arabic{subsubsection}}%
838 \def\p@subsubsection {}%
839 }{}%
840 \@ifundefined\theparagraph{%
841 \def\theparagraph {\thesubsubsection.\arabic{paragraph}}%
842 \def\p@paragraph {}%
843 }{}%
844 \@ifundefined\thesubparagraph{%
845 \def\thesubparagraph {\theparagraph.\arabic{subparagraph}}%
846 \def\p@subparagraph {}%
847 }{}%
848 }%

```

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`.

```

849 \newenvironment{acknowledgments}{%
850 \acknowledgments@sw%
851 \expandafter\section\expandafter*\expandafter{\acknowledgmentsname}%
852 }{}%

```

```

853 \par
854 \phantomsection
855 \addcontentsline{toc}{section}{\protect\numberline{}\acknowledgmentsname}%
856 }%
857 }{%
858 \par
859 }%
860 \@booleantrue\acknowledgments@sw
861 \newenvironment{acknowledgements}{%
862 \replace@environment{acknowledgements}{acknowledgments}%
863 }{%
864 \endacknowledgments
865 }%

```

14.4.3 Part Opener

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

```

866 \def\part{\par
867 \addvspace{4ex}%
868 \@afterindentfalse
869 \secdef\@part\@spart}%
870 \def\@part[#1]#2{%
871 \@ifnum{\c@secnumdepth >\m@ne}{%
872 \refstepcounter{part}%
873 \addcontentsline{toc}{part}{\thepart\hspace{1em}#1}%
874 }{%
875 \addcontentsline{toc}{part}{#1}%
876 }%
877 \begingroup
878 \parindent \z@ \raggedright
879 \interlinepenalty\@M
880 \@ifnum{\c@secnumdepth >\m@ne}{%
881 \Large \bf \partname~\thepart%
882 \par\nobreak
883 }{}%
884 \huge \bf
885 #2%
886 \markboth{}{}\par
887 \endgroup
888 \nobreak
889 \vskip 3ex
890 \@afterheading
891 }%
892 \def\@spart#1{{\parindent \z@ \raggedright
893 \interlinepenalty\@M
894 \huge \bf
895 #1\par}
896 \nobreak

```



```

897 \vskip 3ex
898 \@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`.

```

899 \def\section{%
900   \@startsection
901   {section}%
902   {1}%
903   {\z@}%
904   {0.8cm \@plus1ex \@minus .2ex}%
905   {0.5cm}%
906   {\normalfont\small\bfseries}%
907 }%

908 \def\subsection{%
909   \@startsection
910   {subsection}%
911   {2}%
912   {\z@}%
913   {.8cm \@plus1ex \@minus .2ex}%
914   {.5cm}%
915   {\normalfont\small\bfseries}%
916 }%

917 \def\subsubsection{%
918   \@startsection
919   {subsubsection}%
920   {3}%
921   {\z@}%
922   {.8cm \@plus1ex \@minus .2ex}%
923   {.5cm}%
924   {\normalfont\small\itshape}%
925 }%

```

14.4.5 Runin Heads

```

926 \def\paragraph{%
927   \@startsection
928   {paragraph}%
929   {4}%
930   {\parindent}%
931   {\z@}%
932   {-1em}%
933   {\normalfont\normalsize\itshape}%
934 }%

```

```

935 \def\subparagraph{%
936   \@startsection
937     {subparagraph}%
938     {5}%
939     {\parindent}%
940     {3.25ex \@plus1ex \@minus .2ex}%
941     {-1em}%
942     {\normalfont\normalsize\bfseries}%
943 }%

```

14.5 Math

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

```

944 \def\theequation{%
945   \theequation@prefix\arabic{equation}%
946 }%
947 \def\theequation@prefix{}%

```

14.6 Type Size-Dependent Settings

14.7 All Point Sizes

```

948 \setcounter{secnumdepth}{4}

949 \lineskip 1pt
950 \normallineskip 1pt
951 \def\baselinestretch{1}%

952 \@lowpenalty 51
953 \@medpenalty 151
954 \@highpenalty 301

955 \@beginparpenalty -\@lowpenalty
956 \@endparpenalty -\@lowpenalty
957 \@itempenalty -\@lowpenalty

958 \arraycolsep 3pt
959 \tabcolsep 2pt
960 \arrayrulewidth .4pt
961 \doublerulesep 2pt

962 \skip\@mpfootins = 0pt

963 \fboxsep = 3.0pt
964 \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`.

```

965 \newenvironment{figure}
966     {\@float{figure}}
967     {\end@float}

```

```

968 \newenvironment{figure*}
969         {\@dblfloat{figure}}
970         {\enddblfloat}

971 \def\listoffigures{\print@toc{lof}}%
972 \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.
973 \newlength\abovecaptionskip
974 \newlength\belowcaptionskip
975 \setlength\abovecaptionskip{10\p@}
976 \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).

977 \long\def\@makecaption#1#2{%
978   \par
979   % \nobreak
980   \vskip\abovecaptionskip
981   \begingroup
982   \small\rmfamily
983   \sbox\@tempboxa{%
984     \let\\heading@cr
985     \@make@capt@title{#1}{#2}%
986   }%
987   \@ifdim{\wd\@tempboxa >\hsize}{%
988     \begingroup
989     \samepage
990     \flushing
991     \let\footnote\@footnotemark@gobble
992     \@make@capt@title{#1}{#2}\par
993   \endgroup
994   }{%
995     \global \@minipagefalse
996     \hb@xt@\hsize{\hfil\unhbox\@tempboxa\hfil}%
997   }%
998   \endgroup
999   \vskip\belowcaptionskip
1000 }%
1001 \def\@make@capt@title#1#2{%
1002   \@ifx@empty\float@link{\@firstofone}{\expandafter\href\expandafter{\float@link}}%
1003   {#1}\@caption@fignum@sep#2%
1004 }%
1005 \def\@footnotemark@gobble{%
1006   \@footnotemark
1007   \@ifnextchar[{\@gobble@opt@i}{\@gobble}%
1008 }%
1009 \def\@gobble@opt@i[#1]#2{%
1010 \def\@mpmakefntext#1{%

```

```

1011 \flushing
1012 \parindent=1em
1013 \noindent
1014 \hb@xt@1em{\hss\@makefnmark}%
1015 #1%
1016 }%
1017 \def\@caption@fignum@sep{. }%
1018 \def\setfloatlink{\def\float@link}%
1019 \let\float@link\@empty

```

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

```

1020 \newcounter{figure}
1021 \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`.

```

1022 \def\fps@figure{tbp}
1023 \def\ftype@figure{1}
1024 \def\ext@figure{lof}
1025 \def\fnm@figure{\figurename~\thefigure}

```

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

```

1026 \expandafter\newbox\csname fbox@\ftype@figure\endcsname
1027 \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.

```

1028 \appdef\class@documenthook{%
1029 \do@if@floats{figure}{.fgx}%
1030 }%
1031 \appdef\class@enddocumenthook{%
1032 \printfigures\relax
1033 }%

```

`\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.

```

1034 \newcommand\printfigures{%
1035 \@ifstar{\true@sw}{\floatp@sw{\true@sw}{\false@sw}}%
1036 {%
1037 \print@float{figure}{\oneapage}%
1038 }{%
1039 \print@float{figure}{}%

```

```

1040 }%
1041 }%
\@xfloat@prep We patch into the procedure \@xfloat@prep. This patch applies to all floats (not
figure alone) and makes the type center.
1042 \appdef\@xfloat@prep{%
1043 \appdef\@parboxrestore{\centering}%
1044 %\let\@makefnmark\@makefnmark@latex
1045 }%

```

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`.

```

1046 \newenvironment{table}
1047         {\@float{table}}
1048         {\end@float}
1049 \newenvironment{table*}
1050         {\@dblfloat{table}}
1051         {\end@dblfloat}

```

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

```

1052 \newcounter{table}
1053 \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`.

```

1054 \def\fps@table{tbp}
1055 \def\ftype@table{2}
1056 \def\ext@table{lot}
1057 \def\fnm@table{\tablename~\thetable}

```

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

```

1058 \expandafter\newbox\csname fbox@\ftype@table\endcsname
1059 \expandafter\setbox\csname fbox@\ftype@table\endcsname\hbox{}%
1060 \def\listoftables{\print@toc{lot}}%
1061 \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}...?`)

```

1062 \def\table@hook{\small}%
1063 \def\squeezetable{\def\table@hook{\scriptsize}}%
1064 \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.

```
1065 \def\set@table@environments{%
1066 \floats@sw}{-%
1067 \let@environment{longtable@float}{longtable}%
1068 \let@environment{longtable}{longtable@write}%
1069 \let@environment{longtable*@float}{longtable*}%
1070 \let@environment{longtable*}{longtable*@write}%
1071 \let@environment{turnpage@float}{turnpage}%
1072 \let@environment{turnpage}{turnpage@write}%
1073 }%
1074 \do@if@floats{table}{.tbx}%
1075 }%
1076 \appdef\document@inithook{%
1077 \set@table@environments
1078 }%
1079 \appdef\class@enddocumenthook{%
1080 \printtables\relax
1081 }%
1082 \newenvironment{longtable@write}{-%
1083 \write@float{longtable}{table}%
1084 }{%
1085 \endwrite@float
1086 }%
1087 \newenvironment{longtable*@write}{-%
1088 \write@float{longtable*}{table}%
1089 }{%
1090 \endwrite@float
1091 }%
1092 \newenvironment{turnpage@write}{-%
1093 \immediate\write\tablewrite{\string\begin{turnpage}}%
1094 }{%
1095 \immediate\write\tablewrite{\string\end{turnpage}}%
1096 }%
```

`\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.

```
1097 \newcommand\printtables{%
1098 \begingroup
1099 \let@environment{longtable}{longtable@float}%
1100 \let@environment{longtable*}{longtable*@float}%
1101 \let@environment{turnpage}{turnpage@anchored}%
1102 \prepdef\longtable{\trigger@float@par}%

```

```

1103 \expandafter\prepdef\csname longtable*\endcsname{\trigger@float@par}%
1104 \expandafter\prepdef\csname table@floats\endcsname{%
1105   \onecolumngrid@push
1106 }%
1107 \expandafter\appdef\csname endtable@floats\endcsname{%
1108   \onecolumngrid@pop
1109 }%
1110 \@ifstar{\true@sw}{\floatp@sw{\true@sw}{\false@sw}}%
1111 {%
1112   \print@float{table}{\onepage}%
1113 }{%
1114   \print@float{table}{}%
1115 }%
1116 \endgroup
1117 }%
1118 \newenvironment{turnpage@anchored}{%
1119   \onecolumngrid@push
1120   \setbox\z@\vbox to\textwidth\bgroup
1121   \columnwidth\textheight
1122 }{%
1123   \vfil
1124   \egroup
1125   \rotatebox{90}{\box\z@}%
1126   \onecolumngrid@pop
1127 }%

```

14.10 Videos

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

```

1128 \newenvironment{video}
1129   {\@float{video}}
1130   {\end@float}%
1131 \newenvironment{video*}
1132   {\@dblfloat{video}}
1133   {\end@dblfloat}%

```

`\thevideo` The video counter and float placement defaults.

```

1134 \newcounter{video}
1135 \renewcommand \thevideo {\@arabic\c@video}

1136 \def\fps@video{tbp}%
1137 \def\ftype@video{4}%
1138 \def\ext@video{lov}%
1139 \def\fnm@video{\fname@video~\thevideo}%
1140 \def\fname@video{Video}%
1141 \appdef\document@inithook{%
1142   \@ifxundefined\c@float@type{}{%
1143     \global\setcounter{float@type}{8}%
1144   }%

```

```
1145 }%
```

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

```
1146 \expandafter\newbox\csname fbox@\ftype@video\endcsname
```

```
1147 \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.

```
1148 \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.

```
1149 \def\listofvideos{\print@toc{lov}}%
```

```
1150 \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.

```
1151 \appdef\class@documenthook{%
```

```
1152 \do@if@floats{video}{.vdx}%
```

```
1153 }%
```

```
1154 \appdef\class@enddocumenthook{%
```

```
1155 \printvideos\relax
```

```
1156 }%
```

`\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.

```
1157 \newcommand\printvideos{%
```

```
1158 \@ifstar{\true@sw}{\floatp@sw{\true@sw}{\false@sw}}%
```

```
1159 {%
```

```
1160 \print@float{video}{\oneapage}%
```

```
1161 }{%
```

```
1162 \print@float{video}{ }%
```

```
1163 }%
```

```
1164 }%
```

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 1165 \def\endtabular@hook{}%
  ruledtabular 1166 %\RequirePackage{dcolumn}%
                1167 \appdef\document@inithook{%
                1168 \@ifpackageloaded{dcolumn}{%
                1169 \expandafter\@ifnotrelax\cscname NC@find@d\endcscname}{-%
                1170 \newcolumnntype{d}{D{.}{.}{-1}}%
                1171 }%
                1172 }{}%
                1173 }%
                1174 \def\toprule{\hline\hline}%
                1175 \def\colrule{\hline}%
                1176 \def\botrule{\hline\hline}%
                1177 \newenvironment{ruledtabular}{-%
                1178 \def\array@default{v}%
                1179 \appdef\tabular@hook{\def\@halignto{to\hsize}}%
                1180 \let\tableft@skip@default\tableft@skip
                1181 \let\tableft@skip\tableft@skip@float
                1182 \let\tabmid@skip@default\tabmid@skip
                1183 \let\tabmid@skip\tabmid@skip@float
                1184 \let\tabright@skip@default\tabright@skip
                1185 \let\tabright@skip\tabright@skip@float
                1186 \let\array@row@pre@default\array@row@pre
                1187 \let\array@row@pre\array@row@pre@float
                1188 \let\array@row@pst@default\array@row@pst
                1189 \let\array@row@pst\array@row@pst@float
                1190 \appdef\array@row@rst{%
                1191 \let\array@row@pre\array@row@pre@default
                1192 \let\array@row@pst\array@row@pst@default
                1193 \let\tableft@skip\tableft@skip@default
                1194 \let\tabmid@skip\tabmid@skip@default
                1195 \let\tabright@skip\tabright@skip@default
                1196 \appdef\tabular@hook{\let\@halignto\@empty}%
                1197 }%
                1198 }{}%
                1199 }%

```

16 Footnote Text

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

```

\@makefnmark 1200 \def\@makefnmark#1{%
                1201 \def\baselinestretch{1}%
                1202 \parindent1em%
                1203 \noindent
                1204 \hb@xt@1.8em{%
                1205 \hss\@makefnmark
                1206 }%
                1207 #1%

```

```

1208 \par
1209 }%
1210 \def\@makefnmark{%
1211 \hbox{%
1212 \@textsuperscript{%
1213 \normalfont\@thefnmark
1214 }%
1215 }%
1216 }%

```

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

```

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

`\rev@citealpnm` 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.

```

1217 \expandafter\DeclareRobustCommand
1218 \expandafter\rev@citet
1219 \expandafter{%
1220 \expandafter\beginngroup

```

```

1221 \expandafter\rtx@swap@citea
1222 \expandafter\g@bbblefirsttoken
1223 \csname citet \endcsname
1224 }%
1225 \expandafter\DeclareRobustCommand
1226 \expandafter\rev@citealp
1227 \expandafter{%
1228 \expandafter\beginngroup
1229 \expandafter\rtx@swap@citea
1230 \expandafter\g@bbblefirsttoken
1231 \csname citealp \endcsname
1232 }%
1233 \expandafter\DeclareRobustCommand
1234 \expandafter\rev@citealpnum
1235 \expandafter{%
1236 \expandafter\beginngroup
1237 \expandafter\rtx@swap@citenum
1238 \expandafter\g@bbblefirsttoken
1239 \csname citealp \endcsname
1240 }%
1241 \def\rtx@swap@citenum{%
1242 \rtx@swap@citea
1243 \let\@cite\NAT@citenum
1244 \let\NAT@mbox\mbox
1245 \let\citeyear\NAT@citeyear
1246 \let\NAT@space\NAT@spacechar
1247 }%
1248 \def\g@bbblefirsttoken{%
1249 \expandafter\true@sw
1250 \expandafter\@empty
1251 }%

```

`\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.

```

1252 \newcommand\rtx@citesuper[3]{%
1253 \ifNAT@swa
1254 \leavevmode
1255 \unskip
1256 % \hspace{1\p0}%
1257 \textsuperscript{\normalfont#1}%
1258 \if*#3*\else\ (#3)\fi
1259 \else
1260 #1%
1261 \fi
1262 \endgroup
1263 }%

```

`\@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.

```
1264 \def\@makefnmark@cite{\begingroup\NAT@swatrue\@cite{\@thefnmark}}{}{}}%
```

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

```
1265 \def\rtx@bibsection{%
1266 \@ifx@empty\refname{%
1267 \par
1268 }{%
1269 % \let\@hangfroms@section\@hang@froms
1270 \expandafter\section\expandafter*\expandafter{\refname}%
1271 \@nbreaktrue
1272 }%
1273 }%
```

`\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`.

```
1274 \def\rtx@swap@citea{%
1275 \let\NAT@def@citea\rtx@def@citea
1276 \let\NAT@def@citea@close\rtx@def@citea@close
1277 \let\NAT@def@citea@box\rtx@def@citea@box
1278 }%
1279 \def\rtx@def@citea{%
1280 \advance\c@NAT@ctr\@ne
1281 \let\@citea\NAT@separator
1282 \@ifnum{\count@>\tw@}{%
1283 \@ifnum{\c@NAT@ctr=\count@}{\appdef\@citea{\NAT@conj\NAT@space}}{}%
1284 }{%
1285 \def\@citea{\NAT@space\NAT@conj\NAT@space}%
1286 }%
1287 }%
1288 \def\rtx@def@citea@close{%
1289 \rtx@def@citea
1290 \prepdef\@citea{\NAT@close}%
1291 }%
1292 \def\rtx@def@citea@box{%
1293 \rtx@def@citea@close
1294 \expandafter\def\expandafter\@citea\expandafter{\expandafter\NAT@mbox\expandafter{\@citea}}%
1295 }%
1296 \def\NAT@conj{and}%

1297 \newenvironment{thebibliography}{}{}%
1298 \let\@listi\@empty
1299 \appdef\rtx@require@packages{%
1300 \RequirePackage[sort&compress]{natbib}[2008/12/08 8.3a (PWD, AO)]%
1301 \let\environment{NAT@thebibliography}{thebibliography}%
1302 \let\environment{thebibliography}{rtx@thebibliography}%
```

```

1303 \let\bibliographystyle@latex\bibliographystyle
1304 \let\NAT@citesuper\rtx@citesuper

```

`\NAT@bibsetnum` We define the sectioning command to use when starting the bibliography and gently coax `natbib` into using the formatting procedures that *we* want it to use.

`\NAT@bibsetup` This way of setting up `thebibliography` automatically sets the label width based on the largest number used within the bibliography. This scheme will not work properly using the author/year style of bib entry, though.

`\bibpreamble` 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.

`\newblock`

`\bibnumfmt`

`\NAT@merge`

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 `\@ne` (syntax is still enabled, but semantics are turned off).

```

1305 \let\bibsection\rtx@bibsection
1306 \let\NATx@bibsetnum\NAT@bibsetnum
1307 \def\NAT@bibsetnum#1{%
1308 \setlength{\topsep}{\z@}%
1309 \NATx@bibsetnum{\ref{LastBibItem}}%
1310 }%
1311 \let\NATx@bibsetup\NAT@bibsetup
1312 \def\NAT@bibsetup{%
1313 \setlength{\labelwidth}{\z@}%
1314 \setlength{\labelsep}{\z@}%
1315 \setlength{\itemindent}{\z@}%
1316 \setlength{\listparindent}{\z@}%
1317 \setlength{\topsep}{\z@}%
1318 \setlength{\parsep}{\z@}%
1319 \NATx@bibsetup
1320 }%
1321 \let\bibpreamble\@empty
1322 \def\newblock{\ }%
1323 \let\NATx@bibnumfmt\bibnumfmt
1324 \def\bibnumfmt{\place@bibnumber}%
1325 \let\NAT@merge\thr@@
1326 \let\NAT@citeyear\citeyear
1327 \let\onlinecite\rev@citealp
1328 \let\textcite\rev@citet

```

`\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.

```

1329 \let\bibliographystyle@latex\bibliographystyle
1330 \def\bibliographystyle{\def@bibstyle}%

```

We customize one of the productions of `natbib`.

```

1331 \let\bibitemContinue\bibitemContinue@rtx

```

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

```
1332 }%
```

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

```
1333 \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. `\textcite` 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.

```
1334 \DeclareRobustCommand\onlinecite{\@onlinecite}%
```

```
1335 \DeclareRobustCommand\textcite{\@textcite}%
```

`\bibliography` Provide a hook for supplying Bib_{TEX} a bibliographic database that may contain, say, footnotes.

Note that Bib_{TEX} chokes if the argument of the `\bibdata` command has null fields, hence these tests.

```
1336 \let\bibliography@latex\bibliography
```

```
1337 \def\bibliography#1{%
```

```
1338 \ifx@empty{\pre@bibdata}{%
```

```
1339 \bibliography@latex{#1}%
```

```
1340 }{%
```

```
1341 \@ifempty{#1}{%
```

```
1342 \expandafter\bibliography@latex\expandafter{\pre@bibdata}%
```

```
1343 }{%
```

```
1344 \expandafter\bibliography@latex\expandafter{\pre@bibdata,#1}%
```

```
1345 }%
```

```
1346 }%
```

```
1347 \let\auto@bib\@empty
```

```
1348 }%
```

```
1349 \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.

```
1350 \newenvironment{rtx@thebibliography}[1]{%
```

```
1351 \NAT@thebibliography{#1}%
```

```
1352 \let\@TBN@opr\present@bibnote
```

```
1353 \@FMN@list
```

```
1354 }{%
```

```
1355 %\@endnotesinbib
```

```

1356 \edef\@currentlabel{\arabic{NAT@ctr}}%
1357 \label{LastBibItem}%
1358 \endNAT@thebibliography
1359 \global\let\auto@bib\@empty
1360 }%
1361 \def\present@bibnote#1#2{%
1362 \item[%
1363 \textsuperscript{%
1364 \normalfont
1365 \Hy@raisedlink{\hyper@anchorstart{frontmatter.#1}\hyper@anchorend}%
1366 \begingroup
1367 \c@footnote#1\relax
1368 \frontmatter@thefootnote
1369 \endgroup
1370 }%
1371 ]#2\par
1372 %\global\let\NAT@bibitem@first@sw\@secondoftwo
1373 }%

```

`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).

```

1374 \def\write@bibliographystyle{%
1375 \@ifundefined\@bibstyle{}-%
1376 \expandafter\bibliographystyle@latex\expandafter{\@bibstyle}%
1377 }%
1378 \global\let\write@bibliographystyle\relax
1379 }%
1380 \AtEndDocument{\write@bibliographystyle}%

```

`\rtx@@citetp` We wish to extend `natbib` to move spaces and citations around a subscript 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 accommodate 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 T_EX 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 T_EX 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.

```

1381 \def\rtx@@citetp[#1]{\@ifnextchar[{\rtx@citex[#1]}{\rtx@citex[] [#1]}}%
1382 \def\rtx@citex[#1][#2]#3{%
1383   \begingroup
1384   \def\@tempa{[#1][#2]{#3}}%
1385   \@ifx{\@cite\NAT@citesuper}{%
1386     \leavevmode
1387     \skip@\lastskip
1388     \unskip
1389     \super@cite@let
1390   }{%
1391     \super@cite@end
1392   }%
1393 }%
1394 \def\super@cite@let{%
1395   \futurelet\@let@token\super@cite@check
1396 }%
1397 \def\super@cite@end{%
1398   \aftergroup\@citex\expandafter\endgroup\@tempa
1399 }%
1400 \def\super@cite@check{%
1401   \@ifx{\@let@token\@sptoken}{%
1402     \super@cite@end
1403   }{%
1404     \super@cite@swap
1405   }%
1406 }%
1407 \long\def\super@cite@swap#1{%
1408   \expandafter\@ifx\expandafter{\csname rtx@automove#1\endcsname\@empty}{%
1409     #1%
1410     \super@cite@let
1411   }{%
1412     \super@cite@end
1413     #1%
1414   }%
1415 }%
1416 \expandafter\let\csname rtx@automove.\endcsname\@empty

```



```

1417 \expandafter\let\csname rtx@automove,\endcsname\@empty
1418 \expandafter\let\csname rtx@automove:\endcsname\@empty
1419 \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.

```

1420 \appdef\class@documenthook{%
1421 \citeautoscript@sw{%
1422 \@ifx{\@cite\NAT@citesuper}{%
1423 \let\NAT@@citetp\rtx@@citetp
1424 }{}%
1425 }{}%
1426 }%

```

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
\save@note 1427 \def\mini@note{\save@note\mini@notes}%Implicit #2
1428 \def\save@note#1#2{%
1429 \stepcounter{footnote}%
1430 \protected@xdef\@thefnmark{\the\c@footnote}%
1431 \@footnotemark
1432 \expandafter\g@addto@macro
1433 \expandafter#1%
1434 \expandafter{%
1435 \expandafter \@@footnotetext
1436 \expandafter {\@thefnmark}{#2}%
1437 }%
1438 }%
1439 \long\def\@@@footnotetext#1{\def\@thefnmark{#1}\@footnotetext}%
1440 \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}%
%   \authorityyear@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}%
%}%
%

1441 \def\rev@citemark#1{%
1442 \expandafter\cite\expandafter{\@thefnmark}%
1443 }%
1444 \def\rev@endtext#1{%
1445 \let\@endnotelabel\@thefnmark
1446 \@endnotetext
1447 }%

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

1448 \def\endnote@ext{.end}%
1449 \def\bibdata@app{Notes}%
1450 \def\bibdata@ext{bib}%

```

`\@endnotetext` The procedure `\@endnotetext` writes a Bib_TEX .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` `\@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 `@MISC` 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.

```
1451 \long\def\@endnotetext#1{%
1452 \begingroup
1453 \endnote@relax
1454 \immediate\write\@bibdataout{@MISC{\@endnotelabel,note="#1"}}%year="\@endnotelabel",
1455 \endgroup
1456 }%
1457 \newwrite\@bibdataout
1458 \appdef\class@documenthook{%
1459 \immediate\openout\@bibdataout\pre@bibdata.\bibdata@ext\relax
1460 }%
```

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`.

```

1461 \def\endnote@relax{%
1462 \let\label\relax \let\index\relax \let\glossary\relax
1463 \let\cite\relax \let\ref\relax \let\pageref\relax
1464 \let\(\ \relax \let\) \relax \let\ \relax
1465 \let~\relax
1466 %\let\protect\noexpand
1467 \let \protect \@unexpandable@protect
1468 \newlinechar'\^M%
1469 %\newlinechar'\ %
1470 \let\begin\relax \let\end\relax
1471 }%

\endnotetext %\def\unused@endnotetext{%
% \ifnextchar[{%
% \xendnotenext
% }{%
% \protected@xdef\@thefnmark{\thefootnote}%
% \@endnotetext
% }%
%}%
%

\@xendnotenext %\def\unused@xendnotenext[#1]{%
% \begingroup
% \c@footnote#1\relax
% \unrestored@protected@xdef\@thefnmark{\thefootnote}%
% \endgroup
% \@endnotetext
%}%
%

\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.

1472 \def\printendnotes{%
1473 \class@warn{The \string\printendnotes\space command no longer serves any function. Please remo
1474 }%

%\def\printendnotes{%
% \ifx{\@endnoteout\@undefined}{-}{%
% \begingroup
% \c@secnumdepth-\maxdimen
% \section{%
% \notesname
% }%
% \immediate\closeout\@endnoteout
% \global\let\@endnoteout\@undefined
% \begin{enumerate}%

```

```

% \makeatletter
% \input{\endnote@stream}%
% \end{enumerate}%
% \endgroup
% }%
}%%
%\appdef\class@enddocumenthook{%
% \printendnotes
}%%
%
```

`\firstnote@num` In REVTeX, we have permanently altered the way that the footnote counter gets reset at the beginning of the document.

`\set@firstnote`

If footnotes appear in the bibliography, we initialise the footnote counter to number of cites (found last time) via `\set@firstnote`.

```

1475 \mathchardef\firstnote@num\z@
1476 \appdef\class@documenthook{%
1477 \global\c@footnote\firstnote@num
1478 \appdef\maketitle{\global\c@footnote\firstnote@num}%
1479 }%
1480 \def\set@firstnote#1{%
1481 \@ifnum{\firstnote@num=#1\relax}{\relax}{%
1482 \class@warn@end{Endnote numbers changed: rerun LaTeX}%
1483 }%
1484 \immediate\write\@mainaux{%
1485 \global\mathchardef\string\firstnote@num#1\relax
1486 }%
1487 }%
```

`\@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`.

Obsolete code is commented out.

```

%\def\@endnotesinbib{%
% \set@firstnote\z@
}%%
%\def\@endnotesinbibliography{%
% \expandafter\set@firstnote\expandafter{\the\c@NAT@ctr}%
% \@ifx{\@endnoteout\@undefined}{\relax}{%
% \immediate\closeout\@endnoteout
% \global\let\@endnoteout\@undefined
% \makeatletter
% \input{\endnote@stream}%
%
```

```
% }%
%}%
%
```

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.

```
1488 \def\make@footnote@endnote{%
1489 \footinbib@sw{%
1490 \authoryear@sw}{-%
1491 \ltx@footnote@push
1492 \def\thempfn{Note\thefootnote}%
1493 \let\ltx@footmark\rev@citemark
1494 \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
%
```

```
1495 }%
1496 }{}%
1497 }%
```

```
1498 \def\ltx@footnote@push{%
1499 \let\ltx@footmark@latex\ltx@footmark
1500 \let\ltx@foottext@latex\ltx@foottext
1501 \let\thempfn@latex\thempfn
1502 \def\ltx@footnote@pop{%
1503 \let\ltx@footmark\ltx@footmark@latex
1504 \let\ltx@foottext\ltx@foottext@latex
1505 \let\thempfn\thempfn@latex
1506 }%
1507 }%
```

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`).

```
1508 \appdef\class@documenthook{%
1509 \make@footnote@endnote
1510 }%
```

`\auto@bib` Under some circumstances, we must typeset the bibliography automatically. If the document requires footnotes to be set in the bibliography (effectively, class option `footinbib`), or that frontmatter footnotes be set in the bibliography (effectively, class option `bibnotes`), but contains no explicit `\bibliography` statement.

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.

```

1511 \def\auto@bib{%
1512 \ifx@empty\FMN@list{%
1513 \footinbib@sw{%
1514 \ifnum{\thefootnote>\z@}{%
1515 \true@sw
1516 }{%
1517 \test@bbl@sw
1518 }%
1519 }{%
1520 \test@bbl@sw
1521 }%
1522 }{%
1523 \true@sw
1524 }%
1525 {%
1526 \bibliography{}%
1527 }{}%
1528 }%

```

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 sets a Boolean.

```

1529 \def\test@bbl@sw{%
1530 \begingroup
1531 \let\providecommand\providecommand@j@nk
1532 \let@environment{thebibliography}{thebibliography@nogroup}%
1533 \let\bibfield@gobbletwo
1534 \let\bibinfo@gobbletwo
1535 \let\translation@gobble
1536 \let\BibitemOpen@empty
1537 \let\bibitemStop@empty
1538 \let\bibitemNoStop@empty
1539 \let\EOS@empty
1540 \let\BibitemShut@gobble
1541 \let\bibAnnoteFile@gobbletwo
1542 \let\bibAnnote@gobblethree
1543 \let\textbf@gobble
1544 \let\emph@gobble
1545 \@booleanfalse\bibitem@sw
1546 \let\bibitem\bibitem@set

```

```

1547 \setbox\z@\vbox{\IfFileExists {\jobname.bbl}{\@@input\@filef@und}{}}%
1548 \bibitem@sw{\aftergroup\true@sw}{\aftergroup>false@sw}%
1549 \endgroup
1550 }%
1551 \newcommand\bibitem@set[1] [] {%
1552 \bibitem@sw}{%
1553 \@booleantrue\bibitem@sw
1554 \aftergroup\@booleantrue\aftergroup\bibitem@sw
1555 }%
1556 }%

```

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

```

1557 \long\def \@gobblethree #1#2#3{%
1558 \def\providecommand@j@nk#1[#2]{%
1559 \@ifnum{#2=\z@}{\def\j@nk}{%
1560 \@ifnum{#2=\@ne}{\def\j@nk##1}{%
1561 \@ifnum{#2=\tw@}{\def\j@nk##1##2}{%
1562 \@ifnum{#2=\thr@@}{\def\j@nk##1##2##3}{%
1563 }%
1564 }%
1565 }%
1566 }%
1567 }%
1568 \def\thebibliography@nogroup#1{\endgroup\def\@currenvir{thebibliography}}%
1569 \def\endthebibliography@nogroup{\begingroup}%

```

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.

```

1570 \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`.

```

1571 \appdef\setup@hook{%
1572 \tabbingsep \labelsep
1573 \leftmargin\leftmarginI
1574 \labelwidth\leftmargin\advance\labelwidth-\labelsep
1575 \let\@listI\@listI
1576 \@listI
1577 }%
1578 % \begin{macrocode}
1579 %
1580 % We ensure that the ‘‘environment’’ component mark (implemented by \file{ltxgrid.dtx})

```



```

1581 % is initialized properly (via a hook, itself defined via \file{ltxutil.dtx}).
1582 % \begin{macrocode}
1583 \appdef\class@documenthook{%
1584 \global\c@page\@ne
1585 \def\curr@envir{document}%
1586 \mark@envir{\curr@envir}%
1587 }%

```

`\open@onecolumn` When setting the column grid, we have to override the procedure for formatting lists. Because `\twocolumngrid` requires rebalancing columns at some points, typesetting 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.

```

1588 \def\open@onecolumn{%
1589 \open@column@one\@ne
1590 \set@colht
1591 \@floatplacement
1592 \@dblfloatplacement
1593 }%
1594 \def\open@twocolumn{%
1595 \open@column@mlt\tw@
1596 \set@colht
1597 \@floatplacement
1598 \@dblfloatplacement
1599 \sloppy
1600 \let\set@listindent\set@listindent@
1601 }%

```

18 \appendix

```
1602 %\newif\ifappendixon
```

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

```

1603 \def\appendix{%
1604 \par
1605 %\appendixontrue
1606 \setcounter{section}\z@
1607 \setcounter{subsection}\z@
1608 \setcounter{subsubsection}\z@

```

```

1609 \def\thesubsection{\arabic{subsection}}%
1610 \def\thesubsubsection{\alph{subsubsection}}%
1611 \addtoreset{equation}{section}%
1612 \def\theequation@prefix{\thesection}%
1613 \addtocontents{toc}{\protect\appendix}%
1614 \@ifstar{%
1615   \def\thesection{\unskip}%
1616   \def\theequation@prefix{A.}%
1617 }{%
1618   \def\thesection{\Alph{section}}%
1619 }%
1620 }%

```

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.

```

1621 \def\title@column#1{%
1622   \minipagefootnote@init
1623   #1%
1624   \minipagefootnote@foot
1625 }%
1626 \def\close@column{%
1627   \newpage
1628 }%

```

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 both `\twocolumn@sw` and `\preprintsty@sw` to be false.

```

1629 \def@galley@outdent{\rightmargin-\columnwidth\advance\rightmargin-\columnsep}%
1630 \let\widetext@outdent\@empty
1631 \newenvironment{widetext@galley}{%
1632   \list{}{%
1633     \topsep          \z@skip
1634     \listparindent  \parindent
1635     \itemindent     \parindent
1636     \leftmargin     \z@
1637     \parsep         \z@\@plus\p@
1638     \widetext@outdent

```

```

1639   \relax
1640 }%
1641 \item\relax
1642 }{
1643 \endlist
1644 }%

```

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, then we return to a two-column page grid in anticipation of the upcoming `\clearpage`.

```

1645 \def\title@column@grid#1{%
1646   \minipagefootnote@init
1647   \onecolumngrid
1648   \begingroup
1649   \let\@footnotetext\frontmatter@footnotetext
1650   \let\set@footnotewidth\set@footnotewidth@ii
1651   \ltx@no@footnote
1652   #1%
1653   \endgroup
1654   \twocolumngrid
1655   \minipagefootnote@foot
1656 }%
1657 \def\close@column@grid{%
1658   \balancelastpage@sw{%
1659     \onecolumngrid
1660   } \twocolumngrid
1661 }{}%
1662 }%

```

`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 `widetttext`. These are set as leaders, so they will disappear at a page break.

```

1663 \newenvironment{widetext@grid}{%
1664   \par\ignorespaces
1665   \setbox\widetext@top\vbox{%
1666     \vskip15\p@
1667     \hb@xt@\hsize{%
1668       \leaders\hrule\hfil
1669       \vrule\@height6\p@
1670     }%
1671     \vskip6\p@
1672   }%
1673   \setbox\widetext@bot\hb@xt@\hsize{%

```

```

1674     \vrule\@depth6\p@
1675     \leaders\hrule\hfil
1676   }%
1677   \onecolumngrid
1678   \dimen@\ht\widetext@top\advance\dimen@\dp\widetext@top
1679   \cleaders\box\widetext@top\vskip\dimen@
1680   \let\set@footnotewidth\set@footnotewidth@ii
1681   \prep@math@patch
1682 }{%
1683   \par
1684   \setbox\widetext@bot\vbox{%
1685     \hb@xt@\hsize{\hfil\box\widetext@bot}%
1686     \vskip14\p@
1687   }%
1688   \dimen@\ht\widetext@bot\advance\dimen@\dp\widetext@bot
1689   \cleaders\box\widetext@bot\vskip\dimen@
1690   \twocolumngrid\global\@ignoretrue
1691   \@endpetrue
1692 }%
1693 \newbox\widetext@top
1694 \newbox\widetext@bot

```

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

```

1695 \def\set@page@grid{%
1696   \twocolumn@sw{%
1697     \let@environment{widetext}{widetext@grid}%
1698     \let\title@column\title@column@grid
1699     \let\close@column\close@column@grid
1700   }{%
1701     \let@environment{widetext}{widetext@galley}%
1702     \preprintsty@sw{%

```

Change the page grid not at all.

```

1703   }{%

```

If we are galley style, change the page margin only.

```

1704     \galley@sw{%
1705       \let\widetext@outdent\galley@outdent
1706     }{%
1707   }%
1708 }%
1709 }%
1710 \appdef\setup@hook{\set@page@grid}%

```

20 Old font commands

```

1711 \DeclareOldFontCommand{\rm}{\normalfont\rmfamily}{\mathrm}
1712 \DeclareOldFontCommand{\sf}{\normalfont\sffamily}{\mathsf}
1713 \DeclareOldFontCommand{\tt}{\normalfont\ttfamily}{\mathtt}
1714 \DeclareOldFontCommand{\bf}{\normalfont\bfseries}{\mathbf}

```

```

1715 \DeclareOldFontCommand{\it}{\normalfont\itshape}{\mathit}
1716 \DeclareOldFontCommand{\sl}{\normalfont\slshape}{\@nomath\sl}
1717 \DeclareOldFontCommand{\sc}{\normalfont\scshape}{\@nomath\sc}
1718 \DeclareRobustCommand*\cal{\@fontswitch\relax\mathcal}
1719 \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 compatability, 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.

```

1720 \def\today{\ifcase\month\or
1721   January\or February\or March\or April\or May\or June\or
1722   July\or August\or September\or October\or November\or December\fi
1723   \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`.

```

1724 \def\partname{Part}

```

`\tocname` Text entity `\tocname` is used in `\tableofcontents`, as defined in the standard L^AT_EX book class.

```

1725 \def\tocname{Contents}

```

`\lofname` Text entity `\lofname` is used in `\listoffigures`, as defined in the standard L^AT_EX book class.

```

1726 \def\lofname{List of Figures}

```

`\lotname` Text entity `\lotname` is used in `\listoftables`, as defined in the standard L^AT_EX book class.

```

1727 \def\lotname{List of Tables}

```

`\refname` Text entity `\refname` is used in `thebibliography`.

```

1728 \def\refname{References}

```

`\indexname` Text entity `\indexname` is used in `theindex`, as defined in the standard L^AT_EX book class.

```

1729 \def\indexname{Index}

```

`\figurename` Text entity `\figurename` is used in figure, `\figuresname` in `\printfigures`.
1730 `\def\figurename{FIG.}`
1731 `\def\figuresname{Figures}%`

`\tablename` Text entity `\tablename` is used in table, `\tablesname` in `\printtables`.
1732 `\def\tablename{TABLE}`
1733 `\def\tablesname{Tables}%`

`\abstractname` Text entity `\abstractname` is used in abstract.
1734 `\def\abstractname{Abstract}`

`\appendixesname` Text entity `\appendixesname` is used in TOC.
`\appendixname` 1735 `\def\appendixesname{Appendixes}%`
1736 `\def\appendixname{Appendix}%`

`\acknowledgmentsname` Text entity `\acknowledgmentsname` is used in acknowledgments.
1737 `\def\acknowledgmentsname{Acknowledgments}`

`\journalname` This should be set by the society journal options, eg ‘pra’.
1738 `\def\journalname{??}`

`\copyrightname` Default layout does not assign copyright, but a journal that wants to might use this.
1739 `\def\copyrightname{??}`

`\andname` The text string “and” for use in author lists.
1740 `\def\andname{and}`

`\@pacs@name` The text string prepended to PACS numbers, resp. to keywords.
`\@keys@name` 1741 `\def\@pacs@name{PACS numbers: }%`
1742 `\def\@keys@name{Keywords: }%`

`\ppname` The text string “pp” for use in page ranges.
1743 `\def\ppname{pp}`

`\numbername` The text string “number” for use in article reference.
1744 `\def\numbername{number}`

`\volumename` The text string “volume” for use in article reference.
1745 `\def\volumename{volume}`

`\Dated@name` These texts are used in the `\date`, et al. commands.
`\Received@name` 1746 `\def\Dated@name{Dated: }%`
`\Revised@name` 1747 `\def\Received@name{Received }%`
`\Accepted@name` 1748 `\def\Revised@name{Revised }%`
`\Published@name` 1749 `\def\Accepted@name{Accepted }%`
1750 `\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.

```
1751 \def\address{\replace@command\address\affiliation}%
1752 \def\altaddress{\replace@command\altaddress\altaffiliation}%
1753 \newenvironment{references}{%
1754 \class@warn@end{The references environment is not supported; use thebibliography instead.}
1755 \gdef\references{\thebibliography{}}\references
1756 }{%
1757 \endthebibliography
1758 }%
1759 \def\draft{%
1760 \class@warn@end{Command \string\draft\space is obsolete;^^JInvoke option draft instead.}%
1761 \@booleantrue\draft@sw
1762 }%
1763 \def\tighten{%
1764 \class@warn@end{Command \string\tighten\space is obsolete;^^JInvoke option tightenlines instead.}
1765 \@booleantrue\tightenlines@sw
1766 }%
1767 \def\tableline{%
1768 \noalign{%
1769 \class@warn@end{Command \string\tableline\space is obsolete;^^JUse \string\colrule\space instead.}
1770 \global\let\tableline\colrule
1771 }%
1772 \tableline
1773 }%
1774 \def\case{\replace@command\case\frac}%
1775 \def\slantfrac{\replace@command\slantfrac\frac}%
1776 \def\tablenote{\replace@command\tablenote\footnote}%
1777 \def\tablenotemark{\replace@command\tablenotemark\footnotemark}%
1778 \def\tablenotetext{\replace@command\tablenotetext\footnotetext}%
1779 % Lose the following definition:
1780 \DeclareRobustCommand\REV@text[1]{%
1781 \relax
1782 \ifmmode
1783 \mathchoice
1784 {\hbox{{\everymath{\displaystyle }#1}}}%
1785 {\hbox{{\everymath{\textstyle }#1}}}%
1786 {\hbox{{\everymath{\scriptstyle }#1}}\let\f@size\sf@size\selectfont#1}}%
1787 {\hbox{{\everymath{\scriptscriptstyle}\let\f@size\ssf@size\selectfont#1}}}%
1788 \glb@settings
1789 \else
1790 \mbox{#1}%
1791 \fi
1792 }%
```

```

1793 % Lose the following definition:
1794 \DeclareRobustCommand\REV@bbox[1]{%
1795   \relax
1796   \ifmmode
1797     \mathchoice
1798     {\hbox{\everymath{\displaystyle      }\boldmath$#1$}}}%
1799     {\hbox{\everymath{\textstyle       }\boldmath$#1$}}}%
1800     {\hbox{\everymath{\scriptstyle     }\boldmath$#1$}}}%
1801     {\hbox{\everymath{\scriptscriptstyle}\boldmath$#1$}}}%
1802   \glb@settings
1803 \else
1804   \mbox{#1}%
1805 \fi
1806 }%
1807 \DeclareRobustCommand\REV@bm[1]{%
1808   \class@warn@end{To use \string\bm, please load the bm package!}%
1809   \global\let\bm\relax
1810 }%
1811 \def\FL{\obsolete@command\FL}%
1812 \def\FR{\obsolete@command\FR}%
1813 \def\narrowtext{\obsolete@command\narrowtext}%
1814 \def\mediumtext{\obsolete@command\mediumtext}%
1815 \newenvironment{quasitable}{%
1816   \let@environment{tabular}{longtable}%
1817 }{%
1818 }%

\text If not otherwise defined, give default meanings to certain commands. FIXME:
  \bm \bibinfo?
\bibinfo 1819 \let\text\REV@text
\epprint 1820 \let\bm\REV@bm
  \url 1821 \appdef\setup@hook{%
1822   \providecommand\bibinfo[2]{#2}%
1823   \providecommand\epprint[2][ ]{#2}%
1824   \providecommand\url[1]{#1}%
1825 }%

\bbox
1826 \def\bbox#1{%
1827   \class@warn@end{\string\bbox\space is obsolete,^^Jload the bm package and use \string\bm\space
1828   \global\let\bbox\relax
1829 }%

\mathletters
1830 \newenvironment{mathletters}{%
1831   \class@warn@end{Environment {mathletters} is obsolete;^^Jload the amsmath package and use {sub
1832   \global\let\mathletters\@empty
1833 }{%
1834 }%

```


`\eqnum`

```
1835 \def\eqnum#1{%
1836 \class@warn@end{\string\eqnum\space is obsolete, load the amsmath package and use \string\tag!
1837 \global\let\eqnum\@gobble
1838 }%
```

We read in the symbol definitions.

```
1839 \appdef\rtx@require@packages{%
1840 \RequirePackage{revsymb4-1}%
1841 }%
1842 \appdef\class@documenthook{\revsymb@inithook}%
```

23 Patches for `lineno.sty`

The `revtex4-1.dtxlineno.sty` 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.

```
1843 \def\LN@LError@org{%
1844 \PackageError{lineno}{%
1845 \string\linelabel\space without \string\linenumbers
1846 }{%
1847 Just see documentation. (New feature v4.11)%
1848 }%
1849 \@gobble
1850 }%
1851 \def\LN@LError@ltx{%
1852 \PackageWarning{lineno}{%
1853 To make the \string\linelabel\space command work, you must issue the \string\linenumbers\ com
1854 }%
1855 \@gobble
1856 }%
```

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 `revtex4-1.dtxlineno.sty`, 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.

```
1857 \appdef\class@documenthook{%
1858 \@ifx{\LN@LError\LN@LError@org}{%
1859 \class@info{Overriding \string\LN@LError}%
1860 \let\LN@LError\LN@LError@ltx
1861 }{}%
1862 \@ifpackageloaded{lineno}{%
```

```

1863 \@ifxundefined{\set@linepenalties}{-}{%
1864   \def\prep@absbox{\set@linepenalties}%
1865   \def\post@absbox{\let\@LN@parpgrk\@empty\@linenumberpar}%
1866 }%
1867 }{}%
1868 }%

```

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 subtype. 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.

```

1869 \appdef\rtx@require@packages{%
1870   \InputIfFileExists{\jobname.rty}{-}{-}%
1871 }%

```

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.

```
1872 \@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`.

```
1873 \@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`.

```
1874 \@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`.

```
1875 \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`.

```
1876 \@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.

```
1877 \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.

```
1878 \@options
```

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

```
1879 \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.

```
1880 \setup@hook
```

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

```
% \def\rtx@fin@year{2010}%
% \def\rtx@fin@month{01}%
% \def\rtx@fin@day{01}%
%

1881 \def\rtx@fin@warn{%
1882   \@ifnum{\rtx@fin@year}>\the\year\relax}{\true@sw}{%
1883   \@ifnum{\rtx@fin@month}>\the\month\relax}{\true@sw}{%
1884   \@ifnum{\rtx@fin@day}>\the\day\relax}{\true@sw}{%
1885   \false@sw
1886   }%
1887 }%
1888 }%
1889 {%
1890   \class@info{Beta software expires \rtx@fin@year-\rtx@fin@month-\rtx@fin@day; updates availabl
1891 }{%
1892   \class@warn{Outdated software expired \rtx@fin@year-\rtx@fin@month-\rtx@fin@day; please retri
1893 }%
1894 }%
```

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

```
%\apptdef\class@enddocumenthook{\rtx@fin@warn}%
%
```

End of the class file.

```
1895 %</package>
```

25 Symbols: the revsymb module

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

```
1896 %<*revsymb>
1897 \def\REVSYMB@warn#1{\PackageWarningNoLine{revsymb}{#1}}%
```

```
\lambdabar
```

```
1898 \DeclareRobustCommand\lambdabar{%
```

```

1899 \bgroup
1900   \def\@tempa{%
1901     \hbox{%
1902       \raise.73\ht\z@
1903       \hb@xt@\z@{%
1904         \kern.25\wd\z@
1905         \vrule \@width.5\wd\z@\@height.1\p@\@depth.1\p@
1906         \hss
1907       }%
1908     \box\z@
1909   }%
1910 }%
1911 \mathchoice
1912   {\setbox\z@\hbox{$\displaystyle \lambda$}\@tempa}%
1913   {\setbox\z@\hbox{$\textstyle \lambda$}\@tempa}%
1914   {\setbox\z@\hbox{$\scriptstyle \lambda$}\@tempa}%
1915   {\setbox\z@\hbox{$\scriptscriptstyle\lambda$}\@tempa}%
1916 \egroup
1917 }%

```

`\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`.

```

1918 \DeclareRobustCommand\openone{\leavevmode\hbox{\small1\normalize\kern-.33em1}}%

```

`\corresponds` Jörg Knappen suggests the replacements: replace `\corresponds` with `\triangleq`, `\overdotts` source `amssymb`; replace `\overcirc` with `\mathring`, source `latex2e`; replace `\overcirc` `\overdotts` 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.

```

1919 \DeclareRobustCommand\corresponds{\replace@command\corresponds\triangleq}%
1920 \DeclareRobustCommand\overcirc{\replace@command\overcirc\mathring}%
1921 \DeclareRobustCommand\overdotts{\replace@command\overdotts\ddot}%
1922 \DeclareRobustCommand\REV@triangleq{%
1923   {\lower.2ex\hbox{=}}{\kern-.75em\triangle}%
1924 }%
1925 \DeclareRobustCommand\REV@ddot[1]{%
1926   \@ontopof{#1}{\cdots}{1.0}\mathord{\box2}%
1927 }%

```

`\succsim` These version 3.1 commands are always supplied, but the definitions in `amssymb` `\precsim` are preferred.

```

\lessim 1928 \DeclareRobustCommand\altsuccsim{\succ\kern-.9em_\sim\kern.3em}%
\gtrsim 1929 \DeclareRobustCommand\altprecsim{\prec\kern-1em_\sim\kern.3em}%
\alt 1930 \let\REV@succsim\altsuccsim
\agt 1931 \let\REV@precsim\altprecsim
1932 \DeclareRobustCommand\REV@lessim{\mathrel{\mathpalette\vereq{<}}}%
1933 \DeclareRobustCommand\REV@gtrsim{\mathrel{\mathpalette\vereq{>}}}%
1934 \DeclareRobustCommand\alt{\lessim}

```

```

1935 \DeclareRobustCommand\agt{\gtrsim}
1936 \def\vereq#1#2{%
1937 \lower3\p@\vbox{%
1938 \baselineskip1.5\p@
1939 \lineskip1.5\p@
1940 \ialign{${\m@th#1\hfill##\hfil$\crcr#2\crcr\sim\crcr}}%
1941 }%
1942 }%

\tensor
\overstar 1943 \DeclareRobustCommand\tensor[1]{\@ontopof{#1}{\leftrightharrow}{1.15}\mathord{\box2}}
\loarrow 1944 \DeclareRobustCommand\overstar[1]{\@ontopof{#1}{\ast}{1.15}\mathord{\box2}}
\roarrow 1945 \DeclareRobustCommand\loarrow[1]{\@ontopof{#1}{\leftarrow}{1.15}\mathord{\box2}}
1946 \DeclareRobustCommand\roarrow[1]{\@ontopof{#1}{\rightarrow}{1.15}\mathord{\box2}}

\@ontopof
1947 \def\@ontopof#1#2#3{%
1948 {%
1949 \mathchoice
1950 {\@ontopof{#1}{#2}{#3}\displaystyle \scriptstyle }%
1951 {\@ontopof{#1}{#2}{#3}\textstyle \scriptstyle }%
1952 {\@ontopof{#1}{#2}{#3}\scriptstyle \scriptscriptstyle}%
1953 {\@ontopof{#1}{#2}{#3}\scriptscriptstyle\scriptscriptstyle}%
1954 }%
1955 }%

\@@ontopof Same as REVTeX3, more or less.
1956 \def\@@ontopof#1#2#3#4#5{%
1957 \setbox\z@\hbox{${#4#1$}}%
1958 \setbox\f@ur\hbox{${#5#2$}}%
1959 \setbox\tw@null\ht\tw@\ht\z@ \dp\tw@\dp\z@
1960 \@ifdim{\wd\z@>\wd\f@ur}{%
1961 \setbox\f@ur\hb@xt@\wd\z@{\hss\box\f@ur\hss}%
1962 \mathord{\rlap{\raise#3\ht\z@\box\f@ur}\box\z@}}%
1963 }{%
1964 \setbox\f@ur\hb@xt@.9\wd\f@ur{\hss\box\f@ur\hss}%
1965 \setbox\z@\hb@xt@\wd\f@ur{\hss$#4\relax#1$\hss}%
1966 \mathord{\rlap{\copy\z@}\raise#3\ht\z@\box\f@ur}}%
1967 }%
1968 }%

\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.
1969 \DeclareRobustCommand\frac{%
1970 \REVSymb@warn{%
1971 Command \string\frac\space unsupported:^^J%
1972 please use \string\mathfrac\space instead.%
1973 }%
1974 \global\let\frac\mathfrac

```

```

1975 \frac
1976 }%
1977 \DeclareRobustCommand\REV@mathfrak{%
1978 \REVSymb@warn{%
1979   Command \string\mathfrak\space undefined:^^J%
1980   please specify the amsfonts or amssymb option!%
1981 }%
1982 \global\let\mathfrak\@firstofone
1983 \mathfrak
1984 }%

```

`\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.

```

1985 \DeclareRobustCommand\Bbb{%
1986 \REVSymb@warn{%
1987   Command \string\Bbb\space unsupported:^^J%
1988   please use \string\mathbb\space instead.%
1989 }%
1990 \global\let\Bbb\mathbb
1991 \Bbb
1992 }%
1993 \DeclareRobustCommand\REV@mathfrak{%
1994 \REVSymb@warn{%
1995   Command \string\mathbb\space undefined:^^J%
1996   please specify the amsfonts or amssymb option!%
1997 }%
1998 \global\let\mathbb\@firstofone
1999 \mathbb
2000 }%

```

`\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!

```

2001 \def\Bigglb{\REV@boldopen \Bigg}%
2002 \def\Biglb {\REV@boldopen \Big }%
2003 \def\bigglb{\REV@boldopen \bigg}%
2004 \def\biglb {\REV@boldopen \big }%
2005 \def\Biggrb{\REV@boldclose\Bigg}%
2006 \def\Bigrb {\REV@boldclose\Big }%
2007 \def\biggrb{\REV@boldclose\bigg}%
2008 \def\bigrb {\REV@boldclose\big }%
2009 \def\REV@pmb#1{%
2010 \hbox{%
2011   \setbox\z@=\hbox{#1}%
2012   \kern-.02em\copy\z@\kern-\wd\z@
2013   \kern .04em\copy\z@\kern-\wd\z@
2014   \kern-.02em
2015   \raise.04em\copy\z@
2016 }%

```

```

2017 }%
2018 \def\REV@boldopen #1#2{\mathopen {\REV@pmb{#1#2$}}}%
2019 \def\REV@boldclose#1#2{\mathclose{\REV@pmb{#1#2$}}}%

```

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

```

2020 \def\revsymb@inithook{%
2021 \@ifxundefined\dddots{\let\dddots\REV@dddots}{}%
2022 \@ifxundefined\triangleq{\let\triangleq\REV@triangleq}{}%
2023 \@ifxundefined\sucssim{\let\sucssim\altsucssim}{}%
2024 \@ifxundefined\precsim{\let\precsim\altprecsim}{}%
2025 \@ifxundefined\lessim{\let\lessim\REV@lessim}{}%
2026 \@ifxundefined\gtrsim {\let\gtrsim \REV@gtrsim }{%
2027 \@ifxundefined\mathfrak{\let\mathfrak\REV@mathfrak}{}%
2028 \@ifxundefined\mathbb{\let\mathbb\REV@mathbb}{}%
2029 }%

2030 %</revsymb>

```

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.

```
2031 %<*10pt>
```

26.1 Defend Against Forseeable Errors

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

```

2032 \ifx\undefined\substyle@ext
2033 \def\@tempa{%
2034 \endinput
2035 \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
2036 }%
2037 \expandafter\else
2038 \def\@tempa{%
2039 \expandafter\fi\@tempa
2040 \class@info{RevTeX pointsize 10pt selected}%
2041 \def\normalsize{%
2042 \setfontsize\normalsize\@xpt{11.5}%
2043 \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2044 \belowdisplayskip \abovedisplayskip
2045 \abovedisplayshortskip \abovedisplayskip
2046 \belowdisplayshortskip \abovedisplayskip
2047 \let\@listi\@listI
2048 }%
2049 \def\small{%
2050 \setfontsize\small\@ixpt{10.5}%
2051 \abovedisplayskip 8.5\p@ \@plus3\p@ \@minus4\p@

```



```

2052 \belowdisplayskip \abovedisplayskip
2053 \abovedisplayshortskip \z@ \@plus2\p@
2054 \belowdisplayshortskip 4\p@ \@plus2\p@ \@minus2\p@
2055 \def\@listi{%
2056   \leftmargin\leftmargini
2057   \topsep 4\p@ \@plus2\p@ \@minus2\p@
2058   \parsep 2\p@ \@plus\p@ \@minus\p@
2059   \itemsep \parsep
2060 }%
2061 }%

2062 \def\footnotesize{%
2063   \@setfontsize\footnotesize\@viipt{9.5pt}%
2064   \abovedisplayskip 6\p@ \@plus2\p@ \@minus4\p@
2065   \belowdisplayskip \abovedisplayskip
2066   \abovedisplayshortskip \z@ \@plus\p@
2067   \belowdisplayshortskip 3\p@ \@plus\p@ \@minus2\p@
2068   \def\@listi{%
2069     \leftmargin\leftmargini
2070     \topsep 3\p@ \@plus\p@ \@minus\p@
2071     \parsep 2\p@ \@plus\p@ \@minus\p@
2072     \itemsep \parsep
2073   }%
2074 }%

2075 \def\scriptsize{%
2076   \@setfontsize\scriptsize\@viipt\@viipt
2077 }%
2078 \def\tiny{%
2079   \@setfontsize\tiny\@vpt\@vpt
2080 }%
2081 \def\large{%
2082   \@setfontsize\large\@xiipt{14pt}%
2083 }%
2084 \def\Large{%
2085   \@setfontsize\Large\@xivpt{18pt}%
2086 }%
2087 \def\LARGE{%
2088   \@setfontsize\LARGE\@xviipt{22pt}%
2089 }%
2090 \def\huge{%
2091   \@setfontsize\huge\@xxpt{25pt}%
2092 }%
2093 \def\Huge{%
2094   \@setfontsize\Huge\@xxvpt{30pt}%
2095 }%

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.
2096 \appdef\setup@hook{%

```

```

2097 \twoside@sw{%
2098 % \oddsidemargin -.1in
2099 % \evensidemargin -.4in
2100 \oddsidemargin -20pt
2101 \evensidemargin -20pt
2102 \marginparwidth 107pt
2103 }{%
2104 \oddsidemargin -.25in
2105 \evensidemargin -.25in
2106 \marginparwidth 30pt
2107 }%
2108 }%

2109 \marginparsep 6pt

2110 \topmargin -61pt

2111 \headheight 25pt
2112 \headsep 16pt

2113 \topskip 10pt

2114 \footskip 30pt

2115 \textheight = 56pc

2116 \textwidth42.5pc

2117 \columnsep 1.5pc
2118 \columnseprule 0pt

2119 \footnotesep 1pt
2120 \skip\footins 39pt plus 4pt minus 2pt
2121 \def\footnoterule{\kern-19pt\hrule width.5in\kern18.6pt\relax}%

2122 \floatsep 12pt plus 2pt minus 2pt
2123 \textfloatsep 20pt plus 2pt minus 4pt
2124 \intextsep 12pt plus 2pt minus 2pt

2125 \dblfloatsep 12pt plus 2pt minus 2pt
2126 \dbltextfloatsep 20pt plus 2pt minus 4pt

2127 \@fptop 0pt plus 1fil
2128 \@fpsep 8pt plus 2fil
2129 \@fpbot 0pt plus 1fil
2130 \@dblftop 0pt plus 1fil
2131 \@dblfpsep 8pt plus 2fil
2132 \@dblfpbot 0pt plus 1fil

2133 \marginparpush 5pt

2134 \parskip 0pt plus 1pt
2135 \parindent 10pt
2136 \emergencystretch8\p@

2137 \partopsep 2pt plus 1pt minus 1pt

```

```

2138 \leftmargini 25pt
2139 \leftmarginii 22pt
2140 \leftmarginiii 18.7pt
2141 \leftmarginiv 17pt
2142 \leftmarginv 10pt
2143 \leftmarginvi 10pt

2144 \def\@listI{%
2145   \leftmargin\leftmargini
2146   \parsep 4\p@ plus2\p@ minus\p@
2147   \topsep 8\p@ plus2\p@ minus4\p@
2148   \itemsep 4\p@ plus2\p@ minus\p@
2149 }%

2150 \labelsep 4pt

2151 \def\@listii{%
2152   \leftmargin\leftmarginii
2153   \labelwidth\leftmarginii
2154   \advance\labelwidth-\labelsep
2155   \topsep 4\p@ plus2\p@ minus\p@
2156   \parsep 2\p@ plus\p@ minus\p@
2157   \itemsep \parsep
2158 }%

2159 \def\@listiii{%
2160   \leftmargin\leftmarginiii
2161   \labelwidth\leftmarginiii
2162   \advance\labelwidth-\labelsep
2163   \topsep 2\p@ plus\p@ minus\p@
2164   \parsep \z@
2165   \partopsep \p@ plus\z@ minus\p@
2166   \itemsep \topsep
2167 }%

2168 \def\@listiv{%
2169   \leftmargin\leftmarginiv
2170   \labelwidth\leftmarginiv
2171   \advance\labelwidth-\labelsep
2172 }%

2173 \def\@listv{%
2174   \leftmargin\leftmarginv
2175   \labelwidth\leftmarginv
2176   \advance\labelwidth-\labelsep
2177 }%

2178 \def\@listvi{%
2179   \leftmargin\leftmarginvi
2180   \labelwidth\leftmarginvi
2181   \advance\labelwidth-\labelsep
2182 }%

2183 %</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.

```
2184 %<*11pt>
```

27.1 Defend Against Forseeable Errors

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

```
2185 \ifx\undefined\substyle@ext
2186 \def\@tempa{%
2187 \endinput
2188 \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
2189 }%
2190 \expandafter\else
2191 \def\@tempa{%
2192 \expandafter\fi\@tempa
2193 \class@info{RevTeX pointsize 11pt selected}%
2194 \def\normalsize{%
2195 \setfontsize\normalsize\@xipt{13.6}%
2196 \abovedisplayskip 11\p@ \@plus3\p@ \@minus6\p@
2197 \belowdisplayskip \abovedisplayskip
2198 \abovedisplayshortskip \abovedisplayskip
2199 \belowdisplayshortskip \abovedisplayskip
2200 \let\@listi\@listI
2201 }%
2202 \def\small{%
2203 \setfontsize\small\@xpt\@xiipt
2204 \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2205 \abovedisplayshortskip \z@ \@plus3\p@
2206 \belowdisplayshortskip 6\p@ \@plus3\p@ \@minus3\p@
2207 \def\@listi{\leftmargin\leftmarginI
2208 \topsep 6\p@ \@plus2\p@ \@minus2\p@
2209 \parsep 3\p@ \@plus2\p@ \@minus\p@
2210 \itemsep \parsep
2211 }%
2212 \belowdisplayskip \abovedisplayskip
2213 }%
2214 \def\footnotesize{%
2215 \setfontsize\footnotesize\@ixpt{11}%
2216 \abovedisplayskip 8\p@ \@plus2\p@ \@minus4\p@
2217 \abovedisplayshortskip \z@ \@plus\p@
2218 \belowdisplayshortskip 4\p@ \@plus2\p@ \@minus2\p@
2219 \def\@listi{\leftmargin\leftmarginI
2220 \topsep 4\p@ \@plus2\p@ \@minus2\p@
2221 \parsep 2\p@ \@plus\p@ \@minus\p@
2222 \itemsep \parsep
2223 }%
```

```

2224 \belowdisplayskip \abovedisplayskip
2225 }%

2226 \def\scriptsize{%
2227 \setfontsize\scriptsize\@viiipt{9.5}%
2228 }%
2229 \def\tiny{%
2230 \setfontsize\tiny\@vipt\@viipt
2231 }%
2232 \def\large{%
2233 \setfontsize\large\@xiipt{14}%
2234 }%
2235 \def\Large{%
2236 \setfontsize\Large\@xivpt{18}%
2237 }%
2238 \def\LARGE{%
2239 \setfontsize\LARGE\@xxiipt{22}%
2240 }%
2241 \def\huge{%
2242 \setfontsize\huge\@xxpt{25pt}%
2243 }%
2244 \def\Huge{%
2245 \setfontsize\Huge\@xxvpt{30pt}%
2246 }%
2247 %</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.

```
2248 %<*12pt>
```

28.1 Defend Against Forseeable Errors

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

```

2249 \ifx\undefined\substyle@ext
2250 \def\@tempa{%
2251 \endinput
2252 \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
2253 }%
2254 \expandafter\else
2255 \def\@tempa{%
2256 \expandafter\fi\@tempa
2257 \class@info{RevTeX pointsize 12pt selected}%
2258 \def\normalsize{%
2259 \setfontsize\normalsize\@xiipt{14pt}%
2260 \abovedisplayskip 12\p@ \@plus3\p@ \@minus7\p@

```

```

2261 \belowdisplayskip \abovedisplayskip
2262 \abovedisplayshortskip \z@ plus3\p@
2263 \belowdisplayshortskip 6.5\p@ \@plus3.5\p@ \@minus3\p@
2264 \let\@listi\@listI
2265 }%

2266 \def\small{%
2267 \setfontsize\small\@xipt{14.5pt}%
2268 \abovedisplayskip 8\p@ \@plus3\p@ \@minus6\p@
2269 \belowdisplayskip \abovedisplayskip
2270 \abovedisplayshortskip \z@ \@plus3\p@
2271 \belowdisplayshortskip 6.5\p@ \@plus3.5\p@ \@minus3\p@
2272 \def\@listi{%
2273 \leftmargin\leftmarginI
2274 \topsep 9\p@ \@plus3\p@ \@minus5\p@
2275 \parsep 4.5\p@ \@plus2\p@ \@minus\p@
2276 \itemsep \parsep
2277 }%
2278 }%

Same baselineskip as \small ?

2279 \def\footnotesize{%
2280 \setfontsize\footnotesize\@xpt{14.5pt}%
2281 \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2282 \belowdisplayskip \abovedisplayskip
2283 \abovedisplayshortskip \z@ \@plus3\p@
2284 \belowdisplayshortskip 6\p@ \@plus3\p@ \@minus3\p@
2285 \def\@listi{%
2286 \leftmargin\leftmarginI
2287 \topsep 6\p@ \@plus2\p@ \@minus2\p@
2288 \parsep 3\p@ \@plus2\p@ \@minus\p@
2289 \itemsep \parsep
2290 }%
2291 }%

2292 \def\scriptsize{%
2293 \setfontsize\scriptsize\@viiipt{9.5pt}%
2294 }%

2295 \def\tiny{%
2296 \setfont\tiny\@viipt{7pt}%
2297 }%

2298 \def\large{%
2299 \setfontsize\large\@xivpt{18pt}%
2300 }%

2301 \def\Large{%
2302 \setfontsize\Large\@xxviipt{22pt}%
2303 }%

2304 \def\LARGE{%
2305 \setfontsize\LARGE\@xxxpt{25pt}%
2306 }%

2307 \def\huge{%

```

```

2308 \setfontsize\huge\@xxvpt{30pt}%
2309 }%
2310 \let\Huge=\huge
2311 %</12pt>

```

29 Page parameters

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

```

2312 %<*11pt|12pt>
2313 \appdef\setup@hook{%
2314 \twoside@sw{%
2315 \oddsidemargin Opt
2316 \evensidemargin Opt
2317 \marginparwidth 60pt
2318 }{%
2319 \oddsidemargin Opt
2320 \evensidemargin Opt
2321 \marginparwidth 44pt
2322 }%
2323 }%

2324 \marginparsep 10pt

2325 \topmargin -37pt

2326 \headheight 12pt
2327 \headsep 25pt

2328 \topskip 10pt

2329 \footskip 30pt

2330 \textheight=665.5\p@

2331 \appdef\setup@hook{%
2332 \tightenlines@sw{%
2333 \def\baselinestretch{1}%
2334 }{%
2335 \def\baselinestretch{1.5}%
2336 }%
2337 }%

2338 \textwidth 468pt

2339 \columnsep 10pt
2340 \columnseprule Opt

2341 \footnoteseq 1pt
2342 \skip\footins 25.25pt plus 4pt minus 2pt
2343 \def\footnoterule{\kern-5.25pt\hrule width.5in\kern4.85pt\relax}

2344 \floatsep 14pt plus 2pt minus 4pt
2345 \textfloatsep 20pt plus 2pt minus 4pt
2346 \intextsep 14pt plus 4pt minus 4pt

```

```

2347 \dblfloatsep      14pt plus 2pt minus 4pt
2348 \dbltextfloatsep 20pt plus 2pt minus 4pt

2349 \@fptop 0pt plus 1fil
2350 \@fpsep 10pt plus 2fil
2351 \@fpbot 0pt plus 1fil
2352 \@dblftop 0pt plus 1fil
2353 \@dblfpsep 10pt plus 2fil%
2354 \@dblfpbot 0pt plus 1fil

2355 \marginparpush 7pt

2356 \parskip 0pt plus 1pt
2357 \parindent 15pt
2358 \emergencystretch8\p@
2359 \partopsep 3pt plus 2pt minus 2pt

2360 \leftmargini 30pt
2361 \leftmarginii 26pt
2362 \leftmarginiii 22pt
2363 \leftmarginiv 20pt
2364 \leftmarginv 12pt
2365 \leftmarginvi 12pt

2366 \def\@listI{\leftmargin\leftmargini \parsep 5\p@ plus2.5\p@ minus\p@
2367 \topsep 10\p@ plus4\p@ minus6\p@
2368 \itemsep 5\p@ plus2.5\p@ minus\p@
2369 }%

2370 \labelsep 6pt

2371 \def\@listii{\leftmargin\leftmarginii
2372 \labelwidth\leftmarginii\advance\labelwidth-\labelsep
2373 \topsep 5\p@ plus2.5\p@ minus\p@
2374 \parsep 2.5\p@ plus\p@ minus\p@
2375 \itemsep \parsep
2376 }%

2377 \def\@listiii{\leftmargin\leftmarginiii
2378 \labelwidth\leftmarginiii\advance\labelwidth-\labelsep
2379 \topsep 2.5\p@ plus\p@ minus\p@
2380 \parsep \z@ \partopsep \p@ plus\z@ minus\p@
2381 \itemsep \topsep
2382 }%

2383 \def\@listiv{\leftmargin\leftmarginiv
2384 \labelwidth\leftmarginiv\advance\labelwidth-\labelsep
2385 }%

2386 \def\@listv{\leftmargin\leftmarginv
2387 \labelwidth\leftmarginv\advance\labelwidth-\labelsep
2388 }%

2389 \def\@listvi{\leftmargin\leftmarginvi
2390 \labelwidth\leftmarginvi\advance\labelwidth-\labelsep
2391 }%

2392 %</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`.

```
2393 %<*aps>
```

30.1 Defend Against Forseeable Errors

Protect this file from being read in by anything but `REVTEX`.

```
2394 \ifx\undefined\substyle@ext  
2395 \def\@tempa{%  
2396 \endinput  
2397 \GenericWarning{I must be read in by REVTeX! (Bailing out)}%  
2398 }%  
2399 \expandafter\else  
2400 \def\@tempa{%  
2401 \expandafter\fi\@tempa  
2402 \class@info{RevTeX society APS selected}%
```

Here are the class options relating to the APS:

```
2403 \DeclareOption{pra}{\change@journal{pra}}%  
2404 \DeclareOption{prb}{\change@journal{prb}}%  
2405 \DeclareOption{prc}{\change@journal{prc}}%  
2406 \DeclareOption{prd}{\change@journal{prd}}%
```

```

2407 \DeclareOption{pre}{\change@journal{pre}}%
2408 \DeclareOption{prl}{\change@journal{prl}}%
2409 \DeclareOption{prstab}{\change@journal{prstab}}%
2410 \DeclareOption{prstper}{\change@journal{prstper}}%
2411 \DeclareOption{rmp}{\change@journal{rmp}}%

```

30.2 Abbreviations

The following macros constitute typing shortcuts for certain journal names.

```

2412 \def\ao{Appl.\ Opt.\ }%
2413 \def\ap{Appl.\ Phys.\ }%
2414 \def\apl{Appl.\ Phys.\ Lett.\ }%
2415 \def\apj{Astrophys.\ J.\ }%
2416 \def\bell{Bell Syst.\ Tech.\ J.\ }%
2417 \def\jqe{IEEE J.\ Quantum Electron.\ }%
2418 \def\assp{IEEE Trans.\ Acoust.\ Speech Signal Process.\ }%
2419 \def\aprop{IEEE Trans.\ Antennas Propag.\ }%
2420 \def\mtt{IEEE Trans.\ Microwave Theory Tech.\ }%
2421 \def\iovs{Invest.\ Ophthalmol.\ Vis.\ Sci.\ }%
2422 \def\jcp{J.\ Chem.\ Phys.\ }%
2423 \def\jmo{J.\ Mod.\ Opt.\ }%
2424 \def\josa{J.\ Opt.\ Soc.\ Am.\ }%
2425 \def\josaa{J.\ Opt.\ Soc.\ Am.\ A }%
2426 \def\josab{J.\ Opt.\ Soc.\ Am.\ B }%
2427 \def\jpp{J.\ Phys.\ (Paris) }%
2428 \def\nat{Nature (London) }%
2429 \def\oc{Opt.\ Commun.\ }%
2430 \def\ol{Opt.\ Lett.\ }%
2431 \def\pl{Phys.\ Lett.\ }%
2432 \def\pra{Phys.\ Rev.\ A }%
2433 \def\prb{Phys.\ Rev.\ B }%
2434 \def\prc{Phys.\ Rev.\ C }%
2435 \def\prd{Phys.\ Rev.\ D }%
2436 \def\pre{Phys.\ Rev.\ E }%
2437 \def\prl{Phys.\ Rev.\ Lett.\ }%
2438 \def\rmp{Rev.\ Mod.\ Phys.\ }%
2439 \def\pspie{Proc.\ Soc.\ Photo-Opt.\ Instrum.\ Eng.\ }%
2440 \def\sjqe{Sov.\ J.\ Quantum Electron.\ }%
2441 \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. e_TE_X 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_EX 2_ε (`revtex4-1.dtxlatex.ltx`).

```

2442 \def\@fnsymbol#1{%
2443 \ensuremath{%
2444 \ifcase#1\or
2445   *\or
2446   \dagger\or
2447   \ddagger\or
2448   \mathsection\or
2449   \mathparagraph\or
2450 % \|\or
2451   **\or
2452   \dagger\dagger\or
2453   \ddagger\ddagger\else
2454   \mathsection\mathsection\or
2455   \mathparagraph\mathparagraph\or
2456   ***\or
2457   \dagger\dagger\dagger\or
2458   \ddagger\ddagger\ddagger\else
2459   \mathsection\mathsection\mathsection\or
2460   \mathparagraph\mathparagraph\mathparagraph\or
2461 %
2462   \@ctrerr
2463   \fi
2464 }%
2465 }%
2466 \appdef\document@inithook{%
2467 \@ifxundefined\TextOrMath{%
2468   \DeclareRobustCommand\TextOrMath{\@ifmmode{\false@sw}{\true@sw}}%
2469 }{}%
2470 }%
2471 \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 `\c1o@...` procedures defined in REV_TE_X.

```

2472 \c1o@groupedaddress

```

`\titlepage`

```

2473 \renewenvironment{titlepage}{%
2474   \let\wastwocol@sw\twocolumn@sw

```

```

2475 \onecolumngrid
2476 \newpage
2477 \thispagestyle{titlepage}%
2478 \c@page\z@
    A comment: "article.cls sets this to one not zero?"
2479 }{%
2480 \wastwocol@sw{\twocolumngrid}{\newpage}%
2481 }%

```

`\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.

```

2482 \def\frontmatter@abstractheading{%
2483 \preprintsty@sw{%
2484 \begingroup
2485 \centering\large
2486 \abstractname
2487 \par
2488 \endgroup
2489 }{%
2490 }%

```

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

```

2491 \def\frontmatter@abstractwidth{400\p@}%

```

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

```

2492 \def\frontmatter@abstractfont{%
2493 \small
2494 \parindent1em\relax
2495 \adjust@abstractwidth
2496 }%
2497 \def\adjust@abstractwidth{%
2498 \dimen@\textwidth\advance\dimen@-\frontmatter@abstractwidth
2499 \divide\dimen@\tw@
2500 \galley@sw{%
2501 \advance\rightskip\tw@\dimen@
2502 }{%
2503 \advance\leftskip\dimen@
2504 \advance\rightskip\dimen@
2505 }%
2506 \@totalleftmargin\leftskip
2507 }%

```

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`.

```

2508 \@booleanfalse\preprintsty@sw
2509 \@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.

```

2510 \appdef\setup@hook{%
2511   \preprintsty@sw{%
2512     \ps@preprint
2513     \def\frontmatter@abstractwidth{\textwidth}%
2514     \def\frontmatter@affiliationfont{\it}%
2515     \let\section\section@preprintsty
2516 %   \let\hangfrom@section\hangfrom@section@preprintsty
2517     \let\subsection\subsection@preprintsty
2518     \let\subsubsection\subsubsection@preprintsty
2519   }{%
2520     \ps@article
2521   }%
2522 }%
```

`\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.

```

2523 \def\frontmatter@authorformat{%
2524   \skip@\@flushglue
2525   \@flushglue\z@ plus.3\hsize\relax
2526   \centering
2527   \advance\baselineskip\p@
2528   \parskip11.5\p@\relax
2529   \@flushglue\skip@
2530 %\preprintsty@sw{}-%
2531 % \addvspace{0\p@}%
2532 }%
2533 }%
```

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

```

2534 \def\frontmatter@above@affilgroup{%
2535 %\preprintsty@sw{}-%
2536 % \addvspace{11\p@}%
2537 }%
2538 }%
```

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

```

2539 \def\frontmatter@above@affiliation@script{%
2540   \skip@\@flushglue
```

```

2541 \@flushglue\z@ plus.3\hsize\relax
2542 \centering
2543 \@flushglue\skip@
2544 \addvspace{3.5\p@}%
2545 }%
2546 \def\frontmatter@above@affiliation{%
2547 \preprintsty@sw{ }%
2548 % \addvspace{12\p@}%
2549 }%
2550 }%

```

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

```

2551 \def\frontmatter@affiliationfont{%
2552 \small\it
2553 }%

```

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

```

2554 \def\frontmatter@collaboration@above{%
2555 \preprintsty@sw{%
2556 }{%
2557 \parskip1.5\p@\relax
2558 }%
2559 }%

```

`\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.

```

2560 \def\frontmatter@setup{%
2561 \normalfont
2562 }%

```

`\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 2563 \def\frontmatter@title@above{\addvspace{6\p@}}%
2564 \def\frontmatter@title@format{\large\bfseries\centering\parskip\z@skip}%
2565 \def\frontmatter@title@below{}%

```

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

```

2566 \def\@author@parskip{3\p@}%
2567 \def\frontmatter@makefnmark{%
2568 \@textsuperscript{%
2569 \normalfont\@thefnmark
2570 }%
2571 }%
2572 \def\frontmatter@authorbelow{%
2573 \addvspace{3\p@}%
2574 }%

```

`\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.

```
2575 \def\frontmatter@RRAP@format{%
2576   \small
2577   \centering
2578   % \preprintsty@sw{\parskip.5ex\relax}%
2579   \everypar{\hbox\bgroup(\@gobble@leavemode@uppercase}%
2580   \def\par{\@ifvmode{\unskip}\egroup\@par}}%
2581 }%
2582 \def\punct@RRAP{;\egroup\ \hbox\bgroup}%
2583 \def\@gobble@leavemode@uppercase#1#2{\expandafter\MakeTextUppercase}%
```

\frontmatter@PACS@format

```
2584 \def\frontmatter@PACS@format{%
2585   \addvspace{11\p@}%
2586   \footnotesize
2587   \adjust@abstractwidth
2588   \parindent\z@
2589   \parskip\z@skip
2590   \samepage
2591 }%
```

\frontmatter@keys@format

```
2592 \def\frontmatter@keys@format{%
2593   \footnotesize
2594   \adjust@abstractwidth
2595   \parindent\z@
2596   \samepage
2597 }%
```

\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.

```
2598 \def\ps@titlepage{%
2599   \def\@oddhead{%
2600     \hfill
2601     \preprint@sw%
2602     \expandafter\produce@preprints\expandafter{\@preprint}%
2603   }{}%
2604 }%
2605 \let\@evenhead\@oddhead
2606 \def\@oddfoot{%
2607   \hb@xt@\z@{\byrevtex\hss}%
2608   \hfil
2609   \preprintsty@sw{\thepage}}{}%
2610   \quad\checkindate
2611   \hfil
2612 }%
2613 \let\@evenfoot\@oddfoot
2614 }%
2615 \def\byrevtex{\byrevtex@sw{Typeset by REV\TeX}}{}%
```

`\produce@preprints`

```
2616 \def\produce@preprints#1{%
2617 \vtop to \z@{%
2618 \def\baselinestretch{1}%
2619 \small
2620 \let\preprint\preprint@count
2621 \count@\z@
2622 #1%
2623 \@ifnum{\count@>\tw@}{%
2624 \hbox{%
2625 \let\preprint\preprint@hlist
2626 #1%
2627 \setbox\z@\lastbox
2628 }%
2629 }{%
2630 \let\preprint\preprint@cr
2631 \halign{\hfil##\cr#1\cr}%
2632 \par
2633 \vss
2634 }%
2635 }%
2636 }%
2637 \def\preprint@cr#1{#1\cr}%
2638 \def\preprint@count#1{\advance\count@\@ne}%
2639 \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.

```
2640 \def\@seccntformat#1{\csname the#1\endcsname.\quad}%
2641 \def\@hangfrom#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.

```
2642 \def\section{%
2643 \@startsection
2644 {section}%
2645 {1}%
2646 {\z@}%
2647 {0.8cm \@plus1ex \@minus .2ex}%
2648 {0.5cm}%
2649 {%
2650 \normalfont\small\bfseries
```



```

2651     \centering
2652   }%
2653 }%
2654 \def\hangfrom@section#1#2#3{\@hangfrom{#1#2}\MakeTextUppercase{#3}}%
2655 \def\hangfroms@section#1#2{#1\MakeTextUppercase{#2}}%

2656 \def\subsection{%
2657   \@startsection
2658     {subsection}%
2659     {2}%
2660     {\z@}%
2661     {.8cm \@plus1ex \@minus .2ex}%
2662     {.5cm}%
2663     {}%
2664     \normalfont\small\bfseries
2665     \centering
2666   }%
2667 }%

2668 \def\subsubsection{%
2669   \@startsection
2670     {subsubsection}%
2671     {3}%
2672     {\z@}%
2673     {.8cm \@plus1ex \@minus .2ex}%
2674     {.5cm}%
2675     {}%
2676     \normalfont\small\itshape
2677     \centering
2678   }%
2679 }%

```

30.3.3 Runin Heads

```

2680 \def\paragraph{%
2681   \@startsection
2682     {paragraph}%
2683     {4}%
2684     {\parindent}%
2685     {\z@}%
2686     {-1em}%
2687     {\normalfont\normalsize\itshape}%
2688 }%

2689 \def\subparagraph{%
2690   \@startsection
2691     {subparagraph}%
2692     {5}%
2693     {\parindent}%
2694     {3.25ex \@plus1ex \@minus .2ex}%
2695     {-1em}%
2696     {\normalfont\normalsize\bfseries}%

```

2697 }%

`\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 2698 \def\section@preprintsty{%
2699   \@startsection
2700     {section}%
2701     {1}%
2702     {\z@}%
2703     {0.8cm \@plus1ex \@minus .2ex}%
2704     {0.5cm}%
2705     {%
2706       \normalfont\small\bfseries
2707 %     \centering
2708     }%
2709 }%
2710 %\def\@hangfrom@section@preprintsty#1#2#3{\@hangfrom{#1#2}\MakeTextUppercase{#3}}%
2711 \def\subsection@preprintsty{%
2712   \@startsection
2713     {subsection}%
2714     {2}%
2715     {\z@}%
2716     {.8cm \@plus1ex \@minus .2ex}%
2717     {.5cm}%
2718     {%
2719       \normalfont\small\bfseries
2720 %     \centering
2721     }%
2722 }%
2723 \def\subsubsection@preprintsty{%
2724   \@startsection
2725     {subsubsection}%
2726     {3}%
2727     {\z@}%
2728     {.8cm \@plus1ex \@minus .2ex}%
2729     {.5cm}%
2730     {%
2731       \normalfont\small\itshape
2732 %     \centering
2733     }%
2734 }%
```

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.

```
2735 \def\@pnumwidth{1.55em}%
2736 \def\@tocrmarg {2.55em}%
2737 \def\@dotsep{2}%
2738 \def\ltxu@dotsep{4.5pt}%
2739 \setcounter{tocdepth}{3}%

2740 \def\tableofcontents{%
2741 \addtocontents{toc}{\string\tocdepth@munge}%
2742 \print@toc{toc}%
2743 \addtocontents{toc}{\string\tocdepth@restore}%
2744 }%

2745 \def\tocdepth@munge{%
2746 \let\l@section@saved\l@section
2747 \let\l@section\@gobble@tw@
2748 }%
2749 \def\@gobble@tw@#1#2{%

2750 \def\tocdepth@restore{%
2751 \let\l@section\l@section@saved
2752 }%
```

The following definition of `\l@part` is a variant on the definition of `\l@sections` in `ltxutil.dtx`.

```
2753 \def\l@part#1#2{\addpenalty{\@secpenalty}%
2754 \begingroup
2755 \set@tocdim@pagenum\@tempboxa{#2}%
2756 % \@tempdima 3em %
2757 \parindent \z@
2758 \rightskip\tocleft@pagenum plus 1fil\relax
2759 \skip@\parfillskip\parfillskip\z@
2760 \addvspace{2.25em plus\p@}%
2761 \large \bf %
2762 \leavevmode\ignorespaces#1\unskip\nobreak\hskip\skip@
2763 \hb@xt@\rightskip{\hfil\unhbox\@tempboxa}\hskip-\rightskip\hskip\z@skip
2764 \par
2765 \nobreak %
2766 \endgroup
2767 }%
```

`\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.

```
2768 \def\tocleft@{\z@}%
2769 \def\tocdim@min{5\p@}%
2770 \def\l@section{%
2771 \l@sections}{section}% Implicit #3#4
```

```

2772 }%
2773 \def\l@f@section{%
2774 \addpenalty{\@secpenalty}%
2775 \addvspace{1.0em plus\p}%
2776 %\bf
2777 }%
2778 \def\l@subsection{%
2779 \l@sections{section}{subsection}% Implicit #3#4
2780 }%
2781 \def\l@subsubsection{%
2782 \l@sections{subsection}{subsubsection}% Implicit #3#4
2783 }%
2784 \def\l@paragraph#1#2{%
2785 \def\l@subparagraph#1#2{%

```

Activate the auto TOC processing.

```

2786 \let\toc@pre\toc@pre@auto
2787 \let\toc@post\toc@post@auto

```

30.3.5 Default column bottom

All APS journal styles have flush bottoms.

APS journals may set with ragged bottoms.

```

2788 \@booleantrue\raggedcolumn@sw

```

30.3.6 Table alignment style

`\tableleft@skip@float` All APS publications have the same table specification: Scotch rules above and below, centered in column.

```

\tableleft@skip@float 2789 \def\tableleft@skip@float{\z@ plus\hsize}%
\array@row@pre@float 2790 \def\tabmid@skip@float{\@flushglue}%
\array@row@pst@float 2791 \def\tabright@skip@float{\z@ plus\hsize}%
2792 \def\array@row@pre@float{\hline\hline\noalign{\vskip\doublerulesep}}%
2793 \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
2794 \def\@makefntext#1{%
2795 \def\baselinestretch{1}%
2796 \leftskip1em%
2797 \parindent1em%
2798 \noindent
2799 \nobreak\hskip-\leftskip
2800 \hb@xt@\leftskip{%
2801 \hss\@makefnmark\ %
2802 }%

```

```

2803 #1%
2804 \par
2805 }%

```

30.3.8 Appendix

```

\appendix
\@hangfrom@appendix 2806 \prepdef\appendix{%
\@hangfroms@appendix 2807 \par
\@appendixcntformat 2808 \let\@hangfrom@section\@hangfrom@appendix
2809 %\let\@hangfroms@section\@hangfroms@appendix
2810 \let\@sectioncntformat\@appendixcntformat
2811 }%
2812 \def\@hangfrom@appendix#1#2#3{%
2813 #1%
2814 \@ifempty{#2}{%
2815 #3%
2816 }{%
2817 #2\@ifempty{#3}{\ #3}%
2818 }%
2819 }%
2820 \def\@hangfroms@appendix#1#2{%
2821 #1#2%
2822 }%
2823 \def\@appendixcntformat#1{\appendixname\ \csname the#1\endcsname}%

```

30.3.9 Bibliography

Customize REV_TEX for the journal substyle; this task requires three components: the BIB_TEX `apsrev.bst` and `apsrmp.bst` style files, 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_TEX when compiling the document's `.bb1` 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. ANNOTATIONS: **a: annote**—Annotations in `annote` field or in `.tex` file of citekey name
3. PRESENTATIONS: **b: pres, pres-bf**—Presentation, speaker bold face
4. ORDERING OF REFERENCES: **c: seq-no**—Citation order (unsorted, like `unsrt.bst`)

5. ORDER ON VON PART: **x: vonx**—Sort without von part (de la Maire after Mahone)
6. AUTHOR NAMES: **i: nm-init,ed-au**—Initials + surname (J. F. Smith)
7. POSITION OF JUNIOR: ***: jnr1st**—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. DATE FORMAT: ***: yr-par**—Date in parentheses as (May 1993)
15. DATE EMPTY: **-: date-nil-x**—If date is empty, then do not produce the surrounding punctuation (parens, brackets, colon, comma)
16. TITLE OF ARTICLE: **d: tit-qq**—Title and punctuation in double quotes (“Title,” ..)
17. INPROCEEDINGS CHAPTER AND PAGES, LIKE INBOOK: **-: inproceedings-chapter**—produce pages after chapter, just as in InBook
18. TITLE PRESENT IN ARTICLE, INCOLLECTION, AND INPROCEEDINGS: **x: jtitt-x**—Title is ignored
19. INPROCEEDINGS CHAPTER AND PAGES, LIKE INBOOK: **y: inproceedings-chapter**—produce pages after chapter, just as in InBook
20. ARTICLE BOOKTITLE PRESENT: **: article-booktitle**—format booktitle
21. ARTICLE SERIES PRESENT: **: article-series**—article can has series
22. JOURNAL NAME FONT: **r: jtitt-rm**—Journal name normal font
23. JOURNAL NAME WITH ADDRESS: **y: journal-address**—Include address field (in parentheses) along with journal name
24. BOOK TITLE FIELDS: **y: book-bt**—Field ‘booktitle’, or if absent field ‘title’, is book title

25. THESIS TITLE OPTIONAL: : `thesis-title-o`—Title is optional: no warning issued if empty
26. TECHNICAL REPORT TITLE: **b**: `trtit-b`—Tech. report title like books
27. TECHNICAL REPORT INSTITUTION: : `techreport-institution-par`—format tech report institution like book publisher
28. JOURNAL VOLUME: **b**: `vol-bf`—Volume bold as `vol(num)`
29. JOURNAL VOL AND NUMBER: **x**: `vnum-x`—Journal vol, without number as 34
30. VOLUME PUNCTUATION: **c**: `volp-com`—Volume with comma as `vol(num),`
PPP
31. PAGE NUMBERS: **f**: `jpg-1`—Only start page number
32. BOOK EDITOR W/O AUTHOR: : `book-editor-booktitle`—Book permits empty author, produces title before editor in this case
33. INBOOK PERMITS TITLE, BOOKTITLE, AUTHOR, EDITOR: **a**: `inbook-editor-booktitle`—Allow using both title/booktitle, both author/editor
34. CONFERENCE ADDRESS FOR BOOK, INBOOK, INCOLLECTION, IN-PROCEEDINGS, PROCEEDINGS: **a**: `bookaddress`—Italic booktitle followed by bookaddress in roman
35. NUMBER AND SERIES FOR BOOK, INBOOK, INCOLLECTION, IN-PROCEEDINGS, PROCEEDINGS: *****: `num-xser`—Allows number without series and suppresses word "number"
36. WORD NUMBER CAPITALIZED FOR NUMBER AND SERIES: **c**: `number-cap`—Capitalize word 'number' as: "Number 123"
37. WORD CHAPTER CAPITALIZED: **c**: `chapter-cap`—Capitalize word 'chapter' as: 'Chapter 42'
38. COMBINING NUMBER AND SERIES: **x**: `series-number`—Series number as: 'Springer Lecture Notes No. 125'
39. POSITION OF NUMBER AND SERIES: **b**: `numser-booktitle`—After book title and conference address, and before editors
40. VOLUME AND SERIES FOR BOOKS/COLLECTIONS: **s**: `ser-vol`—Series, vol. 23
41. VOLUME AND SERIES FORMATTING: **y**: `ser-rm`—format series roman, even when used with volume
42. WORD VOLUME CAPITALIZED FOR VOLUME AND SERIES: **y**: `volume-cap`—Capitalize word 'volume', as: 'Volume 7 in Lecture Series'

43. POSITION OF VOLUME AND SERIES FOR INCOLLECTION, INBOOK, AND INPROCEEDINGS: **e: ser-ed**—Series and volume after booktitle and before editors
44. JOURNAL NAME PUNCTUATION: **x: jnm-x**—Space after journal name
45. PAGES IN BOOK: ***: pg-bk,book-chapter-pages**—As chapter and page: chapter 42, page 345
46. PUBLISHER IN PARENTHESES: **d: pub-date**—Publisher with address and date in parentheses (Oxford, 1994)
47. EMPTY PUBLISHER PARENTHESES: **y: ay-empty-pub-parens-x**—eliminate parentheses altogether if nothing inside
48. PUBLISHER POSITION: **: pre-pub**—Publisher before volume, chapter, pages
49. **: : pre-edn**—Edition before publisher
50. **: p: pre-pub,pre-edn**—Edition, publisher, volume, chapter, pages
51. ISBN NUMBER: ***: isbn**—Include ISBN for books, booklets, etc.
52. ISSN NUMBER: ***: issn**—Include ISSN for periodicals
53. DOI NUMBER: **a: doi-link,doi**—Doi forms a link to the publication, anchored to the volume or title
54. EDITOR IN COLLECTIONS: **b: edby**—In booktitle, edited by .. (where .. is names)
55. PUNCTUATION BETWEEN SECTIONS (BLOCKS): **c: blk-com**—Comma between blocks
56. FINAL PUNCTUATION: **c: fin-endbibitem**—Command at end instead of period
57. ABBREVIATE WORD ‘PAGES’: **a: pp**—‘Page’ abbreviated as p. or pp.
58. ABBREVIATE WORD ‘EDITORS’: **a: ed**—‘Editor’ abbreviated as ed. or eds.
59. OTHER ABBREVIATIONS: **a: abr**—Abbreviations of such words
60. ABBREVIATION FOR ‘EDITION’: **a: ednx**—‘Edition’ abbreviated as ‘ed’
61. EDITION NUMBERS: **n: ord**—Numerical editions as 1st, 2nd, 3rd, etc
62. STORED JOURNAL NAMES: **a: jabr**—Abbreviated journal names
63. FONT OF ‘ET AL’: **i: etal-it**—Italic et al

64. ADDITIONAL REVTeX DATA FIELDS: **r: revdata,eprint,url,url-blk,translation**—Include REVTeX data fields collaboration, eid, eprint, archive, url, translation
65. SLACcitation FIELD: : **SLACcitation**—Produce SLACcitation field
66. NUMPAGES DATA FIELD: *: **numpages-x**—Do not include numpages field
67. URL ADDRESS: *: **url,url-prefix-x**—URL without prefix (default: 'URL')
68. REFERENCE COMPONENT TAGS: **b: bibinfo**—Reference component tags like `\bibinfo` in the content of `\bibitem`
69. ELEMENT TAGS: **b: bibfield**—Element tags like `\bibfield` in the content of `\bibitem`
70. 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 2009-10-08 ***
%\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{%
% lang,%: Use language field to switch hyphenation patterns for title
% annote,%: Annotations in annote field or in .tex file of citekey name
% pres,pres-bf,%: Presentation, speaker bold face
% seq-no,%: Citation order (unsorted, like unsrt.bst)
% vonx,%: Sort without von part (de la Maire after Mahone)
% nm-init,ed-au,%: Initials + surname (J. F. Smith)
% jurlst,%: Junior comes last as Smith, John, Jr.
% nmft,nmft-def,%: User defined author font (\bibnamefont)
% fnm-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
% yr-par,%: Date in parentheses as (May 1993)
% 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-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-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
% 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
%
```

Note that `apsrevlong.dbj` is the same as `apsrev.dbj`, except:

- Remove `jtitt-x, jpg-1`. This means article titles and full page range.
- Add `article-title-o`: article title is not required.
- Remove `nm-init`. This means full names.
- The file to be `\generated` is `revtex4-1.dtxapsrev4-1long.bst` instead of `revtex4-1.dtxapsrev4-1.bst`.

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)
- `yr-par`— Date in parentheses as (May 1993)
- `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`— Publisher before volume, chapter, pages
- `pre-pub,pre-edn`— Edition, publisher, volume, chapter, pages
- `url,url-prefix-x`— URL without prefix (default: 'URL ')

To get a banner in the `.blg` file, patch by hand into `apsrev.bst`:

```

% FUNCTION {banner.log} {"REVTeX-compatible apsrev.bst 9812" warning$}
%

and invoke banner.log from within begin.bib
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.
2824 \@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.
2825 \appdef\setup@hook{%
2826 \bibpunct{[]-[]}{,}{n}{,}{,}%
2827 }%

\pre@bibdata Set up to write endnotes to a .bib file; its data will be incorporated into the
bibliography.
2828 \def\pre@bibdata{\jobname\bibdata@app}%

\bibsection We define the sectioning command to use when starting the bibliography.
2829 \appdef\setup@hook{%
2830 \def\bibsection{%
2831 \par
2832 \onecolumngrid@push
2833 \begin@group
2834 \baselineskip26\p@
2835 \bib@device{\textwidth}{245.5\p@}%
2836 \end@group
2837 \nobreak\@nobreaktrue
2838 \addvspace{19\p@}%
2839 \par
2840 \onecolumngrid@pop
2841 }%
2842 }%

\bib@device We define the sectioning command to use when starting the bibliography.
\bibpreamble 2843 \def\bib@device#1#2{%
\bibsep 2844 \hb@xt@#2@{%
\newblock 2845 \hb@xt@#1{%
2846 \hfil

```

```

2847 \phantomsection
2848 \addcontentsline {toc}{section}{\protect\numberline{}\refname}%
2849 % \hyper@anchorstart {\@currentHref }%
2850 \hb@xt@#2{%
2851 \skip@z@\@plus-1fil\relax
2852 \leaders\hrule height.25 \p@ depth.25 \p@ \hskipz@\@plus1fil
2853 \hskip\skip@
2854 \hskipz@\@plus0.125fil\leaders\hrule height.375\p@ depth.375\p@ \hskipz@\@plus0.75fil \hs
2855 \hskip\skip@
2856 \hskipz@\@plus0.25 fil\leaders\hrule height.5 \p@ depth.5 \p@ \hskipz@\@plus0.5 fil \hs
2857 \hskip\skip@
2858 \hskipz@\@plus0.375fil\leaders\hrule height.625\p@ depth.625\p@ \hskipz@\@plus0.25fil \hs
2859 % \hskip\skip@
2860 % \hfil
2861 }%
2862 % \hyper@anchorend
2863 \hfil
2864 }%
2865 \hss
2866 }%
2867 }%
2868 \appdef\setup@hook{%
2869 \let\bibpreamble\@empty
2870 \bibsepz@\relax
2871 \def\newblock{\ }%
2872 }%

```

`\bibfont` We define the font switch that applies to the body of the bibliography.

```

2873 \appdef\setup@hook{%
2874 \def\bibfont{%
2875 \small
2876 \@clubpenalty\clubpenalty
2877 }%
2878 }%

```

30.3.11 Index

FIXME: the following call to `\twocolumn` appears wrong if we were in two-column grid.

```

2879 \newenvironment{theindex}{%
2880 \columnseprule \z@
2881 \columnsep 35\p@
2882 \c@secnumdepth-\maxdimen
2883 \onecolumngrid@push
2884 \section{\indexname}%
2885 \thispagestyle{plain}%
2886 \parindent\z@
2887 \parskipz@ plus.3\p@\relax
2888 \let\item\@idxitem

```

```

2889 \onecolumngrid@pop
2890 }{%
2891 %\onecolumngrid@pop
2892 }%
2893 %
2894 \def\@idxitem{\par\hangindent 40\p@}%
2895 %
2896 \def\subitem{\par\hangindent 40\p@ \hspace*{20\p@}}%
2897 %
2898 \def\subsubitem{\par\hangindent 40\p@ \hspace*{30\p@}}%
2899 %
2900 \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.

```

2901 \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.

```

2902 \def\@pointsize@default{10}%

```

Note: the convention in REV_TE_X 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.

```

2903 \def\rtx@apspra{%
2904 \class@info{APS journal PRA selected}%
2905 }%

```

30.5.2 prb

We define a `\citealp`-like procedure that uses a numerical citation; it is for use in the PRB journal.

```
2906 \def\rtx@apsprb{%
2907 \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.

```
2908 \let\frontmatter@footnote@produce\frontmatter@footnote@produce@endnote
2909 \appdef\setup@hook{%
2910 \bibpunct{}{}{,}{s}{}{\textsuperscript{,}}%
2911 \let\onlinecite\rev@citealpnun
2912 }%
```

`\pre@bibdata` Set up to write endnotes to a .bib file; its data will be incorporated into the `\@endnotetext` bibliography.

```
2913 \def\pre@bibdata{\jobname\bibdata@app}%
```

Invoke `superbib` option. If the document makes a selection of its own, it will override this assignment.

```
2914 \let\place@bibnumber\place@bibnumber@sup
      End of prb code.
2915 }%
```

30.5.3 prc

There is no code specific to `prc`.

```
2916 \def\rtx@apsprc{%
2917 \class@info{APS journal PRC selected}%
2918 }%
```

30.5.4 prd

There is no code specific to `prd`.

```
2919 \def\rtx@apsprd{%
2920 \class@info{APS journal PRD selected}%
2921 }%
```

30.5.5 pre

There is no code specific to `pre`.

```
2922 \def\rtx@apspre{%
2923 \class@info{APS journal PRE selected}%
2924 }%
```

30.5.6 prl

```
2925 \def\rtx@apsprl{%
2926 \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

```
2927 \let\frontmatter@footnote@produce\frontmatter@footnote@produce@endnote
2928 \@booleanfalse\acknowledgments@sw
2929 \appdef\setup@hook{%
2930 \def\bibsection{%
2931 \par
2932 \begingroup
2933 \baselineskip26\p@
2934 \bib@device{\hsize}{72\p@}%
2935 \endgroup
2936 \nobreak\@nobreaktrue
2937 \addvspace{19\p@}%
2938 }%
2939 }%
```

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.

```
2940 \appdef\setup@hook{%
2941 \lengthcheck@sw{%
2942 \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}%
%
```

```
2943 }{}%
2944 }%
```

A PRL does not have numbered sections.

```
2945 \c@secnumdepth=-\maxdimen
```

Note: we defer this code until after type size file is read in.

```
2946 \appdef\setup@hook{%
2947 \@ifnum{\@pointsize=10\relax}{%
2948 \lengthcheck@sw{%
2949 \def\large{%
2950 \@setfontsize\large{12.5}{14\p@}%
2951 }%
2952 \def\normalsize{%
2953 \@setfontsize\normalsize{10.5}\@xiipt
```



```

2954 \abovedisplayskip 6\p@ \@plus6\p@ \@minus5\p@
2955 \belowdisplayskip \abovedisplayskip
2956 \abovedisplayshortskip \abovedisplayskip
2957 \belowdisplayshortskip \abovedisplayskip
2958 \let\@listi\@listI
2959 }%
2960 \def\small{%
2961 \setfontsize\small{9.5}\@xipt
2962 \abovedisplayskip 5\p@ \@plus5\p@ \@minus4\p@
2963 \belowdisplayskip \abovedisplayskip
2964 \abovedisplayshortskip \abovedisplayskip
2965 \belowdisplayshortskip \abovedisplayskip
2966 \let\@listi\@listI
2967 }%
2968 \DeclareMathSizes{12.5}{12.5}{9}{6}%
2969 \DeclareMathSizes{10.5}{10.5}{7.5}{5}%
2970 \DeclareMathSizes{9.5}{9.5}{7.0}{5}%
2971 }{%
2972 \def\normalsize{%
2973 \setfontsize\normalsize\@xpt\@xipt
2974 \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2975 \belowdisplayskip \abovedisplayskip
2976 \abovedisplayshortskip \abovedisplayskip
2977 \belowdisplayshortskip \abovedisplayskip
2978 \let\@listi\@listI
2979 }%
2980 }%
2981 }{%
2982 }%
2983 \textheight = 694.0\p@
End of prl code.
2984 }%

```

30.5.7 per

Here is code specific to per.

```

2985 \def\rtx@apsprstper{%
2986 \class@info{APS journal PRST-PER selected}%
To first order, PER is the same as PRB, with superscript citations.
2987 \rtx@apsprb
"Section heads are bold, centered (Roman numeral, Latin letter)"
Article titles do not have surrounding double-quotes!
End of prb code.
2988 }%

```

30.5.8 prstab

There is no code specific to prstab.

```
2989 \def\rtx@apsprstab{%
2990 \class@info{APS journal PRSTAB selected}%
2991 }%
```

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.

```
2992 \@booleantrue\footinbib@sw
```

`\place@bibnumber` We install code that will select the presentation for `\bibitems` and govern the `\bibstyle` \LaTeX processing.

```
2993 \let\place@bibnumber\place@bibnumber@inl
2994 \def\@bibstyle{apsrev\substyle@post}%
2995 \appdef\setup@hook{%
2996 \longbibliography@sw{%
2997 \appdef\@bibstyle{long}%
2998 }{%
2999 }%
```

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.

```
3000 \appdef\setup@hook{%
3001 \@ifx{\place@bibnumber\place@bibnumber@sup}{%
```

```

3002 \footinbib@sw{}-%
3003 \class@warn{Citations are superscript numbers: footnotes must be endnotes; changing to that
3004 \@booleantrue\footinbib@sw
3005 }%
3006 }{}%
3007 }%

```

Here ends the substyle for society APS.

```

3008 %</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.

```

3009 %<*rmp>

```

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

```

3010 \ifxundefined\substyle@ext
3011 \def\@tempa{%
3012 \endinput
3013 \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
3014 }%
3015 \expandafter\else
3016 \def\@tempa{%
3017 \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.

```

3018 \@ifxundefined\@journal{%

```

One alternative: abort the document. Another alternative: try to recover: force load the `aps` society file

```

3019 \class@warn{Please specify the REVTeX options [aps,rmp]!}%
3020 \@@end
3021 }{}%

```

Log the journal substyle.

```

3022 \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.

```

3023 \clo@groupedaddress

```

`\frontmatter@setup`

```
3024 \def\frontmatter@setup{%
3025 \normalfont\sffamily\raggedright
3026 }%
```

`\PACS@warn` Per Mark Doyle, RMP never displays the PACS, so they don't want the 'use showpacs' warning spit out.

```
3027 \def\PACS@warn{RMP documents do not display PACS. Your \string\pacs\space will be ignored}%
```

`\frontmatter@title@above`

```
\frontmatter@title@format 3028 \def\frontmatter@title@above{%
```

```
\frontmatter@title@below 3029 \def\frontmatter@title@format{\Large\bfseries\raggedright}% HelveticaNeue-Medium(Italic) 14pt.
```

```
3030 \def\frontmatter@title@below{\addvspace{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.

```
3031 \def\frontmatter@authorformat{%
3032 \preprintsty@sw{\vskip0.5pc\relax}{}%
3033 \@tempskipa\@flushglue
3034 \@flushglue\z@ plus.8\hspace
3035 \raggedright\advance\leftskip.5in\relax
3036 \@flushglue\@tempskipa
3037 \parskip\z@skip
3038 \@totalleftmargin\leftskip
3039 }%
```

`\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

```
3040 \def\frontmatter@affiliationfont{% Helvetica 9/10.2
3041 \small\slshape\selectfont\baselineskip10.5\p@\relax
3042 \@tempskipa\@flushglue
3043 \@flushglue\z@ plus.8\hspace
3044 \raggedright\advance\leftskip.5in\relax
3045 \@flushglue\@tempskipa
3046 \@totalleftmargin\leftskip
3047 \let\def@after@address\def@after@address@empty
3048 }%
```

```
3049 \def\frontmatter@above@affilgroup{\addvspace{7.2\p@}}% additional leading above an author
```

```
3050 \def\frontmatter@above@affiliation{\addvspace{5.3\p@}}%
```

```
3051 \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 REV_TE_X.

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.

3052 `\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.

```
3053 \def\frontmatter@RRAP@format{%
3054   \addvspace{7.3\p@}%
3055   \small
3056   \raggedright\advance\leftskip.5in\relax
3057   \@totalleftmargin\leftskip
3058 }%
3059 \def\produce@RRAP#1{%
3060   \@ifempty{#1}{}{%
3061     \@ifvmode{\leavevmode}{}%
3062     \unskip(\ignorespaces#1\unskip)\quad
3063   }%
3064 }%
```

`\frontmatter@abstractheading` Space above 21.8bp b-b.

```
3065 \def\frontmatter@abstractheading{%
3066   \preprintsty@sw%
3067   \begingroup
3068   \centering\large
3069   \abstractname
3070   \par
3071   \endgroup
3072   \vspace{.5pc}%
3073 }{}%
3074 }%
```

`\frontmatter@abstractfont` TimesTen 8.93bp/9.6bp X 360bp, indented 36bp, with 21.9/37.6bp b-b above/below

```
3075 \def\frontmatter@abstractfont{%
3076   \footnotesize
3077   \hspace{360\p@}
3078   \leftskip=0.5in
3079   \parindent\z@
3080   \@totalleftmargin\leftskip
3081 }%
```

`\frontmatter@preabstractspace` Space above and space below abstract in title block. Should be 22/36 points
`\frontmatter@postabstractspace` base-to-base.

```
3082 \def\frontmatter@preabstractspace{7.7\p@}%
3083 \def\frontmatter@postabstractspace{24.6\p@}%
```

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.

```
3084 \appdef\setup@hook{%
3085   \preprintsty@sw}{%
3086   \def\normalsize{%
3087     \@setsize\normalsize{12pt}\xpt\@xpt
3088     \abovedisplayskip 10\p@ plus2\p@ minus5\p@
3089     \belowdisplayskip \abovedisplayskip
3090     \abovedisplaysshortskip \abovedisplayskip
3091     \belowdisplaysshortskip \abovedisplayskip
3092     \let\@listi\@listI
3093   }%
3094 }%
3095 }%
```

Footnote mods:

```
3096 \footnotesep 9.25pt
3097 \skip\footins 36pt plus 4pt minus 2pt
3098 \def\footnoterule{\kern-13pt\hrule width.5in\kern15.6pt\relax}%
```

32.2 Sectioning

We override the meaning of `\secnums@rtx`. The class option `secnumarabic` will continue to work.

```
3099 \def\secnums@rtx{%
3100   \@ifundefined\thepart{%
3101     \def\thepart{\Roman{part}}}%
3102   }{%
3103   \@ifundefined\thesection{%
3104     \def\thesection {\Roman{section}}}%
3105     \def\p@section   {}%
3106   }{%
3107   \@ifundefined\thesubsection{%
3108     \def\thesubsection {\Alph{subsection}}}%
3109     \def\p@subsection {\thesection.}%
3110   }{%
3111   \@ifundefined\thesubsubsection{%
3112     \def\thesubsubsection {\arabic{subsubsection}}}%
3113     \def\p@subsubsection {\thesection.\thesubsection.}%
3114   }{%
3115   \@ifundefined\theparagraph{%
3116     \def\theparagraph {\alph{paragraph}}}%
3117     \def\p@paragraph  {\thesection.\thesubsection.\thesubsubsection.}%

```

```

3118 }{}%
3119 \ifxundefined\thesubparagraph{%
3120 \def\thesubparagraph {\arabic{subparagraph}}%
3121 \def\p@subparagraph {\thesection.\thesubsection.\thesubsubsection.\theparagraph.}%
3122 }{}%
3123 }%

```

In RMP, put a period (.), followed by ‘nut space’, after the section number. Also, hang the section number (the L^AT_EX default).

```

3124 \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.

```

3125 \def\section{%
3126 \@startsection{section}{1}{\z@}{0.8cm plus1ex minus.2ex}{0.4cm}%
3127 {%
3128 \small\sffamily\bfseries\selectfont
3129 \raggedright
3130 \parindent\z@
3131 }%
3132 }%
3133 \def\@hangfrom@section#1#2#3{\@hangfrom{#1#2}\MakeTextUppercase{#3}}%
3134 \def\@hangfroms@section#1#2{#1\MakeTextUppercase{#2}}%
3135 \def\subsection{%
3136 \@startsection{subsection}{2}{\z@}{0.8cm plus1ex minus.2ex}{0.4cm}%
3137 {%
3138 \small\sffamily\bfseries
3139 \raggedright
3140 \parindent\z@
3141 }%
3142 }%
3143 \def\subsubsection{%
3144 \@startsection{subsubsection}{3}{\z@}{.8cm plus1ex minus.2ex}{0.4cm}%
3145 {%
3146 \small\sffamily\selectfont
3147 \raggedright
3148 \parindent\z@
3149 }%
3150 }%
3151 \def\paragraph{%
3152 \@startsection{paragraph}{4}{\z@}{.8cm plus1ex minus.2ex}{-1em}%
3153 {%
3154 \small\slshape\selectfont
3155 \raggedright
3156 \parindent\z@
3157 }%

```

```

3158 }%
3159 \def\subparagraph{%
3160 \@startsection{subparagraph}{4}{\parindent}{3.25ex plus1ex minus.2ex}{-1em}%
3161 {\normalsize\bfseries\selectfont}%
3162 }%
3163 %
3164 \setcounter{tocdepth}{4}% FIXME: has no effect

```

```

\appendix
\@hangfrom@appendix 3165 \appdef\appendix{%
\@hangfrom@appendix 3166 \let\@hangfrom@section\@hangfrom@appendix
\@appendixcntformat 3167 \let\@sectioncntformat\@appendixcntformat
3168 }%
3169 \def\@hangfrom@appendix#1#2#3{%
3170 #1%
3171 \@ifempty{#2}{%
3172 #3%
3173 }{%
3174 #2\@ifempty{#3}{\ #3}%
3175 }%
3176 }%
3177 \def\@hangfrom@appendix#1#2{%
3178 #1\appendixname\@ifempty{#2}{\ #2}%
3179 }%
3180 \def\@appendixcntformat#1{\appendixname \ \csname the#1\endcsname}%

```

32.3 Figure and Table Caption Formatting

```

\@makecaption
3181 \setlength\belowcaptionskip{2\p@}
3182 \long\def\@makecaption#1#2{%
3183 \vskip\abovecaptionskip
3184 \vbox{%
3185 \flushing
3186 \small\rmfamily
3187 \noindent
3188 #1\@caption@fignum@sep#2\par
3189 }%
3190 \vskip\belowcaptionskip
3191 }%
3192 \def\@caption@fignum@sep{\nobreak\hskip.5em plus.2em\ignorespaces}%

```

32.4 Citations and Bibliography

Customize REVTeX for the journal substyle; this task requires three components: a BIBTeX .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 `BIBTEX` 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. ANNOTATIONS: **a:** `annote`—Annotations in `annote` field or in `.tex` file of `citekey` name
5. PRESENTATIONS: **b:** `pres`, `pres-bf`—Presentation, speaker bold face
6. ORDER ON VON PART : **x:** `vonx`—Sort without von part (de la Maire after Mahone)
7. AUTHOR NAMES: **a:** `nm-rev1`—Only first name reversed, initials (AGU style: Smith, J. F., H. K. Jones)
8. POSITION OF JUNIOR : *****: `jnr1st`—Junior comes last as Smith, John, Jr.
9. TYPEFACE FOR AUTHORS IN LIST OF REFERENCES: **u:** `nmft`, `nmft-def`—User defined author font (`\bibnamefont`)
10. FONT FOR FIRST NAMES : **u:** `fnm-def`—First names in user defined font (`\bibfnamefont`)
11. EDITOR NAMES IN INCOLLECTION ETC: **a:** `nmfted`—Editors in collection like authors font
12. FONT FOR 'AND' IN LIST: **r:** `nmand-rm`—'And' in normal font (JONES and JAMES)
13. FONT OF CITATION LABELS IN TEXT : **u:** `lab`, `lab-def`—User defined citation font (`\citenamefont`)
14. FONT FOR 'AND' IN CITATIONS : **r:** `and-rm`—Cited 'and' in normal font
15. LABEL WHEN AUTHORS MISSING : *****: `keyxyr`—Year blank when KEY replaces missing author (for natbib 7.0)
16. DATE POSITION: **b:** `dt-beg`—Date after authors
17. DATE FORMAT : **m:** `yr-com`—Date preceded by comma as ', 1993'

18. INCLUDE MONTHS: **m**: `aymth`—Include month in date
19. REVERSED DATE : **r**: `dtrev`—Date as year month
20. TRUNCATE YEAR : *****: `note-yr`—Year text full as 1990–1993 or ‘in press’
21. TITLE OF ARTICLE: **d**: `tit-qq`—Title and punctuation in double quotes (“Title,” ..)
22. TITLE PRESENT IN ARTICLE, INCOLLECTION, AND INPROCEEDINGS: **x**: `jtit-x`—Title is ignored
23. INPROCEEDINGS CHAPTER AND PAGES, LIKE INBOOK: **y**: `inproceedings-chapter`—produce pages after chapter just as in InBook
24. ARTICLE BOOKTITLE PRESENT: **?**: `article-booktitle`—format booktitle
25. ARTICLE SERIES PRESENT: **?**: `article-series`—article can has series
26. JOURNAL NAME FONT: **r**: `jttl-rm`—Journal name normal font
27. JOURNAL NAME WITH ADDRESS: **y**: `journal-address`—Include address field (in parentheses) along with journal name
28. BOOK TITLE FIELDS: **y**: `book-bt`—Field ‘booktitle’, or if absent field ‘title’, is book title
29. THESIS TITLE OPTIONAL: **?**: `thesis-title-o`—Title is optional: no warning issued if empty
30. TECHNICAL REPORT TITLE: **b**: `trtit-b`—Tech. report title like books
31. JOURNAL VOLUME: **b**: `vol-bf`—Volume bold as `vol(num)`
32. JOURNAL VOL AND NUMBER: **s**: `vnum-sp`—Journal vol (num) as 34 (2)
33. VOLUME PUNCTUATION: **c**: `volp-com`—Volume with comma as `vol(num), PPP`
34. PAGE NUMBERS: **f**: `jpg-1`—Only start page number
35. POSITION OF PAGES: **e**: `pp-last`—Pages at end but before any notes
36. BOOK EDITOR W/O AUTHOR: **:** `book-editor-booktitle`—Book permits empty author, produces title before editor in this case
37. INBOOK PERMITS TITLE, BOOKTITLE, AUTHOR, EDITOR: **a**: `inbook-editor-booktitle`—Allow using both title/booktitle, both author/editor
38. CONFERENCE ADDRESS FOR BOOK, INBOOK, INCOLLECTION, INPROCEEDINGS, PROCEEDINGS: **a**: `bookaddress`—Italic booktitle followed by bookaddress in roman

39. NUMBER AND SERIES FOR BOOK, INBOOK, INCOLLECTION, IN-PROCEEDINGS, PROCEEDINGS: *: **num-xser**—Allows number without series and suppresses word "number"
40. WORD NUMBER CAPITALIZED FOR NUMBER AND SERIES: **c: number-cap**—Capitalize word 'number' as: "Number 123"
41. WORD CHAPTER CAPITALIZED: **c: chapter-cap**—Capitalize word 'chapter' as: 'Chapter 42'
42. COMBINING NUMBER AND SERIES: **x: series-number**—Series number as: 'Springer Lecture Notes No. 125'
43. POSITION OF NUMBER AND SERIES: **b: numser-booktitle**—After book title and conference address, and before editors
44. VOLUME AND SERIES FOR BOOKS: **s: ser-vol**—Series, vol. 23
45. VOLUME AND SERIES FORMATTING: **y: ser-rm**—format series roman, even when used with volume
46. WORD VOLUME CAPITALIZED FOR VOLUME AND SERIES: **y: volume-cap**—Capitalize word 'volume', as: 'Volume 7 in Lecture Series'
47. POSITION OF VOLUME AND SERIES FOR INCOLLECTION, INBOOK, AND INPROCEEDINGS: **e: ser-ed**—Series and volume after booktitle and before editors
48. JOURNAL NAME PUNCTUATION: **x: jnm-x**—Space after journal name
49. PAGES IN BOOK: *: **pg-bk, book-chapter-pages**—As chapter and page: chapter 42, page 345
50. PUBLISHER IN PARENTHESES: **p: pub-par**—Publisher in parentheses
51. EMPTY PUBLISHER PARENTHESES: **y: ay-empty-pub-parens-x**—eliminate parentheses altogether if nothing inside
52. PUBLISHER POSITION: **e: pre-edn**—Edition before publisher
53. SCHOOL: **p: school-par**—school/address in parens: '(school, address)'
54. ISBN NUMBER: *: **isbn**—Include ISBN for books, booklets, etc.
55. ISSN NUMBER: *: **issn**—Include ISSN for periodicals
56. DOI NUMBER: **a: doi-link, doi**—Doi forms a link to the publication, anchored to the volume or title
57. 'EDITOR' AFTER NAMES: **a: bkedcap**—'Name Editor,' as above, editor upper case

58. EDITOR IN COLLECTIONS: **b: edby**—In booktitle, edited by .. (where .. is names)
59. PUNCTUATION BETWEEN SECTIONS : **c: blk-com**—Comma between blocks
60. FINAL PUNCTUATION: **c: fin-endsbibitem**—Command at end instead of period
61. ABBREVIATE WORD ‘PAGES’ : **a: pp**—‘Page’ abbreviated as p. or pp.
62. ABBREVIATE WORD ‘EDITORS’: **a: ed**—‘Editor’ abbreviated as ed. or eds.
63. OTHER ABBREVIATIONS: **a: abr**—Abbreviations of such words
64. ABBREVIATION FOR ‘EDITION’ : **a: ednx**—‘Edition’ abbreviated as ‘ed’
65. EDITION NUMBERS: **n: ord**—Numerical editions as 1st, 2nd, 3rd, etc
66. STORED JOURNAL NAMES: **a: jabr**—Abbreviated journal names
67. COMMA BEFORE ‘AND’: **c: and-com**—Comma even with 2 authors as ‘Tom, and Harry’
68. FONT OF ‘ET AL’: **i: etal-it**—Italic et al
69. ADDITIONAL REVTeX DATA FIELDS: **r: revdata,eprint,url,url-blk,translation**—Include REVTeX data fields collaboration, eid, eprint, archive, url, translation
70. SLACcitation FIELD: **?: SLACcitation**—Produce SLACcitation field
71. NUMPAGES DATA FIELD: ***: numpages-x**—Do not include numpages field
72. REFERENCE COMPONENT TAGS: **b: bibinfo**—Reference component tags like `\bibinfo` in the content of `\bibitem`
73. ELEMENT TAGS: **b: bibfield**—Element tags like `\bibfield` in the content of `\bibitem`
74. 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 2009-10-08 ***
%\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
% annote,,: Annotations in annote field or in .tex file of citekey name
% 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)
% 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)
% dt-beg,,: Date after authors
% yr-com,,: Date preceded by comma as ', 1993'
% aymth,,: Include month in date
% dtrev,,: Date as year month
% date-nil-x,,: If date is empty, then do not produce the surrounding punctuation (parens, brackets)
% note-yr,,: Year text full as 1990--1993 or 'in press'
% tit-qq,,: Title and punctuation in double quotes (''Title,') ..)
% inproceedings-chapter,,: produce pages after chapter, just as in InBook
% jtit-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-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
% 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
%
```

Note that `apsrmp4long.dbj` is the same as `apsrmp.dbj`, except:

- Remove `jtit-x`, `jpg-1`. This means article titles and full page range.
- Add `article-title-o`: article title is optional.

- Remove `nm-rev1`, remove `nm-revv1`. This means full author names.

32.4.1 Comparing `apsrev.bst` and `apsrmp.bst`

These two bibliographic styles differ as follows: `apsrmp.dbj` has the following guard codes, which `apsrev.dbj` does not:

- `ay`— Author-year with some non-standard interface
- `nat`— Natbib for use with natbib v5.3 or later
- `nm-rev1`— Only first name reversed, initials (AGU style: Smith, J. F., H. K. Jones)
- `keyxyr`— Year blank when KEY replaces missing author (for natbib 7.0)
- `dt-beg`— Date after authors
- `yr-com`— Date preceded by comma as ‘, 1993’
- `aymth`— Include month in date
- `dtrev`— Date as year month
- `note-yr`— Year text full as 1990–1993 or ‘in press’
- `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’

```
3193 \def\@bibstyle{apsrmp\substyle@post}%
```

```
\authoryear@sw Author-year citations: default value of \authoryear@sw is true.
```

```
3194 \@booleantrue\authoryear@sw
```

```
\cite Per Mark Doyle, \cite is mapped to \citep in RMP.
```

```
3195 \let\cite\citep
```

```
\bibpunct The following commands effectively establish the style in which \cite commands
\bibsection are formatted. You can think of them as the second needed component for the
\bibpreamble bibliography.
```

```
\newblock Set up for author-year citations: when \NAT@set@cites executes (at \begin{document}
\bibhang time), the \@biblabel will be set to \NAT@biblabel.
```

```
\bibsep
```

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.

We define the sectioning command to use when starting the bibliography.

We change `natbib`'s `\NAT@def@citea` procedure to effect more elaborate punctuation for RMP: see item 473: `\cite` order punctuation: "If possible, `\textcites` should put the word 'and' between two citations and before the last citation in a list of 3 or more."

```
3196 \appdef\setup@hook%
```

We define the punctuation to use in the `\cite` command's production.

```
3197 \bibpunct{(}{)}{;}{a}{,}{,}{,}%
```

We define the sectioning command to use when starting the bibliography.

```
3198 \def\bibsection%
```

```
3199 \expandafter\section\expandafter*\expandafter{\refname}%
```

```
3200 \@nobreaktrue
```

```
3201 }%
```

```
3202 \let\bibpreamble\empty
```

```
3203 \def\newblock{ \ }%
```

```
3204 \bibhang10\p@
```

```
3205 \bibsep\z@
```

```
3206 }%
```

`\footinbib@sw` Footnotes in bibliography are consistent only with numbered citations, and are particularly nasty under `natbib`: the package will automatically change to numbered references if any `\bibitem` commands lack the optional argument. Therefore, we must uninvoke it now, even if invoked by the document. The same is quietly done with `natbib`'s `mcite` and `compress` options.

(AO 523) I changed the code that alters `\NAT@merge` so that it will not override when `\NAT@merge` has been set to `\z@`.

```
3207 \@booleanfalse\footinbib@sw
```

```
3208 \appdef\setup@hook%
```

```
3209 \footinbib@sw%
```

```
3210 \class@warn%
```

```
3211 Footnotes in bibliography are incompatible with RMP.^^J%
```

```
3212 Undoing the footinbib option.
```

```
3213 }%
```

```
3214 \@booleanfalse\footinbib@sw
```

```
3215 }{ }%
```

```
3216 \@ifnum{\NAT@merge>\@ne}{\let\NAT@merge\@ne}{ }%
```

```
3217 \def\NAT@cmprs{\z@}%
```

```
3218 }%
```


`\eprint` RMP requires the `\eprint` field in the bib entry to be set off with the word “eprint”.

```
3219 \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.

```
3220 \def\toc@font{%
3221 \footnotesize\rmfamily
3222 \def\{\space\ignorespaces}%
3223 }%
3224 \def\ltxu@dotsep{5.5pt}%
```

`\l@section` Determine which TOC elements are automatically indented.

```
3225 \def\tocleft@{\z@}%
3226 \def\tocdim@min{5\p@}%
3227 \def\l@section{%
3228 \l@sections{section}% Implicit #3#4
3229 }%
3230 \def\l@subsection{%
3231 \l@sections{section}{subsection}% Implicit #3#4
3232 }%
3233 \def\l@subsubsection{%
3234 \l@sections{subsection}{subsubsection}% Implicit #3#4
3235 }%
3236 %\def\l@subsubsection#1#2{%
3237 \def\l@paragraph#1#2{%
3238 \def\l@subparagraph#1#2{%
```

Activate the TOC processing.

```
3239 \let\toc@pre\toc@pre@auto
3240 \let\toc@post\toc@post@auto
3241 %</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, 64
multiple preprint commands . . .	5	Defer decision until <code>\AtBeginDocument</code> time	5
print homepage	5, 17	Define three separate environments, defer assignment to <code>\AtBeginDocument</code> time. . .	5, 66
protect against hyperref revtex kludges which are not needed now	5, 17	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, 49
single space footnotes	5, 49	Move this “complex” option to the front, where it can be overridden by “simple” options. . .	5, 17
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> . . .	34	One-line caption sets flush left. . .	5
<code>\openone</code> : use font-dependent spacing	77	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, 42, 45
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, 32
<code>\ps@preprint</code> : Move after process options, so the following test works	33	Restore all media size class option of <code>_classes.dtx</code>	5
<code>\ps@titlepage</code> : multiple preprint commands	95	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	20	<code>\figurename</code> : Added localization of <code>\figuresname</code>	70
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.	43	<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>	44
Added localization of <code>\tablename</code>	5		
AO: all code for <code>10pt</code> is in this module.	5, 80		
AO: all code for <code>11pt</code> is in this module.	5, 84		
AO: all code for <code>12pt</code> is in this module.	5, 85		
AO: made <code>aps.rtx</code> part of <code>revtex4.dtx</code>	5, 89		
AO: remove duplicates	5		

<code>\printtables</code> : only execute if appropriate	46	<code>\produce@preprints</code> : (AO, 115) If three or more preprints specified, set on single line, with commas.	96
<code>\ps@preprint</code> : Defer decision until <code>\AtBeginDocument</code> time	33	<code>\ps@preprint</code> : Do not put by REVTeX in every page foot	34
<code>\ps@titlepage</code> : Stack <code>\preprint</code> args flush right at right margin.	95	Insert procedure <code>\checkindate</code>	33, 34
<code>\roarrow</code> : AO: remove duplicates	78	<code>\ps@titlepage</code> : Insert procedure <code>\checkindate</code>	95
<code>\showKEYS@sw</code> : New option	16		
<code>\tablename</code> : Added localization of <code>\tablename</code>	70		
4.0c		4.0d	
<code>@appendixcntformat</code> : (AO, 129) section* within appendix was producing appendixname	101	General: Also alter how lists get indented.	5
<code>@makecaption</code> : Prevent an inner footnote from performing twice	43	But alternative spelling is deprecated.	5, 39
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, 39	New option	5
Do not put by REVTeX in every page foot	5	<code>\open@column@two</code> : Also alter how lists get indented.	65
grid changes via ltxgrid procedures	5	<code>\preprint@sw</code> : New option	17
grid changes with ltxgrid	5, 67, 109	<code>\printtables</code> : make longtable trigger the head, too	46
Insert procedure <code>\checkindate</code>	5	<code>\url</code> : eprint takes an optional argument, syntactical only in this case.	72
Lose compatability mode.	5, 13	4.0e	
New ltxgrid-based code, other bug fixes	5	General: adornments above and below.	5
New option “checkin”	5, 15	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	67	<code>widetext@grid</code> : adornments above and below.	67
<code>\frontmatter@abstractfont</code> : (AO, 123) add parskip to the abstract.	92	<code>\showKEYS@sw</code> : New option showkeys	16
<code>widetext@grid</code> : grid changes via ltxgrid procedures	67		
<code>\open@column@two</code> : Grid changes with ltxgrid	65		
<code>\printfigures</code> : *-form mandates pagebreak	44		
<code>\printtables</code> : *-form mandates pagebreak	46		

4.0f	General: Last bug fixes before release.	5		
4.0rc1	General: grid changes with push and pop	5, 109		
	Running headers always as if two-sided	5		
	<code>\bibsection</code> : grid changes with push and pop	108		
	<code>\ps@preprint</code> : Running headers always as if two-sided	33		
4.0rc4	General: hyperref is no longer loaded via class option: use a usepackage statement instead	5, 17		
4.1a	<code>\@endnotesinbibliography</code> : (AO, 457) Endnotes to be sorted in with numerical citations.	61		
	<code>\@endnotetext</code> : (AO, 457) Endnotes to be sorted in with numerical citations.	59, 111		
	<code>\@makecaption</code> : (AO, 460) “Proper style is ”FIG. 1. ...” (no colon)”	43		
	<code>\@xendnote</code> : (AO, 457) Endnotes to be sorted in with numerical citations.	58		
	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, 99		
	(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, 30		
	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.	21, 108, 127		
	<code>\bibliography</code> : (AO, 457) Endnotes to be sorted in with numerical citations.	54		
	<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.	108		
	<code>\paperwidth</code> : (AO, 478) <code>\ds@letterpaper</code> , so that “letterpaper really is the default”	18		
	<code>\set@firstnote</code> : (AO, 451) “Cannot have more than 256 cites in a document”	61		
	<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.)	129		
4.1b	<code>\@appendixcntformat</code> : Add <code>\@changefroms@section</code>	120		
	<code>\@makecaption</code> : Break out <code>\@caption@fignum@separ</code>	120		
	<code>\@parse@class@options@</code> : Procedures <code>\@parse@class@options@society</code> and <code>\@parse@class@options@journal</code> and friends	30		
	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		
	(AO) No longer use <code>\secnumarabic@sw</code> , instead use <code>\setup@secnums</code>	5, 23		
	(AO) Provide more diagnostics when <code>\@society</code> is assigned.	5		
	(AO) Structure the Abstract using the <code>\bibliography</code> environment	5, 38		
	(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, 17, 116, 118	<code>\balancelastpage@sw</code> : (AO) make settings at class time instead of deferring them to later.	16
(AO) provide option longbibliography	5, 20	<code>\byrevtex@sw</code> : (AO) make settings at class time instead of deferring them to later.	28
(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, 119	<code>\draft@sw</code> : (AO) make settings at class time instead of deferring them to later.	23
Add option reprint, opposite of preprint, and preferred alternative to <code>twocolumn</code>	5	<code>\floatp@sw</code> : (AO) make settings at class time instead of deferring them to later.	24
As with author formatting, rag the right more, and assign <code>\@totalleftmargin</code> . Also neutralize <code>\def@after@address</code>	5	<code>\footinbib@sw</code> : (AO) make settings at class time instead of deferring them to later.	19
Break out <code>\@caption@fignum@sep</code>	5	<code>\force@deferlist@sw</code> : (AO) make settings at class time instead of deferring them to later.	28
Class option galley sets <code>\preprintsty@sw</code> to false	5	<code>\frontmatter@abstractfont</code> : (AO, 455) Be nice to a list within the abstract (assign <code>\@totalleftmargin</code>).	117
Code relating to new syntax for frontmatter has been placed in <code>□ ltxfront.dtx</code>	5, 28	<code>\frontmatter@affiliationfont</code> : (AO, 455) Be nice to a list within the abstract (assign <code>\@totalleftmargin</code>).	116
Package <code>textcase</code> is now simply a required package	5	As with author formatting, rag the right more, and assign <code>\@totalleftmargin</code> . Also neutralize <code>\def@after@address</code>	116
Procedures <code>\@parse@class@options@society</code> and <code>\@parse@class@options@journal</code> and friends	5	<code>\frontmatter@authorformat</code> : (AO, 455) Be nice to a list within the abstract (assign <code>\@totalleftmargin</code>).	116
Rag the right even more: <code>.8\hsize</code> . Also, assign <code>\@totalleftmargin</code>	5	Rag the right even more: <code>.8\hsize</code> . Also, assign <code>\@totalleftmargin</code>	116
Read in all required packages together	5	<code>\frontmatter@footnote@produce</code> : (AO) Implement <code>\bibnotes@sw</code> through <code>\frontmatter@footnote@produce</code> instead of <code>\bibnotes@sw</code>	18
Remove options <code>newabstract</code> and <code>oldabstract</code>	5, 29	<code>\frontmatter@RRAP@format</code> : (AO, 455) Be nice to a list within the abstract (assign <code>\@totalleftmargin</code>).	117
Section numbering via procedures <code>\secnums@rtx</code> and <code>\secnums@arabic</code>	5, 118	<code>\frontmatter@verbose@sw</code> : Code relating to new syntax for front-	
The <code>rmp</code> journal substyle selects <code>groupedaddress</code> by default.	5, 116		
The <code>csname</code> substyle@ext is now defined without a dot (<code>.</code>), to be compatible with <code>L^AT_EX</code> usage (see <code>@clsextension</code> and <code>@pkgextension</code>).	5, 31		
Use <code>\setup@hook</code> to initialize all.	5, 118		
<code>\altaffilletter@sw</code> : (AO) make settings at class time instead of deferring them to later.	19		

matter has been placed in <code>\ltxfront.dtx</code>	29	4.1c	<code>\twoside@sw</code>	20
<code>\galley@sw</code> : Class option galley sets <code>\preprintsty@sw</code> to false	22		<code>\@bibstyle</code> : Document class option longbibliography via <code>\substyle@post</code>	127
<code>\lengthcheck@sw</code> : (AO) make settings at class time instead of deferring them to later.	22		General: Document class option longbibliography via <code>\substyle@post</code>	5
<code>\MakeLowercase</code> : Package textcase is now simply a required package	26	4.1d	<code>\@fnsymbol</code> : Definition of <code>\@fnsymbol</code> follows fixltx2e.sty	91
Read in all required packages together	26		General: Definition of <code>\@fnsymbol</code> follows fixltx2e.sty	5
<code>amsmath</code> : Read in all required packages together	26	4.1e	General: (AO, 455) be nice to a list within the abstract	5
<code>amsmath</code> : Read in all required packages together	26		<code>\frontmatter@abstractfont</code> : (AO, 455) be nice to a list within the abstract	92
<code>amssymb</code> : Read in all required packages together	26	4.1f	<code>\@endnotesinbibliography</code> : (AO, 520) Automatically produce <code>\bibliography</code> command when needed	61, 62
<code>\place@bibnumber</code> : (AO) make settings at class time instead of deferring them to later.	19		<code>\@fnsymbol</code> : (AO, 530) <code>\@fnsymbol</code> : Failed to import fixltx2e.sty technology. Return to LaTeX core.	91
<code>\preprint@sw</code> : (AO) make settings at class time instead of deferring them to later.	17		General: (AO, 513) Add class option <code>linenumbers</code> : number the lines a la revtex4-1.dtx <code>lineno.sty</code>	5
<code>\preprintsty@sw</code> : Add option reprint, opposite of preprint, and preferred alternative to <code>twocolumn</code>	16		(AO, 516) Merged references are separated with a semicolon	5, 54
<code>\raggedcolumn@sw</code> : (AO) make settings at class time instead of deferring them to later.	22		(AO, 520) Automatically produce <code>\bibliography</code> command when needed	5
<code>\revsymb@inithook</code> : (AO) make settings at class time instead of deferring them to later.	80		(AO, 521) Lonely bibliography head	5
<code>\rtx@require@packages</code> : Read in all required packages together	25		(AO, 522) Warn if software is expired	5, 76
<code>\super@cite@let</code> : (AO) No longer need to test <code>\chapter</code> as of <code>natbib</code> version 8.2	57		(AO, 523) Add class option <code>nomerge</code> , to turn off new <code>natbib</code> 8.3 syntax	5
<code>\tightenlines@sw</code> : (AO) make settings at class time instead of deferring them to later.	22		(AO, 524) Makes no sense if citations are superscript numbers and so are footnotes	5, 114
<code>\titlepage@sw</code> : (AO) make settings at class time instead of deferring them to later.	24		(AO, 530) <code>\@fnsymbol</code> : Failed to import fixltx2e.sty technology. Return to LaTeX core.	5
<code>\twocolumn@sw</code> : (AO) make settings at class time instead of deferring them to later.	21			
<code>\twoside@sw</code> : (AO) coordinate <code>\if@twoside</code> with				

<code>\auto@bib:</code> (AO, 520) Automatically produce <code>\bibliography</code> command when needed	62		
<code>\footinbib@sw:</code> (AO, 523) Add class option <code>nomerge</code> , to turn off new <code>natbib</code> 8.3 syntax	128		
<code>\linenumbers@sw:</code> (AO, 513) Add class option <code>linenumbers</code> : number the lines a la <code>revtex4-1.dtx</code> <code>lineno.sty</code>	29		
<code>\NAT@merge:</code> (AO, 523) Add class option <code>nomerge</code> , to turn off new <code>natbib</code> 8.3 syntax	29		
<code>\notesname:</code> (AO, 520) Automatically produce <code>\bibliography</code> command when needed	69		
<code>\present@bibnote:</code> (AO, 521) Lonely bibliography head . . .	54		
<code>\printendnotes:</code> (AO, 520) Automatically produce <code>\bibliography</code> command when needed	60		
		4.1g	
		General: (AO, 525) Remove phantom paragraph above display math that is given in vertical mode	5
		(AO, 538) <code>\MakeTextUppercase</code> inappropriately expands the double backslash	5
		<code>widetext@grid:</code> (AO, 525) Remove phantom paragraph above display math that is given in vertical mode	67
		<code>\MakeLowercase:</code> (AO, 538) <code>\MakeTextUppercase</code> inappropriately expands the double backslash	26
			4.1h
		General: (AO) Remove expiry code in the release software	5, 76

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